



Screening Report Red River Floodway Expansion Project

Prepared for
Infrastructure Canada

Submitted by
Gartner Lee Limited
Falk Environmental Inc.

May 2005

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Prepared for
Infrastructure Canada

In association with
Falk Environmental Inc.

May 2005

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Distribution:

- 1 Infrastructure Canada**
- 1 Gartner Lee Limited**
- 1 Falk Environmental Inc.**

Completion of the Screening Report of the Proposed Red River Floodway Expansion Project

A screening of the proposed Red River Floodway Expansion Project (the Project) has been conducted in accordance with the *Canadian Environmental Assessment Act* (the Act). This assessment is required pursuant to section 5 of the Act, before the responsible authorities, Infrastructure Canada, Fisheries and Oceans Canada and Transport Canada, can respectively provide financial assistance or issue an approval under the *Fisheries Act* or *Navigable Waters Protection Act* that would enable the Project to proceed.

The scope of the Project that has been assessed includes: expanding the existing floodway channel, modifying the existing West Dyke and East Embankment, enlarging the existing Floodway Outlet Structure, improving the existing Inlet Control Structure, modifying the existing Seine River Syphon and City of Winnipeg Aquaducts, modifying or replacing rail and highway bridges, electrical transmission lines and miscellaneous infrastructure crossings of the existing Floodway Channel, fortifying riverbank protection and replacing or modifying culverts and drainage structures in select locations, and associated works.

In accordance with subsection 18(3) of the Act, the responsible authorities are making the Screening Report and other assessment documents available for public review and comment before they determine a course of action in respect of the Project.

Copies of the Screening Report, in both official languages, are also available for review during normal business hours in the public registries maintained by Manitoba Conservation at the following locations beginning May 20, 2005:

Conservation and Environment Library
Main Floor, 123 Main St
Winnipeg

Centennial Public Library
251 Donald St
Winnipeg

Legislative Library
200 Vaughan St
Winnipeg

Manitoba Eco-Network
2nd Floor, 70 Albert St
Winnipeg

Selkirk & St. Andrews Regional Library
303 Main St
Selkirk

Jake Epp Public Library
255 Elmdale St
Steinbach

An electronic version of the Screening Report can be found at the Canadian Environmental Assessment Registry website:

http://www.ceaa.gc.ca/050/Viewer_e.cfm?SrchPg=1&CEAR_ID=5146

The entire federal public registry for the Project can be reviewed by contacting the Prairie Office of the Canadian Environmental Assessment Agency, as detailed at the end of this notice.

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Written comments, in either official language, are invited. **The deadline for the receipt of public comments is: 5:00 pm on June 22, 2005.** Comments received will be placed on the public registry for the Project.

Please direct any comments or enquiries to:

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The Screening Report and comments received from the public prior to the deadline will be taken into consideration before the responsible authorities take a course of action on this Project.

Executive Summary

The Manitoba Floodway Authority (MFA) and the Government of Manitoba are proposing to expand and operate the Red River Floodway, located adjacent to the City of Winnipeg in southern Manitoba. As an integral component of Manitoba's flood protection system, the Floodway is designed to divert flood waters around the City of Winnipeg. The existing Floodway was constructed between 1962 and 1968 and potentially protects Winnipeg from a flood of a 1 in 90 year return period.

The Project involves the expansion of the hydraulic capacity of the existing Floodway to increase Winnipeg's reliable security against floods up to a magnitude of 1 in 700 year return period. Expansion of the hydraulic capacity is proposed to be achieved through the widening of the existing Floodway Channel and by modifying various other associated bridges and infrastructure. The Project includes:

- o Expansion of the existing floodway channel;
- o Restoration armouring of the low flow channel;
- o Expansion of the opening in the East Embankment on the east side of Grande Pointe;
- o Increasing the freeboard of the existing West Dyke;
- o Replacing 7 and rehabilitating 6 bridges over the existing floodway channel;
- o Enlarging the existing Outlet Structure;
- o Fortifying and protecting the riverbank at and downstream of the Outlet Structure;
- o Replacement/rehabilitation of 7 drains along the east bank of the floodway channel;
- o Modifications to the Seine River Syphon;
- o Modifications to the City of Winnipeg aqueducts crossing the floodway channel;
- o Extending a number of electrical transmission lines that cross the floodway channel;
- o Replacing a number of miscellaneous infrastructure crossings of the floodway channel;
- o Improving the existing Inlet Control Structure, and
- o Ancillary works such as construction staging areas, modifying and replacing culverts.

The Government of Manitoba has established the Manitoba Floodway Authority and has charged it with the responsibility to design and construct the project, and to own and maintain the Province's Floodway assets. Operation of the Floodway after the expansion will continue to be the responsibility of Manitoba's Water Stewardship Department.

The Government of Canada has announced the contribution of \$120 million in funding towards the expansion of the Red River Floodway. Funds would be provided through the Canada Strategic Infrastructure Fund. Additional federal contributions may also be provided at a later date. Infrastructure Canada (INFC), having identified that it may provide funding to enable the project to be carried out, Fisheries and Oceans Canada (DFO) having determined that the project would cause habitat losses requiring an authorization under subsection 35(2) of the *Fisheries Act* and Transport Canada (TC) having determined that the Project will require the issuing of a formal approval

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under the *Navigable Waters Protection Act* are required to ensure that an environmental assessment be completed in accordance with the requirements of the *Canadian Environmental Assessment Act* (CEAA), prior to providing the funding or issuing the authorizations or approvals.

The Project also requires a license under the Province of Manitoba *Environment Act* and thus Manitoba is required to conduct an environmental assessment of the project. Given the need for both the federal and provincial governments to conduct an environmental assessment of the Project and given that Canada and Manitoba signed the Canada-Manitoba Agreement on Environmental Assessment Cooperation on May 8, 2000, Canada and Manitoba agreed that a cooperative environmental assessment, led by Manitoba would be undertaken for the Project. In accordance with the cooperative environmental assessment process, the federal departments with responsibilities under the CEAA have developed this screening report, consistent with the requirements of the federal Act and in consultation with other federal departments and agencies (Environment Canada, Health Canada, Natural Resources Canada, Parks Canada, Public Works and Government Services, Indian Affairs and Northern Development, Canadian Environmental Assessment Agency and the Canadian Transportation Agency).

This report fulfills Infrastructure Canada's, Fisheries and Oceans Canada's and Transport Canada's obligations as responsible authorities under the CEAA. The report presents the results of the assessment of the effects of the Project on the environment, in accordance with the requirements of CEAA. This assessment has considered the effects of the Project on the Physical Environment (water regime, groundwater, erosion and sedimentation, drainage, ice processes, climate, air quality and noise, physiography and soils); the Aquatic Environment (surface water quality, fish and clam populations and aquatic species at risk); the Terrestrial Environment (vegetation, wildlife and wildlife habitat and plant and animal species at risk); the Socio-economic Environment (resource use, economy, infrastructure and services, health, personal, family and community life); and navigation. The assessment also considered the effects caused by potential accidents and malfunctions, effects of the environment on the Project and the cumulative effects that the project, combined with other projects or activities is likely to have on the environment.

The assessment outlines and considers the measures proposed by the MFA to mitigate any adverse environmental effects caused by the Project, as well as the monitoring and follow-up programs proposed by the MFA. Throughout the EIS and Supplemental Filings, the MFA have proposed the development of a range of plans for mitigating, monitoring and follow-up, as a means of ensuring that the adverse effects associated with the Project are properly addressed. In order to ensure that these plans are developed in a comprehensive and coordinated way, that they achieve the results desired and that the responsible and federal authorities are able to review and respond to the plans in a timely way, the responsible authorities will require the MFA to develop an overall environmental management plan (EMP) for the Project. The purpose of the EMP will be to describe how all of the environmental commitments (including but not

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limited to mitigation, monitoring and follow-up) outlined in this screening report, the EIS, Supplemental Filings and other documents provided by the MFA will be met during all phases of the Project. The EMP will identify roles and responsibilities for ensuring that the EMP and its component parts are developed and completed and for ensuring the implementation of the required management actions to address potential adverse effects. The EMP will also identify an overall action plan for the preparation and submission of the required plans and other documents for review and approval. This action plan shall incorporate sufficient time for responsible authorities and appropriate federal authorities to review and discuss the plans with the MFA and other stakeholders as appropriate.

The responsible authorities consider that the approach to environmental protection must also include appropriate oversight during construction of the Project. Such oversight will help to ensure that mitigation measures are implemented according to plan and timely action can be taken to address unforeseen or unexpected situations during construction. The MFA will be required to develop an Environmental Inspection Plan, as a component of the Environmental Management Plan. The Environmental Inspection Plan shall outline in sufficient detail to demonstrate adequacy and effectiveness, how during the construction phase of the Project, the MFA intends to ensure compliance with the various environmental commitments outlined in this screening report, the EIS, Supplemental Filings and other documents submitted.

An important element of the overall environmental management plan for the Project will be the ongoing reporting of environmental performance. This reporting will provide responsible authorities and other interested stakeholders with a level of confidence that the effects predictions contained in this screening report and in the MFA's submissions were accurate, that the mitigation measures proposed are effective.

Considering the proposed mitigation measures and follow-up program, the commitments made by the MFA and the additional measures required by the responsible authorities, Infrastructure Canada, Fisheries and Oceans Canada and Transport Canada, have found that the proposed project, as defined in the scope of the project, is not likely to cause significant adverse environmental effects.

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- A. Guidelines for the Preparation of an Environmental Impact Statement For the Red River Floodway Expansion Project**
- B. Summary of Public and Agency Comments – EIS, Supplemental Filing and CEC Hearings**
- C. Summary of Mitigation/Compensation/Follow-up and Reporting Requirements**

1. Introduction

1.1 The Project

The Manitoba Floodway Authority (MFA) and the Government of Manitoba are proposing to expand and operate the Red River Floodway, located adjacent to the City of Winnipeg in southern Manitoba. The existing Floodway, constructed between 1962 and 1968 and located on the east side of the City of Winnipeg, protects the City of Winnipeg to a flood of a 1 in 90 year return period. The proposed Red River Floodway Expansion Project (the Project) is intended to increase Winnipeg's reliable security against floods up to a magnitude of 1 in 700 years (Manitoba Floodway Authority, 2004).

The existing Floodway is aligned in a general north-south direction, with a length of approximately 48 km (29.5 miles) from its inlet south of St. Norbert to its outlet north of Lockport (Figure 1). The Project involves an expansion of the hydraulic capacity of the existing Floodway, by widening the existing floodway channel and by modifying various associated bridges and other infrastructure. As an integral component of Manitoba's overall flood protection system, the Floodway is designed to divert flood waters around the City of Winnipeg (Manitoba Floodway Authority, 2004a).

The Government of Manitoba has established the MFA and has vested it with the responsibility to design and construct the Project, and to own and maintain the Province's Floodway assets. Operation of the Floodway after the expansion will continue to be the responsibility of Manitoba's Water Stewardship Department (Manitoba Floodway Authority, 2004a). The MFA is the proponent of the project for the purposes of this environmental assessment.

1.2 Environmental Assessment Requirements

On April 3, 2003 the Government of Canada and the Province of Manitoba announced that they would each contribute \$80 million towards the expansion of the Red River Floodway. Infrastructure Canada subsequently committed an additional \$40 million, for a total federal contribution of \$120 million. Additional federal contributions to the Project may be provided at a later date.

Federal funds are being provided through the Canada Strategic Infrastructure Fund. The Project matches the description of a physical work set out in the *Canadian Environmental Assessment Act* (CEAA or the federal Act) and, in combination with the decision to fund the Project, it requires that an environmental assessment be completed in accordance with the requirements of the federal Act. The CEAA also requires that a determination be made that the Project is unlikely to cause significant adverse environmental effects taking into account the

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implementation of required mitigation measures prior to the funds being released. Infrastructure Canada (INFC), having identified that it may provide funding to enable the project to be carried out, is a responsible authority under the federal Act. The Department of Fisheries and Oceans (DFO) may have statutory responsibilities pursuant to subsection 35(2) of the *Fisheries Act* with respect to some portions of the Project and is therefore also a responsible authority. Transport Canada has also identified that approvals under the *Navigable Waters Protection Act* will likely be required for the Project and is also likely to be a responsible authority.

On August 6, 2003, the Manitoba Floodway Authority (MFA) filed a Proposal under *The Environment Act* with the Environmental Approvals Branch of Manitoba Conservation, initiating the provincial environmental assessment process. The Project is a Class 3 development in the *Classes of Development Regulation* under *The Environment Act* (the provincial Act). As such, the Project requires a license under the provincial Act prior to the commencement of its construction and operation (Project Administration Team, 2004).

Given the need for both the federal and provincial governments to conduct an environmental assessment of the Project and given that Canada and Manitoba signed the *Canada-Manitoba Agreement on Environmental Assessment Cooperation* on May 8, 2000, Canada and Manitoba agreed that a cooperative environmental assessment, led by Manitoba, would be undertaken for the Project. Canada and Manitoba agreed to cooperate in the environmental assessment process in a manner that meets the regulatory requirements of both parties (Project Administration Team, 2004). As a result, a federal-provincial Project Administration Team¹ and a Technical Advisory Committee² were established for the Project.

In July 2004, the Project Administration Team released a document entitled “Cooperative Environmental Assessment Process Concerning the Red River Floodway Expansion Project”. The document sets out the steps to be taken to ensure the cooperative administration of the environmental assessment of the Project. The steps taken in the cooperative environmental assessment are described in Chapter 2 of this screening report.

In accordance with the cooperative environmental assessment process, the federal departments with responsibilities under the CEAA have developed this screening report, consistent with the requirements of the federal Act.

¹ Project Administration Team (PAT) – pursuant to the Cooperative Agreement, means a “team made up of senior representatives with an environmental assessment responsibility for a project”. PAT is responsible for making required decisions during the administration of the cooperative environmental assessment for the Project.

² Technical Advisory Committee (TAC) – means an advisory committee to the PAT consisting of members representing provincial and federal departments and agencies that contribute to the cooperative environmental assessment.

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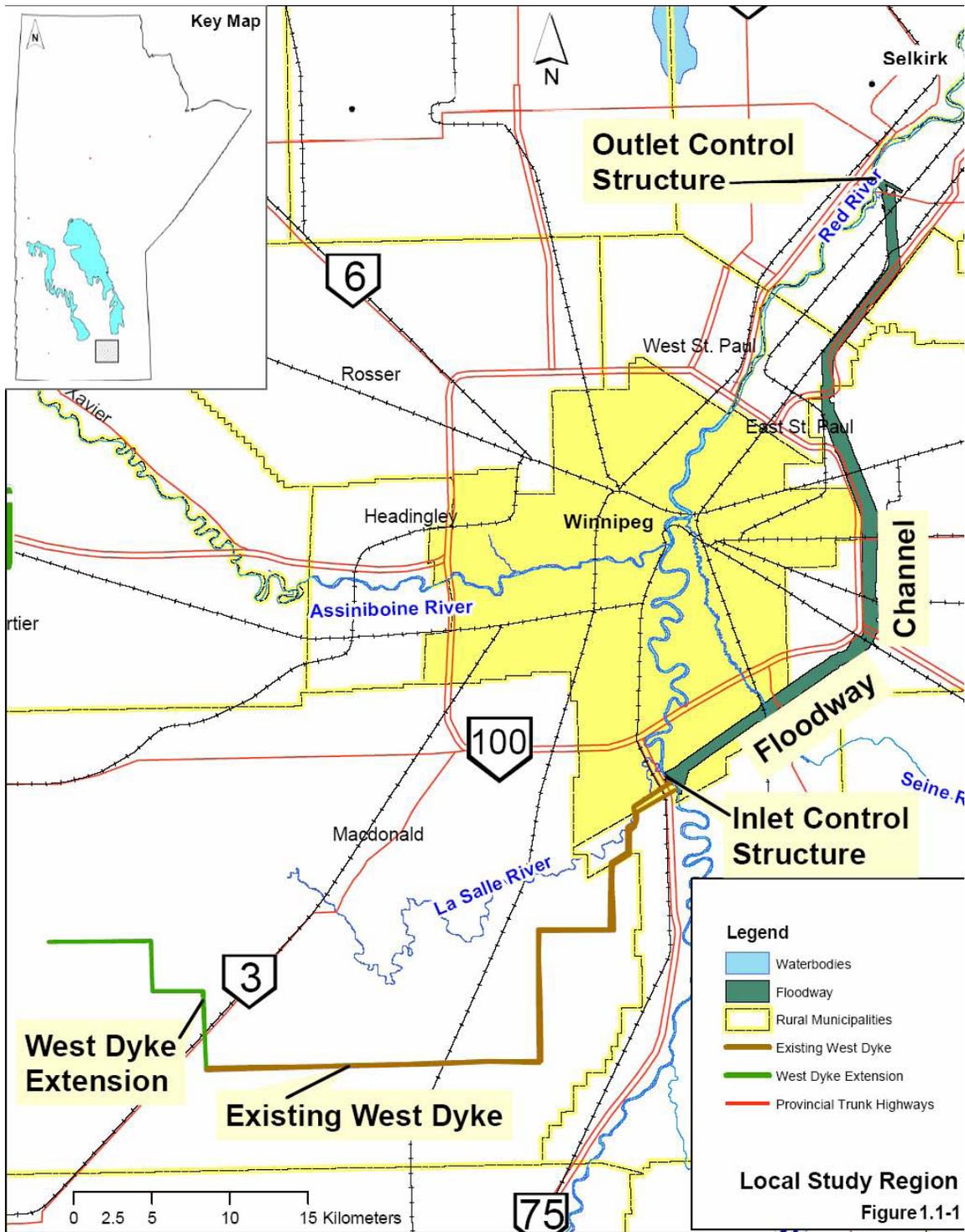


Figure 1. Project Location

1.3 Report Organization

This screening report documents the results of the federal environmental assessment of the Project. The report is organized in the following manner:

Introduction

Background information on the Project is provided. The purpose of this environmental assessment and its relationship to the cooperative environmental assessment process is outlined and the report organization is described.

Environmental Assessment Process

The process for developing this screening level environmental assessment report is described. The nature of federal involvement, including the federal decisions expected in relation to the Project, is also outlined.

Scope

The scope of the Project and environmental assessment, as established by the responsible authorities, is described. The scope is described in accordance with the requirements of the CEAA.

Project Description

The Project is described in both general and specific terms. Project need, purpose and alternatives are also described. For the purposes of the environmental assessment, the Project is subdivided into phases, components and activities.

Environment Description

The existing environment is described in both general and specific terms. For the purposes of the environmental assessment, the environment is subdivided into physical, aquatic, terrestrial, socio-economic and heritage resource components and attributes.

Public Consultation

The public consultation program that has been carried out in conjunction with the environmental assessment of the Project is described. The nature of and results from the consultation activities are presented. Comments received during the review of the Project are summarized.

Aboriginal Communications and Consultation

The communication and consultation activities that have been carried out with aboriginal people in conjunction with the environmental assessment of the Project are described. The nature of and results from the discussions are presented. Comments received during the review of the Project are summarized.

Summary of Environmental Effects Analysis

The potential environmental effects of the Project are identified. Measures to mitigate those effects are identified and considered, follow-up³ requirements are described and the potential significance of any residual effects are identified and evaluated.

Summary of Mitigation Measures and Follow-up Actions

Measures to mitigate adverse environmental effects of the Project and activities required for follow-up purposes are described and summarized.

Conclusion

The responsible authorities' conclusions on the significance of any residual environmental effects from the Project are presented.

³ Follow-up Program- As defined in the *Canadian Environmental Assessment Act*, means a program for verifying the accuracy of the environmental assessment of a project and determining the effectiveness of any measures taken to mitigate the adverse environmental effects of the project.

2. Environmental Assessment Process

2.1 Introduction

This environmental assessment screening report on the proposed Red River Floodway Expansion Project has been prepared to address the requirements of CEAA, following a cooperative environmental assessment process led by the Province of Manitoba. The cooperative process was conducted in accordance with the *Canada-Manitoba Agreement on Environmental Assessment Cooperation* (Government of Canada and Government of Manitoba, 2000) and as described in the document “*Cooperative Environmental Assessment Process Concerning the Red River Floodway Expansion Project, July 2004*”. Key features of the Canada-Manitoba Agreement include:

- An intent to meet the environmental assessment obligations of each jurisdiction through the cooperative process.
- The identification of the Province as the lead party for proposed projects within its provincial boundary and not on federal land;
- The coordination of information requirements;
- Provision for either party to seek additional information if required, and
- The opportunity to coordinate the announcement of each jurisdiction’s respective decisions.

2.2 Canadian Environmental Assessment Act

The *Canadian Environmental Assessment Act* (CEAA) identifies responsibilities and procedures for the assessment of projects that involve the federal government. Given that the Project, as described by the MFA, meets the definition of a project contained in the CEAA and the Government of Canada has agreed to provide financial assistance to the proponent and is likely to exercise regulatory duties (i.e. issuing licenses, permits or approvals for the Project or components thereof) that are included in the *Law List Regulations* under the federal Act for the purpose of enabling the Project to be carried out, the environmental assessment process provided in the CEAA applies. The project is not of a type that is described in the *Comprehensive Study List Regulations*. Therefore, the Project is subject to the screening provisions of that federal Act.

Financial assistance is being provided for the Project by Infrastructure Canada through the Canada Strategic Infrastructure Fund. It is likely that authorizations under the *Fisheries Act* (Department of Fisheries and Oceans) and permits under the *Navigable Waters Protection Act* (Transport Canada) will be also be required. The Department of Fisheries and Oceans and Transport Canada participated in the assessment as responsible authorities for those aspects of the Project for which they might respectively issue authorizations under the *Fisheries Act* and

the *Navigable Waters Protection Act* and which trigger CEAA. In accordance with the provisions of the CEAA, Infrastructure Canada, the Department of Fisheries and Oceans, and Transport Canada are responsible authorities. As such, these authorities are required to ensure that an environmental assessment of the proposed Project is carried out in accordance with the CEAA.

The Department of Fisheries and Oceans and Transport Canada also provided specialist or expert advice to Infrastructure Canada in relation to fish and fish habitat and to navigation, navigation safety and rail safety respectively for those aspects of the Project for which they are not triggered under CEAA. Other federal authorities possessing specialist or expert information or knowledge in relation to the Project have also participated in the environmental assessment process, including the Canadian Transportation Agency, Canadian Environmental Assessment Agency, Environment Canada, Health Canada, Natural Resources Canada, Parks Canada Agency, and Public Works and Government Services Canada.

2.3 Federal Participation in the Cooperative Environmental Assessment Process

Consistent with the Canada-Manitoba Agreement on Environmental Assessment Cooperation, Manitoba established and chaired a Project Administration Team (PAT). Membership on the PAT included representatives from Infrastructure Canada, the Department of Fisheries and Oceans, Transport Canada and the Canadian Environmental Assessment Agency. The PAT was responsible for making required decisions during the administration of the cooperative environmental assessment process for the proposed Project.

The Cooperative Environmental Process Concerning the Red River Floodway Expansion Project (Government of Canada and Government of Manitoba, 2004) describes the steps and activities undertaken to complete the cooperative environmental assessment. Figure 2 illustrates these steps. The cooperative process ensured that federal departments and agencies were directly involved in the key steps in the process (primarily through the activities of the PAT and the Technical Advisory Committee (TAC). Federal members of the PAT included Infrastructure Canada, the Department of Fisheries and Oceans Canada, Transport Canada and the Canadian Environmental Assessment Agency. Table 1 outlines the key milestones in the cooperative process.

2.4 Clean Environment Commission Public Hearing

On January 14 2005, the Chair of PAT wrote to the Chair of the Manitoba Clean Environment Commission (CEC), encouraging the CEC to convene a public hearing on the Project at the earliest opportunity.

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The CEC initiated its public hearing process on February 14, 2005. The CEC process was conducted over 16 hearing days, concluding on March 10, 2005. Weekly summaries of the proceedings were posted on the Commission web site. Information provided through the CEC hearing process has been considered in the development of this screening report.

2.5 Development of the Federal Environmental Assessment Screening Report

A key purpose of the cooperative environmental assessment process was the development of the information necessary to meet the requirements of the CEAA. Subsequent to the Chair of PAT referring the Project to the CEC, the responsible authorities wrote to the MFA indicating that there were outstanding information requirements in relation to comments provided by the responsible and federal authorities on both the EIS and Supplementary Filings. The responsible authorities requested that this information be provided so that the screening could be completed in a timely manner. The MFA submitted additional information in response to the request on April 21, 2005.

Table 1. Key Milestones in the Environmental Assessment Process	
Submission of an <i>Environment Act</i> Proposal (Project Description)	August 2003
Development of draft Environmental Impact Statement (EIS) Guidelines by the PAT	August 2003
TAC and public review of the draft EIS Guidelines	October 2003
PAT review and disposition of TAC and public comments on the draft EIS Guidelines	February 2004
Release of final EIS Guidelines by the PAT	February 2004
Submission of the EIS by the Manitoba Floodway Authority (MFA)	August 2004
TAC and public review of the EIS submitted by the MFA	October 2004
PAT review and disposition of public comments on the EIS	October 2004
PAT request for supplemental information	November 2004
Submission of the Supplemental Filings by the MFA	November and December 2004
TAC and public review of the Supplementary Filings	January 2005
Chair of PAT recommends Manitoba Clean Environment Commission (CEC) proceed with a Public Hearing	January 2005
Federal departments request further information	February 2005
CEC Public Hearing commences	February 2005
CEC Public Hearing concludes	March 2005
MFA submits additional information in response to RA request	April 2005
Public review of the Federal Screening Report	May/June 2005

Table 1. Key Milestones in the Environmental Assessment Process	
CEC report submitted to provincial Minister of Conservation	May/June 2005
Federal environmental assessment decision	Expected mid-2005
Coordinate announcements of federal and provincial environmental assessment decisions	Expected mid-2005

In late February 2005, the responsible authorities and the MFA met to discuss how the information required for the completion of the screening report would be obtained and provided by the MFA. Subsequent meetings were held during March and April 2005 to discuss the information provided. Responsible authorities incorporated the additional information received from the MFA into the screening report. All information provided by the MFA was also placed on the public registry for the Project, as required under the CEAA.

2.6 Post Screening Determination

Responsible authorities completed the screening report in late May 2005 and released the report for a 30-day public comment period ending in late June 2005. Following receipt and consideration of public comments, responsible authorities will make their respective decisions under Section 20 of CEAA, taking into account the screening report and comments received from the public. Section 20 of CEAA provides responsible authorities with the following courses of action in respect of a project after taking into consideration the screening report and any public comments filed pursuant to subsection 18(3) of CEAA:

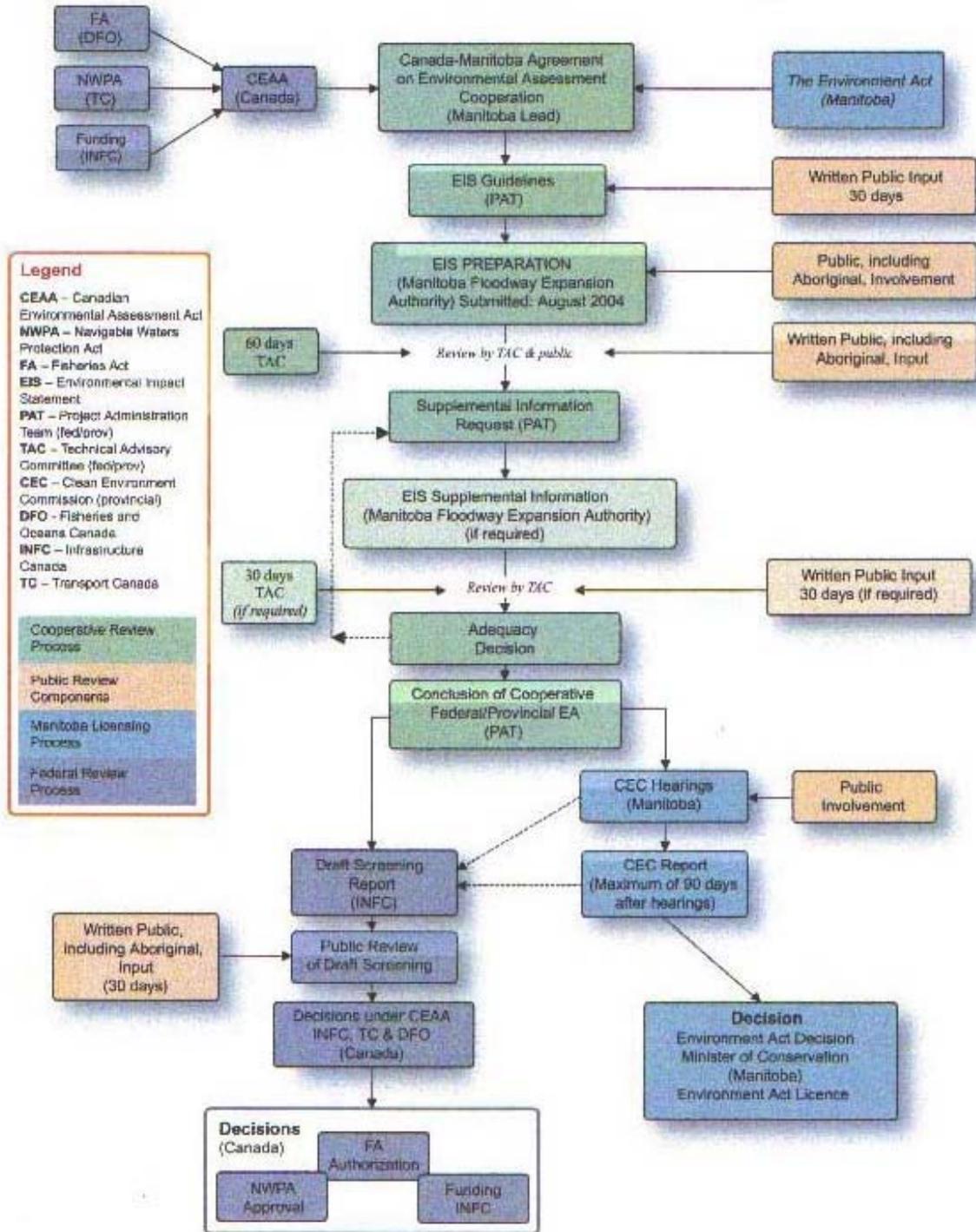
“(a) Subject to subparagraph (c)(iii), where, taking into account the implementation of any mitigation measures that the responsible authority considers appropriate, the project is not likely to cause significant adverse environmental effects, the responsible authority may exercise any power or perform any function that would permit the project to be carried out and shall ensure that any mitigation measures that the responsible authority considers appropriate are implemented;

(b) where, taking in to account the implementation of any mitigation measures that the responsible authority considers appropriate, the project is likely to cause significant adverse environmental effects that cannot be justified in the circumstances, the responsible authority shall not exercise any power, duty or function conferred on it by or under any Act of Parliament that would permit the project to be carried out in whole or in part; or

(c) where

- (i) it is uncertain whether the project, taking into account the implementation of any mitigation measures that the responsible authority considers appropriate, is likely to cause significant adverse environmental effects,

Figure 2. Cooperative Environmental Assessment and Licensing Process



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- (ii) the project, taking into account the implementation of any mitigation measures that the responsible authority considers appropriate, is likely to cause significant adverse environmental effects and paragraph (b) does not apply, or
- (iii) public concerns warrant a reference to a mediator or a review panel,

the responsible authority shall refer the project to the Minister for a referral to a mediator or a review panel in accordance with section 29.”⁴

If it is determined that the project can proceed, with mitigation, the responsible authorities are required to ensure the implementation of mitigation, monitoring and follow-up measures deemed necessary. The mechanism(s) for addressing this responsibility will be determined through consultation with Manitoba. In addition, pursuant to the terms and conditions of the contribution agreement between INFC and Manitoba a federal-provincial oversight committee will verify that the work is proceeding in accordance with the approval under CEAA as a condition of release of any funds.

⁴ Statutes of Canada 1992. Canadian Environmental Assessment Act.

3. Scope

3.1 Introduction

The purpose of this Chapter of the Screening Report is to outline the scope of the assessment conducted by the federal responsible authorities (RAs) in relation to the Red River Floodway Expansion Project (the Project). The scope of the environmental assessment includes both the scope of the Project (those project components, undertakings and activities that are the subject of the environmental assessment) and the scope of the assessment (the factors to be considered in the environmental assessment and the scope of those factors, including their temporal and geographic extent). The scope has been established in accordance with Sections 15 and 16 of the *Canadian Environmental Assessment Act* (CEAA).

The scope follows from that described in the *Guidelines for the Preparation of an Environmental Impact Statement for the Red River Floodway Expansion Project* (Project Administration Team, 2004). These EIS Guidelines are provided in Appendix A.

3.2 Scope of the Project

The scope of the Project established for the purposes of this environmental assessment comprise the various components of the Project as described by the Manitoba Floodway Authority in the Red River Floodway Expansion Project Description (July, 2003), the Environmental Impact Statement (August 2004), the Supplemental Filings (November, December, 2004) and the undertakings, activities and works described in this document.

The scope of the Project includes the site preparation, construction, operation, maintenance and final disposition of all components of the Red River Floodway Expansion Project and, more specifically, the following works and activities:

- expansion of the existing floodway channel;
- restoration/armouring of the low flow channel;
- expansion of the opening in the East Embankment on the east side of the Grande Pointe Drop Structure;
- increasing the freeboard of and extending the existing West Dyke;
- modifying the bridges over the existing Floodway Channel;
- enlarging the existing Floodway Outlet Structure;
- fortifying and protecting the riverbank at and downstream of the Floodway Outlet Structure;
- replacing drainage structures, where necessary, along the east bank of the Floodway Channel;

- modifications to the Seine River Syphon;
- modifications to City of Winnipeg aqueducts crossing the Floodway Channel;
- extending a number of electrical transmission lines that cross the Floodway Channel;
- replacing a number of miscellaneous infrastructure crossings of the Floodway Channel;
- improving the existing Floodway Inlet Control Structure, and
-
- ancillary works such as construction staging areas, modifying and replacing culverts.

Not included within the scope of project for the purposes of this environmental assessment is the potential recreational use of the lands along the floodway channel and operation of the floodway in situations other than that provided in Rules 1 to 4 as these are not considered likely at this time. However, if there are substantial changes to the Project as assessed, in these or other respects, the responsible authorities will consider such changes in light of section 15(3) and 24(1) of CEAA.

3.3 Scope of the Assessment

The scope of the assessment of the Project includes the consideration of changes to the environment that may result from the Project, including but not limited to, consideration of:

- The environmental effects of the Project, including the environmental effects of malfunctions or accidents that may occur in connection with the Project and any cumulative environmental effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out;
- The significance of these effects;
- Comments from the public;
- Measures that are technically and economically feasible and that would mitigate any adverse environmental effects of the Project;
- The implications of the Project with respect to climate change;
- Alternative means of carrying out the Project that are technically and economically feasible and the environmental effects of any such alternative means;
- The need for and requirements of any follow-up program in respect of the Project; and
- The capacity of any renewable resources that are likely to be significantly affected by the Project.

The environmental effects of the Project includes any change that the Project may cause in the environment and any effect of any change in the environment on health and socio-economic conditions, physical and cultural heritage, the current use of lands and resources for traditional purposes by aboriginal persons, or any structure, site or thing that is of historical,

archaeological, paleontological or architectural significance. In addition, consideration is also given to any change to the Project, which may be caused by the environment.

3.4 Temporal and Geographic Scope

For screening purposes, consideration has been given to potential environmental effects that may be associated with the Project during construction-and operation and maintenance. As the floodway is intended to operate over a prolonged period in the future, decommissioning/abandonment is not considered likely and have consequently not been considered in the screening. However, final disposition of certain project components such as temporary crossings during construction have been taken into account. Specific temporal boundaries have been identified, as appropriate, for each environmental component, based on the expected or predicted interaction between components of the Project and the environment.

The geographic scope included the local areas directly affected by the undertakings associated with the Project, the regional area within which there may be environmental effects of a more regional or global nature, and the area within which cumulative environmental effects may be expected to occur. Specific geographic boundaries have been identified, as appropriate, for each environmental component, based on the expected or predicted interactions between the Project and environmental components.

3.5 Cumulative Environmental Effects

The cumulative effects assessment for the Project included consideration of the cumulative effects that are likely to result from the Project in combination with the effects of other projects or activities that have been or will likely be carried out in the reasonably foreseeable future. The assessment of cumulative effects included consideration of existing and proposed projects and activities within the regional assessment area. The effects of existing projects and activities including those of the existing Red River Floodway were considered as being part of baseline conditions.

4. Project Description

4.1 Project Definition

The description of the Project contained in this environmental assessment is presented as proposed by the Manitoba Floodway Authority (MFA) in its Project Description document (July 2003), Environmental Impact Statement (August 2004), the Supplementary Filings (November and December 2004) and various other documents. It also includes changes and clarifications made to the Project by the MFA through the cooperative environmental assessment process and the Clean Environment Commission public hearing.

The MFA proposes to expand the hydraulic capacity of the existing Red River Floodway, by widening the existing floodway channel and by modifying various associated bridges and other infrastructure. The Floodway, an integral component of the overall Manitoba flood protection system, is designed to divert flood waters around the City of Winnipeg. Subject to approval, construction of the Project is expected to commence in 2005, with substantial completion of the construction in 2009.

This screening level environmental assessment report has been prepared based on the engineering design information available at the time of drafting. Final engineering design commenced in the fall of 2004 and is expected to continue through to early 2009, as the various components of the Project are tendered for construction. As this engineering proceeds and as the Project is further discussed with regulators, improvements in Project design may be identified that result in changes to the final project description that would eventually receive licences, authorizations or permits. Should a major change occur to the Project during final engineering, the responsible authorities will determine whether the environmental assessment screening report requires an amendment.

4.2 Project Overview

The design objective for the expansion of the Red River Floodway is the requirement for the passage of a flood with a probability of being equaled or exceeded once in every 700 years. This flood magnitude is also referred to as the “1 in 700-year flood”, and represents the “design flood” for the Project. The design criterion of the Expanded Floodway to handle a flood of this magnitude is that this operating performance must be achieved at a maximum water level of 237.13 m (778 feet above sea level) at the Floodway entrance (Manitoba Floodway Authority, 2004a).

The primary components of the Project include:

Floodway Channel Excavation

- Widening of the channel in varying amounts up to as much as 60 m (200 ft) per side
- No deepening of the channel is proposed
- A volume of excavation of approximately 20,900,000 m³ (27,300,000 yd³)
- Re-vegetation of all areas where bare soil will be exposed by the excavation

Restoration/armouring of the Low Flow Channel

- Infill and excavation of previously eroded zones of the Low Flow Channel
- Placement of armouring along approximately 60% of the length of the Low Flow Channel (previously eroded zones) to protect against future erosion

Expansion of the opening in the east embankment on the east side of the Grande Point Drop Structure

- Removing approximately 400 m (1,300 ft) of the east embankment (existing spoil pile)
- Excavation of existing fill down to El. 235 m (771 ft)

Replacement of seven bridges

- St. Mary's Road Bridge, including realignment of road works
- CPR Emerson Rail Bridge
- Provincial Trunk Highway (PTH) 59 South (Southbound)
- Trans Canada East
- PTH 15
- PTH 59 North
- PTH 44

Rehabilitation of six bridges (including raising elevation of girders where needed)

- PTH 59 South (Northbound)
- CNR Sprague rail bridge
- GWWD rail bridge
- CPR Keewatin rail bridge
- CNR Redditt rail bridge
- CEMR Pine Falls rail bridge

Enlargement and improvement of the Outlet Control Structure

- Increase width (laterally across the channel) by approximately 50 m (164 ft)
- Enlargement of the stilling basin and improvement in its capability to dissipate energy by using energy absorbing appurtenances
- Rip-rapping (new) approximately 1.2 km along the west bank of the Red River downstream of the Outlet to protect the shoreline from erosion and repairing approximately 0.3 km of existing rip-rap.

Replacement/rehabilitation of drainage structures that discharge local runoff into the Floodway Channel

- Centreline Drain – replacement
- North Bibeau Drain – replacement
- Cook’s Creek Diversion – repair (retains 1 in 50 year capacity)
- Springfield Road Drain – replacement
- Shkolny Drain – replacement
- Ashfield Drain – replacement
- Transcona Storm Sewer Outlet – replacement

Modification of the two water supply aqueducts, the Deacon drain line, owned by the City of Winnipeg, the two RM of East St. Paul waterlines and the Seine River Syphon

Modification of seven electrical transmission line crossings

Replacement of utility lines

- 2 Manitoba Hydro fiber-optic communication lines
- 10 crossings or parallel natural gas lines
- 5 buried MTS cables
- 5 MTS cables on modified bridges

Replacement of two oil pipelines

Increase in height and length of the West Dyke to protect against wind effects during major floods

- Extension in length by 15 km (9 miles)
- Increase in height by up to 2.7 m (8.9 ft)
- Fill quantities totaling 4,600,000 m³ (6,000,000 yd³)

Improvement in protection and reliability of the Floodway Inlet Control Structure

- Erosion protection on the upstream and downstream surfaces of the embankments adjacent to the Inlet Control Structure
- Installation of a fire protection system in the control room and equipment room
- Improvements in redundant features in the gate systems
- Improvements to hoists

As noted in the Project Scope (Chapter 3), this environmental assessment considers all undertakings in relation to these project components (site preparations, construction, operations, modifications, maintenance and disposition as appropriate). More detailed

descriptions of these project components are provided in the EIS and Supplemental Filings. The information provided in this section of the screening report is intended to provide an overview and to focus on those project components and activities that may interact with the environment and for which environmental effects are predicted to occur.

4.3 Existing Floodway Facilities

The existing Red River Floodway consists of four components – The Floodway Channel, the Inlet Control Structure, the East and West Dykes, and the Outlet Structure. The existing floodway was completed in 1968 and first operated during a spring flood in 1969 (Manitoba Floodway Authority, 2004a).

Existing Floodway Diversion Channel

The existing floodway channel is an approximately 48-kilometre long, grass-lined diversion channel. The channel conveys a portion of Red River flow around the east side of the City of Winnipeg and discharges this floodwater back into the Red River via the outlet structure immediately downstream of Lockport (Manitoba Floodway Authority, 2004a).

The average depth of the channel is 9.1 metres, except through Bird's Hill Ridge, where the depth reaches 20.1 metres. The upstream end of the channel is equipped with an earthen lip, with a crest 2.1 metres above the channel bottom. The lip functions as an obstacle to keep river ice out of the channel, allowing river ice to break up and flow through the City of Winnipeg before flows rise enough to begin entering the channel. River ice is not desired in the channel as it can jam against bridge crossings over the channel, potentially resulting in damage to the bridges and a reduction of the capacity of the channel (Manitoba Floodway Authority, 2004a).

The existing channel has a longitudinal slope of 8.6 cm/km (0.5 feet/mile) upstream of Bird's Hill and a steeper slope of 16 cm/km downstream of Bird's Hill. In order to address concerns of erosion within the channel, the maximum design water velocity is 1.5 m/s (Manitoba Floodway Authority, 2004a).

The existing Floodway Channel was designed to convey a flow of 1,700 m³/s (60,000 cfs) while maintaining a water surface elevation on the Red River at the channel entrance of 234.77 metres. Thirteen bridges cross the channel and were designed to have a maximum cumulative hydraulic impact on the channel water levels of 0.3 metres at a design flow of 1,700 m³/s (60,000 cfs). The ultimate capacity of the channel, assuming the bridges were not in place, was estimated to be 2,800 m³/s (100,000 cfs), with a corresponding elevation of the water surface at the channel entrance of 237.13 m and a minimum freeboard along the floodway channel embankments of 0.6 metres. This represents the maximum water level south of the

structure that could be allowed without potential overtopping of the West Dyke or the Floodway embankments (Manitoba Floodway Authority, 2004a).

On the basis of discharge metering data collected between 1969 and 1999, the Floodway Channel capacity was re-estimated to be 1,700 m³/s (61,500 cfs) when the surface water elevation at the channel entrance is 234.77 m. In addition, the roughness coefficient of the channel was reduced to reflect the actual existing channel performance. The channel capacity with the bridges in place is estimated to be 2,500 m³/s (90,000 cfs) for a level of 237.13 m at the channel entrance. The MFA estimates that, if the bridge crossings were removed or raised, the ultimate capacity of the channel would be 2,800 m³/s (100,000 cfs). This increase in capacity could be gained if only the seven most upstream bridges were raised or removed (Manitoba Floodway Authority, 2004a).

Existing Inlet Control Structure

The entrance to the Floodway is located in the eastern bank of the Red River near St. Norbert. An earth-fill weir at the entrance ensures that flows below flood level continue down the Red River. The inlet control structure is located on the Red River just downstream of the floodway inlet. The purpose of the structure is to regulate the flow between the natural channel of the Red River and the Floodway Channel, during the period of high water levels. The gates of the control structure are normally in a submerged position with about 1.8 metres of water over them in the summer months (Manitoba Floodway Authority, 2004a).

The Inlet Control Structure consists of two independent steel gates housed within a monolithic concrete structure. Each gate has its own flow channel and is separated by a central concrete pier that supports the inlet control structure bridge deck and control room. The Inlet Control Structure constricts the Red River to approximately half of its width when the gates are down. Through controlled raising and lowering of the flow control gates, the inlet control structure regulates the water level in the Red River at the entrance of the floodway channel, controlling how much of the Red River's flow is allowed to pass through Winnipeg and how much is diverted to flow through the floodway channel. During non-flood conditions, the gates rest in a fully down position with the top of the gates at elevation 728 feet at the river bottom. In summer months the elevation of the surface of the Red River is normally about 734.35 feet (Manitoba Floodway Authority, 2004a and 2004b). This water level is maintained by the St. Andrews Lock and Dam (just upstream of the existing Floodway Outlet Structure) during the open water season.

Existing Outlet Structure

The purpose of the Outlet Structure is to dissipate the differential energy in the water from the Floodway Channel at its point of reentry into the Red River near Lockport, preventing damage and erosion to the channel and to the River. The difference in water level over the

entire reach of the Floodway Channel from inlet to outlet is about 5 metres under design conditions. The corresponding difference in elevation along the Red River between those two points is about 10 metres. The Outlet Structure is founded on bedrock and is constructed of concrete with an uncontrolled rollway, a crest length of 160 feet and a stilling basin 120 feet in length. The design capacity of the existing Outlet Structure is 1,700 m³/s (60,000 cfs) (Manitoba Floodway Authority, 2004).

Existing West and East Dykes

Floodwaters are retained on either side of the Inlet Control Structure by dykes. East of the Red River, the East Dyke is incorporated into the embankment created by the Floodway Channel. This dyke extends parallel to the Floodway Channel and on its west base for a distance of 9.7 km. West of the Red River, the West Dyke extends about 32 kilometres from the Inlet Control Structure to a point where the natural ground elevation is above the design flood elevation. The West Dyke contains the floodwaters of the Red River from the southwest and prevents the flow from passing into the LaSalle River watershed, where it could bypass the Inlet Control Structure. During the 1997 Flood, the West Dyke was raised and extended an additional 25 kilometres to prevent floodwaters from bypassing the structure and entering the City (Manitoba Floodway Authority, 2004).

4.4 Schedule and Sequencing of Construction

The EIS indicates that the construction of the expanded floodway and associated works is proposed to take place over about a four-year time period, commencing in the summer of 2005 and extending until the summer of 2009. The schedule is intended to achieve a reasonable balance between utilizing local resources, minimizing the disruption of traffic flows over bridges that require modifications and completing the work in an acceptable timeframe. Each year of construction will achieve an incremental increase in the capacity of the Floodway to handle large floods. The construction schedule is premised on the receipt of approval in the early summer of 2005 (Manitoba Floodway Authority, 2004a).

Channel Expansion

Construction of the Low Flow Channel is scheduled to occur in the late fall or early winter, when flows are low. Excavation and erosion protection of the Main channel will occur between April and November each year (depending upon weather and Spring runoff), commencing in 2005 and concluding in 2009 (Manitoba Floodway Authority, 2004a). The MFA also indicates that the construction schedule could be advanced and the expansion of the channel could occur within a shorter timeframe.

Rail Bridges

Construction work on the rail bridges would occur over a 4-year period, commencing in 2005 and concluding in 2009. Work duration ranges from 6 months for the CEMR Pine Falls Bridge to 15 months for the CNR Sprague and Redditt and CPR Keewatin bridges. The schedules reflect work continuing through the winter and during April and May when the Floodway Channel is inaccessible. Work during these time periods will be focused on the substructure and superstructure. Work in April and May will only be undertaken on elements of the Project that do not require access to the main Floodway Channel (Manitoba Floodway Authority, 2004a).

Highway Bridges

Work on the highway bridges would extend over a four-year period and would proceed during the winter and April and May on components of the bridges which do not require access to the Floodway Channel. Duration of work ranges from 18 months for the St. Mary's Road Bridge to 29 months for the TCH No. 1 East Bridge and PTH 15 Bridge (Manitoba Floodway Authority, 2004a).

Utilities/Transmission Lines

The timing of utility and transmission line work spans 4 construction seasons and generally reflects the latest dates by which the relocations can be completed without interfering with work associated with the Floodway Channel (Manitoba Floodway Authority, 2004a).

Outlet Structure

The proposed modifications to the Outlet Structure would be undertaken in three phases, over two years, commencing in mid-2007. In the first phase, a new east wall and new east rollway section would be constructed while the existing outlet structure remains in place and operational. During the second phase, the existing west structure would be isolated and modified, while the new east structure remains operational. In the final phase, excavation of earth and rock, and subsequent construction of the remaining rollways would take place (Manitoba Floodway Authority, 2004a).

West Dyke

Construction of an expanded West Dyke is projected to take two to three years commencing in 2006, with each construction season spanning the months of May to November. This construction is relatively independent of all other construction activities (Manitoba Floodway Authority, 2004a).

Aqueduct Modifications

The Aqueduct relocation schedules must be integrated with the construction of the proposed Water Treatment Plant and other City of Winnipeg regional water supply upgrading

programs. The work is scheduled for completion during 2006, in the months of October and November, when flows are at their seasonal lows and weather conditions are favourable (Manitoba Floodway Authority, 2004a).

Drain Replacements

The construction activities associated with drain replacements would be coordinated with the earthwork activities in the Floodway Channel.

RM of East St. Paul Water lines

The construction activities associated with the two water lines would be coordinated with the earthwork activities in the Floodway Channel.

Seine River Syphon

Modifications to the Seine River Syphon are scheduled to occur from June to November 2007.

Floodway Inlet Control Structure

Erosion protection measures above the normal water level at the Inlet Control Structure are proposed for the early fall of 2006 and modifications to the control gates and operation systems are proposed to be undertaken in the late fall or early winter of 2005, when the risk of a flood is minimal.

4.5 Operation of the Project

The Floodway is operated according to a “state-of-nature” discharge-rating curve developed using conditions in Winnipeg following the 1950 flood and before the development of the major flood control works (Red River Floodway, Portage Diversion, Shellmouth Dam and Reservoir and the Winnipeg’s primary dykes) and a set of operating rules updated after the 1997 flood (Manitoba Floodway Authority, 2004a). An updated “state-of-nature” discharge-rating curve was developed following the 1997 flood and using current computer based hydraulic analysis. This updated “state-of-nature” discharge-rating curve was used to determine the baseline condition for the purposes of the environmental assessment and is used to calculate the “natural” elevation of water at the Inlet Control Structure. This “natural” elevation is the level in the Red River immediately upstream of the Inlet Control Structure that would occur if the major flood control works did not exist.

The original policy of operation of the Floodway, established in March of 1970, stated:
“The Red River Floodway will be operated to provide maximum protection for the Metropolitan Area of Winnipeg but, at the same time, the interests upstream of the Floodway should not be adversely affected. In order to accomplish this, the water levels upstream of the Inlet Control

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Structure shall be maintained at the elevation which would have been obtained under natural conditions except as noted...” (Red River Floodway Program of Operation, 1970 in Manitoba Floodway Authority, 2004b).

Detailed operating rules were developed in October 1984 to assist in achieving compliance with this policy. In 1997, following the flood, the Province of Manitoba appointed the Red River Floodway Operations Review Committee to review the rules and criteria for operation of the Red River Floodway. The changes recommended by the Operations Review Committee were accepted by the Province in April 2000 and are incorporated into the current operating rules.

Four main operating rules govern the operation of the Floodway, three of which apply to spring conditions and the fourth to non-spring emergency operations:

Rule 1 – Normal Operations

The Floodway should be operated to maintain “natural” water levels on the Red River at the entrance to the Floodway Channel, until the water surface elevation at the James Avenue gauge in downtown Winnipeg (also known as James Avenue Pumping Station Datum or JAPSD) reaches an elevation of 24.5 feet JAPSD, or the river level anywhere along the Red River within the City of Winnipeg reaches 2 feet below the Flood Protection Level of elevation 27.8 feet JAPSD. Zero (0) feet at JAPSD is 727.57 feet above sea level and is associated with the normal river ice level.

Rule 2 – Major Flood Operation

Once the river levels in Winnipeg reach the limits described in Rule 1, the level in Winnipeg should be held constant while river levels south of the Inlet Control Structure continue to rise. Furthermore, if forecasts indicate that river levels south of Winnipeg will rise more than 2 feet above natural, the City must proceed with emergency raising of the dykes and temporary protection measures on the sewer systems in accordance with the flood levels forecasts within Winnipeg. The water levels in Winnipeg should be permitted to rise as construction proceeds, but not so as to encroach on the freeboard of the dykes or to compromise the emergency measures undertaken for protecting sewer systems. At the same time, the Province should consider the possibility of an emergency increase in the height of the Floodway embankments and the West Dyke. At no time will the water level at the Floodway Channel's entrance be allowed to rise to a level that infringes on the allowable freeboard on the Floodway West Embankment (Winnipeg side) and the West Dyke.

Rule 3 – Extreme Flood Operation

For extreme floods, where the water level at the Floodway Channel's entrance reaches the maximum level that can be held by the Floodway West Embankment and the West Dyke,

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the river level must not be permitted to exceed that level. All additional flows must be passed through Winnipeg (Manitoba Floodway Authority, 2004a).

The Floodway has been operated in response to spring flood events in 22 years since it was commissioned in 1968.

Rule 4 – Emergency Operation

In November 2004, Manitoba Water Stewardship adopted a formal rule governing decisions to carry out emergency operation of the Floodway to reduce sewer back-up in Winnipeg during non-spring periods, given that there will likely be circumstances in the future where there are significant rainstorms forecasted while river levels are elevated above normal levels.

Rule 4, entitled “Rules for Emergency Operation of the Red River Floodway to Reduce Sewer Backup in Winnipeg”, includes specific criteria related to water levels and the use of the Floodway after the spring crest from snowmelt runoff at Winnipeg, whenever high river flows substantially impact the capacity of Winnipeg’s combined sewer system. Rule 4 indicates that as long as the Department of Water Stewardship forecasts that river levels for the next 10 days will be below 14 feet James Avenue Pumping Station Datum (JASPD), then the Floodway control structure would not be operated. When river levels are forecasted to rise to 14 feet JASPD or higher, then the Department of Water Stewardship must prepare a report describing:

- o River level forecast basis and risk assessment;
- o Risks of basement flooding, including predicted peak river levels in the next 10 days, length of time forecasts levels to be at 14 feet JASPD or higher and risk of intense rainfall in the next 10 days;
- o Benefits and costs of floodway operation, including
 - o Extent of basement flooding and property damage expected;
 - o Risk to health of Winnipeg residents due to sewer back-up;
 - o Economic losses and damages expected;
 - o Impacts of operation of the floodway on fish and wildlife;
 - o Risks and costs of riverbank instability caused by operation of the floodway;
 - o Other benefits and costs as appropriate
- o Measures that may be taken to mitigate those costs and benefits including minimizing the rate at which river levels are changed both upstream and downstream and providing means to assure fish passage;

The Rule also indicates that the Department will not recommend operation of the Floodway unless the expected benefits of doing so clearly and substantially outweigh the

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expected costs. The Department's report and recommendation are provided to the Minister of Water Stewardship, who will make a decision respecting Floodway operation based on consideration of the report, subject to the following conditions.

The Floodway Control Structure will operate under Rule 4 to raise river levels immediately upstream of the Inlet Control Structure to an elevation no higher than 760 feet above sea level (to maintain river levels below the top of the riverbank), to achieve a river level of no less than 9 feet JASPD or except in circumstances of extreme urgency, to lower river levels no more than 1 foot per day.

The new Rule 4 also includes provision for Manitoba Water Stewardship to maintain a program of compensation for property damages incurred by property owners arising from flooding caused by floodway operation under this rule and for notification of the public regarding the pending use of the floodway (Manitoba Floodway Authority, 2004b).

In 1993, higher than normal summer water levels occurred in July in combination with heavy thunderstorms. Extensive basement flooding damage due to sewer backups occurred within Winnipeg primarily due to the fact that emergency operation of the Floodway was not performed. Total damages were estimated at over \$100 million. When the Red River is high the, combined sewers are not able to provide relief from large rainstorms because gravity discharge is significantly reduced or eliminated. Flood Pumping Stations, which are typically activated to lift the wastewater into the River, were overwhelmed as they were designed for smaller spring rainstorms and have much less capacity than gravity discharge.

The Floodway has been used in an emergency on two occasions during the summer, as discussed below. In the April 2005 submission, the MFA indicate that the conditions necessary to operate the Floodway under Rule 4, occurred in the past less than 45% of the time.

The Floodway was operated during the period of July 5 to August 4, 2002 as an emergency measure to reduce the potential for widespread basement flooding in Winnipeg and the resulting risk to health and property damage. As a result of Floodway operation, the Province provided compensation to property owners upstream of Winnipeg who suffered damage as arising from artificial flooding (Manitoba Floodway Authority, 2004b).

Use of the Floodway was also authorized between June 10 and July 30, 2004, again as an emergency measure to reduce the probability of widespread basement flooding in Winnipeg and the resulting risk to health and damage to property. The Province also made compensation available to local governments, individuals, farm and market garden operations, small businesses and non-profit organizations that had incurred losses or damages as a result of the operation of the Floodway (Manitoba Floodway Authority, 2004b).

4.6 Alternatives

4.6.1 Environmental Impact Statement

The conceptual definition of the proposed Floodway Expansion Project was developed through a series of studies that began after the flood of 1997. The EIS reviewed the various studies and reports, and the alternatives to the Project that were considered.

The International Joint Commission (IJC) announced the appointment of the International Red River Basin Task Force in 1997 to examine a range of alternatives to prevent or reduce future flood damage. The Task Force undertook and commissioned a series of studies and, in 1999, commissioned a study of the flood risks in Winnipeg and possible means of reducing those risks. The results of this study were reported to the IJC Task Force in 1999, and in 2000 (Flood Protection in Winnipeg; KGS Group 1999, Part I, II, and III) concluded that the preferred options to provide a major increase in flood protection for Winnipeg were the Ste. Agathe Detention Structure and the Floodway Expansion.

The selection process that led to these two preferred alternatives included examination of a wide range of alternatives that included:

- channel improvements to the Red River in Winnipeg and the river reach north of Winnipeg to increase the discharge capacity of the river
- diversion of the eastern tributaries of the Red River around the City to re-enter the Red River North of the existing Floodway Outlet
- a detention structure on the Red River upstream of Winnipeg near Ste. Agathe where some of the flood waters of the Red River would be detained temporarily during an extreme flood
- raising the primary dikes in Winnipeg on a permanent basis to permit more flow to safely pass through the river during a flood
- installing of a massive pumping plant at the inlet to the floodway to mobilize the large discharge capacity of the floodway at high water levels
- increase the freeboard on the west dike and modify the operation rules to permit more frequent and higher water levels upstream of the floodway inlet
- remove a portion of the east embankment of the floodway to permit more efficient entrance of floodwaters into the floodway
- removal of the outlet control structure on the floodway
- removal of the entrance weir at the inlet of the floodway
- raise the bridges along the floodway channel to increase the hydraulic capacity at high water levels

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- construct a twin floodway to the existing channel to increase the discharge capacity of the diversion
- construct a separate new floodway channel to the west of Winnipeg
- increase the capacity of the Portage Diversion thereby reducing the potential for the Assiniboine River to exacerbate flood levels in Winnipeg
- increase the height of the Shellmouth Dam to develop more storage capacity that could further reduce the contribution of flood waters from the Assiniboine River
- expand the existing floodway to increase its discharge capacity and continue with the operating rules

Further studies on flood protection alternatives were conducted. During 2001, the two preferred options were investigated in terms of biophysical and socio-economic effects, legal considerations, operational risks, flood management, implementation schedule and other matters without selecting a preferred option. Manitoba conducted concurrent consultations with the public regarding the project alternatives. The Manitoba Clean Environment Commission then held a series of public meetings in early 2002 in the flood study region and reported on the public issues raised during the meetings. An all-party committee of the Manitoba legislature reviewed the technical and public consultation information. The Manitoba Government subsequently selected the Floodway Expansion as the preferred flood protection alternative for the City of Winnipeg. The Federal Government supported this decision, which resulted in a Canada – Manitoba cost sharing agreement in December 2003.

The planning and environmental assessment process considered alternative means for carrying out the Project within the defined site (e.g. widening vs. deepening of the existing channel, retrofit vs. new higher bridges) and resulting refinements to the Project definition. Alternative means were considered for all major Project components including the Floodway channel, inlet and outlet structures, drainage structures, bridge and utility crossings, west dike enhancements, etc. Detailed information on the alternatives considered and the rationale for the selected alternative are provided in Chapter 2 of the EIS.

In addition, with respect to alternative mitigation strategies, e.g. erosion control and sediment transport mitigation during construction, the MFA referred to environmental protection plans, which would be completed after final design is approved and before project construction commences. Alternatives considered in the EIS for riverbank erosion mitigation included rip rapping, planting of adaptive vegetation and a combination of the two.

A summary of the comments received on the issue of alternatives during the review of the EIS, Supplemental Filings and at the CEC hearing is provided in Appendix 2.

4.6.2 Responsible Authority Conclusion

Taking into account the information contained in the EIS and the comments received from government agencies and the public, the responsible authorities conclude that there has been adequate consideration of the issue of alternatives. Furthermore, the responsible authorities recognize that further consideration to alternative mitigation strategies will be given during the final design of the Project and in the preparation of Environmental Protection Plans and other follow-up plans. This will include, but not be limited to:

- alternative culvert designs to provide for fish passage/navigation;
- alternative drop structure designs;
- alternative erosion minimization measures;
- alternative sediment control measures;
- alternative construction material, fuel and hazardous goods storage and handling practices;
- alternative timing and sequencing of construction activities, and
- alternative mitigation strategies for groundwater protection.

5. Environment Description

5.1 Introduction

The Guidelines for the Preparation of an Environmental Impact Statement (EIS) for the Red River Floodway Expansion Project (EIS Guidelines) (Appendix A) required that the Manitoba Floodway Authority (MFA) describe the environmental setting for the Project including a broad overview of the local area and the spatial and temporal zones within which there may be environmental effects either regional or global in nature (Project Administration Team, 2004). The EIS Guidelines also required that a description of any deficiencies or limitations in the existing environmental data base be reported and any plans to collect required additional data be described.

Specific requirements were detailed in the EIS Guidelines for the physical, aquatic, terrestrial and socio-economic components of the environment. The EIS was organized based on those environmental components (Manitoba Floodway Authority, 2004). The following environmental description is adapted from the EIS (Manitoba Floodway Authority, 2004a), the Final Report on Flood Protection Studies for Winnipeg (KGS Group, 2001) and supporting references.

5.2 Physical Environment

5.2.1 Floodway Study Region

An overall Floodway Study Region was defined for the Project to include all environmental components based on the maximum geographic extent to which the Project may be expected to have discernable biophysical effects. The Region extended through the Red River Valley from just north of the Town of Morris in the south to the southern tip of Lake Winnipeg in the north based on the extent to which water levels and flows may be affected by the Project during different flood events. Eastward, the Region extended to Highway 12 and then followed the southern boundary of the RM of Taché. Westward, the Region extended to the eastern border of the Rural Municipality (RM) of St. Francis Xavier and included the West Dyke expansion in the RM of Macdonald.

5.2.2 Regional Geology

The Red River Floodway is located within the glacial Lake Agassiz clay plain of the Manitoba Lowlands physiographic region, with topographic relieve generally less than 25 feet, rising slowly eastward and westward away from the Red River.

Surficial sediments overlying the Paleozoic carbonate bedrock are composed of glaciolacustrine clays and an underlying calcareous silt till. Depth to bedrock is variable in the

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City of Winnipeg area, with a thick cover of overburden in areas to the south and southwest. The Bird's Hill glaciofluvial complex is part of a larger complex of esker ridges, kames and kettle holes that extends northward to Lake Winnipeg.

Bedrock beneath the City of Winnipeg consists of gently westerly dipping Paleozoic strata. Ordovician-aged carbonate rocks underlie the area and consist predominately of dolomite, agrillaceous dolomite, calcareous shales and mottled dolomite limestone commonly referred to as "Tyndall Stone". Typically, the bedrock at shallower depths in the Winnipeg region shows some degree of fracturing, confined by the overlying till and clay units.

Overlying the bedrock is an assemblage of glacial sediment, deposited by ice during multiple Pleistocene glaciations. Calcareous silt till, situated directly on the bedrock, is 3 to 30 feet in thickness. The till surface is fluted in many places with ridges that are generally oriented northwest to southeast and are up to several feet in areas southeast of the City. Glaciofluvial sediments northeast of Winnipeg, in the Bird's Hill area, consist of sands and gravels 50 to 100 feet thick that were deposited in ice contact by glacial meltwater. There are several poorly-graded sand and gravel beaches, spit complexes, and nearshore sand and gravel bars around the periphery of the glaciofluvial core of Bird's Hill.

Lake Agassiz deposition of the glaciolacustrine clay resulted in sediments 30 to 50 feet in thickness near Winnipeg and thinner sediments from Bird's Hill to Lockport. In many areas, massive clay to silty clay is overlain by laminated silt to clayey silt, which is lighter in colour and is typically found from the surface to shallow depths in the Winnipeg area. These deposits may also include fine sand and silt in areas adjacent to Bird's Hill. The base of the clay sequence is often inter-bedded with the underlying silt till. The variable texture of these upper Lake Agassiz clay plain sediments has resulted in site-specific variability in geochemical and shallow groundwater signatures.

The overburden along the Floodway Channel consists primarily of high plasticity lacustrine clay overlying an uncemented to cemented silt till and Paleozoic limestone. The bedrock forms the regional confined upper carbonate aquifer. The existing main channel cuts into the glacial till intermittently for approximately 28% or 13 kilometres (8 miles) of the 47 kilometre Floodway length. The Low Flow Channel cuts into till for approximately 38% or 18.3 kilometres (11.4 miles). The channel also cuts through 1.5 kilometres (1 mile) of sand and gravel outwash complex at Bird's Hill.

Lacustrine clay is up to 10 metres (33 feet) in thickness near the Floodway Inlet, decreasing to 1 or 2 metres thickness locally between Highway 59 south and Trans-Canada Highway crossings. The till unit is exposed in the Floodway Channel between Highway 15, the CNR Redditt Rail Bridge and Cook's Creek, for 2.5 kilometres south of the CPR Keewatin Rail Bridge, and extensively downstream of the Highway 59 North crossing.

5.2.3 Groundwater

Regionally, there are two main aquifers, the unconfined aquifer which is located in a sand and gravel deposit above the bedrock, and a confined upper carbonate aquifer located within 15 and 30 metres of dolomite and limestone bedrock which is covered by clay/till overburden. Groundwater flow direction in the Greater Winnipeg region typically reflects the topographic gradient of the land surface. The principal recharge area for the bedrock aquifer is through the till unit, where the till is not covered by clay, as in the east of the Town of Anola. Recharge to the bedrock aquifer also occurs through the glaciofluvial sand and gravel deposits such as the Bird's Hill aquifer because the clay is absent. To the east of the Red River, groundwater flow in the bedrock aquifer is generally from east to west with groundwater discharging to the Red River. In the unconfined aquifers, groundwater flow directions radiate from the highest area of the mound towards the edge. On both the clay plains and at the sand and gravel mounds, vertical hydraulic gradients are downward towards the bedrock aquifer. Upward vertical gradients occur at the large surface water drainage features such as the Red, Assiniboine and Seine rivers and at the bottom of the Floodway, where groundwater discharges to become surface water.

Groundwater in the carbonate bedrock near the Floodway is generally high in dissolved solids (>500 mg/L), reflecting the natural carbonate hardness. Lower dissolved solids are found in the carbonate bedrock at Bird's Hill. The chloride values have been measured at 140 and 146 mg/L between St. Mary's Road and St. Anne's Road and generally decrease further north. Chloride values in bedrock at Bird's Hill were less than 25 mg/L reflecting freshwater recharge from the granular aquifer. Analysis for trace metals has shown that bedrock water quality exceeds the aesthetic objective for iron in most of the provincial water quality tests, and manganese has exceeded the objective in the Spring Hill area.

5.2.4 Surface Water

The Red River originates near the North Dakota/South Dakota border and flows north for 550 miles into the south end of Lake Winnipeg. The drainage basin encompasses approximately 107,000 square miles, including much of northern Minnesota and North Dakota, southeast Saskatchewan and southern Manitoba. The Assiniboine River, which converges with the Red River in downtown Winnipeg, accounts for approximately 59,000 square miles of the total drainage area. At Lockport, 45% of the flow originates from Manitoba, 46% from the United States and 9% from Saskatchewan.

The Red River flows through glaciolacustrine deposits that aggraded within glacial Lake Agassiz. The River has a fairly uniform, continuous descent northward, averaging less than 0.5 feet/mile; consequently water velocities are low. It is a typical lowland zone stream, consisting of oxbows and meanders, highly turbid waters, and substrates composed of silt/sand and/or gravel/cobble. In general, substrates from St. Adolphe to the north end of the City of Winnipeg are primarily composed of silt, clay, sand and/or gravel. From the north end of the City

downstream to Selkirk, substrates are composed primarily of limestone boulders and cobble. Substrates return to silt, mud and clay as the River approaches Netley Marsh at the south end of Lake Winnipeg.

Flows on the Red River have fluctuated over time with seasons and precipitation. Since the Floodway was constructed, peak river flows have occurred in 1974, 1979, 1996 and 1997, with the latter being the largest flood ever in recent history. Other extreme flood events have occurred in 1826 and 1950. Some 75% of the Red River basin's 50 cm of annual precipitation falls between April and September, with about two-thirds of that falling in May to July. Elevated flows occur from April to late May each year and range from 600 to 2,900 m³/sec. Precipitation, ice break up, and spring runoff all contribute to the high flows observed during the spring months. Flow rates tend to taper off in June and are sometimes followed by a slight increase during July due to precipitation events from thunderstorms in the watershed. Relatively constant flows of 100 to 250 m³/sec occur during the remainder of the year.

Flooding is a frequent occurrence in the Red River Basin, usually in the spring as a result of heavy precipitation the previous fall, hard and deep frost prior to snowfall, substantial snowfall during the winter months, and sudden thaws or heavy precipitation during break up. The low absorptive capacity of clay soil in the basin is also a contributing factor. Ice jams north of Winnipeg are also a cause of spring flooding. Early records indicated several major floods in the 1800s with the most notable in 1826, 1852 and 1861. Over the past 100 years, major floods have occurred in 1950, 1966, 1979, 1996 and 1997. The flows for the major flood events ranged from 3,058 m³/sec in 1950 to 4,587 m³/sec in 1997, and to 6,371 m³/sec in 1826.

The Red River water quality is relatively well understood. The City of Winnipeg, the Province of Manitoba and Environment Canada test water quality in the Red River on a regular basis and have long-term water quality databases. Water quality of the River is characterized by high levels of turbidity, total suspended solids (TSS) and nutrients. Turbidity and TSS levels are related to discharge and are generally highest during the spring freshet in April and lowest during the winter. Manitoba's Water Quality Standards, Objectives and Guidelines for Total Suspended Solids (TSS), phosphorus, ammonia and fecal coliforms. Many of these exceedences are related to low flows during the winter and drought conditions.

5.3 Aquatic Environment

5.3.1 Fish

At least 57 native fish species are known to inhabit the Manitoba portion of the Red River and its tributaries. An additional 9 fish species have been introduced to the River system. Some 18 species are commonly caught by anglers along the Red River in Manitoba. The most common species are reported to be goldeye, channel catfish, walleye, white sucker, sauger, carp, freshwater drum, golden redhorse, silver redhorse, shorthead redhorse, mooneye and northern pike. There are no species currently designated as endangered or threatened;

however, the bigmouth buffalo, big mouth shiner, silver chub and chestnut lamprey are listed as Species of Concern on Schedule III to the *Species at Risk Act* (SARA). The Lake Sturgeon is presently being considered for listing under SARA.

The majority of the Red River fish species spawn during the spring when discharges are high and water temperatures are rising. A few species such as channel catfish, freshwater drum, carp and goldeye and a number of Cyprinid species, spawn during late spring and into early summer. None of the fish species found in the Red River upstream of Lockport spawn in the Red River or its tributaries during the fall. Lake whitefish spawn in the late fall off rock/gravel shoreline areas of Lake Winnipeg. Burbot is the only known winter spawner in the Red River. Specific spawning locations within the main stem of the River are largely unknown; however, tributaries and tributary mouths are known to provide important spawning habitat for many fish species.

Red River fish populations tend to be highly mobile during open-water periods. Fish tagged in Winnipeg have been recaptured 256 miles south at Halstad, Minnesota, and 153 miles north at Dogwood Point on Lake Winnipeg. Fish in the River have been shown to travel up to 34 miles in two days and 250 miles in 14 days. A large portion of the fish within Winnipeg's perimeter appears to leave the City during the fall. Fish that remain within the City limits during winter remain relatively stationary in the deeper reaches of the River.

5.3.2 Lower Trophic Levels

Over 200 species of plankton occur in the Red River and are generally grouped as either zooplankton or phytoplankton. Six main types of algae occur in the Red River: blue-green algae, green algae, diatoms, euglena silicoflagellates and Cryptophyta. Green algae and diatoms comprise 90% of the algae in the River. Other algae and zooplankton make up less than 1% of the volume of plankton in the Red River. Each species of algae has a period of accelerated growth or "bloom" season in which the population increases and then decreases. Consequently, the total algae biomass varies seasonally and annually.

The benthic invertebrate community in the Red River is diverse with species representing six main Phyla: Annelida (segmented worms), Arthropoda (insects and crustaceans), Mollusca (bivalves and snails), Nematoda (round worms), Cnidaria, and Platyhelminthes (flat worms). Approximately 50 families within these Phyla have been identified to occur historically in the Red River. Lower trophic level and aquatic invertebrate sampling has not occurred in the Floodway Channel or ditches and drainage channels associated with the West Dyke.

Approximately 32 species of freshwater clams and mussels occur or potentially occur in the Red River, of which 23 species are considered common. Clams and mussels are of special concern because the Red River has the most diverse assemblages of freshwater clam species in any Canadian River. Also, general habitat degradation and destruction within the

Red River over the past 20 to 30 years has resulted in a decline in the abundance of all clam species, and most mussel species present are at the limit of their range and any further degradation of habitat would be difficult to rebound from. The occurrence of clams along the Red River substrate is usually patchy and discontinuous due to their specialized habitat requirements.

5.4 Terrestrial Environment

5.4.1 Ecological Areas

The Floodway Study Region occurs within the Prairie, Boreal Plains and Boreal Shield ecozones of southern Manitoba. The ecozones within this Region are subdivided into three ecoregions (Lake of the Woods, Lake Manitoba Plain and Interlake Plain), which collectively contain nine ecodistricts. Within these ecodistricts are areas specially designated for wildlife management and wildlife and/or ecosystem protection including, 21 provincial parks, 21 wildlife management areas, three important bird areas, three heritage marshes, one special conservation area, and one provincial park reserve.

5.4.2 Vegetation

Most of the Region is part of the Winnipeg Ecodistrict which occurs in a transitional zone between the grassland biome and aspen-oak forest. The aspen parkland zone encompassing most of the Region is bordered by a zone of native prairie to the southwest and by deciduous forest to the north and east. Remnant strands of aspen parkland and native prairie have been highly modified by agriculture. Native vegetation, which originally consisted of aspen-oak forest and tall grass prairie and meadow grass associations, has been largely replaced by cultivated cropland.

Native woods commonly occur along stream channels and as isolated tree communities in the agricultural areas. Trembling aspen and bur oak are normally the dominant tree species. Common understory species include snowberry, red osier dogwood and goldenrod. Balsam poplar usually occurs in moister locations. Elm, basswood, cottonwood, green ash, and willow are typically confined to alluvial deposits and floodplains. Landscape plantings and treed shelterbelts are relatively common at farmsteads and rural residential properties throughout the Region.

5.4.3 Wildlife

Certain ecodistricts within the Floodway Study Region and specially designated areas within these ecodistricts are recognized for their provision of suitable habitat for a variety of wildlife species. These areas along with rural and urban landscapes provide a mosaic of habitats that may support a diverse number of wildlife species. It is estimated that over 250 bird

species, 62 mammal species and 17 amphibian/reptile species may occur in the Region. There are also thousands of species of terrestrial insect and other invertebrates and microorganisms.

A number of waterfowl species, namely ducks, presently occurs within the Floodway and West Dyke areas. The Floodway Channel is generally more likely to support waterfowl in years when water is present in the Channel throughout the spring, summer and fall seasons. Water levels within the Floodway are an important factor in determining waterbird usages of the Low Flow Channel. Dabbling ducks have been noted foraging within ditches of the West Dyke during the spring and may have been nesting in the area.

Among the most productive and sensitive wildlife habitats in the Region are river bottom forests, which normally maintain high biodiversity and typically support larger wildlife populations. A variety of mammal species utilizes the Floodway during the spring, summer and fall. White-tailed deer forage within the alfalfa/brome haylands along the spoil banks and side slopes, as well as within the willow and herbaceous plant mix covering the base of the Floodway Channel. Small mammals including jackrabbit are attracted to the Channel base which in turn attract predators such as coyote and red fox. The surrounding area typically harbours Richardson ground squirrel, thirteen-lined ground squirrel, white-tailed jack rabbit and some ground-nesting bird species. The Floodway also provides habitat for beaver moving up the Red River and/or Seine River.

Amphibian habitat occurs predominately within the Floodway Channel and along ditches of the West Dyke. These habitats support a number of amphibian species, including wood frogs, boreal chorus frogs, leopard frogs, and American/Canadian toads. The habitat located within the Floodway and West Dyke is not expected to support large numbers of reptile species.

5.5 Socio-Economic Environment

5.5.1 Resource Use

Resource use in the Floodway Study Region is diverse and encompasses a range of activities including commercial land and resource use, residential land use, and traditional land and resource use by Aboriginal communities.

Commercial Land Use

The Region includes the most active commercial area of the Province including the City of Winnipeg and surrounding municipalities. Commercial land uses include industrial production, manufacturing, construction services and retail businesses. Most of these activities are concentrated in the City of Winnipeg and other adjacent urban centres. The primary form of commercial resource use in the Region is agriculture.

Residential Land Use

The 1997 Red River flood had a considerable impact on land and resource use in the Floodway Study Region. Approximately 1,200 homes in seven municipalities south of Winnipeg were directly affected by the flood waters. Other recent floods have also had effects on residential land use, notably the 1997 flood for residents downstream of the Floodway Outlet. In 1996, approximately 66% of all occupied dwellings in Manitoba were located in one of the communities in the Region. The majority of these dwellings (~89% of the Region and 59% of Manitoba) were located in the City of Winnipeg. The total number of occupied dwellings in the Region communities increased by approximately 3% between 1996 and 2001. This was generally in line with the increase in owned private dwellings in the rest of the Province. Housing values for the Region tend to be higher on average than for Manitoba as a whole.

Aboriginal Land and Traditional Resource Use

The Floodway Study Region and the Red River Valley in particular have been important locations for Aboriginal communities and resource use. Three Aboriginal communities have been identified as having either potential land or resource interests in the Region. These are the Brokenhead Ojibway Nation, the Métis Nation and the Peguis First Nation. The Brokenhead Ojibway Nation is located near Lake Winnipeg in the northeast portion of the Region. The Métis Nation has a long, historical connection to land and resource use in the Red River Valley. While the Peguis First Nation community is located outside the Region, the First Nation has historical connections to the Red River Valley and has several reserve parcels along the Red River north of Selkirk. In addition claims against Canada for outstanding treaty land entitlement and the St. Peter's Reserve are currently under negotiation with the Peguis First Nation in the Region.

5.5.2 Economy

The economy of the Floodway Study Region is diverse and encompasses a range of economic sectors and industries. The Region includes the City of Winnipeg and much of the Capital Region of Manitoba.

Employment

A majority of the communities in the Region experienced an increase in labour force participation rates from 1996 to 2001. However, the Village of St. Pierre-Jolys, the RM of Taché, the RM of East St. Paul, the RM of Hanover and the Peguis First Nation had decreasing participation rates over this period. The total participation rate for the Region increased from 67.3% to 68.7% from 1996 to 2001. This is somewhat higher than the total participation rate for Manitoba as a whole. Generally, total employment rates for the communities in the Region increased from 1996 to 2001 with the exception of the above-mentioned communities.

Education

For the Floodway Study Region, the percent of population in all major highest level of schooling categories decreased from 1996 to 2001 except for trade certificates or diploma categories which increased from 3.2% in 1996 to 11.5% in 2001, and bachelors' degrees or

post-grad categories which increased from 14.3 to 17.1%. For the Province of Manitoba, all major categories decreased or were unchanged from 1996 to 2001 except for trade certificates or diploma categories which increased from 3.3% in 1996 to 11.7% in 2001, and bachelors' degrees or post grad categories higher which increased from 11.6% to 14.3 %.

Income

Average personal income increased in all communities in the Floodway Study Region and Manitoba as a whole from 1996 to 2001. In the Region, the average personal income increased from \$24,044 in 1996 to \$28,305 in 2001. In both years, the average personal income was somewhat higher than for Manitoba. The RM of East St. Paul had the highest average personal income in 1996 while the RM of West St. Paul had the highest in 2001.

Business and Industry

The top employers by industry type for the City of Winnipeg in 1996 were manufacturing (13.3%), retail trade (12.1%), and health and social services (12.0%). Manufacturing, retail trade, and health and social services were also the top employers by industry type in the Region excluding Winnipeg. In 2001, the top employers by industry sector for the City of Winnipeg and the Floodway Study Region were manufacturing, health care and social services, and retail trade. Agriculture, forestry, fishing and hunting were also important industry sectors for employment in the Region excluding Winnipeg.

For areas in the northern part of the Region, both the RMs of St. Andrews and St. Clements characterized the southern portion of the municipalities as having a number of smaller home-based businesses. The economy of the central or more northern portions of the municipalities are characterized as being a mix of agriculture and recreation or cottage country-related businesses near Lake Winnipeg. The City of Selkirk has a more diverse economy with some industry, government services and a trend toward becoming more of a commercial service centre.

For the eastern part of the Region, the economy of the RM of Springfield is characterized as being diverse, with no single firm being notable as the most important employer. Notable segments of Springfield's economy include agriculture, aggregate and an industrial area. Agriculture and medical services are the most important sectors for the RM of Taché.

Communities in the south portion of the Region generally include agriculture, agricultural services and manufacturing. The economy of the RM of Ritchot is characterized as being predominately related to residence-based businesses and service industries. Agriculture and Trans-Canada Pipeline compressor at Île-des-Chênes are also important for the local economy. The economy of the Village of St. Pierre-Jolys is characterized as largely service-oriented. Agriculture, industry and manufacturing are generally important for communities in the south.

5.5.3 Infrastructure and Services

Infrastructure and services in the Floodway Study Region include transportation and roads, water supply, utilities, police, fire, ambulance and emergency services, and other community services. This infrastructure and these services were affected by the 1997 flood and subsequent flood protection measures, and are continuing to develop over time.

Highways and Bridges

The Region's infrastructure includes a number of major highway and bridge crossings at the existing Floodway, and provincial and municipal roads that form part of the West Dyke. The major Provincial Trunk Highway is No. 75 from Winnipeg to the United States border at Emerson. The six highway bridges spanning the existing Floodway are the following:

- St. Mary's Road Bridge
- Provincial Trunk Highway No. 59 South Bridge
- Trans-Canada Highway No. 1 East Bridge
- Provincial Trunk Highway No. 15 Bridge
- Provincial Trunk Highway No. 59 North Bridge
- Provincial Trunk Highway No. 44 Bridge

Rail bridges that span the existing Floodway include:

- Canadian Pacific Railway – Emerson
- Canadian National Railway – Sprague
- Greater Winnipeg Water District Railway
- Canadian National Railway – Redditt
- Canadian Pacific Railway – Keewatin
- Central Manitoba Railway – Pine Falls

Dunning Road

The Dunning Road crossing is a low-level crossing located in the RM of St. Clements. The principal purpose of the crossing is to provide access for emergency vehicles between the fire hall on the west side of the Floodway and the Pine Ridge Trailer Park on the east side. There is also local use of the connection. The crossing is closed whenever there is flow in the Floodway or sometimes following significant summer precipitation events.

West Dyke

The West Dyke extension involves some raising of the existing structure as well as raising or modifying portions of certain roads in the RM of Macdonald.

Water Supply

Most areas in the City of Winnipeg are covered by the municipal water system with the major water source being Shoal Lake. The City of Selkirk is serviced by a municipal water

system with groundwater being its source. All urban areas within the RM of Macdonald are served by a municipal water system from La Salle River. In the RMs of Ritchot and Ste. Agathe, the Red River Drive area and some rural areas are supplied by an artesian well municipal water system. The RM of Springfield is serviced by a municipal water system and by individual wells. All developed areas in the RM of East St. Paul are covered by a municipal well-water system while the RM of St. Clements is entirely supplied by private wells.

Utilities

Manitoba Hydro serves all Regional communities with electricity. Its subsidiary, Centra Gas, is the major natural gas distributor in Manitoba and the utility delivers natural gas to most urban communities in the Region. MTS provides telecommunication services to commercial and residential customers in the Region.

Police, Fire and Ambulance Services

All communities in the Region have access to and are served by ambulance, fire and police services. Ambulance service is generally provided out of one or two urban centres in each of the municipalities. Fire Hall service includes both professional and volunteer fire departments. Police service is provided by municipal police forces or by the RCMP. In some communities, RCMP service is supplemented by a municipal safety officer. It is noted that the construction of the Floodway in the 1960s resulted in the division of the service zones, which remains a concern for some Rural Municipalities.

Emergency Response

Under provisions of *The Emergency Measures Act*, every local authority is responsible for developing an emergency preparedness, response and recovery plan to ensure protection of people, property and the environment within their municipal boundary. The Manitoba Emergency Measures Organization (EMO) assists with the preparation, review and enhancement of emergency preparedness programs.

5.5.4 Personal, Family and Community Life

Population and Demographic Characteristics

The Floodway Study Region includes fifteen municipalities and two First Nations ranging in size from about 200 to 300 residents to the City of Winnipeg with approximately 640,000 residents. Métis residents are included in the total population figure for the Region. The total population of the Region in 2001, including members of the Peguis First Nation, is estimated between 716,000 and 734,000 residents for about 64% of Manitoba's overall population

Recreation and Travel

There are a number of summer and winter recreational opportunities in the areas along the Red River and Floodway. The main recreational activities include sport fishing and hunting. Other winter recreational activities include cross-country skiing, downhill skiing, tobogganing

and snowmobiling. Other summer recreational activities include canoeing and paddling, rowing and motorized boating, and trail walking.

Aesthetics

The Floodway Study Region is located in the Red River Valley which is characterized by glacial Lake Agassiz and is consequently described as being relatively flat agricultural land with urban communities and exurban development throughout. The aesthetic character of the existing Floodway can be seen by people from several roads and bridges which cross the channel, by residents who work and live within sight of the facility, and by residents who make use of the Floodway at various locations.

Health and Well-Being

Health services in Manitoba are provided by Regional Health Authorities (RHAs) that have the responsibility for administering health services in specified geographic areas. Overall, when compared with the rest of Manitoba, health status indicators show that the population of the Floodway Study Region is healthy with very few health or social issues that stand out as unique to the area.

Perspectives from local health providers generally confirm that communities in the Region are in good health and typically healthier on the whole than those in the rest of Manitoba. Despite these positive factors, health care providers indicate that there are several issues create barriers to achieving better health within certain parts of the Region. These issues include; mental health, hypertension, declining and aging population, rapid growth in bedroom communities, groundwater quality, and other environmental conditions.

Way of Life, Culture and Spirituality

The cultural origins of the Floodway Study Region are grounded in the rich Aboriginal history of trading, the buffalo hunt and seasonal travel as well as the immigration of settlers from other countries during the mid to late 1800s and early 1900s. For thousands of years, Winnipeg, at the junction of the Red and Assiniboine Rivers, was a popular summer spot for Aboriginal people to camp, celebrate and trade. Since then, the Red River Valley has developed into a culturally diverse region with Aboriginal and immigrant communities pursuing lifestyles engrained in their history and the geographic climate of the region.

The ways of life in municipalities adjacent to the City of Winnipeg and within the Red River Valley today generally fall into three groupings of communities and residential lifestyles, namely rural communities, bedroom communities and urban areas and rural residential. Demographic changes over time illustrate the trend toward growth in the Floodway Study Region occurring mainly in the bedroom communities and rural residential areas surrounding Winnipeg.

After-effects of the 1997 flood have been the subject of much research and assessment, with key findings regarding how flooding has affected the way of life for many in the Region.

Residents of the RMs of Ritchot, Taché, Macdonald and Morris have expressed a diminished sense of safety in homes and communities, disparity among communities in flood response, and dissatisfaction with compensation.

5.5.5 Heritage Resources

Aboriginal peoples have inhabited Manitoba, including the Floodway Study Region, for several thousand years before the start of historical records related to their initial contact with European traders in the 1600s and 1700s. Rival external trading interests began to influence activities in the Region by the later 1700s. By the 1800s, the Red River Métis had emerged as a distinct Aboriginal people, and settlement was being sponsored in the Red River area. In 1870, Hudson Bay Company administration and occupancy of the Region ended and Manitoba entered Confederation (with its area restricted initially to the “postage stamp area” focused on the Red River valley). The settled portion of the area defined then as Manitoba was populated by approximately 12,000 people in 1870 and was predominately Métis. Settlement accelerated in subsequent years and many Métis dispersed to areas north and west of Manitoba’s then border. Treaties were signed with the First Nations during the 1870 to 1912 period.

Archaeological records and surveys conducted as part of the site assessments determine that archaeological or other heritage resource sites are not present along the West Dyke or at any of the potential borrow locations. Examination of areas surrounding abutments of Floodway crossings which may require reconfiguration as a result of Channel widening found no areas of undisturbed ground that would contain archaeological or other heritage sites. The known sites at the Outlet Structure are south of the limits of construction and outside the areas of likely impact from the project although effects might occur from sightseers and casual visitors. One new archaeological site was recorded on the west bank of the Red River. A heritage resource impact assessment was not required for the Floodway Channel due to its location and relatively recent disturbance.

5.6 Navigation

A wide range of activities occurs on the Red River within the Flood Study Region. Commercial operators include Paddlewheel and River Rouge Tours, water bus and water taxis as well as fishing guides and tour operators. Recreational or private users include canoeing, rowing and fishing enthusiasts, the Winnipeg Rowing Club, Redboine Boating Club and the Royal Manitoba Yacht Club.

On the Red River, boats are generally put into the water after the ice has melted and water levels have decreased in the spring, and taken out of the water by the middle of October. Kayaks are generally the first boats on the water in the spring and the majority of boats are launched within the City of Winnipeg at various public boat launches (St. Vital Park being the

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most highly utilized facility). The main destination for boats on the Red River is the Forks Historic Site at the confluence of the Red and Assiniboine Rivers. Within the City of Winnipeg there is a controlled speed zone, authorized under the Boating Restriction Regulation of the *Canada Shipping Act* and enforced by the City of Winnipeg River Patrol (a division of the Winnipeg Police Service).

It is estimated that approximately 150 boats are docked at private boat club facilities and another 150 boats are at private individual facilities. During the summer season, it is estimated that the number of boats on the River averages between 400 and 500 on any given day. The July 1st fireworks at the Forks can attract up to 1,200 boats. Discussions with major users of the River suggests that the number of boats navigating the River has decreased over the past few years. Many boats also travel downstream, through the locks at St. Andrews Lock and Dam (SALD) and then onto Selkirk and Lake Winnipeg. Traffic varies seasonally and in the spring the traffic between SALD and Selkirk is estimated to be between 50 and 150 boats, with fewer boats on the River during the summer months and the fall season being the busiest (with some 400 to 500 boats on the River at that time). Records from Public Works and Government Services on the operation of the SALD indicate that the number of boats passing through the SALD has declined since the early 1990s. In the 1985 to 1990, an average of 2,000 to 2,250 boats per year passed the locks. In recent years, the number of boats passing the locks has dropped to 500 to 700 per year.

On the Seine River, the Save Our Seine River Environment Inc. hosts between two and four organized paddling events per year, with some 30 to 40 participants per event. These events take place on the Seine River, within the City of Winnipeg. There are also two or three private outfitters within Winnipeg, who offer guided paddling activities on the Seine River within the same regional area. These activities cater to smaller groups, but use the river more frequently (evenings and weekends). It is also reported that there are many other individual users of the Seine River, although their number has not been quantified. The City of Winnipeg River Patrol has placed a Boating Restriction on the Seine River under the *Canada Shipping Act* that prohibits use of motorized craft on the Seine River.

At the Inlet Control Structure, boats can and do pass through the Structure when the gates are in the down (fully open) position. Very few boats go through the Structure and travel upstream, as the River is shallow and the channel unmarked. However smaller boats are able to use the River upstream of the Inlet Control Structure.

At the Outlet Structure, the channel is used for fishing at different times of the year, although the channel is not accessible during low flow periods and typically is only accessible by boat during high water conditions. The Red River downstream of the SALD and Outlet Structure is an internationally renowned fishing location and attracts numerous boats for that reason. Strong currents and severe turbulence occur in the channel immediately downstream of the Structure when flows are being discharged. A fatality occurred in 1993, when a boat was operating near the Structure while water was flowing over the Outlet Structure. Although no

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fatalities have been reported at the SALD, a number of rescues have been necessary in the past. The record flows which occurred in the 1997 Flood changed the bathymetry of the outlet channel and, as a result, the channel is not accessible by boat, except under high water conditions.

6. Public Consultation

6.1 Introduction

The Guidelines for the Preparation of an Environmental Impact Statement (EIS) for the Red River Floodway Expansion Project (EIS Guidelines) (Appendix A) required that the Manitoba Floodway Authority (MFA) provide the details of the overall public consultation plan for the Project. The EIS Guidelines also required that the EIS describe:

- the role of community contacts in the consultation program;
- the use of any communications tools employed;
- the frequency and outcome of any events employed; and
- the plans for any ongoing consultation following completion of the environmental assessment.

The MFA was also required to describe how concerns and issues raised by the public were incorporated into the development of the Project including its design, effect mitigation and monitoring (Project Administration Team, 2004).

6.2 Public Consultation and Involvement Plan (PIP)

According to the MFA, the Public Consultation and Involvement Plan (PIP) for the Project was intended to provide early and ongoing opportunities for potentially affected and interested parties to receive information on, and express their views about the Project and its effects, measures to mitigate Project effects and the environmental assessment process. The PIP was intended to assist in planning of the Project, both before and after filing of the EIS documents (MFA, 2004a).

The MFA developed the PIP to cover four broad stages or rounds of activity. Three rounds of consultation were completed prior to the EIS being filed and the fourth round was completed following submission of the EIS. A more detailed description of the MFA's public consultation activities is provided in the EIS and Supplemental Filings.

Round One consultation activities were undertaken from January to March 2004. During this round, activities focused on initiating dialogue about the Project, informing the public about the process and schedule for the environmental assessment, describing the Project, and identifying and confirming issues and concerns about both the consultation process and the Project.

Round Two activities were undertaken from April to May 2004. The activities focused on providing information and perspectives on key Project elements such as compensation,

recreation and economic opportunities, water levels, mitigation, floodway operating rules, summer operation and ongoing communications beyond the assessment process.

Round Three focused on presenting the initial findings from the EIS, with a particular emphasis on Project features, potential effects and proposed mitigation measures.

Round Four was undertaken after the EIS was filed in August 2004 and addressed the results provided in the EIS.

6.3 Approaches

The MFA employed a range of approaches for consulting with and involving the general public in the assessment of the Project. These included:

open houses – at 4 to 6 locations during each round of consultation;

stakeholder Workshops – during rounds 1, 3 and 4 with organizations identified as having a particular interest in the Project;

municipal Government Meetings – with various municipal governments in areas potentially affected by the proposed Project, during all four rounds;

individual Stakeholder Meetings – with various stakeholders during all four rounds of consultation;

electronic and Paper Communications – the MFA created a web site to provide current information about the Project and the environmental assessment, and a web site specific to the Project for ongoing communication purposes;

newsletters/Print Materials – providing general information about the Project and the environmental assessment, distributed to local households in the area potentially affected by the Project. Newsletters were prepared during all four rounds of consultation; and

presentations – by the MFA to various groups interested in the Project.

Issues identified through the MFA's consultation activities were recorded in an issues database. This enabled the MFA to follow up on issues to ensure that they were addressed during the development of the environmental assessment. The issues database was also made available to the public through the environmental assessment web site.

6.4 Key Public Issues During Development of the EIS

The MFA summarized the key issues heard during the first three rounds of public consultation into four main groups:

1. effects Related to Floodway Expansion
2. effects Related to the Existing Floodway and Flood Management
3. issues Related to the Floodway Expansion Environmental Assessment and the PIP
4. other Issues

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A more detailed discussion of these issues is provided in the EIS and Supplemental Filings.

The MFA indicated that it had considered the key issues, comments and perspectives that arose during the PIP and where appropriate incorporated them into the design of the Floodway Expansion and the environmental assessment. The MFA notes the following changes to the Project design on the basis of input received through the PIP.

- elimination of Floodway deepening in response to concerns about lowering groundwater levels and contamination of wells;
- establishment of a groundwater mitigation fund to address concerns about unforeseen and unanticipated effects on groundwater;
- improvements to drainage drop structures to accommodate increased flows and future growth;
- twinning of Highway 15 to handle increased traffic flows;
- reduction in land acquisition requirements addressing concerns regarding reductions in the property tax base;
- discussions with Rural Municipalities regarding recreation opportunities and to address concerns regarding increased demands on emergency services and nuisance, vandalism and crime which may be associated with recreational use of the Expanded Floodway;
- adjust construction schedule to accommodate Springhill ski facility to address concerns over conflicting uses;
- re-use of excavated earth in response to requests from the public to access excavated earth from the Floodway Channel. MFA has established a series of principles to guide use of the excavated earth;
- involvement in design. MFA has consulted with local municipalities and residents to develop detailed plans regarding the raising of the West Dyke and to determine the best approach for drainage structures in the RM of Taché and the Cook's Creek Conservation District;
- additional analysis in response to issues and concerns raised during the PIP, MFA examined a number of additional areas, including;
 - implications on downstream water levels during a severe flood event of a choke point in the Red River near Lower Fort Garry National Historic Site;
 - potential for surface water intrusion into ground water when the Expanded Floodway is operating during a flood event, with particular emphasis on the area from Birds Hill to Lockport;
 - effects of sediment during construction and operation on the Red River and the need for dredging;
 - effects of expansion on Birds Hill aquifer and measures to minimize influence on ground water; and

- o nature of ice jams downstream of the Floodway Outlet and effects on downstream ice jams of Floodway Expansion water levels and flows.

6.5 Key Issues Raised in Comments on the EIS, Supplemental Filings and the CEC Public Hearing

In August 2004, the MFA filed the EIS on the proposed Project and the EIS was made available for public comment. Following submission of comments on the EIS, the PAT requested a supplemental filing from the MFA to further clarify and receive more information on identified issues. The MFA provided its Supplementary Filings in November and December 2004. The Supplemental Filings were also made available for public comment.

The Manitoba Clean Environment Commission (CEC) initiated its public hearing process on February 14, 2005. The CEC process was conducted over 16 hearing days and concluded on March 10, 2005. Weekly summaries of the proceedings are posted on the Commission's web site and transcripts from the hearing are accessible through that web site.

Appendix B provides a summary of the comments received from the public, and federal and provincial review agencies on the EIS and Supplemental Filings, as well as those raised by participants at the CEC public hearing.

7. Aboriginal Communications and Consultation

7.1 Manitoba Floodway Authority

The MFA's public consultation and involvement program involved Aboriginal communities and people that might be affected by or have an interest in the Project. A special initiative was undertaken by the MFA and their environmental assessment team to contact potentially affected or interested Aboriginal communities and peoples, and follow-up with those who expressed a desire to be involved. Three First Nations (Peguis, Brokenhead, and Roseau River) and two Manitoba Métis Federation (MMF) locals (Winnipeg and South East Regions) were initially identified by the MFA as potentially being affected by the Project impacts or as having an interest in the Project (Manitoba Floodway Authority, 2004a).

Introductory letters were sent to the leadership of each organization informing them of the Project and the environmental assessment, and asking if they had any issues, concerns, question or interests relating to the Project. The letter invited them to contact a designated member of the assessment team with their concerns. A copy of the PIP newsletter and the study region map were included to assist in their deliberations. No responses were received to these letters which prompted implementation of a second procedure.

Each organization was contacted by telephone and asked if they had any issues related to the Project and if they were interested in some form of follow-up activity such as a meeting with the assessment team of MFA. Some of the organizations had not seen the introductory letters. The telephone contact process resulted in the Peguis First Nation and the Manitoba Métis Federation (MMF) requesting follow-up meetings. The Peguis agreed to a meeting with the study team and the MFA while the MMF requested a meeting with the MFA.

Representatives of the Peguis First Nation met with representatives of the assessment team and the MFA in April 2004. Information was presented about the Project and the environmental assessment. The First Nation identified various concerns about the Project including:

- potential effects on reserve lands and Peguis traditional activities by added water levels due to operation of the Project;
- potential effects of the Project on the ecological health of Netley Marsh (in particular potential impacts from herbicides, pesticides and fertilizers used in the Floodway) and the ability of the Peguis to use the Marsh for traditional and other activities in the future;
- potential effects on fish and fish movements;

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- potential effects of the Project on Red River water quality and quantity in the next thirty years and how this might affect the Peguis' ability to use or develop their future reserve lands in the area;
- mitigation measures that address potential unknown and unanticipated effects that could impinge on the Peguis' resource use rights;
- potential economic opportunities for Peguis First Nation members on the Project;
- lack of consultation by the Province of Manitoba on the Manitoba Floodway Authority Act, and
- that any future agreements related to the Project do not abrogate or derogate Treaty and Aboriginal rights.

This meeting led to others and discussions between designated representatives of the Peguis and the assessment team and the MFA. An outcome of these discussions was creation and implementation of a key person interview program with Peguis members and Elders to gather information about local knowledge about the Peguis reserve and Treaty Land Entitlement lands near the Red River. In September 2004, the MFA met with representatives of the Peguis First Nation to provide an overview of the project and associated environmental effects, as provided in the EIS (which had been filed in August 2004). The MFA has indicated that it is committed to building a positive, ongoing working relationship with the Peguis First Nation and will continue to work with the Peguis on important Floodway-related topics.

In response to invitations from the MFA, the MMF economic development representatives participated in several meetings during the winter and spring of 2004 about discussions with respect to pre-project training for Aboriginal workers and how they would be engaged in construction of the Project. Representatives of the MMF met with MFA senior management in June 2004 to review the Métis people's rights related to the Project, review the status of the Project and identify MMF's expectations for involvement in the EIS and other aspects of the Project. This dialogue between the MFA and MMF will be maintained. Since the filing of the EIS and supplementary information, the MFA has continued dialogue with the MMF on ways to involve the Métis People. MFA has engaged the MMF to conduct three workshops for local Métis.

7.2 Cooperative Environmental Assessment Process

During the course of the cooperative environmental assessment process, First Nations and the MMF were notified of and provided opportunities to participate in the process. The draft EIS Guidelines were provided for review and comment in October 2003, the EIS was provided for review and comment in August 2004 and the Supplemental Filing was provided for review and comment in November and December 2004. The Peguis First Nation also received funding and participated in the Clean Environment Commission Public Hearing.

7.3 Responsible Authorities

In September 2004, an official of Infrastructure Canada attended a meeting of the MFA and the Peguis First Nation to provide an overview of the cooperative review process and the opportunities for participation by interested parties. The subsequent discussion focused on potential impacts of concern to the Peguis First Nation.

Canadian Environmental Assessment Agency and Infrastructure Canada representatives met with Peguis First Nation and Indian and Northern Affairs Canada in March, 2005 to obtain Peguis First Nation views on the EIS of the Project, the potential environmental effects on First Nation lands and interests, and appropriate measures for the management of those effects.

It was suggested that Peguis review the information provided by the MFA regarding increased flows north of the Floodway Outlet Structure. Peguis First Nation identified several additional concerns that are summarized below:

- The CEC public hearing would have benefited from participation by federal departments.
- There is concern that the Project will move water northward faster and thereby exacerbate flooding associated with ice jams.
- Protection of lands of cultural and spiritual interest including St. Peters Church and cemetery lands is important to the First Nation.
- There is concern about the potential destruction of medicinal plants along the riparian zone of the Red River that may be impacted by proposed shoreline protection works.
- The Peguis First Nation emphasized its interest in promoting economic opportunity for members through its land holdings along the Red River.
- It was noted that some of its members fish and trap in the Netley Marsh area.
- The Peguis First Nation reiterated concerns raised during the CEC public hearing that they should receive equal protection from flooding as that being given to the City of Winnipeg.

7.4 Key Issues Raised in Comments on the EIS, Supplemental Filings and the CEC Public Hearing

As noted above, in August 2004, the MFA filed the EIS on the proposed Project and the EIS was made available to First Nations and the MMF for comment. Following submission of comments on the EIS, the PAT requested a supplemental filing from the MFA to further clarify and receive more information on identified issues. The MFA provided its Supplementary Filings in November and December 2004. The Supplemental Filings were also made available to First Nations and the MMF for comment.

The Manitoba Clean Environment Commission (CEC) initiated its public hearing process on February 14, 2005. The CEC process was conducted over 16 hearing days and concluded

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on March 10, 2005. Weekly summaries of the proceedings are posted on the Commission's web site and transcripts from the hearing are accessible through that web site. The Peguis First Nation received funding under the Participant Assistance Program to participate in the CEC public hearings.

Appendix B provides a summary of the comments received from the Aboriginal communities, the public, and federal and provincial review agencies on the EIS and Supplemental Filings, as well as those raised by participants at the CEC public hearing.

8. Summary of the Environmental Effects Analysis

8.1 Approach

The following chapters of the Screening Report provide a summary of the potential environmental effects, an outline of the proposed mitigation measures and the significance of any residual effects for the proposed expansion of the Red River Floodway. Cumulative environmental effects of the proposed project in combination with the effects other projects and activities in the Floodway Study Region over the foreseeable future of the Project are also presented. Chapter 8 considers the effects related to the physical environment including the water regime, groundwater, erosion and sedimentation, drainage, ice processes, climate air quality and noise and physiography, geology and soils. Chapter 9 considers the effects related to the aquatic environment, including surface water quality, fish and fish habitat and aquatic species at risk. Chapter 10 considers the effects related to the terrestrial environment, including vegetation, wildlife and wildlife habitat and terrestrial species at risk. Chapter 11 considers effects related to the socio-economic environment including resource use, economy, infrastructure and services, personal, family and community life and health. Effects related to heritage resources are considered in Chapter 12. Chapter 13 considers effects related to navigation. Cumulative effects are considered in Chapter 14 and effects of accidents and malfunctions, effects of the environment on the project and effects related to sustainability are considered in Chapters 15, 16 and 17 respectively. A summary of mitigation measures and follow-up actions is provided in Chapter 18 and conclusions are presented in Chapter 19.

For the purposes of the Screening Report, the environmental assessment has considered the environmental effects of the Project in relation to the environmental conditions that currently exist prior to the project being carried out. The existing environmental setting provides an appropriate baseline to identify and assess the potential effects of the proposed expansion. The existing environmental setting includes the existing Floodway in place.

The environmental effects analysis is based on information contained in the EIS and the Supplemental Filings, augmented with information subsequently obtained from the MFA and that presented at the Manitoba Clean Environment Commission public hearing.

Three phases of the Project were considered in this assessment: 1) construction, 2) operation (inactive) and 3) operation (active - Rules 1 to 3 and Rule 4). The operational phase of the project refers to the period following construction of the expanded Floodway. It consists of periods when the Floodway is inactive, that is flows from the Red River are not being directed through the expanded channel and periods when the channel is in use, pursuant to Rules 1 to 4, to divert flows from the Red River around Winnipeg. Mitigation measures and follow-up actions considered include those outlined in the MFA's EIS, Supplemental Filings and subsequent documentation, as well as additional measures proposed by the responsible and federal

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authorities. The responsible authorities have considered the appropriateness and likely effectiveness of mitigation measures, the need for follow-up and the significance of any residual environmental effects.

Throughout the EIS and Supplemental Filings, the MFA have proposed the development of a range of plans and actions for mitigating, monitoring and follow-up, as a means of ensuring that the adverse effects associated with the Project are properly addressed. In order to ensure that these plans are developed in a comprehensive and coordinated way, that they achieve the results desired and that the responsible and federal authorities are able to review and respond to the plans in a timely way, the responsible authorities will require the MFA to develop an overall environmental management plan (EMP) for the Project. The purpose of the EMP will be to describe how all of the environmental commitments (including but not limited to mitigation, monitoring and follow-up) outlined in this screening report, the EIS, Supplemental Filings and other documents provided by the MFA will be met during all phases of the Project. The EMP will provide the MFA with a management tool for ensuring that the adverse environmental effects associated with the Project are addressed appropriately. Elements to be addressed by the EMP include:

- o Construction Phase Environmental Protection Plans (CPEPP);
- o Operation Phase Environmental Protection Plans (OPEPP);
- o Environmental Inspection Plans;
- o Monitoring and Follow-up Plans;
- o Reporting Plans, and
- o Any other conditions of the environmental assessment approval and other environmental approvals and related conditions as appropriate.

Further detail on the EMP and its component parts is provided in Appendix C.

8.2 Physical Environment

The EIS presented an assessment of the effects of the Project on the physical environment including the water regime, groundwater, erosion and sedimentation, land drainage, ice processes, climate, and physiography and soils. Further information on these elements is provided in the EIS and Supplemental Filings.

8.3 Water Regime

8.3.1 Introduction

The EIS Guidelines required the proponent describe the existing surface water regime and how it may be affected by the proposed project. The EIS Guidelines are provided in Appendix A.

8.3.2 Summary of Effects – Surface Water Regime

The MFA examined four large flood scenarios: a 100-year return period event (similar to the 1997 flood), a 120-year return event, a 225-year return event and a 700-year return event. The 1 in 100 year event is similar to and the 1 in 120 year event is greater than the 1997 Flood. The 1 in 225 is similar to the 1826 Flood and represents the maximum capacity of the existing Floodway. The 1 in 700 year event is larger than any flood historically and was selected as the Design Flood based on cost-benefit analysis. The expanded Floodway is not expected to change water flows and levels relative to those events that would occur in the existing Floodway for lower magnitude spring floods. In addition consideration was given to flows expected when the Floodway is operated in accordance with Rule 4 (non-spring emergency operation). Table 2 provides a summary of the predicted differences in water levels at key locations in the flood study region for the each of the four large flood scenarios. Proposed measures to mitigate adverse effects of the water levels are also identified.

8.3.2.1 Construction

The EIS and supporting documentation indicate that construction will not occur during the spring operating season in April and May and thus would not interfere with Floodway operations. As construction proceeds, the capacity of the Floodway will be increased from its current capacity of 2,550 m³/s to a capacity of 3,960 m³/s with the Expanded Floodway. The MFA and Manitoba Water Stewardship have indicated that operation of the Floodway in accordance with Rule 4 is unlikely during the construction period since the costs of delay of Floodway expansion exceeds the benefits of operation to prevent sewer back-up in Winnipeg. As a result, the MFA predicts that during the construction phase of the Project, there may be an increased risk of basement flooding in Winnipeg, however, the cost of increased risk of

basement flooding in Winnipeg over 5 year construction period is low compared to the flood protection benefits of the timely completion of the project. In addition, the likelihood of flooding of low-lying areas upstream of the Inlet will be reduced during this phase. The MFA concludes that these residual effects are of moderate magnitude, short duration, of low frequency.

The MFA is proposing the preparation of a Construction Phase Environmental Protection Plan (CPEPP) that will describe the surface water conveyance and management measures to be implemented during the Project's construction phase. The CPEPP will integrate both temporary and permanent measures representing the best available technologies that are economically achievable.

8.3.2.2 Operation – Inactive

The MFA indicates that the Project will not have any effect on the water regime in periods when the expanded Floodway is not in active use.

8.3.2.3 Operation – Active

The MFA predicts that water levels at the Floodway Inlet would remain the same as the existing Floodway for floods less than the 100-year return period as defined by Operating Rule 1 (see Table 2). Since the expanded Floodway would allow more water to be diverted through the Floodway Channel and less through the City of Winnipeg at the same water level at the Floodway Inlet, water levels in Winnipeg would be reduced by up to 0.3 m during the high range of Rule 1.

In the event of a 100-year return frequency flood, the MFA predicts that water levels at the Floodway Inlet would be 0.3 m lower, tapering to no effect on water levels at St. Agathe. Water levels in Winnipeg would be about 0.3 m lower and water levels downstream of the Floodway Outlet would be about 0.02 to 0.08 m higher.

For the 120-year return frequency flood, water levels from Morris to Ste. Agathe would be unaffected by the Project. Water levels at St. Adolphe would be approximately 0.3 m lower than would occur for a comparable flood with the existing floodway and 0.75 m lower at the Floodway Inlet. Within Winnipeg, the MFA predicts that the water levels would be approximately the same as the baseline condition. Downstream of the Floodway Outlet, water levels would be about 0.02 to 0.08 m higher than the baseline.

During a 1:225 year flood, the MFA predicts that water levels from Morris to the United States border would be unaffected. For communities immediately upstream of the Floodway Inlet (i.e. Grande Pointe, St. Adolphe, Niverville), water levels would be reduced by 0.9 m. At the Floodway Inlet, the water level would be reduced by slightly more than 1 m. Water levels in Winnipeg would be unchanged; however, the freeboard on the West Dyke would be increased and no bridges crossing the Floodway Channel would be submerged. At and downstream of the Floodway Outlet, water levels would increase by a maximum of 0.06 m, due to reduced ponding in the RM of Richot, upstream of the Floodway Inlet.

Screening Report-Red River Floodway Expansion Project

Table 2. Summary of Peak Water Levels Along the Red River Under Flood Scenarios

Table 2 – Summary of Peak Water Levels Along the Red River Under Flood Scenarios

Location		Maximum Water Level (ft)											Proposed Mitigation Measures	
		1 in 100-Year Flood			1 in 120-Year Flood			1 in 225-Year Flood			1 in 700-Year Flood			
		Existing Floodway	Expanded Floodway	Difference (Exp-Ext)	Existing Floodway	Expanded Floodway	Difference (Exp-Ext)	Existing Floodway	Expanded Floodway	Difference (Exp-Ext)	Existing Floodway	Expanded Floodway	Difference (Exp-Ext)	
Upstream of Floodway Inlet Structure	Emerson	792.81	792.81	0	793.00	793.00	0	793.81	793.81	0	794.54	794.54	0	Sandbags to property owners downstream of the Outlet Structure during large flood events. Compensation under the Red River Floodway Act for artificial flooding during operation under Rules 1 to 3. Compensation by Manitoba Water Stewardship for flooding caused by Floodway operations under Rule 4. Purchase of low-lying properties subject to flooding due operations under Rule 4, south of the Inlet Control Structure. Lowering of the gates to mimic the natural reduction of river levels.
	Letellier	787.27	787.27	0	787.29	787.29	0	788.30	788.30	0	789.08	789.08	0	
	St. Jean Baptiste	784.37	784.37	0	784.04	784.04	0	785.00	785.00	0	785.59	785.59	0	
	Morris	783.17	783.17	0	783.06	783.06	0	783.47	783.47	0	784.32	784.32	0	
	St. Pierre-Jolys	781.26	781.26	0	780.90	780.90	0	782.20	782.20	0	783.01	783.01	0	
	Rosenort	783.08	783.08	0	782.97	782.97	0	783.32	783.32	0	784.12	784.12	0	
	Aubigny	781.20	781.20	0	781.13	781.13	0	781.47	781.47	0	782.21	782.21	0	
	Brunkild	783.19	783.19	0	783.01	783.01	0	783.43	783.43	0	784.12	784.12	0	
	Avonlea Corner	778.08	778.02	-0.06	777.74	778.02	0.28	778.79	778.35	-0.44	779.37	779.37	0	
	Ste. Agathe	776.07	776.07	0	776.00	776.00	0	778.77	777.15	-1.63	779.26	779.26	0	
	Niverville	773.82	773.44	-0.38	773.90	773.38	-0.52	778.42	775.80	-2.62	778.59	778.59	0	
	St. Adolphe	772.59	772.14	-0.46	773.24	772.18	-1.06	778.31	775.40	-2.91	778.38	778.38	0	
	Grande Pointe	770.92	769.75	-1.17	772.38	770.10	-2.28	778.13	774.70	-3.43	778.00	778.00	0	
	Floodway Inlet (Turnbull Dr.)	770.52	769.56	-0.96	772.26	769.80	-2.46	778.07	774.57	-3.50	777.91	777.91	0	
Through Winnipeg	James Avenue	752.06	750.89	-1.17	751.99	752.27	0.28	752.27	752.30	0.03	760.56	755.30	-5.26	
	North Perimeter Bridge	748.72	748.10	-0.62	747.97	748.23	0.26	748.52	748.59	0.07	755.58	751.54	-4.04	
	St. Andrews Church	741.08	740.91	-0.16	740.94	741.31	0.36	742.75	742.91	0.16	747.70	746.92	-0.79	
	St. Andrews Lock & Dam	738.81	738.91	0.10	739.01	739.44	0.43	741.37	741.57	0.20	745.47	746.00	0.52	
	Red River at Floodway Outlet	738.42	738.58	0.16	738.68	739.07	0.39	741.11	741.31	0.20	744.82	745.70	0.89	
Downstream of Outlet	Lower Fort Gary	729.53	729.59	0.07	729.66	729.92	0.26	731.27	731.40	0.13	734.06	734.48	0.43	
	Selkirk Bridge	729.53	729.59	0.07	729.66	729.92	0.26	731.27	731.40	0.13	734.06	734.48	0.43	
	PTH 4 Bridge	726.67	726.74	0.07	726.80	727.03	0.23	728.22	728.35	0.13	730.68	731.00	0.33	
	Breezy Point	721.06	721.06	0.00	721.10	721.16	0.07	721.65	721.69	0.03	722.97	723.13	0.16	

Under Rule 4, water levels at the Inlet Control Structure are not allowed to exceed elev. 760 ft., in order to maintain water levels below the top of bank. The Floodway would not be operated until the river levels in Winnipeg are expected to rise to or above 14 ft JAPSD. The operation is not allowed to achieve a river level of less than 9 ft JAPSD, recognizing that when the river flows are decreasing that this level will eventually be reached.

Source: MFA, 2004a

Notes:

Frequency relationships relative to natural flow at James Avenue

Water levels upstream of the Inlet Control Structure for the 1 in 225 year – existing Floodway are at 778 ft, however this level upstream of the Inlet for existing conditions carries unacceptable risk to the flood protection works.

Water levels in the City for the 1 in 700 year flood – expanded floodway are controlled at 2 ft above the 24.5 ft JAPSD which accounts for either permanent or emergency temporary raising of the Primary Dykes.

For the 700-year return period flood, the MFA predicts that water levels upstream of the Floodway Inlet would be unaffected. Within Winnipeg, water levels would be reduced by 1.5 m. At the Floodway Outlet, water levels are predicted to be 0.27 m higher, but would remain within the banks of the Red River. From Lower Fort Garry to Breezy Point, water levels are predicted to increase between 0.13 to 0.05 m. Water levels would be higher downstream since water is being conveyed in the expanded Floodway Channel instead of being partially stored in the Winnipeg floodplain.

Figures 8.1 and 8.2 in Section 8 and Annex F of the Supplemental Filings illustrate the geographic extent of flooding under the various scenarios considered.

The MFA proposes to provide additional sandbags to downstream properties affected by the incremental increase in water levels caused by the Project. In the event that the Project must be operated above natural water levels, compensation for flooding, both upstream and downstream of Winnipeg, will be awarded in accordance with *The Red River Floodway Act*. The MFA concluded that these residual effects are of short duration (1-2 months), very infrequent, fully reversible and of regional extent.

Manitoba Water Stewardship has adopted a formal rule (Rule 4) governing decisions to carry out emergency operation of the Floodway to reduce sewer back-up in Winnipeg when significant rainstorms are forecasted upstream while Red River levels are elevated above normal levels. The rule establishes that the operation of the Floodway would not be initiated until the Red River levels in Winnipeg were expected to rise to or above 14.0 feet James Avenue Pumping Station Datum (JAPSD). During operation, the water level at the Floodway Inlet is not allowed to exceed elevation 760 feet, to maintain water levels below the top of riverbank. Figures 13.1 and 13.2 in the Supplemental Filings, illustrate the maximum flooded areas when the Red River level at the Floodway Inlet is at 760 feet. Figure 13.3 in the Supplemental Filings illustrates in more detail, the land affected by this non-spring emergency operation.

The EIS includes an examination of the effects of past instances when the Floodway had been operated in non-spring emergency situations (2002 and 2004), prior to the adoption of Rule 4. In 2002, the Floodway was operated between July 5 and August 4. Raising of the Floodway gates at the Floodway Inlet structure resulted in artificial water levels upstream of the Inlet that reached a peak of 754.9 feet. Natural water levels were calculated to be 749.8 feet and normal summer water level is 734.9 feet. At the time, the natural water level was approximately 16 feet above normal summer levels and the use of the Floodway resulted in a water level approximately 5 feet above the natural level. As noted earlier, the top of the riverbank is at an elevation of 760 feet. Limited flooding occurred upstream of the Inlet Control Structure, principally in low-lying lands affecting market gardens and other croplands. Compensation was provided to property owners who suffered property damage as a result of the artificial flooding due to non-spring emergency operations in 2002.

In 2004, the Floodway was operated between June 10 and July 27. This resulted in artificial water levels upstream of the Floodway Inlet that peaked at 756.6 feet. The natural water level was calculated to be 749.8 feet and the normal water level expected during this period was 734.0 feet. Thus natural level was approximately 16 feet above normal and the artificial level was almost 7 feet above natural. Some flooding again occurred upstream of the Floodway Inlet in low-lying lands affecting market gardens and other croplands. Compensation was made available to local governments, individuals, farm and market garden operations, small business and non-profit organizations that incurred losses or damages as a result of the operation of the Floodway.

Use of the expanded Floodway during non-spring emergencies will be undertaken in accordance with Rule 4 and can be expected to result in effects similar to those experienced during the 2002 and 2004 events. Rule 4 also includes provision for mitigation of the adverse effects of artificial flooding through a program of compensation. This program, to be administered by Manitoba Water Stewardship, is intended to compensate property owners for damages incurred from flooding above natural levels caused by Floodway operation under the rule. Manitoba Water Stewardship has also sought approval from Manitoba Treasury Board for the purchase of low-lying lands (below top of bank) along the Red River south of the Inlet Control Structure that are currently being farmed as market gardens. Some property owners have requested this purchase.

Public Works and Government Services Canada (PWGSC) expressed a number of concerns regarding the impact of operation of the Floodway under Rule 4 on the operation and maintenance of the St. Andrew's Lock and Dam (SALD). Potential concerns include variation in flows that affect the ability of the SALD operators to react quickly enough to prevent damage to the structure. PWGSC indicate that there needs to be improved communication as to how and when the Floodway would be operated under Rule 4, particularly when the flows are receding from flood levels and approaching flows when at which the SALD begins regulation. MFA have indicated that there needs to be ongoing discussion between the operators of the Floodway and the SALD to ensure that there is appropriate coordination among these operations.

8.3.3 Proposed Mitigation, Monitoring and Follow-up

The MFA have proposed the following mitigation measures to address predicted effects to the surface water regime:

- Construction: CPEPP to address surface water conveyance and management;
- Operation – Inactive: no specific measures required;
- Operation – Active: additional sandbags for properties affected by higher water levels downstream; compensation under *The Red River Floodway Act* for properties affected by artificial flooding caused by the Project; compensation in accordance with Rule 4 for properties affected by artificial flooding caused by the

Project and purchase of low-lying property subject to flooding during operation of the Floodway under Rule 4.

MFA have also developed a conceptual level plan for Monitoring and Follow-up (M&F). Separate M&F plans will be prepared for each of the major components identified in the EIS Guidelines. MFA proposes that monitoring and follow-up in relation to the water regime would involve determining the extent of flooding during an event or other physical information about a flood as may be requested by the Manitoba Water Commission or other agency.

8.3.4 Responsible Authority Conclusion

Federal and Provincial departments and agencies, and members of the public made a number of comments regarding the surface water regime. Appendix B provides a summary of those comments by environmental category and issue. Many of the comments received related to the operating rules for the Floodway, the effects of summer operations and artificial flooding. The responsible authorities have considered those comments in assessing the effects of the project and in coming to a conclusion on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the effects to the surface water regime predicted by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitment to monitoring and follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding the surface water regime conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA and the following additional management actions are implemented:

- The MFA develops and submits to the RAs for review and approval prior to construction the Environmental Management Plan (EMP) outlining how the commitments related to the flow regime contained in the EIS and supplementary filings and this screening report will be met during construction and operation of the Project, how monitoring and follow-up will be undertaken, the MFA's plans to adaptively manage any adverse effects and the MFA's plans for reporting progress and compliance with the terms and conditions outlined in this screening report;
- In accordance with the EMP, the MFA submits to the RAs for review and approval prior to construction the CPEPP describing how flow regime and surface water conveyance and management issues will be addressed during construction. The CPEPP will also include any contingency plans outlining actions necessary in the event of a failure of any of the proposed measures;
- In accordance with the EMP, the MFA submits to the RAs for review and approval prior to operations of the Project, the OPEPP for addressing flow regime and surface water conveyance and management issues during operations. The OPEPP will also include any contingency plans necessary in the event of a failure of any of the proposed measures;

- The MFA submits to the RAs for review prior to operation of the Expanded Floodway, the details of the compensation program for artificial flooding caused by non-spring emergency operation under Rule 4. This shall include how the compensation is to be administered and accessed.
- The MFA to develop for review and approval by the RAs a Monitoring and Follow-up Plan describing how the flow regime will be monitored during operation. The MFA should also continue to monitor flows and levels and confirm predictions made in the EIS are accurate. The results of this monitoring should be made available to public.
- The MFA to develop and submit for the review and approval by the RAs a plan for ensuring coordination of the operation of the Floodway and of the St. Andrew's Lock and Dam. This plan is to be developed in consultation with Public Works and Government Services Canada and Transport Canada.
- The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required;
- The RAs also encourage the MFA and Manitoba Water Stewardship to advance its program for the purchase of low-lying lands (below top of bank) along the Red River South of the Inlet Control Structure that are currently being farmed as market gardens and which are flooded during operation under Rule 4 and to investigate and act upon cost effective means of protecting low-lying lands that are prone to flooding as a result of non-spring emergency operation under Rule 4.

8.4 Groundwater

8.4.1 Introduction

The EIS Guidelines required that the proponent describe local and regional hydrogeology and how it may be affected by the proposed Project. The EIS Guidelines are provided in Appendix A.

8.4.2 Summary of Effects - Groundwater

The EIS and Supplemental Filings identified potential sources of effects to groundwater as being related to the deepening of the Floodway Channel, temporary construction dewatering around bridge piers, the Winnipeg Aqueduct, and widening of the Floodway Channel, intrusion of Red River water carried in the Channel during flood events into the underlying aquifer and groundwater seepage to the low flow channel. Subsequent to submission of the EIS and Supplemental Filings, the MFA confirmed that the Project would be constructed without a requirement to deepen the Floodway Channel. The MFA has announced that it will not deepen the channel in response to the public consultation program. The capacity of the Channel will remain unchanged from that originally proposed.

8.4.2.1 Construction

The EIS predicts that during construction of the expanded Floodway, groundwater dewatering is expected to adversely affect residential wells in a number of areas.

Near the Highway 59 N Bridge, the MFA determined the drawdown to be less than 1 metre at the RM of East St. Paul wells. The MFA predicts that the effects on groundwater levels will occur for approximately 6 months, occur only during the construction phase, be reversible and local in the area affected. The MFA proposes to monitor and could implement additional mitigation measures such as grouting or recharge of the pumped water back into bedrock aquifer to create a hydraulic barrier to reduce the adverse effect.

At the Highway 15 Bridge, CNR Redditt and CPR Keewatin bridges, the MFA predicts that the dewatering activities will result in a drawdown in local residential wells near the bridges of 1.5 metres or less. The MFA predicts that the effects on groundwater levels will also be local, temporary, reversible and of short-term duration. The MFA proposes mitigation measures such as grouting of bedrock, dewatering one pier at a time, lower pumping rates and supplying an alternate source of water.

At the Winnipeg Aqueduct, the MFA predicts that construction dewatering activities may result in a temporary drawdown of 4 metres in the groundwater levels in nearby residential wells. The MFA predicts that the effects on groundwater levels would be local in extent and short-term in duration. The MFA proposes that these effects be monitored and mitigation measures such as grouting or recharge of the pumped water back into the bedrock aquifer to

create a hydraulic barrier be considered. MFA also suggests that field visits may be required to identify the wells that may be affected and temporary alternate supplies of water may be required. Pumping rates may be reduced as a result of monitoring. It is also proposed to discuss the mitigation options with the affected parties.

The MFA proposes to prepare a CPEPP to prevent groundwater effects as a result of construction. The Plan will be prepared following detailed design and it will present construction methods to prevent groundwater effects such as seepage, construction site dewatering, blowouts, aquifer interconnection and surface water intrusion situations, and monitoring and contingency plans. The MFA indicates that the CPEPP will describe:

- procedures for drilling and installation of boreholes, test holes, dewatering and water wells to protect groundwater resources from contamination and prevention of cross aquifer contamination;
- decommissioning of all boreholes, test holes and dewatering wells that are no longer in use;
- maintenance or alternative supply of potable water to supply adjacent lands;
- procedures to prevent blowouts during excavation;
- provide groundwater source protection in terms of both quality and quantity and recognize vulnerable or sensitive aquifer zones and wellhead protection zones; and
- decommissioning of bridge piles and piers.

The EIS also predicts a potential effect on groundwater quality associated with use of hydrocarbons, herbicides and other chemicals during construction. This effect may occur as a result of accidents or malfunctions during construction. The MFA proposes to mitigate these potential effects through adoption of good management practices for handling these materials. The Construction Phase Environmental Protection Plan (CPEPP) will be prepared to further describe these measures. The CPEPP will address procedures for proper storage, good fuelling practices, and spill response and cleanup. The MFA concluded that these effects would be small and local in extent.

8.4.2.2 Operation - Inactive

The MFA predicts that the widening of the Floodway channel through the Birds Hill/Oakbank area will result in a drop in the water table elevation of 2.6 m, tapering to 0.6 m at Oasis Road. A subsurface cutoff wall will be constructed by the MFA to reduce the effect of widening on groundwater seepage into the low flow channel during the inactive phase of the Project. The MFA also indicated that it had considered the installation of a liner to address groundwater seepage into the floor of the Floodway Channel. The MFA indicated that there were a number of practical problems with installing a floodway liner and that the pressurized nature of the aquifer would make it difficult to maintain the liner in place. The MFA also noted that construction of a liner would require deeper excavation in to the channel, increasing the risk to groundwater. As a result, the MFA concluded that the installation of a liner would be impractical and not cost-effective.

In order to address public concerns regarding potential impacts on groundwater, the MFA has announced a five-point program for groundwater protection. The program includes:

- No deepening of the Floodway Channel;
- Low Flow Channel protection – measures to strengthen, armour and fill in erosion spots to re-establish the grade of the Low Flow Channel;
- Environmental mitigation fund - \$11 million fund to mitigate any unanticipated, isolated environmental effects, including groundwater protection;
- Ongoing monitoring – in partnership with Manitoba Water Stewardship and local authorities, adoption of a monitoring and adaptive management approach to identify and respond to any unpredictable adverse effects regarding groundwater. Key principles include:
 - a focus on sensitive spring areas;
 - focus on the bedrock aquifer, but also includes the sand and gravel aquifer;
 - consisting of multiple wells into bedrock or other granular zones;
 - establishment of secure wells for on-going monitoring;
 - facilitate both monitoring and pumping of affected groundwater if required.
- Community Liaison – establish a Community Liaison Committee to provide local residents with updates on the project as well as a venue to raise issues related to the expansion project.

The MFA also notes that it has adopted an overall approach to effects management based on the principles of adaptive management.

The MFA predicts that with the implementation of mitigation measures, that the effects of channel widening on groundwater are of long-term duration, local in extent and irreversible.

The MFA predicts that during inactive operations a drawdown of the groundwater levels of less than 0.5 metres at the CPR Keewatin Bridge and the Dunning Road Crossing locations is expected to occur. The MFA does not propose any specific mitigation measures, beyond the Groundwater Protection Plan described above. The MFA predicts that the effects are of long-term duration, local in extent and not reversible.

8.4.2.3 Operation – Active

The MFA predicts that during active operation of the expanded Floodway that the zone of surface water infiltration is expected to widen in proportion to the widening of the Floodway Channel in the northern third of the Floodway. The MFA predicts that no additional vertical intrusion of surface water will occur. The MFA proposes to implement the Groundwater Protection Plan described above. The MFA predicts that the adverse effects on groundwater during active operation will be temporary, local in extent and likely reversible.

8.4.3 Proposed Mitigation, Monitoring and Follow-up

As outlined above, the MFA have proposed a series of measures intended to address the potential effects to groundwater as a result of the Project. These include a range of measures to be implemented at bridge dewatering sites, CPEPP to address potential contamination due to hydrocarbons, herbicides and chemical spills and a five-point groundwater protection plan.

Separate monitoring and follow-up (M&F) plans will be prepared for groundwater to include post-construction groundwater level monitoring focused on areas where mitigation actions were installed and areas where existing groundwater discharge into the Floodway is taking place. Monitoring of groundwater quality would focus on the western side of the Floodway to verify movement and any effect of surface water intrusion. Follow-up would be taken depending upon the nature and extent of the need.

8.4.4 Responsible Authority Conclusion

Federal and provincial departments and agencies, and members of the public made a number of comments regarding groundwater. Appendix B provides a summary of those comments by environmental category and issue. Comments received related to the effects of the Project on both groundwater quantity and quality and the potential interactions between ground and surface waters. Contamination of groundwater from Red River water during flood events was of particular concern to RMs north and east of Winnipeg. The responsible authorities have considered those comments in assessing the effects of the Project and in coming to a conclusion on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the effects to the groundwater predicted by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitment to monitoring and follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding the potential effects to groundwater which may result from the Project, conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA and the following additional management actions are implemented:

- The MFA develops and submits to the RAs for review and approval prior to construction the Environmental Management Plan (EMP) outlining how the commitments related to groundwater contained in the EIS and supplementary filings and this screening report will be met during construction and operation of the Project, how monitoring and follow-up will be undertaken, the MFA's plans to adaptively manage any adverse effects and the MFA's plans for reporting progress and compliance with the terms and conditions outlined in this screening report;
- The MFA develop and provide to the RAs for review and approval prior to construction, the CPEPP dealing with groundwater. The CPEPP shall include the site-specific

groundwater protection plans for all sites where groundwater effects are predicted, including but not limited to the Highway 59 N Bridge, the Highway 15 bridge, CNR Redditt and CPR Keewatin Bridges, the Winnipeg Aqueduct, Dunning Road Crossing and in the Bird's Hill/Oakbank area. These plans shall specify the specific pre and post-construction monitoring, monitoring in respect to floodway operations and mitigation actions that will be undertaken to protect groundwater resources from adverse effects as a result of the Project. The CPEPP shall also outline how the MFA, in consultation with Rural Municipalities, will identify sensitive groundwater areas along the Floodway Channel and develop a model for determining whether further mitigation measures are necessary to ensure these areas are protected from effects as a result of the Project. Use of a health-based risk assessment approach should be considered. The MFA shall report to the RAs how it will address sensitive groundwater areas and the results of the consultations with Rural Municipalities, prior to construction. The CPEPP will also include the MFA's plans for on-going and site-specific groundwater monitoring. This plan shall be provided prior to construction. The plan shall include how the MFA intends to consult with stakeholders during the implementation of the plan. The MFA shall also indicate how the MFA's groundwater monitoring program will relate to the proposed regional groundwater study. The RAs note that this study will be an important component in assisting in addressing cumulative effects associated with the project and support its development and implementation. The CPEPP will also include any contingency plans outlining actions necessary in the event of a failure of any of the proposed measures;

- The MFA will provide for review by the RAs detailed procedures for administration of the mitigation fund, including processes for determining how funds are to be accessed, when and how decisions will be made, contingency plans in the event the fund is exhausted prior to the adverse effects of the project being fully resolved and the MFA's plans for informing the public about the fund and its operation;
- ⊖ MFA develop and provide to the RAs for review and approval, procedures for responding to and addressing any complaints regarding potential effects on groundwater received during construction and operation of the Project;
- ⊖ In accordance with the EMP, the MFA submits to the RAs for review and approval prior to operations of the Project, the OPEPP for addressing groundwater issues during operations. The OPEPP will also include any contingency plans necessary in the event of a failure of any of the proposed measures;
- The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required.

8.5 Erosion and Sedimentation

8.5.1 Introduction

The EIS Guidelines required the proponent to describe the existing shoreline environment and the rate of shoreline erosion and recession based on long-term monitoring programs, and the nature and extent of existing sediment deposition and shoreline debris. The EIS Guidelines are provided in Appendix A.

8.5.2 Summary of Effects – Erosion and Sedimentation

The EIS and Supplemental Filings indicated that typical sources of effects of the Project related to erosion and sedimentation include:

- removal of soil during the construction of the expanded Floodway, creating the potential for temporary erosion and sedimentation during construction;
- erosion of the Low Flow Channel during use of the Floodway or during the inactive phase when it transports local runoff;
- potential for erosion of the spoil piles and channel side slopes from rain fall/runoff;
- erosion at the Inlet Control Structure and Outlet Structure during construction and operation,
- and
- increase in sediment carried downstream to Lake Winnipeg due to reduced flooding and sediment deposition in Winnipeg.

8.5.2.1 Construction

The MFA predicts that during construction there is a potential for incremental increases in Total Suspended Solids (TSS) in the Red River due to erosion caused by higher magnitude rainfall events. For smaller rainfall events, the EIS predicts that there will be no effect on TSS in the Red River. The MFA indicates that the risk of a five-year rainstorm event occurring during construction is anticipated to be 60%, resulting in a maximum potential increase in TSS of 400 mg/L. The chance of a 20-year rainstorm event occurring during construction is considered to be 18.5%, resulting in a maximum TSS of 700 mg/L. A Sediment and Erosion Control Plan is proposed as a component of the CPEPP. The plan will incorporate guidance from Manitoba Conservation and include the following elements:

- Maps showing the areas on the site to be protected, and the direction of surface water flows;
- Identification of areas requiring special protection, such as surface water bodies or areas susceptible to groundwater pollution;
- A description of temporary and permanent erosion control measures and sedimentation containment measures. This includes a description of materials to be used and installation procedures;

- Standard detail plans for erosion control measures and sedimentation containment measures;
- A discussion of maintenance measures;
- A description of the re-vegetation plan including nutrient and pesticide application;
- A description of emergency plans – responsibilities for identifying emergency situations, contacts for notification, materials available on site, and equipment available on site; and
- Identification of responsibility for plan implementation – an on-site person responsible for all aspects of the installation, maintenance and removal of erosion and sediment control works.

In addition, the MFA indicates in the EIS that the sediment and erosion control plan could include the following best management practices:

- Construction timing and sequencing will be coordinated to maximize excavation while minimizing the time of exposure for newly excavated slopes to less than 30 days before planting;
- Minimize disturbance to adjacent vegetated areas and base of Floodway for buffering suspended sediments;
- Implement surface roughening techniques; and
- Re-vegetate exposed areas directly after finished grade is established and minimize the amount of over-winter exposed surfaces.

General best management practices to be used to manage the effects of excavation include:

- Excavation should be completed from the top down and not from the inside out. This will maximize the vegetation buffer below the excavation;
- When excavating below 1:20 year summer Floodway levels (years 2, 3 and 4), excavate from the outside in and leave an earth plug until the end of the construction period. This will maintain the excavation in the dry and allow for containment of internal sediment during storm runoff;
- Implement slope roughening techniques on exposed side slopes to limit erosion; and
- A silt fence will be maintained around the perimeter of excavated areas.

Additional measures being considered include:

- Installation of silt fencing parallel to the benched areas, allowing 3 to 4 metres of buffer between the toe of the up slope and the line of the silt fence;
- Construction flow interceptor swales at regular intervals cross-slope;
- Permeable sediment barriers; and
- Temporary vegetation seeding.

The MFA proposes to review these possible measures during the preparation of the CPEPP.

At bridges and drop structures, the MFA proposes to place silt fences along the outside edge of the work areas and construct an erosion resistant pad with coarse granular or small rock-fill riprap.

Areas will be re-vegetated immediately after excavation and measures will be used to promote fast establishment of plant growth.

The MFA indicates that the magnitude of the predicted increase in TSS, after mitigation and as a result of construction, is expected to be less than the natural variation of TSS, to be short-term in duration and reversible.

The EIS also indicates that there is potential for an increase in TSS concentrations in the Red River in the event of a flood occurring during construction. If a 1 in 33-year or larger flood occurs, the sediment concentration is expected to exceed Manitoba's Water Quality Standards, Objectives and Guidelines. The concentration is expected to be within the range of concentrations historically experienced during flood events. MFA proposes to prepare a Sediment and Erosion Control Plan as a component of the CPEPP. The elements of the Plan are described above. The MFA indicates that the magnitude of the effect after mitigation is expected to be less than the natural variation of TSS, to be short-term in duration and reversible.

MFA predicts that there is potential for increased erosion and sedimentation at the Outlet Structure during construction. It is proposed to prepare a Sediment and Erosion Control Plan as a component of the CPEPP. The elements of the Plan are described above. At the Outlet Structure, the MFA also proposes a number of measures that may be used to mitigate potential erosion effects. These include:

- isolation of the construction area from the Red River;
- use of silt fences and low level weirs for filtration and sedimentation; and
- completion of the work before spring to avoid soil exposure during spring and summer.

Should spring flooding occur during construction, the MFA proposes the following additional measures:

- maintaining vegetation in the base of the Floodway Channel;
- building the Project in sequential segments to minimize the amount of time the given area of soil is exposed; and
- re-vegetating as excavation proceeds instead of waiting until excavation is complete.

The MFA predicts that the effects of increased erosion and sedimentation due to spring flooding during construction are expected to be short-term in duration, local in extent and reversible.

The MFA indicates that there is potential for sediment from the construction of the West Dyke to affect downstream waterways. It is proposed to prepare a Sediment and Erosion Control Plan as a component of the CPEPP. The elements of the plan are as described above. The MFA predicts that the effects are expected to be short-term in duration, local in extent and reversible.

8.5.2.2 Operation – Inactive

The MFA indicates that there could be erosion from the slopes of the Floodway and the disposal piles following construction of the Project when the Floodway is inactive. The MFA proposes to re-vegetate these areas immediately after excavation and the disposal piles will not be steeper than existing piles. The MFA concluded that the effects are small in magnitude, local in extent, long-term in duration and not reversible.

8.5.2.3 Operation – Active

The MFA indicates that there is potential for the Project to change sedimentation and riverbank erosion during active operation of the expanded Floodway Channel. During large flood events sediment that would have settled on the floodplain protected by the Floodway will be carried to Netley Marsh and Lake Winnipeg. MFA predicts the amount of sediment to be no more than 0.1 % of the total load entering Lake Winnipeg. No specific mitigation measures are proposed. The MFA predicts that the effect will be regional in nature, small in magnitude and permanent.

The MFA also indicates that the Outlet Structure may result in a slight increase in velocities on the west bank of the Red River, immediately north of the Floodway outlet. It is proposed to extend erosion control (riprap) on the west bank for a distance of 1,200 metres downstream of the Outlet Structure. The MFA indicates that the residual effects are expected to be short-term and infrequent. In addition, a slight increase in water levels in the region of the Outlet Structure for the larger infrequent events (>100 year return period) will only last for about 1 week. The MFA predicts that this will result in a negligible amount of additional infiltration into the low permeability clays along the riverbanks.

The MFA indicate that operation of the Floodway under Rule 4 may impact riverbank stability both upstream and downstream of the Inlet Control Structure. River levels upstream would be artificially raised above natural levels and downstream river levels would drop following the raising of the inlet gates. The MFA indicate that riverbank stability is controlled by numerous natural and man-made factors, including flood elevations, flow velocities, precipitation intensity and amount, runoff versus infiltration, vegetation cover, soil types and their susceptibility to overall slope movement and erosion and fill placement. The MFA indicate that isolating impacts that could be directly attributable to effects from Rule 4 operations as opposed to other influences is very complex and difficult.

During operations of the Floodway in the summers of 2002 and 2004, the gates were lowered in a controlled way (by approximately ½ foot per day) to mimic the natural reduction in river levels to reduce or eliminate the potential impacts on riverbank stability.

MFA is proposing to implement a long-term monitoring program to evaluate the influences that operations under Rule 4 (as well as other potential non-emergency summer operations) may have on riverbank stability, both upstream and downstream of the Inlet Control Structure. Such a program would form the basis of an adaptive management approach to addressing effects associated with the operation of the Project. The proposed monitoring program would be implemented over an extended period (minimum 10 years) to isolate and identify the potential impacts on bank performance that may be directly attributable to summer flood control. The proposed program would monitor the performance of the riverbank slopes at a number of sites under normal river flows, natural floods (both spring and summer), and summer controlled floods in an attempt to isolate and verify management strategies in respect of the impacts that could be directly attributed to the summer flooding versus natural conditions.

8.5.3 Proposed Mitigation, Monitoring and Follow-up

As detailed above, the MFA have proposed the following mitigation measures to address predicted erosion and sedimentation effects:

- Construction: CPEPP and detailed erosion and sediment control plans;
- Operation – Inactive: immediate re-vegetation, monitoring to ensure effectiveness;
- Operation – Active: no specific measures identified to address potential changes in riverbank erosion and sedimentation in Lake Winnipeg; rock rip-rapping downstream of the Outlet Structure to protect the west bank of the Red River, long-term monitoring and adaptive management program to address riverbank stability upstream and downstream of the Inlet Control Structure during operations under Rule 4.

Separate M&F plans will be prepared for each of the major components identified in the EIS Guidelines including erosion and sedimentation. MFA proposes that monitoring would be done to evaluate the effectiveness of the sediment and erosion control works. Monitoring would be a combination of visual inspections and possibly water quality sampling during flood events. Depending upon the nature and extent of problems identified during monitoring and the effectiveness of the mitigation measures, additional measures would be implemented to manage sedimentation and erosion associated with operation of the Project.

8.5.4 Responsible Authority Conclusion

Federal and provincial departments and agencies, and members of the public made a number of comments regarding erosion and sedimentation. Appendix B provides a summary of

those comments by environmental category and issue. Comments received in relation to erosion and sedimentation were primarily related to concerns regarding increased potential for riverbank erosion as a result of the Project. The responsible authorities have considered those comments in assessing the effects of the project and in coming to a conclusion on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the effects related to erosion and sedimentation predicted by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitment to monitoring and follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding the potential effects which may result from the Project, conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA and the following additional management actions are implemented:

- The MFA develops and submits to the RAs for review and approval prior to construction the Environmental Management Plan (EMP) outlining how the commitments related to erosion and sedimentation contained in the EIS and supplementary filings and this screening report will be met during construction and operation of the Project, how monitoring and follow-up will be undertaken, the MFA's plans to adaptively manage any adverse effects and the MFA's plans for reporting progress and compliance with the terms and conditions outlined in this screening report;
- MFA develop and provide to the responsible authorities for review and approval prior to construction, the Sediment and Erosion Control Plan. This Plan shall include site-specific erosion and sediment control plans for all sites where erosion and sedimentation effects are predicted. It must specify the specific monitoring and mitigation actions that will be undertaken to prevent erosion and sedimentation effects as a result of the Project. The Plans shall also describe how the predictive model will be verified with actual data and outline the actions necessary to adaptively manage the adverse effects, should results differ from predictions. The Plan will also include any contingency plans outlining actions necessary in the event of a failure of any of the proposed measures;
- The MFA provide for the review and approval by the RAs its plans for long-term monitoring of riverbank stability in the areas upstream and downstream of the Inlet Control Structure. The plan should also outline any actions to be taken to adaptively manage adverse effects associated with the Project, particularly with operations in accordance with Rule 4.
- In accordance with the EMP, the MFA submits to the RAs for review and approval prior to operations of the Project, the OPEPP for addressing erosion and sedimentation issues during operations. The OPEPP will also include any contingency plans necessary in the event of a failure of any of the proposed measures;
- The MFA submits to the RAs for review and approval prior to operation of the Expanded Floodway, a Monitoring and Follow-up Plan for erosion and sediment control. The Plan shall describe how the operation of the Expanded Floodway will be monitored and any

corrective actions required, should monitoring identify effects unanticipated by this assessment.

- The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required;

8.6 Drainage

8.6.1 Introduction

The EIS Guidelines required that the proponent describe the existing drainage environment and how it may be affected by the Project. The EIS Guidelines are provided in Appendix A.

8.6.2 Summary of Effects - Drainage

The MFA indicates potential sources of project effects on drainage are related to construction of new drop structures and changes in capacity of drop structures. The proposed Project does not include any new drainage structure discharging to the Floodway.

8.6.2.1 Construction

The MFA predicts that the replacement of existing drainage structures may result in effects on the existing drainage while the structure is repaired or replaced. Existing drop structures are proposed to remain operational while the replacement drop structures are constructed. In addition, the MFA proposes to schedule construction in the late fall or early winter when little drainage is taking place. As a result, the MFA predicts that the magnitude of effect will be low, local in extent, short in duration and temporary.

The MFA proposes to prepare a CPEPP to describe the surface water conveyance and management measures that will be implemented during the Project. The Plan will integrate both temporary and permanent measures representing the best available technologies that are economically achievable.

8.6.2.2 Operation – Inactive

The MFA indicates that during the inactive operation phase of the Project, no adverse effects are predicted.

8.6.2.3 Operation – Active

During the active operation phase of the Project, the MFA predicts that during extreme flood events of a magnitude of 1 in 250 years or higher, the three downstream drains will need to be closed to prevent backwater flooding. The MFA proposes to install temporary pumps to pump local drainage into the Floodway during these flood events. The MFA predicts that these effects would be infrequent and of short duration.

8.6.3 Proposed Mitigation, Monitoring and Follow-up

As detailed above, the MFA have proposed the following mitigation measures to address predicted effects to drainage:

- Construction: CPEPP for surface water conveyance and management measures, construction scheduling and maintaining existing structures in place while replacements are installed;
- Operation – Inactive no specific measures; and
- Operation – Active: temporary pumping at closed drains.

The MFA also indicates that plans for monitoring and follow-up with respect to drainage issues would be included in operation and maintenance plans for the Project. The MFA notes that either the MFA or Manitoba Water Stewardship would be responsible to address drainage infrastructure following implementation of the Project.

8.6.4 Responsible Authority Conclusion

Federal and provincial departments and agencies, and members of the public made a number of comments regarding drainage. Appendix B provides a summary of those comments by environmental category and issue. Comments received in relation to drainage were primarily related to concerns regarding the capacity of the drop structures and the adequacy of the structures to meet current and future drainage needs. The Cooks Creek Conservation District made a number of specific recommendations relating to existing and proposed new drop structures, including the ability to lower the outlets of the drop structures in future. The responsible authorities have considered those comments in assessing the effects of the project and in coming to a conclusion on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the effects related to drainage predicted by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitment to monitoring and follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding the potential effects related to drainage which may result from the Project, conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA and the following additional management actions are implemented:

- The MFA develops and submits to the RAs for review and approval prior to construction the Environmental Management Plan (EMP) outlining how the commitments related to drainage contained in the EIS and supplementary filings and this screening report will be met during construction and operation of the Project, how monitoring and follow-up will be undertaken, the MFA's plans to adaptively manage any adverse effects and the MFA's plans for reporting progress and compliance with the terms and conditions outlined in this screening report;
- MFA develop and provide to the responsible authorities for review and approval prior to construction, the CPEPP detailing surface water conveyance and management measures to be undertaken, including measures in respect of drainage. The CPEPP will also include any contingency plans necessary in the event of a failure of any of the proposed measures;

- In accordance with the EMP, the MFA submits to the RAs for review and approval prior to operations of the Project, the OPEPP for addressing drainage issues during operations. The OPEPP will also include any contingency plans necessary in the event of a failure of any of the proposed measures;
- The MFA submits to the RAs for review and approval prior to operation of the Expanded Floodway, a Monitoring and Follow-up Plan for the drainage. The Plan shall describe how the operation of the Expanded Floodway will be monitored and identify any corrective actions required, should monitoring identify effects unanticipated by this assessment.
- The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required;

8.7 Ice Processes

8.7.1 Introduction

The EIS Guidelines specified that the EIS describe the existing environmental setting for the Project, including ice conditions and changes during the winter and variability from year-to-year. The EIS Guidelines are provided in Appendix A.

8.7.2 Summary of Effects – Ice Processes

The MFA acknowledges in their EIS that there is considerable uncertainty in predicting under what conditions ice jams will occur. Ice jams have historically occurred on the Red River before and since construction of the existing Floodway. The MFA could not determine any sources of effects from the Project that would affect ice-jamming.

8.7.2.1 Construction

The MFA predicts that construction of the Project would not have any effects on ice jams.

8.7.2.2 Operation – Inactive

The inactive operation phase of the Project would not have any effect on ice jams.

8.7.2.3 Operation – Active

The MFA indicates that the Project is expected to increase the travel times through the Floodway of water by approximately 1-2 hours during the rising limb of the spring flood hydrograph when ice jamming events have historically occurred. The MFA predicts that this will not have any effect on the frequency or severity of ice-jamming at and downstream of Selkirk. No mitigation measures are proposed.

8.7.3 Proposed Mitigation, Monitoring and Follow-up

None identified.

8.7.4 Responsible Authority Conclusion

Federal and Provincial departments and agencies, and members of the public made a number of comments regarding ice processes. Appendix B provides a summary of those comments by environmental category and issue. Comments received in relation to ice processes were primarily related to concerns regarding the potential interaction between the Project and ice-jamming downstream of the Outlet Structure and the potential for ice build-up at the Inlet Structure. The responsible authorities have considered those comments in assessing the effects of the project and in coming to a conclusion on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the effects related to ice processes including ice-jamming predicted by the MFA and the comments received from federal and provincial departments and agencies, and the public regarding the potential effects related to ice jamming which may result from the Project, conclude that the effects are not likely to be significant. However, the responsible authorities do appreciate the concerns expressed by residents downstream of the Floodway Outlet regarding ice-jamming and would like to see the MFA continue to participate in efforts to educate, inform and advise these residents about ice-jamming. The RAs also encourage the MFA and other stakeholders to continue efforts to identify causes of ice jams and measures that might be employed to prevent their occurrence in the future.

8.8 Climate, Air Quality and Noise

8.8.1 Introduction

The EIS Guidelines specified that the EIS describe general climate conditions with sufficient data provided to predict the effect of the Project on climate and the potential effects of climate on the Project, over time, local air quality potentially affected by the Project, and ambient noise levels in the project area. The EIS Guidelines are provided in Appendix A.

8.8.2 Summary of Effects – Climate, Air Quality and Noise

The EIS examined the effects of the Project on air quality, noise, greenhouse gas emissions (CO₂) and climate change.

8.8.2.1 Construction

Dust

The MFA predicts that potential effects on air quality during the construction phase of the Project will be associated with emissions from construction vehicles and dust effects from vehicular movements along any temporarily established roadways. The MFA proposes to prepare a Dust Control Plan as part of the CPEPP. This Plan would outline dust control practices that will be implemented by the Contractors during construction. The plan is to include the following items:

- cleaning of roadways;
- measures to minimize dust from construction operations;
- hauling of excavated material and backfill;
- measures to address soil stockpiles or spoil piles;
- measures to address asphalt or concrete plants or recycling equipment; and
- measures to address demolition of existing structures.

The MFA predicted the residual effects related to dust during construction to be local in extent, short-term in duration and small in magnitude.

Greenhouse Gas Emissions

The MFA predicts in their EIS that the construction of the Project is expected to result in the emissions of an estimated 40 kilotonnes of CO₂. This represents an average of 10 kilotonnes of CO₂ per year. On an annual basis, this would result in the contribution of approximately 0.05% of the total yearly Manitoba CO₂ emissions. The MFA also examined the effects of changes in land uses as a result of the Project. The MFA predicts these effects to be local, of small magnitude and of short duration.

Noise

The MFA also predicts that construction of the Project is expected to increase noise levels. The MFA proposes to prepare an assessment and plan to address noise effects on neighbouring land users as part of the CPEPP. The MFA will undertake the construction activities in such a way as to minimize noise levels and identify a process for dealing with public complaints during construction. The plan will include:

- equipment maintenance and muffling systems;
- hours of operation; and
- work on statutory holidays and weekends.

The MFA indicates that the effects of noise will be temporary, local and of short duration.

8.8.2.2 Operation – Inactive

The EIS indicates that the inactive operation phase of the Project is not expected to have an effect on climate change, air quality or noise.

8.8.2.3 Operation – Active

The MFA predicts that the active operation phase of the project is not expected to have an adverse effect on air quality, noise or climate change.

8.8.3 Proposed Mitigation, Monitoring and Follow-up

As detailed above, the MFA have proposed the following mitigation measures to address predicted effects to climate, air quality and noise:

- Construction: CPEPP for dust control and noise protection and a process for recording and responding to complaints;
- Operation – Inactive no specific measures; and
- Operation – Active: no specific measures.

8.8.4 Responsible Authority Conclusion

Federal and Provincial departments and agencies, and members of the public made a number of comments regarding climate, air quality and noise. Appendix B provides a summary of those comments by environmental category and issue. Comments received in relation to climate, air quality and noise were primarily related to climate change and the desire for the Project to be carbon neutral. The responsible authorities have considered those comments in assessing the effects of the project and in coming to a conclusion on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the effects related to climate, air quality and noise predicted by the MFA, measures proposed by the MFA to mitigate those effects, the

MFA's commitment to monitoring and follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding the potential effects related to climate, air quality and noise which may result from the Project, conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA and the following additional management actions are implemented:

- The MFA develops and submits to the RAs for review and approval prior to construction the Environmental Management Plan (EMP) outlining how the commitments related to climate, air quality and noise contained in the EIS and supplementary filings and this screening report will be met during construction and operation of the Project, how monitoring and follow-up will be undertaken, the MFA's plans to adaptively manage any adverse effects and the MFA's plans for reporting progress and compliance with the terms and conditions outlined in this screening report;
- MFA develop and provide to the responsible authorities for review and approval prior to construction, the CPEPP detailing dust and noise control measures to be undertaken during construction. Any assessments of noise or dust levels completed to support the CPEPP shall be provided as well. The CPEPP will also include any contingency plans necessary in the event of a failure of any of the proposed measures;
- MFA develop and provide to the responsible authorities for review and approval, procedures for responding to and addressing any dust or noise complaints received during construction of the Project.
- The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required;
- A report summarizing the complaints received and the actions taken in response to those complaints shall be provided in accordance with a schedule outlined in the EMP to the RAs for information.

8.9 Physiography, Geology and Soils

8.9.1 Introduction

The EIS Guidelines specified that the EIS describe local and regional soil, land use and geology and how they may be affected by the Project. The EIS Guidelines are provided in Appendix A.

8.9.2 Summary of Effects – Physiography, Geology and Soils

The EIS identifies that the primary source of effect on the physiographic environment is as a result in the change in footprint due to the Project.

8.9.2.1 Construction

The EIS identifies that the construction of the Project will result in the need to remove approximately 21 million m³ of soil. This material is proposed to be disposed of in spoil disposal piles. The MFA indicates that specific mitigation practices for spoil disposal will be identified in the CPEPP. The Project will result in a permanent expanded footprint. The MFA indicates that these effects are expected to occur in a localized area, be long-term in duration and permanent.

8.9.2.2 Operation – Inactive

The MFA indicates that inactive operation phase of the Project is not expected to have any effect on physiography, geology or soils.

8.9.2.3 Operation – Active

The EIS indicates that the active operation phase of the Project is not expected to have any effect on physiography, geology or soils.

8.9.3 Proposed Mitigation, Monitoring and Follow-up

- o Construction: CPEPP for spoil disposal;
- o Operation- Inactive: none identified;
- o Operation – Active: none identified.

8.9.4 Responsible Authority Conclusion

Federal and provincial departments and agencies, and members of the public made a number of comments regarding physiography, geology and soils. Appendix B provides a summary of those comments by environmental category and issue. Comments received in relation to physiography, geology and soils were related to the need to carefully study the area north of the Floodway Outlet to Lake Winnipeg. The responsible authorities have considered those comments in assessing the effects of the project and in coming to a conclusion on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the effects related to physiography, geology and soils predicted by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitment to monitor and follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding the potential effects related to physiography, geology and soils which may result from the Project, conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA and the following additional management actions are implemented:

- The MFA develops and submits to the RAs for review and approval prior to construction the Environmental Management Plan (EMP) outlining how the commitments related to physiography, geology and soils contained in the EIS and supplementary filings and this screening report will be met during construction and operation of the Project, how monitoring and follow-up will be undertaken, the MFA's plans to adaptively manage any adverse effects and the MFA's plans for reporting progress and compliance with the terms and conditions outlined in this screening report;
- MFA develop and provide to the responsible authorities for review and approval prior to construction, the CPEPP detailing the mitigation measures to be implemented during spoil disposal. The CPEPP will also include any contingency plans necessary in the event of a failure of any of the proposed measures;
- The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required;
- The RAs note that there may be opportunities to improve flood protection in the flood study region through the use of excess spoil materials associated with the expansion of the floodway channel. The RAs encourage the MFA to actively explore the use of this spoil material to improve flood protection in the flood study region.

9. Aquatic Environment

The EIS presented an assessment of the effects of the Project on the aquatic environment, including surface water quality, aquatic habitat, lower trophic levels and aquatic invertebrates, fish and clam populations and aquatic species at risk. Further information on these elements is provided in the EIS and Supplemental Filings.

9.1 Surface Water Quality

9.1.1 Introduction

The EIS Guidelines required the proponent to describe the existing surface water quality watercourses, wetlands and other waterbodies and how it may be affected by the Project. The EIS Guidelines are provided in Appendix A.

9.1.2 Summary of Effects – Surface Water Quality

The EIS and Supplemental Filings identified potential sources of effects to surface water as being related to the use of fertilizers (containing phosphorus, nitrogen and potassium), herbicides (glyphosate and 2,4-D amine) or spills of chemicals during construction or maintenance. The potential for sedimentation associated with Project construction and operation was also evaluated.

9.1.2.1 Construction

The MFA predicts that the majority of construction-related impacts to surface water quality will result from mechanical disturbance of the Floodway Channel. Increased sedimentation is predicted to occur as a result of:

- o In-stream modification of the Floodway Channel and/or deposition of riprap at selected sites;
- o Runoff from newly exposed soils of the excavated Floodway side slopes during rain events;
- o Increased suspended sediment from floodwaters flowing over newly excavated land in the Floodway during flood events in the construction years;
- o Construction activities related to the extension of the Outlet Structure along the east bank of the Red River, and
- o The deposition of riprap along selected shoreline sections of the Red River in the vicinity of the Floodway Inlet and Outlet Structures.

The MFA's analysis suggests that if severe events such as a 1 in 20 year rainstorm or a 1 in 50 year flood occurs without mitigation, then there could be large increases in the sediment concentrations in the Red River. During these events, the MFA predicts that the total suspended solids concentration is expected to exceed the Manitoba Surface Water Quality

Standards, Objectives and Guidelines. The increases would still be within the natural variation in sediment concentrations in the Red River and the MFA proposes the implementation of an extensive erosion control plan to ensure this potential effect is mitigated.

The MFA also considered the potential impacts on surface water quality from spills of hazardous materials used during construction. The MFA proposes the preparation of a Construction Phase Environmental Protection plan (CPEPP) to outline the appropriate construction management practices to be used to prevent spills from occurring and to outline any response and clean-up practices should a spill occur.

The MFA also considered the effects of herbicides and fertilizers used in the re-vegetation of areas disturbed by construction could be released to surface waters. The MFA examined the potential load that could enter the Red River, under worst case conditions where all of the herbicides and fertilizers proposed to be applied washed into the river. This analysis assumed that no plant take-up, soil binding, chemical decay or mitigation measures such as Best Management Practices or the implementation of the CPEPP.

In the case of herbicides, this analysis showed that even if the unlikely worst-case scenario occurred, the concentrations of glyphosate and 2,4-D amine would be well below the lowest surface water guidelines. In the case of fertilizers, the worst-case analysis suggests that the potential increase in annual nitrogen loadings would be about 33 tonnes or less than 0.1% of the mean annual nitrogen loadings in Selkirk. For phosphorous, the worst-case analysis suggested a potential increase of about 71 tonnes or less than 1.4% of mean annual phosphorous loadings in Selkirk. No surface water quality guidelines are specified for nutrients.

The MFA indicates that the application rates will be carefully reviewed after soil testing and the actual rates used will depend upon the species used, the ability to re-utilize topsoil and the timing of seeding. Expected application rates will create a much lower release of nutrients to the river. The MFA also propose the mitigation of the effects of herbicide and fertilizer release with the completion and implementation of the CPEPP. The CPEPP will specify the best management practices to be implemented during herbicide and fertilizer application. As a result the MFA predicts that the effects of construction on surface water quality will be adverse, small in magnitude, short-term in duration and regional in extent.

9.1.2.2 Operation – Inactive

Recreational vehicles use the bottom of the Floodway Channel when inactive. The MFA suggests that the deposition of materials from the use of recreational vehicles (i.e. ATVs, snowmobiles) has the potential to affect surface water quality, but indicate that any deposition would depend upon the extent of use and that this type of use occurs with the Existing Floodway. The MFA notes that any development of future recreational opportunities will need to include a requirement to manage any effects on surface water quality. The MFA indicates that no Project related effects are expected.

The MFA also examined whether mercury concentrations in the Red River would be affected by the Floodway, although it was unable to determine the rate at which the Floodway wetlands are mobilizing mercury, including the bio-active water soluble methyl mercury (MeHg). The MFA notes that the proposed modifications to the Low Flow Channel will result in reduced wetland occurrence, which should decrease water retention time in the Channel. As a result the MFA predicts that the Project is likely to result in a reduction in MeHg production.

Vegetation management/maintenance of the Floodway Channel and West Dyke will occur during this phase of the Project. The MFA indicate that vegetation management is typically a combination of mechanical (mowing) and chemical treatment and that a comprehensive maintenance manual, which will include channel maintenance activities, will be prepared following construction. The MFA indicate that future maintenance of the main channel base would likely follow past practices, including a five-year cycle of mowing any heavy growth in the fall and an application of an approved targeting broadleaf herbicide on the re-growth the following year. The approach proposed by the MFA for addressing vegetation management in drains would also see use of a targeting broadleaf herbicide, licensed for aquatic application. The proposed maintenance manual and OPEPP would outline the measures to be followed during these activities to ensure effects to surface water quality are avoided or minimized.

9.1.2.3 Operation – Active

The MFA suggest that surface water quality will not be changed during operation of the Project, compared to that which occurs with the operation of the Existing Floodway. The MFA also suggest that reduced flooding of industrial areas in Winnipeg will result in a positive effect on surface water quality.

9.1.3 Proposed Mitigation, Monitoring and Follow-up

As detailed above the MFA have proposed the following mitigation measures to address predicted surface water quality effects:

- o Construction: CPEPP including Best Management Practices and detailed erosion and sediment control plan;
- o Operation – Inactive: OPEPP and Maintenance Manual;
- o Operation – Active: None specified.

Separate M&F plans will be prepared for each of the major components identified in the EIS Guidelines, including surface water quality as a component of the Fisheries and Aquatic Ecosystems component. The MFA proposes that monitoring would be done to evaluate the effectiveness of mitigation measures and to verify the accuracy of effects predictions. Follow-up would be implemented depending upon the nature and extent of the need.

9.1.4 Comments on the Environmental Impact Statement, Supplementary Filings and Clean Environment Commission Public Hearings

Federal and provincial departments and agencies, and members of the public made a number of comments regarding surface water quality. Appendix B provides a summary of those comments by environmental category and issue. Comments received in relation to surface water quality were primarily related to concerns regarding the use of herbicides and fertilizers, spills, recreational use of the Floodway Channel and sewage impacts. The responsible authorities have considered those comments in assessing the effects of the project and in coming to a conclusion on the likely significance of the adverse environmental effects.

9.1.5 Responsible Authority Conclusion

Responsible authorities, having considered the effects related to surface water quality predicted by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitment to monitoring and follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding the potential effects which may result from the Project, conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA and the following additional management actions are implemented:

- The MFA develops and submits to the RAs for review and approval prior to construction the Environmental Management Plan (EMP) outlining how the commitments related to the surface water quality contained in the EIS and supplementary filings and this screening report will be met during construction and operation of the Project, how monitoring and follow-up will be undertaken, the MFA's plans to adaptively manage any adverse effects and the MFA's plans for reporting progress and compliance with the terms and conditions outlined in this screening report;
- MFA develop and provide to the RAs for review and approval prior to construction, the CPEPP and Sediment and Erosion Control Plans. These plans should specify the actions being taken to protect surface water quality from impacts associated with construction of the Project. The CPEPP will also include any contingency plans outlining actions necessary in the event of a failure of any of the proposed measures;
- MFA develop and provide to the RAs for review and approval prior to the completion of construction, the Maintenance Manual and OPEPP. These plans should outline the specific actions to be taken with regards to on-going maintenance of the Project and how surface water quality will be protected during these activities. The OPEPP will also include any contingency plans outlining actions necessary in the event of a failure of any of the proposed measures;
- The MFA submits to the RAs for review and approval prior to operation of the Expanded Floodway, a Monitoring and Follow-up Plan for surface water quality. The Plan shall describe how the operation of the Expanded Floodway will be monitored and any corrective actions required, should monitoring identify effects unanticipated by this

assessment. The MFA should also indicate how the interactions between surface water and ground waters will be addressed through the monitoring program.

- The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required;

9.2 Fish and Fish Habitat

9.2.1 Introduction

The EIS Guidelines required the proponent to describe the existing water quality, aquatic biological resources and associated habitat in watercourse, wetlands and other waterbodies and how they may be affected by the proposed project. The EIS Guidelines are provided in Appendix A.

9.2.2 Summary of Effects – Fish and Fish Habitat

A number of potential effects of the Project on fish and fish habitat have been identified including:

- o Loss of habitat due to extension of culverts, reconstruction of drainage outlets, and elevation and extension of the west dyke embankment;
- o HADD of fish habitat from the maintenance and reconstruction of drains entering the Floodway, the Floodway outlet, and the Floodway Low Flow Channel;
- o Stranding of fish when floodwaters recede and flows are reduced;
- o Effects on fish passage/movement with changes in operations or flows, particularly at the inlet and outlet of the Floodway;
- o Mortality of fish from passage through the inlet and outlet structures
- o Contributions of potential deleterious substances during construction and maintenance of the drains and Floodway Channel;
- o Creation of new potential habitat;
- o Increased erosion and bank instability upstream of the Inlet Control Structure;
- o Increased erosion along the Floodway channel during construction and downstream of the Outlet Structure, and
- o Changes in water velocities and water levels.

9.2.2.1 Construction

Red River Shoreline – West Bank in the Vicinity of the Outlet Structure

The MFA proposes to repair and upgrade 365 m of existing riprap and extend shoreline erosion control along the west bank of the Red River an additional 1,200 m downstream to control bank erosion caused by wave action due to the outlet discharge. Application of riprap to the bank will involve removal of all trees and shrubs currently growing between the low water level and the top of bank. Minor regrading of the bank may also occur. Geotextile fabric will be placed over the slope with riprap overlain on the fabric. The riprap is to be placed from 1 m above the design flood (700 year level 227.4m) to just below the low water level (218.5 m).

During final design the MFA will determine the specific extent of the proposed riprap or other shoreline erosion control techniques (i.e., revegetation using willow cuttings) that may be used on the Red River banks. For the purposes of this evaluation, conservative estimates of

effect have been used pending more detailed design. Conceptually, the Project may therefore involve up to 30,000 m² of riprap on the bank above the low summer water level along the 1,200 m of riverbank and about 4,700 m² of riprap below the low summer water level. The riprap below water would be placed along the 1,200 m worst-case scenario and the 365 m of existing riprap (assuming a 1-m depth of riprap to occupy a 3-m-wide area of river bottom).

The area affected by this activity is located immediately downstream of the St. Andrews Lock and Dam and is noted for its “*importance in sustaining ... recreational fisheries, ... their high productive capacity, the sensitivity of certain life stages of the fish species they support.*” Therefore, this area is considered to represent critical habitat, as defined by DFO (1998). The results of the field surveys conducted in the area note the west bank of the Red River in this area to be a mixture of grass/herb and shrub/tree vegetation. The instream substrate near the bank varied from soft sand upstream to increasing amounts of gravel, until it was a cobble substrate at the downstream reach of the area.

For this assessment average annual high water level is assumed to be in the area directly below the zone where the terrestrial vegetation on the bank ends and above the silt bench along the shoreline). It is anticipated that vegetation will become reestablished over time and can be encouraged to do so with willow cuttings. Once revegetated, the upper shoreline area would be similar to the existing shorelines and fish utilization of these areas during high water events (spring melt, floods and after summer rainfall events) on the Red River is anticipated to be similar to the current vegetated shoreline. However, as this area is only intermittently wetted, and primarily during the spring melt, this riparian vegetation would only be available as a fish habitat for a short period of time, and generally represents marginal fish habitat.

Riprap applied below the waterline would alter up to 4,700 m² of critical fish habitat in the Red River. The most substantive potential structural change in the habitat would occur in the first 400 m downstream of the Outlet area, where sand/gravel types dominate the existing substrate. This potential change may be temporary, since sand substrates generally suggest a depositional area, in which case a layer of sand is expected to eventually cover the riprap and the habitat would return to a state similar to the pre-Project status. In the 800 m downstream of this area, the substrate is dominated by cobble and cobble-gravel substrates to which the modification to a cobble to boulder sized riprap substrate should present less of a disruption. Riprap can provide cover and feeding substrates similar to the cobble present.

In order to mitigate the alteration of this habitat, the MFA is proposing to time construction such that the potential contribution of sediment to the Red River is low (expected to be winter). Sediment and erosion control works are proposed to be installed to assist in reducing the potential for sedimentation during construction. In water construction timing windows for warm water species from July 1 to March 31 shall be observed as required by DFO (no in water works April 1 to June 30).

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The shoreline stabilization works will infill habitat and will be considered harmful to the productive capacity of fish habitat. Appropriate compensation would be used to fully address this impact. Potential options and plans for habitat compensation are outlined in Section 9.2.4.

Inlet Control Structure

Construction of the erosion protection at the inlet structure to the Red River is out of water and therefore does not have the potential to directly destroy fish and fish habitat. Sediment can be contributed and therefore, sediment and erosion control measures should be in place prior to and during construction. The CPEPP will outline the specific measures to be employed. In addition, construction will be timed to coincide with low water periods to reduce potential interactions with the river.

Floodway Channel

It is proposed that the Low Flow Channel be regraded and riprapped over a significant portion of its length to prevent future erosion and to allow the channel to drain more efficiently. Temporary alteration of the Low Flow Channel during construction will require dewatering, where water remains or is permanent. Fish may be stranded when dewatering occurs and are proposed to be salvaged and relocated to appropriate habitat within the Low Flow Channel, the Red River or Floodway tributaries.

The upstream reach of the Low Flow Channel, within approximately 8 km of the Floodway Inlet, consists of a very shallow ditch a few metres wide and is considered ephemeral. The remaining downstream reach of the Low Flow Channel receives groundwater discharges, resulting in a more permanent flow. This portion of the Low Flow Channel is considered a Type B drain (in accordance with the draft DFO Drain Classification), with simple habitat and the presence of sport fish species. The outlet control structure limits connection of the Low Flow Channel with the Red River.

For the purpose of this assessment, it is assumed that the entire Low Flow Channel to be regraded and riprapped is composed of softer substrates. The remainder of the area is composed of the native gravel to cobble substrate. The Preliminary Design intends to maintain the current low flow channel width. Within the Floodway Channel, only the Low Flow Channel is to be considered fish habitat. Fish use of this area should not be actively encouraged due the intended function of the Floodway Channel and limited ability to support fish year round.

In the reconstructed condition the Low Flow Channel will remain a structurally simple man-made channel, and as a result the total area of either Drain Type E or B fish habitat present will remain unchanged. The Project is also anticipated to result in a minimum water depth in the Low Flow Channel (defined as the water depth as a result of groundwater seepage only, with no surface water inputs) of about 20 cm (i.e., 18 in.) in the lower reaches of the Low Flow Channel that could potentially be occupied by fish. Better drainage should encourage fish to move downstream through the outlet and reduce the stranding potential

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associated with the pools. The aquatic habitat area in the Low Flow Channel to be potentially altered by the Project is estimated to be between 200,000 and 400,000 m².

Final calculation of the potential effects of the Project on the amount of aquatic habitat in the low flow channel will need to be completed once the Final Design is available. It is anticipated that, based on a worst-case interpretation of the Preliminary Design information, no net loss of the productive capacity for fish may be achieved by implementing appropriate mitigation and compensation measures. Appropriate compensation would be used to fully address this impact. Potential options and plans for habitat compensation are outlined in Section 9.2.4.

The CPEPP and Sediment and Erosion Control Plans to be prepared by the MFA will outline in more detail, the measures required to reduce impacts to fish and fish habitat during the reconstruction of the Low Flow Channel. These plans will include the water management measures required to deal with dewatering of the Low Flow Channel. The MFA proposes to schedule construction to avoid sensitive time periods

Temporary water control dams will be installed at 250 to 500 m intervals and dewatered between. Pumped water will be discharged downstream or to vegetated areas of the floodplain, filter bags or a splash pad if excessive turbidity is encountered.

Construction to widen the floodway embankment is to be undertaken in lifts with areas stabilized as soon as possible after completion. The construction will not be undertaken in the spring and the floodway will not be operated in the summer during the construction period to reduce the potential for erosion of the construction area.

Reconstruction of the Low Flow Channel will require access routes, which will alter the vegetation in the floodplain. Access points will be stabilized and their locations limited in construction plans to maintain the majority of the vegetation which currently provides stabilization of soils.

In water construction timing windows for warm water species shall be observed July 1 – March 31 as required by DFO (no in water work from April 1 to June 30).

Work near water that requires revegetation will be done during the growing season to allow establishment of vegetation prior to winter. Where disturbed soils near water cannot be revegetated prior to winter, temporary erosion control will be used until vegetation can be established during the next growing season.

Outlet Structure

To accommodate the increased design flow of the expanded Floodway Channel during a major flood event, the Outlet Structure is proposed to be enlarged. The width of the Outlet Structure would be increased by 60 m (for a total width of 100 m). Increasing the width of the

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Structure requires the current Outlet Channel to the Red River also being widened by a similar amount.

The modified Outlet Structure will also incorporate energy dissipation structures that will reduce water velocities from the Outlet as they enter the Red River. The expanded Outlet Channel is expected to result in the modification of the east bank along the Red River for approximately 100 m downstream of the existing Outlet Channel. Historic records have noted this to be an area of Walleye spawning and the bathymetric survey suggests the presence of an underwater shelf (potentially suitable for walleye spawning) adjacent to the shoreline. The area is noted by the MFA in the EIS as representing critical fish habitat.

The current area between the Outlet Structure and the Red River is a man-made, mostly intermittent fish habitat that is connected to the critical habitats in the adjacent Red River during active operations and high-flow inactive operations. During these high water events the area should be considered to be a potentially important habitat that is utilized by fish for feeding, growth and migration, as defined by DFO (1998). During lower-flow events much of the area is dewatered and consists of a series of narrow channels through which the discharge from the Floodway Low Flow Channel passes to the Red River. During this period most of the area downstream of the structure becomes marginal habitat, with insufficient depth for many species.

Replacement of the existing structure with the new structure will increase the structure's footprint on the existing aquatic habitat by about 500 m². The important fish habitat in this area adjacent to the existing structure will be destroyed in the footprint area of this structure. The remainder of the expanded structure will occur on areas that are not currently fish habitat and no further habitat destruction will occur. This expanded area (about 25,500 m²) is currently terrestrial habitat that will be available as new fish habitat that is likely to be a mix of marginal/important fish habitat similar to the existing Outlet to Red River area. Appropriate compensation would be used to fully address this impact. Potential options and plans for habitat compensation are outlined in Section 9.2.4.

The existing north side shoreline will be displaced further north by about 100 m and a riprapped shoreline similar to the existing recreated. Walleye spawning activity has been noted to occur along the eastern side of the Red River adjacent to the Floodway Outlet Field surveys detailed in the EIS suggest that this activity may be centered on a unique feature along this bank in the form of an underwater shelf or ledge. The current design is not expected to impinge on this area and thus no adverse effects are expected. The final design will be reviewed to ensure the conservation of this feature.

Temporary alteration of the outlet channel during construction will result in dewatering where water remains or is permanent. Fish may be stranded when dewatering occurs and will need to be salvaged and moved to the Red River. Construction to widen the floodway control structure is to be undertaken in phases maintaining discharge through the floodway. Control of

debris and sediment entry into the channel is important and the MFA propose to prepare a CPEPP to ensure that protection measures are developed and properly employed.

Construction of the new bank and channel downstream of the outlet structure to the Red River shall be undertaken so as not to alter the existing shelf along the east bank of the Red River.

MFA is proposing to complete a CPEPP, which will outline the range of measures to be implemented, including sediment and erosion control and water management measures. Manitoba timing windows (no in water work from April 1 to June 30) will be followed. Work near water that requires revegetation will be done during the growing season to allow establishment of vegetation prior to winter. Where disturbed soils near water cannot be revegetated prior to winter, temporary erosion control will be used until vegetation can be established during the next growing season.

Floodway Drains

Eight drains and associated drop structures flowing into the Floodway Channel are proposed to be expanded in size and drop structures replaced. Channels upstream of the floodway embankment will be relocated and widened to accommodate any increased flow. Each drain discharges to the floodway through an existing drop structure, which will be replaced, with the exception of Cooks Creek Diversion, which will be retained and repaired. Fish may be transferred downstream to the floodway but each drop structure represents an upstream barrier to fish movement. In addition, drainage ditches are located on the landward side and running parallel to the embankment. All of these ditches are Ephemeral in nature and mitigative measures would apply in accordance with DFO's draft Drainage Guidelines (2004).

The characterization of the drains, in accordance with DFO's draft Drainage Guidelines is as follows:

Drains Associated with the Floodway	DFO Drain Classification
Seine River	Type A – Complex Indicator
Centreline Drain	Type D – Simple Non-indicator species
North Bibeau Drain	Type E – Ephemeral
Cooks Creek Diversion	Type B – Simple Indicator Species
Kildare Drain	Type E – Ephemeral
Springfield Road Drain	Type E – Ephemeral
Shkolny Drain	Type D – Simple Non-indicator species
Ashfield Drain	Type E – Ephemeral

While no substantive alterations to the Seine River Syphon are proposed, the existing trash rack on the inlet to the Syphon will be replaced with a much larger trash rack. Primarily designed to improve safety near the inlet, the larger trash rack should also reduce the frequency of the rack becoming clogged with debris, improving flows in the Seine River downstream of the siphon. The MFA has made a commitment to the Save Our Seine community group to ensure that the maximum allowable flow enters the Seine River Syphon, with the overflow being delivered to the floodway. Currently, the majority of flow enters the floodway limiting baseflow contributions downstream.

The DFO Drain Maintenance Protocol (2004) notes that typical maintenance activities on Type E (Ephemeral Channels) do not require compensation, while similar activities on Type B and D drains may require a class authorization and/or consultation with DFO. DFO has noted that the small area of alteration upstream of the floodway on these drains would likely not be considered harmful, even on Type B or D drains, dependant on final designs. The area of alteration downstream, within the floodway occurs outside the low flow channel in an area not deemed to be fish habitat. Some ponding of water into the discharge channel may occur but it is not considered by DFO to be harmful or beneficial. A connection should be provided between the outlet channel and the low flow channel of the floodway to ensure that fish can move into the floodway if they are carried downstream.

Construction of drain outlet structures and new conveyance channels has the potential to carry sediment into the floodway. Many of these drains are seasonally dry and construction should be timed to coincide with dry conditions. The MFA is proposing to complete a CPEPP to ensure that the appropriate measures are implemented during construction. Sediment and erosion controls will be required prior to and during construction. The existing channels should be left in place to convey drainage until such time as the new channel and outlet structure are in place and stabilized. The design of the channel upstream of the outlet could include pools or other low velocity structures to provide refuge for fish in an attempt to reduce the potential for them to be carried to the floodway. In water construction timing windows for warm water species shall be observed July 1 – March 31 as required by DFO (no in water work from April 1 to June 30). When the original channel is abandoned, fish may be left stranded. Salvage operations should be undertaken with fish moved upstream, or into the low flow channel of the floodway as appropriate.

West Dyke Drains and Culverts

The MFA is proposing to raise and extend the West Dyke, increasing the footprint of the dyke and requiring the modification of a number of culverts or control structures, which convey overland drainage through, or perpendicular to, the West Dyke. The changes include:

- o The extension of six uncontrolled culvert-type crossings;
- o Modification of three larger control structures; and
- o Construction of a control structure for the new Glenlea Drain.

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In addition, raising of the West Dyke will result in the need to raise a number of road crossings. Raising the road crossing will increase the footprint width of the road and require that thirty-four (34) (parallel) culverts be extended. These culverts have the potential to act as barriers to fish movement either through improper installation or due to high velocities that are conveyed through the structure. Modeling of potential barrier effects to local fish species was undertaken by MFA and it was found that all of the existing culverts are potential barriers to fish under most flows.

A series of drainage ditches parallel to the West Dyke will also need to be modified when the dyke is raised. Using the terms contained in the Manitoba Drain Maintenance Protocols (Draft DFO 2004), the raising of the dyke and improvements to the flood drainage system will result in:

- o 20 km of ditch maintenance (cleanout).
- o 43 km of ditch reconstruction (relocation).
- o 8 km of new drain construction (new Glenlea drain south of the West Dyke).

Five borrow pits in various locations will also be created to supply material for the Project.

Sixty-three (63) km, of ditches will be altered, disrupted or destroyed by the project. Based on the classification of the ditches using the DFO Drain Classification (2004), less than 5 km of these ditches involves work in Drain Type B areas. These works would likely require an application for authorization under the *Fisheries Act*. Based on an assumed width of wetted area of 3 m, a maximum of 15,000 m² of marginal fish habitat will be affected. Appropriate compensation would be applied to fully address this impact. Potential options and plans for habitat compensation are outlined in Section 9.2.4. The remaining 58 km of drains are considered ephemeral, and as such mitigation measures and best management practices would be required to protect downstream fish habitat.

Construction of 8 km of the Glenlea Drain will create new marginal fish habitat in the area. The Drain is considered a modification of the existing drainage network that drains toward the Red River. It is therefore anticipated that any use of this Drain (Type B Drain Classification) by fish is a displacement of productive capacity from other areas of the drainage network. The new drain is therefore not anticipated to add to the productive capacity of the fish habitats in the area and will not be considered a gain in habitat.

Five borrow areas will result in the creation of 150,000 m² of pit area, 70,000 m² along Ephemeral drains and 80,000 m² along Type B Drains, which can ultimately be turned into aquatic habitat. Appropriate compensation would be used to fully address this impact. Potential options and plans for habitat compensation are outlined in Section 9.2.4.

The design of the replaced or extended culvert crossings should include the requirement to countersink the culvert into the bed of the drain to ensure no barrier to fish movement. Given that modeling has suggested that the culverts may be posing a barrier to fish movement due to velocities, designs should also incorporate measures to decrease velocities where fish passage is required.

Maintenance and reconstruction of the ditches and extension of culverts has the potential to carry sediment into the local drains and ultimately to the LaSalle River. Many of these drains are seasonally dry and construction should be timed to coincide with dry conditions. Sediment and erosion controls will be required prior to and during construction. MFA notes the need to undertake ditch improvements in 1-2 mile segments, with stabilization provided immediately following completion. Provisions for maintenance of the vegetation and erosion controls until stabilization has been successful should be included in the detailed plans.

Wherever practical existing channels should be left in place to convey drainage until such time as the new drains are in place and stabilized. For fish bearing drains in-water construction timing windows for warm water species shall be observed July 1 – March 31 as required by DFO (no in water work from April 1 to June 30).

When the original drainage channel is abandoned or where dewatering is required, fish may be left stranded so salvage operations should be undertaken with fish moved downstream into waterbodies with more permanent flow conditions.

Seine River at Prairie Grove Road

Prairie Grove road currently crosses the Seine River a few hundred metres downstream of the Seine River Syphon discharge point. The roadbed will need to be raised at this point to accommodate the raising of the rail bridge crossing, resulting in a need to alter the current culvert crossing of the Seine River at Prairie Grove Road. The preliminary design concept involves removal of existing culverts and replacing them with a much larger culvert to allow for navigation. The result will be an increase in the wetted width of the river through the crossing and an expected reduction of velocities through the culvert, which should not impede upstream movement of fish. The presence of the Seine River siphon a short distance upstream provides a barrier to any further upstream movements of fish. While the road footprint may be increased depending on final design, resulting in some loss of fish habitat at the embankments, it is expected that the overall crossing will be improved with respect to fish habitat.

A conceptual design of this new crossing has been included in the submission to Navigable Waters and will need to be incorporated into the application for authorization under the *Fisheries Act* and an accompanying fish habitat compensation plan. Potential options and plans for habitat compensation are outlined in Section 9.2.4.

The construction of the crossing has the potential to carry sediment into the Seine River. Construction should be timed to coincide with low flow conditions. Sediment and erosion

controls will be required prior to and during construction. Detailed plans shall be provided for review and comment as part of the application for authorization under the *Fisheries Act*. Provisions for maintenance of the vegetation and erosion controls until stabilization has been successful should be included in the detailed plans.

During construction, flow in the Seine River must be maintained around the construction area. In water construction timing windows for warm water species shall be observed July 1 – March 31, as required by DFO (no in water work from April 1 to June 30).

When the original channel is abandoned or where dewatering is required, fish may be left stranded so salvage operations should be undertaken with fish moved downstream into waterbodies with more permanent flow conditions.

9.2.2.2 Operation – Inactive

Red River Shoreline – West Bank in the Vicinity of the Outlet Structure

There are no changes to the west bank of the Red River in the vicinity of the Outlet Structure that are expected to occur during inactive operations of the Expanded Floodway.

Inlet Control Structure

Under non-operation conditions, the gates on the inlet structure are down, and water passes over the structure with some potential to impede fish passage. Additional studies are underway by the MFA to track movements of fish through the floodway, Red River and inlet structure, Interim results of the tracking study found that walleye, northern pike and channel catfish all moved through the gates, when not in operation.

Floodway Channel

Future conditions of the floodway during inactive operation will be similar to the existing conditions. The intent to regrade the channel to encourage more efficient drainage may decrease fish stranding and encourage movement back to the Red River. Sufficient water depth needs to be maintained within the low flow channel to ensure opportunities for fish to move downstream freely.

Outlet Structure

Modifications to the Outlet Structure may make it slightly less suitable to pass fish downstream to the Red River as the discharge will pass through concrete dissipation blocks and be spread over a wider area with shallower water depth. Concentrating flow toward the centre of the outlet may maintain sufficient water depth to reduce this potential impact. The floodway outlet is a barrier to the upstream movement of fish into the floodway channel under existing and future conditions.

Floodway Drains

No change between existing and future conditions in the drains is anticipated.

West Dyke Drains and Culverts

No changes in operations during inactive operations are expected.

Seine River at Prairie Grove Road

The replacement of the existing culvert with a larger diameter culvert is expected to provide a positive benefit for fish under both operational and non-operational conditions. The commitment by MFA to ensure that the maximum flow through the Seine River siphon is delivered downstream will be a benefit to fish habitat during low flow conditions. No other changes to fish habitat during inactive operations are expected.

9.2.2.3 Operation – Active

Red River Shoreline – West Bank in the Vicinity of the Outlet Structure

Table 2 outlines the expected changes in water levels in the Red River with the Expanded Floodway. Water levels in the vicinity of west bank of the Red River, downstream of the Outlet Structure will increase slightly (up to 0.3m) over the four flood scenarios examined by the MFA. This increase is within the range of typical annual fluctuations. No significant changes to water velocities are predicted by the MFA under normal operating conditions.

Inlet Control Structure

Under operating conditions, the gates are raised and form a barrier to upstream fish movement. Fish can be carried downstream over the inlet structure. Spring operations have been ongoing for over 30 years and effects to fish under this operating condition have been considered as part of the baseline for the purposes of this assessment.

Concerns have been expressed regarding the potential for fish mortality when fish move through the inlet structure under high flows. Sources of mortality are likely related to indirect lethal injuries (i.e., bruising, lacerations and scale loss that result in fungal infections) and gas supersaturation. Indirect or delayed mortality of fish that pass through spillways may also be related to disorientation caused by extreme turbulence with subsequent predation by birds and fish downstream from the spillway. Velocities of less than 15 m/s do not typically result in fish mortality. Velocities are reported to be in the order of 8 m/s at the Inlet Structure during active operation.

The operation of the floodway during Rule 4 results in the raising of the gates at the Inlet Control Structure during non-spring time frames, which prevents upstream fish passage through the Inlet Control Structure. The MFA have determined that under this rule, the floodway could be operated 4 of every 10 years, although still subject to a review and decision on the part of the province. Many of the species in the river, including channel catfish, bass, and forage fish spawn in early summer and may be prevented from reaching suitable spawning grounds. Delayed migration can result in absorption of gametes, reproductive interference and recruitment failure. Locations of spawning areas were not defined as part of the baseline work

done for the EIS. Additional studies are underway by the MFA to track movements of fish through the floodway, Red River and inlet structure. The MFA has committed to developing a Fish Technical Experts Committee to explore issues with respect to fish passage at the Inlet Control Structure.

Floodway Channel

No changes to fish habitat are expected during active operation of the Expanded Floodway.

Outlet Structure

The modifications to the existing Outlet Structure to accommodate flows on the scale of a 1:700 year flood have incorporated chute blocks and baffle blocks (or baffle piers) into the structure. To reduce erosion and channel degradation due to turbulence and excessive water velocities (i.e., between 8 and 12 m/s), these blocks dissipate energy in the high velocity jet flowing over the ogee weir crest. The MFA notes that the incorporation of baffle blocks will reduce excavation and construction costs substantially relative to other proposed outlet design options that require a longer stilling basin to contain and reduce energy in high discharge flows. However the introduction of the chute blocks and baffle blocks raises potential for adverse impacts to fish (injury and mortality) that may be entrained in floodwater flows and passed downstream through the spillway.

Injuries to fish in violently turbulent, high water velocity environments result from a variety of sources. These sources include rapid changes in pressure, excessive shear forces that can cause tissue damage, rapid deceleration, and most importantly with the Floodway Outlet Structure, mechanical injury caused when fish strike solid stationary objects such as chute blocks and baffle blocks. An analysis of the scientific literature suggests that direct mortality and injury rates were less than 1% in environments where jet flow velocities were less than 13.7 m/s and a threshold velocity of 15.2 m/s was established as the upper safe limit for passing fish.

MFA suggest that water velocities will be reduced to much less than 15.2 m/s by energy dissipation appurtenances. As a result direct mortality that may result from high velocity strikes with chute blocks or baffle blocks will be minimized. Velocity magnitude contours for the 100m floodway outlet show maximum water velocities of 13 m/s over the ogee crest, that diminish to approximately 3 m/s directly in front of baffle blocks. Analysis of velocity magnitude contours with chute blocks shows water velocities approximately 10 m/s directly above the chute block, that appear to be more turbulent than the option with baffle piers Fish that strike the chute block would likely hit at an oblique angle with a downward velocity vector much less than 10 m/s. It is therefore unlikely that significant direct mortality will occur as a result of fish passage through the outlet structure after the floodway is expanded.

The velocity profiles suggest that higher velocities will be concentrated in the mid channel as they currently are, leaving the margins with slower water in the area of the walleye spawning habitat. No change to this habitat is expected.

Floodway Drains

Drainage improvements will result in less flooding of lands upstream of the floodway. The upstream barrier effect of the drop structures is an existing condition that will not change with the implementation of the Project. The discharge through the outlet control structures has the potential to cause fish mortality due to turbulence and physical damage to fish on the proposed dissipation structures. The evaluation of mortality effects at the floodway outlet, with much greater velocities, demonstrated that the potential for adverse effect was low. Given that many of these drains were found to be ephemeral, potential adverse effects due to increased velocity of flow are not expected.

West Dyke Drains and Culverts

The increased capacity of the reconstructed ditches and those that have been maintained should see an improved efficiency of water conveyance into the downstream drainage network, reducing the potential for stranding of fish. Existing barriers to fish passage have the potential to be corrected through reconstruction of the existing culverts.

Seine River at Prairie Grove Road

The replacement of the existing culvert with a larger diameter culvert is expected to provide a positive benefit for fish under operational conditions, expecting to reduce velocities and potentially improve fish movement. This is a relatively minor benefit however, as the siphon provides a barrier to further upstream movement.

9.2.3 Proposed Mitigation, Monitoring and Follow-up

As detailed above a number of measures have been proposed to address potential effects on fish and fish habitat. They include:

- o Construction: CPEPP, construction scheduling and timing, fish habitat compensation, sediment and erosion control plans, water management plans, fish salvage operations, revegetation and drainage maintenance.
- o Operation-Inactive: none specified.
- o Operation-Active: Fisheries Technical Experts Committee to examine fish passage issues at the Inlet Control Structure.

MFA proposes to undertake monitoring in accordance with its M&F framework.

9.2.4 Responsible Authority Conclusion

Federal and Provincial departments and agencies, and members of the public made a number of comments regarding the fish and fish habitat. Appendix B provides a summary of

those comments by environmental category and issue. Issues raised included fish and mussel movements, fish stranding and fish mortality, fish habitat alterations and compensation and mitigation options. The responsible authorities have considered those comments in assessing the effects of the project and in concluding on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the effects to fish and fish habitat predicted by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitments to monitoring and follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding the potential effects to fish and fish habitat conclude that the effects are not likely to be significant providing the mitigation and compensation measures proposed or to be developed by the MFA, as well as the following additional management actions are implemented:

Fisheries Technical Experts Committee (FTEC)

The MFA is to establish and support a Fisheries Technical Experts Committee with membership/representation from a wide range of disciplines and jurisdictions related to fish and fish habitat. The FTEC would review and provide advice to the Project Oversight Committee on whether the mitigation measures identified in the screening report, EIS and Supplemental Filings, related to fish and fish habitat issues, have been adequately implemented. The FTEC would review and provide advice to the Oversight Committee on all of the plans developed to address fish and fish habitat issues. The FTEC would also examine and provide advice to the Oversight Committee on the further evaluation of fish passage effects and compensation options.

Habitat Compensation Options

The overall conclusion remains that the effects of the project on fish and fish habitat can be adequately mitigated for and that appropriate compensation measures are available to address residual effects such that the 'no net loss' policy of DFO can be achieved.

Detailed design has not been completed for the entire project. Therefore, final HADD determinations cannot be completed. Through the recent submissions (MFA 2005) worst case scenarios have been assumed and mitigation and compensation requirements determined. Details will continue to be developed through the EMP, CPEPP, and the applications for authorizations under the *Fisheries Act*.

Preferred fish habitat compensation priorities and options are listed in DFO (1998) and in order of descending preference are:

1. Create similar habitat at or near the development site within the same ecological unit.
2. Create similar habitat in a different ecological unit that supports the same stock or species.

3. Increase the productive capacity of existing habitat at or near the development site and within the same ecological unit.
4. Increase the productive capacity of a different ecological unit that supports the same stock or species.
5. Increase the productive capacity of existing habitat for a different stock or a different species of fish either on- or off-site.

A number of possible compensation options (listed below) have been suggested to date as a result of the public process associated with the Project, team input or by regulatory agencies. It is proposed that the Fisheries Technical Experts Committee (FTEC) undertake further evaluation of these options. The MFA will be required to undertake the additional studies necessary and provide the information to the FTEC in order for it to determine which options are possible and how they will best satisfy the 'no net loss' requirements of DFO. Possible options include but would not be limited to:

- o Restoration of a cut-off part of the Seine River immediately upstream of the Seine River Syphon intake:
- o Investigation of the replacement of the LaBarriere Park St Norbert Dam on the LaSalle River.

This dam is one of a series of dams on the LaSalle River which presents an impediment to upstream fish movement during all but very high-river flows (during which times the dams are overtopped and upstream fish movement occurs). The areas immediately downstream of other similar dams on the LaSalle River are known to be over wintering oxygen refuges, therefore the structure, if removed, would need to be replaced with structures, (such as pool and riffles features), that would preserve the winter habitat characteristics of the current dams. Removal of the LaBarriere Dam has the potential to allow access to Important fish habitats upstream of the structures (for about 5 km upstream to the next obstruction – the LaSalle Dam); use of those fish habitats by fish may result in the upgrading of habitats in the LaSalle River to Critical habitat types. The Project wetlands would also be expected to benefit by increasing potential fish access.

- o Glenlea Drain Fish Habitat Demonstration Project. This could involve designing "fish friendly" features into the Drain as a demonstration Project for other drainage activities in the province.

It is unlikely that the habitat created by the Demonstration Project would satisfy the compensatory needs for Critical habitat, but it could be used to offset the needed Marginal habitat requirements.

- o Fish Passage at the St. Andrews Lock and Dam or the Portage Diversion, have been identified as a potentially detrimental impediment to fish movement.

- o Access wish lists of others including the City of Winnipeg Naturalist, Rat River and LaSalle River Conservation District Watershed Inventories to identify potential projects
- o Create aquatic habitat in one or more of the borrow pits to be created during construction of the West Dyke (up to 150,000 m²)
- o Investigate possible options at Netley Marsh located at the confluence of the Red River with Lake Winnipeg.
- o Cooks Creek – Seine River habitat enhancements.
- o Conduct an aerial survey or “fly-over” of the area to document potential fish habitat compensation options available in the area, particularly for passage improvements.

It is likely that the LaBarriere Dam offers the greatest opportunity of the options presented to date to achieve a supplemental habitat creation of up to 4,700m² of Critical habitat and 30,000 m² of Marginal fish habitat equivalent.

Further site-specific investigations of the options will be required for inclusion in the Final Fish Habitat Compensation Plan. This Plan would form part of the applications for authorization submitted to DFO under the *Fisheries Act*. The MFA will complete the Final Fish Habitat Compensation Plan in consultation with DFO and submit it along with the required applications for authorizations under the *Fisheries Act*.

Fish Passage

To ensure that there are no additional impacts due to operation of the Floodway under Rule 4, it is the position of the RA's that unless scientific studies demonstrate otherwise, fish passage must be provided for at the Inlet Control Structure. This passage shall be assessed and designed in collaboration with the FTEC to meet the requirements of the species in the river and to maintain integrity of the flood protection structures. The MFA will continue the study of fish movement at the Floodway Inlet Control Structure and provides the results to DFO and the FTEC for review.

Environmental Management Plan

The MFA develops and submits to the RAs for review and approval prior to construction the Environmental Management Plan (EMP) outlining how the commitments related to fish and fish habitat contained in the EIS and supplementary filings and this screening report will be met during construction and operation of the Project, how monitoring and follow-up will be undertaken, the MFA's plans to adaptively manage any adverse effects and the MFA's plans for reporting progress and compliance with the terms and conditions outlined in this screening report.

The MFA develop and provide to the RAs for review and approval prior to construction, the CPEPP dealing with fish and fish habitat. The CPEPP shall include the site-specific fish and fish habitat protection plans for all sites where effects are predicted, including but not limited to West Bank of the Red River (downstream of the Outlet Structure), Inlet Control Structure, Floodway Channel, Outlet Structure, Floodway Drains, West Dyke Drains and Culverts and the

Seine River at Prairie Creek Road. These plans shall specify the specific pre and post-construction monitoring, monitoring in respect to floodway operations and mitigation actions that will be undertaken to protect fish and fish habitat from adverse effects as a result of the Project. The CPEPP will also include any contingency plans outlining actions necessary in the event of a failure of any of the proposed measures.

In accordance with the EMP, the MFA submits to the RAs for review and approval prior to operations of the Project, the OPEPP for addressing fish and fish habitat issues during operations. The OPEPP will also include any contingency plans necessary in the event of a failure of any of the proposed measures.

The MFA submits to the RAs for review and approval prior to operation of the Expanded Floodway, a Monitoring and Follow-up Plan for the fish and fish habitat. The Plan shall describe how the operation of the Expanded Floodway will be monitored and identify any corrective actions required, should monitoring identify effects unanticipated by this assessment.

The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required.

9.3 Lower Trophic Levels and Invertebrates

9.3.1 Introduction

The EIS Guidelines required the proponent to describe the existing aquatic invertebrates and how they may be affected by the Project. The EIS Guidelines are provided in Appendix A.

9.3.2 Summary of Effects – Lower Trophic Levels and Invertebrates

The EIS and Supplemental Filings identified that effects from the Project on aquatic lower trophic and invertebrate communities is anticipated to be primarily related to changes in habitat as a result of construction activities such as the Floodway Channel excavation, Low Flow Channel reconstruction, Outlet Structure reconstruction, shoreline protection measures on the west bank of the Red River and various drain and culvert replacement and reconstruction along the Floodway Channel and West Dyke. Potential effects on clam species known to occur in the area are discussed more specifically in Section 9.4. Invertebrates that associate with the sediments and provide food for fish and other species will be destroyed during excavation. Others are associated with the water column, which may be affected by potential increases in suspended sediments arising from construction related run-off and riprap replacement.

9.3.2.1 Construction

The MFA predicts that due to the potential increases in suspended sediments arising from the construction activities that there is the potential for adverse effect to some lower trophic levels and aquatic invertebrates. MFA indicates that populations of lower trophic levels are expected to repopulate the aquatic environment shortly after the disturbance has ended and that the implementation of the CPEPP detailing the appropriate sediment and erosion control measures to be employed during construction will assist in minimizing sediment transfer to waterbodies and thus reduce the potential for adverse effect on aquatic invertebrates. MFA predicts that these effects will be small in magnitude, short-term in duration and site-specific in extent.

Disruption of aquatic habitat during construction is predicted to result in adverse impacts to aquatic invertebrates, as will the alteration of bottom substrate due to the reconstruction of the Low Flow Channel and in the Red River downstream of the Outlet Structure. Invertebrates will readily recolonize the disturbed area post construction. No specific mitigation measures are proposed and the MFA predicts these effects to be small in magnitude, short-term in duration and site-specific in extent.

The placement of riprap is predicted by the MFA to increase the potential habitat for attached algae, increasing attached algae presence in the Floodway. No other measurable effects from riprap placement are expected. MFA predicts this effect to be positive, moderate in magnitude, long-term in duration and site-specific in extent.

9.3.2.2 Operation – Inactive

The EIS and Supplemental Filings suggest that aquatic invertebrate populations are expected to recover from disruptions due to construction activities when the Floodway is in the inactive operations phase. The habitat-based effects as a result of construction are anticipated to persist in the long-term during the inactive operations phase. The inherent instability of the lower trophic levels and invertebrate communities associated with the Existing Floodway are expected to continue.

9.3.2.3 Operation – Active

No effects are anticipated.

9.3.3 Proposed Mitigation, Monitoring and Follow-up

As detailed above, the MFA have proposed the following mitigation measures to address predicted effects to lower trophic levels and aquatic invertebrates:

- o Construction: CPEPP and sediment and erosion control measures;
- o Operation-Inactive: None identified
- o Operation-Active: None identified.

Separate M&F plans will be prepared for each of the major components identified in the EIS Guidelines. MFA proposes that monitoring would be done to evaluate the effectiveness of the potential revegetation of the riprapped areas in three to five years following construction. This would confirm the pattern of revegetation characterized to help direct future riprap-related shoreline stabilization projects.

9.3.4 Responsible Authority Conclusion

Federal and Provincial departments and agencies, and members of the public made a number of comments regarding lower trophic levels and aquatic invertebrates. Appendix B provides a summary of those comments by environmental category and issue. Issues raised related primarily to fish habitat alterations and compensation and mitigation options. The responsible authorities have considered those comments in assessing the effects of the project and in concluding on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the effects to lower trophic levels and aquatic invertebrates by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitments to monitoring and follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding the potential effects to lower trophic levels and aquatic invertebrates conclude that the effects are not likely to be significant providing the mitigation and compensation measures proposed or to be developed by the MFA are implemented. Responsible authorities suggest that provisions be made in the fish and fish habitat related EMP, CPEPP, OPEPP and M&F Plans for inclusion of considerations related to lower trophic levels and aquatic invertebrates.

9.4 Aquatic Species at Risk

9.4.1 Introduction

The EIS Guidelines indicated that the EIS should describe whether any aquatic species found in the Floodway Study Region are listed in Manitoba's Endangered Species Act (MESA), by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), or in the Federal Species at Risk Act (SARA). The EIS Guidelines are provided in Appendix A.

9.4.2 Summary of Effects – Aquatic Species at Risk

Four fish species known to exist in the Red River Basin are species of special concern listed under the *Species at Risk Act* (SARA): Bigmouth Buffalo, Chestnut Lamprey, Bigmouth Shiner and Silver Chub. In addition the Lake Winnipeg Physa Snail is currently being considered for listing under SARA. COSEWIC recently declared the Lake Sturgeon to be endangered in western Canada and a species of special concern in eastern Canada. COSEWIC is also reviewing the status of the Mapleleaf Clam. Two other potentially important commercial species, the White Heel Splitter and Threeridge Clams, have been found in the Red River.

9.4.2.1 Construction

Bigmouth Buffalo

Bigmouth Buffalo are not believed to inhabit the Floodway Low Flow channel, as the Red River more closely matches their preferred habitat. This species was not found during fish sampling efforts in the Floodway Low Flow Channel during baseline field studies. Therefore, proposed construction in, and alteration of, the floodway channel is not expected to impact Bigmouth Buffalo habitat.

The proposed bank stabilization in the Red River near the Floodway Outlet is also not expected to impact Bigmouth Buffalo habitat, as they are largely pelagic feeders in mid-channel areas with relatively low water velocities. Spawning habitat will not be impacted, as the construction area does not include vegetated areas prone to flooding. Therefore, the proposed construction is not expected to result in a change in productive capacity of the system for Bigmouth Buffalo.

Silver Chub

The silver chub is listed as a Species of Special Concern but are considered abundant in the Red River although they were not collected in any of the sampling efforts for this project. They are found in slow moving water over soft bottoms, a habitat that is readily available in the study area. Assuming that they will be found principally in the Red River and not in the tributary streams or floodway, then the stabilization of the west bank near the outlet has the primary potential to affect their habitat. However, the field inventory noted the presence of gravel and cobble shoreline where the riprap would be placed, suggesting that this shoreline may not provide preferred habitat for this species.

Big Mouth Shiner

Big mouth shiners are noted from the area but not in the main Red River and were not encountered in the sampling undertaken for the project in the main streams along the West Dyke. Shallow gravel bottomed creeks and small rivers with fast, permanent flow and little vegetation are preferred habitat, which is not readily available in the study area. Where such habitat may exist in the area, the extension of culverts and possible encroachment of road embankments may be the only potential interactions causing an adverse impact.

Chestnut Lamprey

Chestnut lamprey is found in most streams and lakes in southern Manitoba, but was not collected in any of the sampling efforts for this project. As a larva, its life is spent burrowed in the sand or mud substrate of fast flowing streams and rivers. It is unlikely that the lamprey are located in the floodway, but they may be associated with some of the drains crossing the West Dyke or in the Seine River. The extension of culverts and possible encroachment of road embankments may be the only potential interactions causing an adverse impact.

Lake Sturgeon

Lake Sturgeon are not believed to inhabit the Floodway Low Flow Channel, which is a waterbody that is substantively smaller than those that they are usually associated with. Therefore, proposed construction in the Floodway Channel is not expected to directly impact Lake Sturgeon habitat.

The proposed bank stabilization on the Red River near the Floodway Outlet will result in the loss of some fine-substrate (silt/sand) habitat generally associated with Lake Sturgeon feeding habitat. However, its replacement with coarse substrate (rip-rap) will likely provide habitat also suitable for feeding while increasing habitat diversity, and may provide habitat suitable for spawning, particularly during high flow events (i.e., during operation of the Floodway). If so, the proposed bank stabilization would likely result in a net benefit in terms of habitat for Lake Sturgeon in the Red River, as spawning habitat is likely more of a limiting factor for sturgeon populations than feeding habitat in the Red River system. The proposed bank stabilization is not expected to reduce the overall productive capacity of the system for Lake Sturgeon.

Mapleleaf Clam

The distribution of the Mapleleaf Clam in the Red River is not well known, and no studies were undertaken to determine its presence in the Floodway low flow channel. It is reported have affinity for vegetated habitats which is expected to preclude widespread colonization in the Floodway low flow channel and the Red River, which are generally devoid of submerged aquatic vegetation.

Changes to the shoreline on the west bank of the Red River for the bank protection could result in destruction of habitat potentially inhabited by the Mapleleaf Clam. However, as the preferred habitat of the Mapleleaf Clam is vegetated substrate in slow to moderate currents, the area of proposed construction at the Floodway Outlet (a steep bank with scouring currents and devoid of vegetation) has a low potential for use by this species. The potential for destruction or disruption of Mapleleaf Clam habitat is low as a result.

As the productive habitat for the Mapleleaf Clam is likely associated with a number of discreet habitats that are not found within the proposed construction areas for the Floodway Expansion Project, Project construction is not expected to impact productive capacity of the system for this species. Should they be found to occur in construction areas that might be impacted (such as the low flow channel), it is proposed that they be relocated before construction.

White Heel Splitter

Although the distribution of this species is not well documented, for the purposes of this screening report, construction within the Floodway Low Flow Channel and application of bank protection on the west bank of the Red River at the Floodway Outlet is assumed to result in impacts to the habitat potentially inhabited by the White Heel Splitter.

Should they be found to occur in the construction area, construction will be halted and the specimens relocated. Following construction, recovery of the habitat for the White Heel Splitter is expected to occur.

Threeridge Clam

The Threeridge Clam is typically found in rivers on or in a variety of substrata, although stable gravel shoals have been reported as preferred habitat. Although the distribution of this species is not well documented, for the purposes of this screening report, construction within the Floodway low flow channel and application of bank protection on the west bank of the Red River at the Floodway Outlet is assumed to result in the destruction of habitat potentially inhabited by the Threeridge Clam. Should they be found to occur in the construction area, construction will be halted and the specimens relocated. Following construction, recovery of the habitat in terms of suitability for the Threeridge Clam is expected, as the species is known to inhabit a variety of substrata including cobble.

In-water construction will be scheduled to avoid sensitive spawning time periods for species at risk (April 1 to June 30). Prior to and during construction in the Red River, floodway channel and at the outlet, a qualified biologist shall inspect the site to determine the potential presence of the three species of clam in the working area. Should they be found to occur in the construction area, construction will be halted and the specimens relocated outside the existing and future work zones, and to habitat of similar characteristics. Relocation will continue as long as new populations are uncovered.

9.4.2.2 Operation - Inactive

No changes from the existing conditions are expected.

9.4.2.3 Operation-Active

As indicated in the EIS, no effects from project operations on fish or clam populations are anticipated. The operation of the Floodway will not change with the Project and water level changes in the Red River will only occur during very infrequent events.

Water level changes downstream of the Inlet Control Structure during operations of the Floodway under Rule 4 could result in clams being exposed on shorelines for a temporary period. While clams are tolerant of fluctuating water levels and would be able to move to more favourable conditions, the extent speed and duration of the drawdown will determine whether this will occur. Rule 4 requirements indicate that Manitoba Water Stewardship is to examine whether it can minimize the rate at which river levels are changed both upstream and downstream of the Inlet Control Structure, in order to minimize impacts of the operation under Rule 4.

9.4.3 Proposed Mitigation, Monitoring and Follow-up

As detailed above, the MFA have proposed the following mitigation measures to address predicted effects to aquatic species at risk:

- o Construction: CPEPP, construction scheduling and timing, sediment and erosion control plans, fish and clam salvage operations.
- o Operation-Inactive: none specified.
- o Operation-Active: fish and clam salvage operations.

Separate M&F plans will be prepared for each of the major components identified in the EIS Guidelines. Monitoring should be conducted to confirm the effects predictions and to ensure the effectiveness of the mitigation measures employed.

9.4.4 Responsible Authority Conclusion

Federal and Provincial departments and agencies, and members of the public made a number of comments regarding aquatic species at risk. Appendix B provides a summary of those comments by environmental category and issue. Issues raised related primarily to fish habitat alterations and compensation and mitigation options. The responsible authorities have considered those comments in assessing the effects of the project and in concluding on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the effects to aquatic species at risk predicted by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's

commitments to monitoring and follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding the potential effects to aquatic species at risk conclude that the effects are not likely to be significant providing the mitigation and compensation measures proposed or to be developed by the MFA and the following additional management actions are implemented:

- o The MFA develops and submits to the RAs for review and approval prior to construction the Environmental Management Plan (EMP) outlining how the commitments related to the aquatic species at risk contained in the EIS and supplementary filings and this screening report will be met during construction and operation of the Project, how monitoring and follow-up will be undertaken, the MFA's plans to adaptively manage any adverse effects and the MFA's plans for reporting progress and compliance with the terms and conditions outlined in this screening report;
- o MFA develop and provide to the RAs for review and approval prior to construction, the CPEPP and Sediment and Erosion Control Plans. These plans should specify the actions being taken to protect aquatic species at risk from impacts associated with construction of the Project. The CPEPP will also include any contingency plans outlining actions necessary in the event of a failure of any of the proposed measures;
- o MFA develop and provide to the RAs for review and approval prior to the completion of construction, the Maintenance Manual and OPEPP. These plans should outline the specific actions to be taken with regards to on-going maintenance of the Project and how aquatic species at risk will be protected during these activities. The OPEPP will also include any contingency plans outlining actions necessary in the event of a failure of any of the proposed measures;
- o The MFA submits to the RAs for review and approval prior to operation of the Expanded Floodway, a Monitoring and Follow-up Plan for surface water quality. The Plan shall describe how the operation of the Expanded Floodway will be monitored and any corrective actions required, should monitoring identify effects unanticipated by this assessment.
- o The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required;

10. Terrestrial Environment

MFA's analysis of the terrestrial environment included an assessment of the effects of the Project on vegetation, wildlife and wildlife habitat, species at risk and Manitoba's Protected Area Initiative. Further information on these topics is provided in MFA's EIS and Supplemental Filing.

10.1 Vegetation

10.1.1 Introduction

The EIS Guidelines specified that the EIS describe information on plant communities, "Species at Risk" and Rare Species that may be affected by the Project in sufficient detail to predict the effect of the Project on vegetation in the study area. The EIS Guidelines are provided in Appendix A.

10.1.2 Summary of Effects - Vegetation

The EIS identifies the main sources of effects to be related to activities associated with removal of vegetation during excavation and ongoing maintenance of the Floodway Channel and West Dyke.

10.1.2.1 Construction

The MFA in their EIS identifies that construction and maintenance of the Project is expected to disrupt vegetation communities along the floodway as a result of excavation and herbicide treatment activities. The MFA proposes to immediately implement the CPEPP and a re-vegetation program for each phase of the Project. The CPEP is expected to outline the steps to:

- Avoid effects on land that provides critical habitat for listed species;
- Maintain the diversity of native vegetation in natural areas and natural connections between them; and
- Protect, where practical, the features and functions of retained vegetated areas.

The MFA determined these effects to be small in extent, short-term in duration, temporary and not significant.

The EIS also identifies that construction of the Project is expected to result in a loss of organic soils, which in turn would result in a loss of plant habitat. Clearing and widening of the land on the east shore of the Red River downstream of the Outlet Structure will also result in the permanent conversion of about 1 hectare of land to semi-aquatic habitat that, depending upon

the timing and amount of water released through the Floodway this land will be inundated ephemerally. As noted above, the MFA proposes to immediately implement the CPEPP and a re-vegetation program for each phase of the Project. The MFA identified these effects as moderate in magnitude, short-term in duration and site-specific in extent.

The MFA identifies that subsoil compaction may occur as a result of heavy equipment movements over areas where the topsoil has been stripped. The MFA proposes to scarify the subsoil and spread stockpiled organic layer over subsoil prior to reseeding. As noted above, the MFA also proposes to immediately implement the CPEPP and a re-vegetation program for each phase of the Project. The MFA identified these residual effects to be small in magnitude, short-term in duration and site-specific in extent.

The MFA indicates in the EIS that it is not expected that there will be a potential loss of provincially rare, threatened or endangered plant species. The MFA indicates that follow-up monitoring will be required to further ensure that no species at risk are present in the areas affected by the Project. Mitigation measures such as relocation to other suitable sites may be required. The MFA indicated that the residual effects will be small to moderate in magnitude, site-specific in extent and short-term in duration.

10.1.2.2 Operation – Inactive

The OPEPP and Vegetation Management Plans proposed by the MFA will include measures to mitigate any effects associated with the ongoing maintenance of the Project (Floodway Channel and West Dyke). Regular maintenance includes cutting (hay) and weed treatment. The MFA suggests that the inactive operation phase of the Project is not expected to result in any adverse effects on vegetation.

10.1.2.3 Operation – Active

During the active operation phase of the Project, the MFA predicts that vegetation communities in the floodway and along the West Dyke will be inundated during flood events. This is expected to result in the disruption and disturbance of some plants intolerant to short-term inundation. Field surveys also identified that flooding results in the loss of plant litter on the floodway base increasing the potential for erosion and the successful germination of willow seeds. Surveys conducted along the floodway channel following the flood in 2004 revealed that all aboveground biomass, with the exception of two species of willow and the herb fringed loosestrife, was killed. Two weeks following the recession of the floodwaters revealed some recovery of vegetation and eight weeks after the vegetation had largely recovered. The MFA proposes to reseed vegetation communities using flood tolerant species and/or species capable of rapid re-growth along the base of the Floodway. Re-vegetation success will be monitored and additional mitigation measures, if needed, will be identified. The MFA predicts that these residual effects will be small in magnitude, short-term in duration and site-specific in extent.

10.1.3 Proposed Mitigation, Monitoring and Follow-up

As detailed above, the MFA have proposed the following mitigation measures to address predicted effects to vegetation:

- Construction: CPEPP and re-vegetation program, monitoring and relocation of rare species if required;
- Operation – Inactive: OPEPP and Vegetation Management Plan will include specific measures to address effects of on-going maintenance of the Project including the Channel and West Dyke; and
- Operation – Active: OPEPP and re-vegetation program.

The MFA proposes to undertake vegetation monitoring in accordance with its M&F framework. This monitoring would be undertaken mainly as part of the re-vegetation plan or the operation and maintenance plan. In addition, the EIS indicates that monitoring of weeds after construction is required. Ongoing monitoring will include:

- An analysis of the success of the initial seeding – to occur in the first two years following implementation of the re-vegetation plan, with additional follow-up monitoring to occur approximately every third year thereafter; and
- An ongoing examination of the Floodway for non-native weedy species – to occur on a bi-annual basis after implementation of the vegetation program that includes an adaptive approach to weed management that considers any input received from local residents.

The MFA proposes to use line transects situated along the floodway channel to provide a basis for determining areas needing reseeding. This will also direct the implementation of mitigation measures.

It is proposed that the second component be carried out by reconnaissance-level surveys of the floodway on a regular basis and by examining the vegetation for invasive weedy species. Mitigation in the form of spot spraying would be carried out as necessary. It is proposed that vegetation monitoring along the West Dyke be coordinated with Macdonald Weed District personnel.

Follow-up monitoring will be required to further ensure that no species at risk are present in the areas affected by the Project. Mitigation measures such as relocation to other suitable sites may be required should monitoring identify rare species in areas to be disturbed by the Project.

10.1.4 Responsible Authority Conclusion

Federal and Provincial departments and agencies, and members of the public made a number of comments regarding vegetation. Appendix B provides a summary of those

comments by environmental category and issue. Comments received in relation to vegetation were related to protected areas and vegetation displaced due to flooding. The responsible authorities have considered those comments in assessing the effects of the project and in coming to a conclusion on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the effects related to vegetation predicted by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitment to monitoring and follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding the potential effects related to vegetation which may result from the Project, conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA and the following additional management actions are implemented:

- The MFA develops and submits to the RAs for review and approval prior to construction the Environmental Management Plan (EMP) outlining how the commitments related to vegetation contained in the EIS and supplementary filings and this screening report will be met during construction and operation of the Project, how monitoring and follow-up will be undertaken, the MFA's plans to adaptively manage any adverse effects and the MFA's plans for reporting progress and compliance with the terms and conditions outlined in this screening report;
- MFA develop and provide to the responsible authorities for review and approval prior to construction, the CPEPP detailing the re-vegetation measures to be undertaken. As part of the CPEPP, the re-vegetation plan shall
 - Identify the objectives underlying the plan;
 - Describe the re-vegetation measures to be implemented at the various project locations;
 - Describe the monitoring program to be implemented to ensure re-vegetation success;
 - Describe the measures to be taken to adaptively manage any adverse effects, and
 - Describe the frequency and approach to reporting progress on the re-vegetation plan.
 - The CPEPP will also include any contingency plans necessary in the event of a failure of any of the proposed measures;
- Prior to the initiation of construction, the MFA complete plant surveys of the areas to be affected by construction. The results of the surveys shall be provided to the RAs and include a description of any measures required to address and adaptively manage any adverse effects.
- MFA develop and provide to the responsible authorities for review and approval procedures for addressing protected plant species should they be found during follow-up activities;
- The MFA submits to the RAs for review and approval prior to operation of the Expanded Floodway, a Monitoring and Follow-up Plan for vegetation. The Plan shall describe how

the operation of the Expanded Floodway will be monitored and identify any corrective actions required, should monitoring identify effects unanticipated by this assessment. This plan shall include requirements for monitoring re-vegetation success, both immediately following construction and during operation of the Expanded Floodway;

- MFA develop and provide to the responsible authorities prior to operation of the Project the OPEPP detailing the plans and measures to be undertaken to maintain and manage vegetation. The OPEPP will also include any contingency plans necessary in the event of a failure of any of the proposed measures;
- The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required;

10.2 Wildlife and Wildlife Habitat

10.2.1 Introduction

The EIS Guidelines specified that the EIS describe wildlife and wildlife habitat and how it may be affected by the Project. The EIS Guidelines are provided in Appendix A.

10.2.2 Summary of Effects – Wildlife and Wildlife Habitat

The EIS identifies key disturbances to wildlife communities as a result of the Project to include:

- Temporary disruption of vegetative communities, through clearing and grubbing activities associated with excavation during the construction phase;
- Removal of ground cover;
- Noise disturbance from construction vehicles and activities;
- Roosting and/or nesting site disturbance from construction vehicles and activities; and
- Inundation of habitat during flood events.

10.2.2.1 Construction

Waterfowl and Waterbirds

The MFA in their EIS identifies that potential construction-related effects on waterfowl include the loss of breeding/nesting, foraging, cover and staging habitat cover. Lost habitat includes upland grass cover and wetland vegetation within the Low Flow Channel of the Floodway. The MFA proposes to conduct the clearing and grubbing activities in the September to April period in the year prior to excavation to reduce impacts on waterfowl and waterbirds. Additional mitigation proposed includes the restoration of some habitat through the implementation of the re-vegetation plan for the floodway channel. The MFA also proposes to prepare a CPEPP to address wildlife related issues.

The MFA concluded that these residual effects are moderate in magnitude, short-term in duration and site-specific in extent.

Excavation activities are also expected to disturb foraging and nesting habitat of other waterbirds and disturb primary food sources for these waterbirds. While the present quality and amount of waterbird habitat is limited, this temporary loss is expected to be offset by the availability of adjacent habitat and the immediate implementation of a re-vegetation program. Nesting habitat for ground-nesting birds is also predicted to be impacted by excavation activities. The MFA proposes to schedule clearing and grubbing activities in the September to April period of the year prior to excavation. This will reduce the amount of habitat disturbed at any one time. As noted above, the MFA is proposing to develop and implement a CPEPP to further address wildlife issues during construction activities. The MFA indicated that these residual effects are small in magnitude, short-term in duration and site-specific in extent.

Raptors

Construction-related activities are predicted to result in noise-related disturbance behaviour for raptors. This may cause site-specific disruption or avoidance in the use of habitat. Disturbance of ground cover may also cause a localized decrease in prey species densities. Finally, the MFA in their EIS identifies that construction activities may disrupt habitat for ground nesting raptors. The MFA proposes to implement the re-vegetation plan immediately following construction and to schedule clearing and grubbing activities in the fall/winter period prior to excavation activities. The MFA concluded that these residual effects are small in magnitude, short-term in duration and site-specific in extent. As noted above, the MFA is proposing to develop and implement a CPEPP to further address wildlife issues during construction activities.

Passerines

The MFA's EIS identifies that construction activities may temporarily disrupt breeding/foraging habitat for ground nesting passerines through the removal of vegetation communities. The MFA proposes to implement the re-vegetation plan immediately following construction and to schedule clearing and grubbing activities in the fall/winter period prior to excavation activities. As noted above, the MFA is proposing to develop and implement a CPEPP to further address wildlife issues during construction activities. The MFA concluded that these effects are moderate in magnitude, long-term in duration and site-specific in extent. The MFA also identifies that the activities associated with bridge construction may also temporarily disrupt species (rock doves) that utilize these structures as roosting/nesting sites. The availability of other roosting/nesting sites is expected to offset this effect. The MFA concluded that the residual effects are small in magnitude, short-term in duration and site-specific in extent.

Mammals

Construction activities are predicted to result in a loss of forage/hunting habitat and avoidance of habitat due to noise from construction activities. The MFA proposes to implement a re-vegetation plan immediately following construction and to schedule clearing and grubbing activities in the fall/winter period prior to excavation activities. In addition, excavation activities will be undertaken during daylight and thus avoid disturbance of habitat during peak use periods. Alternate forage/hunting habitat is also available adjacent to the Floodway. As noted above, the MFA is proposing to develop and implement a CPEPP to further address wildlife issues during construction activities. The MFA concluded that habitat loss effects are moderate in magnitude, long-term in duration, site-specific in extent and not significant. Disturbance related residual effects were judged to be small in magnitude, short-term in duration and site-specific in extent.

Other Wildlife

The EIS predicts similar construction related disruption (loss of habitat) and disturbance (noise-related) effects on invertebrates, amphibians and reptiles. The MFA proposes to implement the re-vegetation plan immediately following construction. Alternate forage/hunting habitat is also available adjacent to the Floodway. As noted above, the MFA is proposing to develop and implement a CPEPP to further address wildlife issues during construction activities.

The MFA concluded that the residual effects are small in magnitude, short-term in duration and site-specific in extent.

10.2.2.2 Operation – Inactive

Adverse effects associated with the inactive operation phase of the Project identified in the EIS include clearing of woody vegetation from the floodway channel and other vegetation management activities, including herbicide applications as appropriate. These activities are expected to result in the loss of habitat (some of which is higher quality habitat for some bird species). These effects are expected to be offset by the implementation of the re-vegetation program and by timing the vegetation management activities to occur outside of sensitive periods. MFA also suggests that some willow replanting may occur in certain areas to replace lost habitat. The MFA concluded that the residual effects are small in magnitude, short-term in duration and site-specific in extent.

10.2.2.3 Operation – Active

The MFA in their EIS identifies the effects related to the active operation phase of the Project to be primarily related to inundation of habitat. The MFA predicts that the effects of inundation will be less with the Project, than that which would occur under current conditions. The MFA concluded that these residual effects are small in magnitude, site-specific in extent and short-term in duration.

Potential also exists for adverse impacts to wildlife habitat and wildlife resident in the Floodway Channel and in the areas upstream of the Inlet Control Structure that are flooded during operation of the Project under Rule 4. Impacts are expected to relate primarily to habitat inundation during this condition.

10.2.3 Proposed Mitigation, Monitoring and Follow-up

As detailed above, the MFA have proposed the following mitigation measures to address predicted effects to wildlife and wildlife habitat:

- Construction: CPEPP and re-vegetation program, construction scheduling, monitoring and relocation of rare species if required;
- Operation – Inactive: OPEPP and re-vegetation program; and
- Operation – Active: no specific measures.

The MFA proposes that the M&F for wildlife and wildlife habitat would include additional spring surveys of migratory birds and their habitats in 2005 to confirm current predictions.

10.2.4 Responsible Authority Conclusion

Federal and provincial departments and agencies, and members of the public made a number of comments regarding wildlife and wildlife habitat. Appendix B provides a summary of

those comments by environmental category and issue. Comments received in relation to wildlife and wildlife habitats were mainly related to the effects of artificial flooding on wildlife. The responsible authorities have considered those comments in assessing the effects of the project and in coming to a conclusion on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the effects related to wildlife and wildlife habitat predicted by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitment to monitoring and follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding the potential effects related to wildlife and wildlife habitat which may result from the Project, conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA and the following additional management actions are implemented:

- The MFA develops and submits to the RAs for review and approval prior to construction the Environmental Management Plan (EMP) outlining how the commitments related to wildlife and wildlife habitat contained in the EIS and supplementary filings and this screening report will be met during construction and operation of the Project, how monitoring and follow-up will be undertaken, the MFA's plans to adaptively manage any adverse effects and the MFA's plans for reporting progress and compliance with the terms and conditions outlined in this screening report;
- MFA develop and provide to the responsible authorities for review and approval prior to construction, the CPEPP (Wildlife and Wildlife Habitat Protection Plan) detailing the measures to be taken in relation to wildlife, wildlife habitat and re-vegetation. The CPEPP will also include any contingency plans necessary in the event of a failure of any of the proposed measures;
- MFA develop and provide to the responsible authorities for review and approval procedures for addressing protected species should they be found during construction activities;
- The MFA submits to the RAs for review and approval prior to operation of the Expanded Floodway, a Monitoring and Follow-up Plan for wildlife and wildlife habitat. The Plan shall describe how the operation of the Expanded Floodway will be monitored and identify any corrective actions required, should monitoring identify effects unanticipated by this assessment. The Plan shall include requirements for on-going monitoring of re-vegetation success and wildlife and wildlife habitat;
- MFA develop and provide to the responsible authorities prior to operation of the Project the OPEPP detailing the plans and measures to be undertaken to maintain and manage vegetation, wildlife and wildlife habitat. The OPEPP will also include any contingency plans necessary in the event of a failure of any of the proposed measures;
- The MFA will consult with the RAs, Environment Canada and Manitoba Conservation in the development of a plan and specific measures to minimize the impact to wildlife and wildlife habitat of operations under Rule 4, with a particular focus on the Floodway Channel and the riparian zone upstream of the Inlet Control Structure. The MFA will

provide the plan to the RAs for review and approval prior to operation of the Project under Rule 4;

- The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required;

10.3 Species at Risk

10.3.1 Introduction

The EIS Guidelines indicated that the EIS should describe whether any animal species found in the Floodway Study Region are listed in Manitoba's (*The Endangered Species Act* (MESA), the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), or the federal *Species at Risk Act*. The EIS Guidelines are provided in Appendix A.

10.3.2 Summary of Effects – Species at Risk

While a number of protected species or species at risk potentially inhabit the Region in which the Project is located, no such species are known to occur within the area directly affected by the Project. The EIS indicates that the potential for an effect on plant or wildlife species at risk would be contingent upon the presence of a rare species at or near the Project. The EIS identifies potential sources of effects on species at risk to be similar to those on vegetation and wildlife. They include:

- Removal/disturbance of vegetation during construction;
- Implementation of a re-vegetation plan, which may preclude re-establishment of rare plant species or unique habitat used by rare species;
- Temporary disturbance of vegetation communities during operations;
- Removal of ground cover, reducing available forage/hunting/scavenging habitat for some rare or endangered wildlife species and escape and/or nesting cover for others; and
- Noise disturbance during operations and maintenance activities.

10.3.2.1 Construction

As there are no plant or wildlife species at risk affected by or near the Project, the MFA predicts no effects on terrestrial species at risk as a result of the project. Activities associated with raising and extending the West Dyke will be undertaken during the fall period to avoid any potential conflicts with the Parkland Mews' Peregrine Falcon Breeding Program. As noted in the previous section, the MFA is proposing to develop and implement a CPEPP to further address wildlife issues during construction activities.

10.3.2.2 Operation – Inactive

As no plant or wildlife species at risk are affected by or near the project, the MFA predicts no adverse effects.

10.3.2.3 Operation – Active

As no plant or wildlife species at risk are affected by or near the project, the MFA predicts no adverse effects.

10.3.3 Proposed Mitigation, Monitoring and Follow-up

As detailed above, the MFA have proposed the following measures to ensure the protection of species at risk, if any, that may be affected by the Project :

- Construction: CPEPP, construction scheduling, monitoring and relocation of rare species if required;
- Operation – Inactive: no specific measures; and
- Operation – Active: no specific measures.

Separate M&F plans will be prepared for each of the major components identified in the EIS Guidelines including terrestrial and aquatic species at risk. MFA proposes that in relation to protected species that a follow-up survey occur along the Floodway Channel and West Dyke prior to the onset of clearing and grubbing activities to ensure that there are no rare or endangered species using the Floodway Channel or West Dyke. If rare or endangered species are found, then an adaptive management approach will be taken whereby construction activities will be postponed for the area in question until the mitigation measures, where necessary, have been developed and implemented in consultation with Manitoba Conservation and Environment Canada.

10.3.4 Responsible Authority Conclusion

Federal and provincial departments and agencies, and members of the public made a number of comments regarding species at risk. Appendix B provides a summary of those comments by environmental category and issue. Comments received in relation to species at risk were related to the lack of a comprehensive program to identify species at risk potentially affected by the Project. The responsible authorities have considered those comments in assessing the effects of the project and in coming to a conclusion on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the effects related to species at risk predicted by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitment to monitoring and follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding the potential effects related to species at risk which may result from the Project, conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA and the following additional management actions are implemented:

- The MFA develops and submits to the RAs for review and approval prior to construction the Environmental Management Plan (EMP) outlining how the commitments related to terrestrial species at risk contained in the EIS and supplementary filings and this screening report will be met during construction and operation of the Project, how monitoring and follow-up will be undertaken, the MFA's plans to adaptively manage any

adverse effects and the MFA's plans for reporting progress and compliance with the terms and conditions outlined in this screening report;

- MFA develop and provide to the responsible authorities for review and approval prior to construction, the CPEPP detailing the measures to be taken in relation to plant and wildlife species at risk. The CPEPP will also include any contingency plans necessary in the event of a failure of any of the proposed measures;
- The re-vegetation plan to be developed as part of the CPEPP should contain measures to reduce the value of wildlife habitat in the Floodway Channel and riparian areas upstream of the Inlet Control Structure that would be affected by operations under Rule 4;
- MFA develop and provide to the responsible authorities for review and approval procedures for identifying and addressing rare species should they be found during construction activities;
- The MFA develop and provide to the responsible authorities a plan for on-going monitoring of species at risk. The plan should provide flexibility to address any changes which may occur to those species considered at risk;
- The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required;

11. Socio-Economic Environment

MFA's analysis of the socio-economic environment included an evaluation of the effects of the Project on resource use, economy, infrastructure and services, health and personal, family and community life. Further information is provided in MFA's EIS and Supplemental Filings. It is noted that under the *CEAA*, environmental effects include socio-economic effects caused by a change in the biophysical environment, which in turn is caused by the project. However, if a socio-economic effect is not caused by a change in the environment, but by something related directly to the project, the socio-economic effect is not an environmental effect within the meaning in the *CEAA*.

11.1 Resource Use

11.1.1 Introduction

The EIS Guidelines specified that the EIS describe potential changes to the environment that may result from the project including consideration of effects to human health, socio-economic and cultural conditions. The EIS Guidelines are provided in Appendix A.

11.1.2 Summary of Effects – Resource Use

The MFA identifies the main sources of effects on resource use in their EIS to include disruption due to construction activity, traffic and access, land acquisition, land use, drainage changes to water regimes (flows and levels) and the current use of land/resources for traditional purposes by aboriginal peoples.

11.1.2.1 Construction

The MFA identifies that during the construction phase of the Project traffic disruption at the Floodway channel crossings and the West Dyke may affect commercial resource and residential land use. The MFA proposes to maintain reasonable access at crossings of the Floodway channel and at the West Dyke. The MFA is also proposing to complete a CPEPP to further address these issues during the construction phase of the Project. The CPEPP is expected to outline provisions with respect to construction traffic such as:

- Limiting workforce parking to areas designated for such so as not to interfere with or impede traffic flow;
- Ensure that all construction traffic is restricted to the right-of-way, existing roads and approved access paths;
- Measures to control egress and access to public roadways; and
- Measures to prevent the general public from entering the construction right-of-way, roadways or bridges while under construction.

The MFA identified these residual effects to be short-term in duration, site-specific in extent and minor in magnitude.

The construction activities are also expected to result in some disruption to haying and cropping leases on the Floodway channel and West Dyke. Certain lands will not be available for haying or cropping during the construction phase. Total lease area affected is small and lands leased typically represent a small portion of a producer's operation. The MFA has notified all current leaseholders. Lands affected will be re-vegetated following construction and the lands returned to agricultural use shortly after construction. These residual effects were determined by the MFA to be short-term in duration, site-specific in extent and minor in magnitude.

The MFA indicates that there may be certain medicinal plants used by aboriginal peoples for traditional purposes, affected by the proposed riprapping of the west bank of the Red River, downstream of the outlet structure. The MFA have proposed a site investigation to be undertaken with a Peguis First Nation Elder prior to any construction activity at this site. The field investigation will identify if medicinal plants are present and identify any mitigation necessary.

11.1.2.2 Operation – Inactive

The inactive operation phase of the Project is not expected to result in any adverse effects to commercial resource, residential land use or land and resource use for traditional purposes by Aboriginal people.

11.1.2.3 Operation – Active

During the active operation phase of the Project, the MFA predicts that higher water levels are expected to occur at and downstream of the outlet structure during large flood events. This is expected to result in adverse effects to commercial resource and residential land use in the vicinity of the outlet structure. Compensation will be available from the MFA to those affected. The MFA indicated that this residual effect is likely to short-term in duration, rare in frequency and minor in magnitude. Under Rule 4, artificial flooding is predicted to occur upstream of the Inlet Control Structure. This flooding is limited to low-lying lands (below the top of bank) currently being farmed as market gardens. Manitoba Water Stewardship has sought approval from the Manitoba Treasury Board for the purchase of these lands, as has been requested by some of the property owners. Compensation will also be available from Manitoba Water Stewardship for damages incurred by property owners arising from flooding caused by floodway operation under Rule 4.

Higher water levels during large flood events may also adversely affect land currently held by the Peguis First Nation.

11.1.3 Proposed Mitigation, Monitoring and Follow-up

As detailed above, the MFA have proposed the following mitigation measures to address predicted effects to resource use:

- Construction: CPEPP and re-vegetation program, construction scheduling, medicinal plant survey along west bank of the Red River;
- Operation – Inactive: no specific measures; and
- Operation – Active: sandbags will be provided to property owners and compensation is available for those properties adversely affected by higher flows downstream of the Outlet Structure during large flood events and upstream of the Inlet Control Structure by flooding caused by floodway operations under Rule 4. Manitoba Water Stewardship has also proposed the purchase of these low-lying lands along the Red River south of the Inlet Control Structure.

The MFA indicates that it is expected that after major floods, the Province of Manitoba will engage the Manitoba Water Commission or another similar agency to independently study the effects of the flood and the actions taken during the flood. The agency is expected to have a mandate to determine the extent of unnatural upstream and downstream flooding, to determine whether the Project had any significant effect on water levels and recommend appropriate compensation for incremental damages.

11.1.4 Responsible Authority Conclusion

Federal and provincial departments and agencies, and members of the public made a number of comments regarding effects on resource use. Appendix B provides a summary of those comments by environmental category and issue. Comments received in relation to effects on resource use related to aboriginal interests in relation to the Project and lands potentially affected by the Project downstream of the Floodway Outlet Structure. The responsible authorities have considered those comments in assessing the effects of the project and in coming to a conclusion on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the effects related to resource use predicted by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitment to monitoring and follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding the potential effects related to resource use which may result from the Project, conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA and the following additional management actions are implemented:

- The MFA develops and submits to the RAs for review and approval prior to construction the Environmental Management Plan (EMP) outlining how the commitments related to resource use contained in the EIS and supplementary filings and this screening report

will be met during construction and operation of the Project, how monitoring and follow-up will be undertaken, the MFA's plans to adaptively manage any adverse effects and the MFA's plans for reporting progress and compliance with the terms and conditions outlined in this screening report;

- MFA develop and provide to the responsible authorities for review and approval prior to construction, the CPEPP detailing the measures to be taken in relation to resource use issues. The CPEPP should include a traffic management plan and the MFA shall consult with the Manitoba Transportation and local communities in regards to the traffic management measures proposed. The CPEPP will also include any contingency plans necessary in the event of a failure of any of the proposed measures;
- MFA advise the Peguis First Nation regarding its construction plans, methods and schedules in the area where potential medicinal plants are located (west bank of Red River downstream of the Outlet Structure). The MFA shall enlist PFN members to complete the plant survey and to develop and advise on protection measures, such as replanting or designating plant protected areas. Any plans developed should seek to avoid impacts where possible, then to minimize any effects which cannot be avoided.
- MFA shall report to the RAs the results of the discussions with the Peguis First Nation and the procedures agreed upon to identify and protect medicinal plant species should they be found during the plant survey;
- MFA shall consult with the Peguis First Nation on protection measures such as construction of a wall along the riverbank, to afford protection to the St. Peter's Oldstone Church and Cemetery as a result of increased flows downstream of the Outlet Structure,
- MFA shall consult with the Peguis First Nation regarding the need for similar protection from increased flows that may be required for gravesites on Indian Reserve (IR) II. The MFA shall report the results of those discussions with the responsible authorities and outline and measures to be taken as a result;
- MFA should to the extent possible encourage parties to act promptly in the assessment and payment of claims for flood damages, in order to reduce the stress and financial difficulties experienced by claimants. Any report prepared by or under the direction of the Manitoba Water Commission in relation to a major flood event, should be provided to the RAs with proposals by the MFA to respond to the recommendations, during the construction period and following the initial use of the expanded Floodway;
- The MFA submits to the RAs for review and approval prior to operation of the Expanded Floodway, a Monitoring and Follow-up Plan for resource use. The Plan shall describe how the operation of the Expanded Floodway will be monitored and identify any corrective actions required, should monitoring identify effects unanticipated by this assessment.
- The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required.

- The RAs also encourage and support the plans of Manitoba Water Stewardship to acquire those low-lying lands (as requested by some of the property owners) south of the Inlet Control structure that are subject to flooding during operations under Rule 4.

11.2 Economy

11.2.1 Introduction

The EIS Guidelines specified that the EIS indicate the extent to which the economy would be affected by the Project. The EIS Guidelines are provided in Appendix A.

11.2.2 Summary of Effects - Economy

The EIS identifies the main source of effects to be as a result of changes to the water levels and flows experienced during a large flood event. This may result in changes to flood damages experienced. A change in the perceived flood risk profile of a community as a result of the Project may affect the ability of a community to retain existing businesses or attract new business opportunities.

11.2.2.1 Construction

The EIS indicates that the construction phase of the Project is expected to result in beneficial effects to the economy through employment opportunities and the purchase of materials and services.

11.2.2.2 Operation – Inactive/ Operation – Active

The EIS indicates that during both the inactive and active operation phases of the Project changes in flood risk may have adverse effects on the economy of municipalities outside of the area protected by the Floodway expansion. Two pathways by which the flood risk may change were identified:

- From increased flooding in certain areas outside of the protected area; and
- From changes in relative flood protection as between different areas.

In terms of the first pathway, the MFA's EIS indicates that changes in water levels are predicted to occur only downstream of the outlet structure, would be rare in frequency, small in magnitude (less than 1 foot), and of short duration. Compensation would be available to those adversely affected, in the event that flood protection mitigation was not fully effective.

The MFA indicates that concerns have been expressed by municipalities outside of the area protected by the expanded Floodway, that increasing the level of protection to the City of Winnipeg (to approximately the 1 in 700-year level) without similarly increasing the level of flood protection afforded to other communities (in most cases currently at the 1 to 100 year level), would make these communities appear to be more at risk for flooding and therefore less desirable locations for new economic developments. The MFA indicates that available experience suggests that the effects of rare flood events do not tend to have significant long-term effects on personal or business location decisions. The EIS also indicates that since the

1997 flood, the governments of Canada and Manitoba jointly invested approximately \$110 million in flood protection works in the Red River valley under the “1997 Red River Valley Flood Proofing and Dyke Enhancement” agreement. Under this program, community dykes protected 9 additional Red River Valley communities:

- Grande Pointe;
- Niverville;
- Gretna;
- Aubigny;
- St. Pierre-Jolys;
- Lowe Farm;
- Riverside;
- Rosenfeld; and
- Ste. Agathe.

Four other communities (Emerson, Dominion City, Roseau River and Rosenort) upgraded their existing dykes to the new level of protection. Approximately 1,900 residences and businesses were protected under the community dyking program. Twenty-two residences were purchased and removed from the flood plain immediately south of the Floodway.

Outside of the major community dykes, 2,850 applications for financial assistance were received from individual homes and businesses, of which 2,576 were determined to be eligible and were incorporated into the flood protection program. All properties under this program were required to be protected to the 1997 level plus 2 feet freeboard. The specifications for construction required top-widths of dykes or clear widths on pads that envisaged the ability to build temporary sandbag dykes to further accommodate floods of higher return frequency. In light of this requirement, communities and properties protected under the post-1997 program, from (and including) Ste. Agathe and upstream, could be protected against the 700 year event by supplementing their permanent protection measures with temporary works.

However, many properties between Ste. Agathe and the Floodway Inlet, would not likely be upgradeable to 700-year protection with out major modifications, since they lie within the zone of backwater influence of the inlet control structure and would be subject to artificial flooding as a result of Floodway operation in response to the extreme event. Damages caused to those properties would be covered under the compensation legislation. In addition operations under Rule 4 may also result in limited artificial flooding upstream of the Inlet Control Structure as previously described. Manitoba Water Stewardship will maintain a program of compensation for damages incurred by property owners from flooding caused by floodway operations under this rule.

11.2.3 Proposed Mitigation, Monitoring and Follow-up

As detailed above, the MFA have proposed the following mitigation measures to address predicted effects to economy:

- Construction: no specific measures;
- Operation – Inactive: no specific measures; and
- Operation – Active: compensation for those properties adversely affected by higher flows downstream of the Outlet Structure during large flood events and upstream of the Inlet Control Structure by flooding caused by floodway operations under Rule 4. Manitoba Water Stewardship has also proposed the purchase of these low-lying lands along the Red River south of the Inlet Control Structure.

No monitoring requirements were identified in the EIS.

11.2.4 Responsible Authority Conclusion

Federal and provincial departments and agencies, and members of the public made a number of comments regarding effects on the economy. Appendix B provides a summary of those comments by environmental category and issue. Comments received in relation to effects on the economy related to concerns regarding the inequality in flood protection between those in the City of Winnipeg and those upstream and downstream of the Project. The responsible authorities have considered those comments in assessing the effects of the project and in coming to a conclusion on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the effects related to the economy predicted by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitment to monitoring and follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding the potential effects related to the economy which may result from the Project, conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA are implemented.

The RAs also encourage and support the plans of Manitoba Water Stewardship to acquire those low-lying lands (as requested by some of the property owners) south of the Inlet Control structure that are subject to flooding during operations under Rule 4. Where purchase of flood prone properties is not feasible, consideration should be given to the identification and implementation of other cost-efficient measures to enhance flood protection.

11.3 Infrastructure and Services

11.3.1 Introduction

The EIS Guidelines specified that the EIS provide a general description of the infrastructure and services of communities affected by the Project. The EIS Guidelines are provided in Appendix A.

11.3.2 Summary of Effects – Infrastructure and Services

The EIS identifies the potential sources of effects on infrastructure and services to include:

- Traffic activity and access disruptions;
- Land use changes;
- Land acquisition;
- Changes to groundwater levels/water quality; and
- Changes to water regimes (levels and flows) during flood events.

11.3.2.1 Construction

Transportation and Roads

During the construction phase of the Project, the MFA in their EIS indicates that traffic disruption due to construction is expected to occur. Six bridges will be replaced; however, they will remain operational during construction of the new bridges, in order to mitigate traffic disruptions. Five railway bridges will be modified and one bridge will be replaced. At three of the bridges (CNR Sprague, CNR Redditt and CPR Keewatin), temporary detour structures will be constructed to enable railway operations to proceed without disruption. Two bridges (GWWD and CEMR Pine Falls) will be closed for approximately 4 months. The MFA has been working with the rail companies and has undertaken to schedule the construction to minimize service disruptions.

The Dunning Road Crossing will also be removed when construction occurs in that area of the Channel. The EIS indicates that this will affect the ability of the RM of St. Clements to respond to emergency events on the east side of the Floodway while the Dunning Crossing is closed. The MFA indicates that possible mitigation could include coordinating with the RM of East St. Paul to provide emergency service to that portion of St. Clements on a temporary basis during construction.

Raising the West Dyke is also expected to disrupt traffic and construction will be scheduled to provide reasonable access during construction for the movement of farm equipment and emergency services. The MFA concludes these residual effects are small in magnitude and temporary in duration.

Water Supply

As noted in Section 8.4 - Groundwater, dewatering is expected to occur at a number of locations in order for the piers of the new bridges to be constructed. This is expected to result in a temporary lowering of the water table in the vicinity of some of the bridge crossings and the Winnipeg Aqueduct. As noted in Section 8.4, mitigation measures proposed include:

- Notifying all potentially affected property owners prior to construction and assessing their wells to determine if they will be affected;
- Lowering pumps;
- Deepening wells; or
- Providing delivered water until levels are restored (as required).

MFA indicates that affected property owners will be included and involved in determining mitigation. The MFA concludes that these residual effects are short-term in duration, site-specific and reversible.

In addition, as also noted in Section 8.4, the EIS also predicts potential effects on groundwater quality associated with use of hydrocarbons, herbicides and other chemicals during construction. These effects may occur as a result of accidents or malfunctions during construction. The MFA proposes to mitigate these potential effects through adoption of good practices for handling these materials. The CPEPP will be prepared to further describe these measures and will address plans for proper storage, good fuelling practice and spill response and cleanup. The MFA concludes that these effects would be small and local in extent.

The MFA proposes to prepare a CPEPP to prevent groundwater effects as a result of construction. The Plan will be prepared following detailed design and will present construction methods to prevent groundwater effects such as seepage, construction site dewatering, blowouts, aquifer interconnection and surface water intrusion situations, monitoring plans and contingency plans. The MFA indicates that the CPEPP will describe:

- Procedures for drilling and installation of boreholes, test holes, dewatering and water wells to protect groundwater resources from contamination and prevention of cross aquifer contamination;
- Decommissioning of all boreholes, test holes and dewatering wells that are no longer in use;
- Maintenance or alternative supply of potable water to supply adjacent lands;
- Procedures to prevent blowouts during excavation;
- Provide groundwater source protection in terms of both quality and quantity and recognize vulnerable or sensitive aquifer zones and wellhead protection zones; and
- Decommissioning of bridge piles and piers.

Police, Fire, Ambulance and Emergency Services

The MFA indicates in the EIS that traffic disruptions construction could affect access for emergency services during construction. Of particular concern is that the temporary removal of the Dunning Crossing could adversely affect the ability of emergency vehicles at the RM of St. Clements south fire hall to access the Pine Ridge Trailer Park during construction. Notification of the construction schedule and detours will be provided to emergency service providers. In addition, the EIS indicates that it may be possible to have emergency services provided to the Pine Ridge Trailer Park by the RM of East St. Paul on a temporary basis.

11.3.2.2 Operation – Inactive

Transportation and Roads, Utilities, Police, Fire, Ambulance and Emergency Services and Community Facilities

No adverse effects are predicted.

Water Supply

The MFA predicts that the widening of the Floodway Channel through the Birds Hill/Oakbank area will result in a drop in the water table elevation of 2.6 m, tapering to 0.6 m at Oasis Road. The MFA will install a subsurface cutoff wall to reduce the effect of widening of the channel on groundwater. The MFA has also announced a five-point program for groundwater protection. The program includes:

- No deepening of the floodway channel;
- Low flow channel protection – measures to strengthen, armour and fill in erosion spots to re-establish the grade of the low flow channel;
- Environmental mitigation fund - \$11 million fund to mitigate any unanticipated, isolated environmental effects, including groundwater protection;
- Ongoing monitoring – in partnership with Manitoba Water Stewardship and local authorities, adoption of a monitoring and adaptive management approach to identify and respond to any unpredictable adverse effects regarding groundwater. Key principles include:
 - A focus on sensitive spring areas;
 - Focus on the bedrock aquifer, but also includes the sand and gravel aquifer;
 - Consisting of multiple wells into bedrock or other granular zones;
 - Establishment of secure wells for on-going monitoring;
 - Facilitate both monitoring and pumping of impacted groundwater if required.
- Community Liaison – establish a Community Liaison Committee to provide local residents with updates on the project as well as a venue to raise issues related to the expansion project.

The MFA predicts that the effects are of long-term duration, local in extent and irreversible.

The MFA predicts that during inactive operations a drawdown of the groundwater levels of less than 0.5 metres at the CPR Keewatin Bridge and the Dunning Road locations is expected to occur. The MFA does not propose any specific mitigation measures, beyond the Groundwater Protection Plan described above. The MFA predicts that the effects are of long-term duration, local in extent and not reversible.

11.3.2.3 Operation – Active

No adverse effects predicted

11.3.3 Proposed Mitigation, Monitoring and Follow-up

As detailed above, the MFA have proposed the following mitigation measures to address predicted effects to infrastructure and services:

- Construction: CPEPP and groundwater protection program to address water supply and groundwater issues and construction scheduling to address access and traffic disruptions;
- Operation – Inactive: OPEPP and groundwater protection program to address water supply and groundwater issues; and
- Operation – Active: groundwater protection program.

The MFA proposes that the groundwater M&F Plan would include post-construction groundwater water level monitoring focused on areas where mitigation actions were installed and areas where existing groundwater discharge into the floodway is taking place. Monitoring of groundwater quality would focus on the western side of the Floodway to verify movement and any effect of surface water intrusion. Follow-up would be taken depending upon the nature and extent of the need.

11.3.4 Responsible Authority Conclusion

Federal and provincial departments and agencies, and members of the public made a number of comments regarding effects on infrastructure and services. Appendix B provides a summary of those comments by environmental category and issue. Comments received in relation to effects on infrastructure and services related to concerns regarding the provision of emergency services, maintenance of access and the provision of flood protection and flood proofing. The responsible authorities have considered those comments in assessing the effects of the project and in coming to a conclusion on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the effects related to infrastructure and services predicted by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitment to monitoring and follow-up, and the comments received from federal and

provincial departments and agencies, and the public regarding the potential effects related to infrastructure and services which may result from the Project, conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA and the following additional management actions are implemented:

- o The MFA develops and submits to the RAs for review and approval prior to construction the Environmental Management Plan (EMP) outlining how the commitments related to infrastructure and services contained in the EIS and supplementary filings and this screening report will be met during construction and operation of the Project, how monitoring and follow-up will be undertaken, the MFA's plans to adaptively manage any adverse effects and the MFA's plans for reporting progress and compliance with the terms and conditions outlined in this screening report;
- o MFA develop and provide to the responsible authorities for review and approval prior to construction, the CPEPP detailing the measures to be taken in relation to potential effects to infrastructure and services, including maintenance of access and emergency service provisions. The CPEPP should include a traffic management plan and the MFA shall consult with the Manitoba Transportation and local communities in regards to the traffic management measures proposed. In addition, the traffic management plan should take into account the provision of emergency service in the RM of St. Clements while the Dunning Crossing is closed. The CPEPP will also include any contingency plans necessary in the event of a failure of any of the proposed measures. The CPEPP will also outline the site-specific groundwater protection plans for all sites where groundwater effects are predicted. These plans shall specify the specific monitoring and mitigation actions that will be undertaken to protect groundwater resources from adverse effects as a result of the Project;
- o With respect to water supply, the plans for mitigation should reflect the principle that the project should not disrupt water supply and the MFA should take measures as may be needed to ensure secure and reliable water supply during the construction phase and thereafter as necessary;
- o MFA will provide to responsible authorities and other interested parties detailed procedures for administration of the mitigation fund, including processes for determining how funds are to be accessed, when and how decisions will be made and contingency plans in the event the fund is exhausted prior to the adverse effects of the project being fully resolved;
- o The MFA schedules construction to avoid sensitive time periods relative to infrastructure and services (access, traffic, farm equipment and emergency services);
- o The MFA submits to the RAs for review and approval prior to operation of the Expanded Floodway, a Monitoring and Follow-up Plan for infrastructure and services. The Plan shall describe how the operation of the Expanded Floodway will be monitored and identify any corrective actions required, should monitoring identify effects unanticipated by this assessment.
- o The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the

provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required.

11.4 Personal, Family and Community Life

11.4.1 Introduction

The EIS Guidelines specified that the EIS shall provide a general description of the personal, family and community life of communities affected by the Project. The EIS Guidelines are provided in Appendix A.

11.4.2 Summary of Effects – Personal, Family and Community Life

The EIS identifies potential sources of effects on personal, family and community life to include:

- Traffic activity and access disruptions, changes to landscape, and economy effects of the Project;
- Changes in groundwater levels/water quality; and
- Changes to water regimes (levels and flows) during flood events and subsequent effects on perceptions and way of life.

Health effects are addressed in Chapter 11.5.

11.4.2.1 Construction

Population and Demographics and Community Cohesion and Organization

No adverse effects are predicted.

Recreation and Travel

The EIS identified a number of recreational opportunities in the areas along the Red River and the Floodway, including sport fishing, sport hunting, winter recreational activities (cross-country skiing, downhill skiing, tobogganing, snowmobiling and others), and summer recreational activities (canoeing, rowing, motorized boating, trail walking and others).

Construction effects included traffic delays during construction of bridges crossing the Floodway channel and in the vicinity of the West Dyke which would be mitigated by maintaining reasonable access to the Floodway crossings and the West Dyke. Another construction effect identified was cessation of recreational activities along the Floodway Channel due to construction or while re-vegetation is being established which would be mitigated by sequencing construction to one or two seasons in any one segment. The MFA concluded that these residual effects would be temporary, small in magnitude.

Aesthetics

The EIS indicates that negative changes to aesthetics are expected during construction and at construction sites and disposal piles until vegetation is re-established. Undertaking the

re-vegetation immediately following construction will help to reduce the time that disturbed areas are exposed. The MFA predicts these residual effects will be small in magnitude, site-specific in extent and short-term in duration.

Way of Life, Culture and Spirituality

The MFA's EIS indicates that during the construction phase of the project, the main effects of the Project are related to short-term changes in patterns of work and family life due to access disruptions on roads and bridges subject to construction. The MFA indicates that this restriction in access is most likely to affect the RMs of Macdonald, Springfield, Ritchot, East St. Paul and to a limited extent St. Andrews and St. Clements. In the case of the RM of Macdonald, mitigation measures proposed include sequencing construction to avoid seeding and harvesting times. In the RM of Springfield, the existing Floodway has restricted access, causing considerable detours to cross on of the three main bridges. Mitigation proposed includes keeping the existing bridges open while the replacement bridges are being constructed. The MFA predicts these residual effects to be short-term in duration, site-specific in extent and small in magnitude.

11.4.2.2 Operation – Inactive and Active

Population and Demographics

The MFA in their EIS indicates that flood events and changes in protection related to such events, potentially might cause population changes through in migration. However, the MFA notes that there are many uncertainties with respect to projecting migration and decisions of an individual and/or family to move involves an array of factors. The MFA suggests that the experience from the 1997 flood and from literature on flood events, show that there has been some population change and out-migration from flood damaged communities. Communities that are affected by severe flooding are therefore likely to continue to experience some out-migration effects with the Floodway expansion in the period immediately following severe flood events. The EIS indicates that there is no basis for predicting or expecting measurable change in such short-term migration immediately after any flood related to expected effects of the Project. The EIS suggests mitigation measures to address concerns that may lead to out-migration from flood-affected areas could include communication about the effects of the Project, flood risks and flood management plans, available financial assistance and compensation. The EIS indicates that improving the level of trust between residents in flood-affected areas and the provincial government is an important factor in allowing available mitigation measures to be effective in addressing concerns about effects related to the Project.

With respect to the extent to which the developability of land in flood-prone areas and population out-migration after a flood event is affected on a long-term basis, the EIS indicates that the available information suggests that effects on population are more closely linked to actual flood damage than to the desirability of moving out of a flood prone area. The MFA suggests that improved flood protection since 1997 and the expected reduction in backwater effects of the Project should reduce perceptions of risk and lower the potential for this

population effect south of the Inlet Control Structure. The MFA concluded that there remains no basis for predicting or expecting measurable changes in long-term migration related to the expected effects of the Project.

Recreation and Travel

Operational effects included additional recreational opportunities along the Floodway Channel and additional recreational use by non-local recreationalists resulting in vandalism, nuisance and additional insurance and maintenance costs. Management of these effects is to be addressed through a public consultation process on recreational options to be undertaken by the MFA. The proponent will undertake monitoring to provide timely information and response that will help to manage the effects of the Project.

The MFA released a Recreation and Economic Development Opportunities Report for the Red River Expansion Project in December, 2004. The report outlined ideas submitted to the MFA by the public and options for consideration as the floodway expansion project moves ahead. Based on the submission received through a statement of interest process the MFA is considering a number of next steps as the Project moves forward, including a Floodway Recreation Working Group, establishment of a multi-use, four season greenway trail along the floodway within the project's pre-design, and other initiatives.

The report states that any recreation or economic development proposal is expected to be the responsibility of the proponent and that no such proposal will be authorized that has a potential to have a significant adverse effect on the environment. Further, proponents will be required to comply with all relevant environmental regulatory standards and any other applicable legislation. Three activities that the MFA will not consider as part of the expansion project are any proposals that require water in the Floodway, acquisition of additional lands for the sole purposes of recreational development and development of a new ski hill. In addition, the MFA will not consider the following activities within the floodway channel:

- Permanent or temporary structures;
- Earth trails;
- Earth trails in areas subject to sediment transport into the floodway channel;
- Hazardous materials storage; and
- Sewage or solid waste.

In the Supplementary Filings, the MFA explained that at the same time as improving flood protection for Manitobans, the floodway expansion also has the potential to result in other long-lasting benefits for all Manitobans and future generations. Some of these benefits include recreation and economic development opportunities.

The MFA has committed to a public participation process involving the proponents and stakeholders to ensure that any concerns about potential recreational enhancements of the Project can be addressed. The implementation of any recreation or economic proposal will be

the responsibility of the proponent or stakeholder. No recreation or economic proposals will be authorized that has a potential to have significant adverse environmental effects. Proponents will be required to comply with relevant environmental standards and any other applicable legislation.

Aesthetics

The MFA in their EIS indicates that it is expected that there will be no appreciable adverse effects on the aesthetic quality of the area. However, the MFA indicates that those living near the Floodway Channel or West Dyke area may have concerns about changes in aesthetics due to higher berms. No specific mitigation is proposed and the MFA concludes that these residual effects are small in magnitude, site-specific in extent and short-term in duration.

Way of Life, Culture and Spirituality

The MFA indicates that the inactive operation and active operation phases of the Project are not expected to have discernable effects on the way of life, culture or spirituality within the Flood Study Region. However, the MFA points out that the Project has renewed and intensified a sense among many Red River valley residents outside of Winnipeg that they are not being treated equitably in terms of flood protection. The MFA also notes in their EIS that the potential for summer operation of the Floodway will likely exacerbate the current feelings of inequity. It was noted that distrust in authorities and perceived changes in way of life by residents, based on current perceptions and feelings of some individuals as triggered by the Project, remains a concern. The MFA indicates that local stakeholders and residents have suggested a number of measures to address overall flood management issues and their effects on way of life for Red River Valley residents outside of Winnipeg. These include:

- Development of a plan for flood protection throughout the Red River Valley;
- Ongoing meaningful consultation with stakeholders who are affected by artificial flooding caused by the Floodway operation to develop agreements as a compensation mechanism; and
- Provide an appeals process to an independent third party in the proposed compensation legislation.

Community Cohesion and Organization

The operation inactive and operation active phases of the Project are not expected to result in any discernable effect on community cohesion and organization. Similar to concerns expressed regarding way of life, culture and spirituality, the MFA also points out in their EIS that activities related to the Project will most likely continue to act as a catalyst for interest group activity by residents outside of Winnipeg who have expressed feelings that they are not being treated equitably in terms of flood protection and are not being fairly compensated for artificial flooding they experience during existing or expanded Floodway operation.

In the area north of the Outlet Structure, where water levels are predicted to be higher as a result of the Project and south of the Inlet Control Structure, where low-lying lands (below the

top of bank) are flooded during floodway operations under Rule 4, the MFA indicates that the increase potential for flood risk during rare extreme flood events has the potential to affect personal properties and disrupt people's way of life. Mitigation measures to address this effect include the provision of sandbags to property owners during these events, compensation to those adversely affected from the incremental flooding caused by the Project (both downstream and upstream) and purchase of those low-lying lands upstream of the Inlet Control Structure that flood during floodway operations under Rule 4. The MFA conclude that this residual effect is small in magnitude, short-term in duration, local in extent and rare in frequency.

11.4.3 Proposed Mitigation, Monitoring and Follow-up

As detailed above, the MFA have proposed the following mitigation measures to address predicted effects to personal, family and community life:

- Construction: Maintenance of access, construction sequencing and re-vegetation;
- Operation – Inactive: No specific measures; and
- Operation – Active: Sandbags for properties downstream of the Outlet Structure during large flood events. Compensation for those properties adversely affected by higher flows downstream of the Outlet Structure during large flood events and by flooding caused by floodway operations under Rule 4. Manitoba Water Stewardship has also proposed the purchase of these low-lying lands along the Red River south of the Inlet Control Structure.

The EIS indicates that monitoring will be undertaken in order to provide in a timely way, information and response that will help to manage the effects of the Project. Specific work plans for monitoring and following up of topics in personal, family and community life, will be developed between the MFA and key stakeholders in the Floodway Study Region.

11.4.4 Responsible Authority Conclusion

The responsible authorities have noted the differing views expressed concerning the nature, extent and significance of potential effects of the Project on personal, family and community life, including human health. Those raising concerns point to past damages and other adverse effects from flooding, both natural and resulting from decisions to operate the Floodway gates, and to difficulties in obtaining what was felt to be adequate compensation for these damages. Strong concerns were also expressed regarding the potential for the Floodway Expansion Project to cause artificial flooding and other adverse effects in the future, and the perceived inadequacy of measures proposed to mitigate those problems associated with the existing Floodway and those expected to occur as a result of the expansion. There is a perception among some stakeholders that communities and residents outside the flood protection zone are not being treated fairly.

Federal and provincial departments and agencies, and members of the public made a number of comments regarding effects on personal, family and community life. Appendix B provides a summary of those comments by environmental category and issue. Comments received in relation to effects on personal, family and community life related to concerns regarding compensation, property rights, flood protection, recreation, and health. The responsible authorities have considered those comments in assessing the effects of the project and in coming to a conclusion on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the effects related to personal, family and community life predicted by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitment to monitoring and follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding the potential effects related to personal, family and community life which may result from the Project, conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA and the following additional management actions are implemented:

- The MFA develops and submits to the RAs for review and approval prior to construction the Environmental Management Plan (EMP) outlining how the commitments related to personal, family and community life contained in the EIS and supplementary filings and this screening report will be met during construction and operation of the Project, how monitoring and follow-up will be undertaken, the MFA's plans to adaptively manage any adverse effects and the MFA's plans for reporting progress and compliance with the terms and conditions outlined in this screening report;
- MFA develop and provide to the responsible authorities for review and approval prior to construction, the CPEPP detailing the measures to be taken in relation to maintenance of access. The CPEPP should include a traffic management plan as previously noted and include contingency plans in the event of a failure of any of the proposed measures;;
- MFA develop and provide to the responsible authorities for review and approval prior to construction, its plan for on-going stakeholder involvement relating to the construction and operation of the Project;
- MFA develop and provide for review and approval by responsible authorities in accordance with the schedule outlined in the EMP, its plans for monitoring and follow-up in relation to personal, family and community life issues. This should include addressing potential issues of migration and shifts in home valuation related to flood events.
- The MFA will provide to the responsible authorities and other stakeholders, detailed procedures for administration of the mitigation fund, including processes for determining how funds are to be accessed, when and how decisions will be made and contingency plans in the event the fund is exhausted prior to the adverse effects of the project being fully resolved;
- The MFA submits to the RAs prior to operation of the Expanded Floodway, the details regarding the compensation programs provided for under the *Red River Floodway Act* and as outlined in Rule 4. This shall include how the compensation is to be administered and accessed;

- The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required;
- The RAs also encourage and support the plans of Manitoba Water Stewardship to acquire those low-lying lands (as requested by some of the property owners) south of the Inlet Control structure that are subject to flooding during operations under Rule 4.

It has been stated by the MFA that construction of any future approved recreational development would be incorporated into the end of project construction. It is important to note that such proposals are not included in the scope of this assessment and have not been assessed. Any plans to undertake recreational development as part of the Floodway Expansion Project should be submitted to the RAs, who will determine whether the screening report will require revision to reflect any changes to the Project.

11.5 Health

11.5.1 Introduction

The EIS Guidelines specified that the scope of the assessment shall include potential changes to the environment that may result from the project including consideration of effects to human health, socio-economic and cultural conditions. The EIS Guidelines are provided in Appendix A.

11.5.2 Summary of Effects - Health

The MFA predicted in their EIS a small potential for change in quality or availability of drinking water due to dewatering at Floodway construction sites. The MFA has committed to rectify any effects on quantity or quality of drinking water. Traffic delays due to construction of bridges may create small adverse effects on stress of managing work/family balance for commuters are predicted. Reasonable access will be maintained at Floodway crossings and the West Dyke during construction. There is also potential for traffic congestion and re-routing to increase traffic accidents and need to re-route emergency medical responders to accidents.

During inactive operation of the Floodway there is small potential for changes in availability of groundwater for which the MFA will monitor for any change in quality and quantity of groundwater. The MFA has taken a zero tolerance approach regarding the risk to public health as a result of groundwater contamination from the Project and has stated that it will react accordingly to any detected contamination. As noted earlier, the MFA has also committed to rectify any effects on quantity or quality of drinking water.

During active operation there is concern for increased potential of non-compliance with evacuation orders during a rare flood event due to issues relating to compensation for the existing Floodway. Communication and consultation related to concerns about potential non-compliance with evacuation orders is proposed. The Project will generate benefits to health during rare flood events by raising the level of flood protection for the majority of Winnipeg residents and reduces potential risk to their safety and health.

Monitoring will be undertaken to provide timely information and response that will help to manage effects of the Project. Specific work plans for monitoring and follow-up of topics including health will be developed between MFA and key stakeholders in the Floodway Study Region.

The MFA provided information on health response planning in the Supplemental Filings for the EIS. The information explained that since the 1997 flood event, emergency and health response planning in Manitoba has undergone and is continuing to undergo review, revision and refinement. The Manitoba Emergency Plan has been amended. Manitoba Health issued its latest Emergency Response Plan in 2002 and the Rural Municipalities with the area affected by

Red River flooding are in the process of producing plans. The Regional Health Authorities, which were formed in 1997, approved the adoption of a standardized approach to disaster management in 2003.

The MFA has acknowledged that it is important to ensure that emergency response network, health service providers and the Regional Health Authorities have access to the information needed to understand how the Project may affect public health and well-being in Manitoba. The MFA confirmed that it will hold an information workshop on the Project with health service providers in the flood study region. The workshop purpose will be to provide information about the Project and to create an ongoing dialogue with health service providers so that potential health and well-being effects of the project can be identified, mitigated and monitored.

11.5.3 Responsible Authority Conclusions

Federal and provincial departments and agencies, and members of the public made a number of comments regarding effects on health. Appendix B provides a summary of those comments by environmental category and issue.

Health Canada commented that the Project has the potential to contribute significantly to and positively to the health protection of the population within the Red River watershed. However, with the information provided the Department was unable to establish whether or not any sub-populations within the study area and/or watershed will be adversely and significantly affected considering the proposed mitigation and future projects. Additional information was requested to allow for a more robust evaluation of the extent to which there may be populations at risk of health concerns resulting from the operation of the Project.

Health Canada outlined a strategy for integrating health into the Project by proposing the following broad planning themes to aid in the better integration of health considerations into the EIS:

- Engage specialist expertise to evaluate the risk of health effects related to the flooding scenarios particular to the study area and its context;
- Maintain an ongoing dialogue with the health and emergency services infrastructures in order to better ascertain and prepare for any risks arising from the project
- Communicate these initiatives publicly in collaboration with the health and emergency services infrastructure; and
- Adopt a flood protection plan for an area larger than the current study and move tangibly towards putting it into place.

Responsible authorities, have considered the effects related to health predicted by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitment to monitoring and follow-up, and the comments received from federal and provincial departments

and agencies, and the public regarding the potential effects related to health which may result from the Project, conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA and the following additional management actions prescribed by Health Canada.

- The MFA develops and submits to the RAs for review and approval prior to construction the Environmental Management Plan (EMP) outlining how the commitments related to health contained in the EIS and supplementary filings and this screening report will be met during construction and operation of the Project, how monitoring and follow-up will be undertaken, the MFA's plans to adaptively manage any adverse effects and the MFA's plans for reporting progress and compliance with the terms and conditions outlined in this screening report.
- MFA develop and provide to the RAs in accordance with the schedule outlined in the EMP, its plans for monitoring and follow-up in relation to health issues. These plans should be developed in consultation with key stakeholders and include plans relating to groundwater quantity and quality, in respect of construction activities, Floodway operations and discharges to the Floodway Channel during periods when the Floodway is not in use.
- The MFA develop and provide to the RAs its communication and consultation plans aimed at promoting compliance with evacuation orders during flood events.
- Responsible authorities, on the advice of Health Canada, believe that collaboration with public health and emergency response authorities within the flood study region is needed to ensure that prompt action can be taken to minimize any adverse health effects associated with the project. To initiate this process, a workshop(s) with the health and emergency services sectors will be organized by the MFA. This proactive measure will promote health protection within the flood study region by ensuring key stakeholders are involved in the project.
- The purpose of the proposed workshop(s) is to present what is known (and not known) about the links between the effects of the proposal and potential health impacts as a means of informing these key stakeholders. There are a number of potential health issues associated with the project, the risk levels for which remain unclear, and the specific vulnerable populations yet identified. It is important to inform the health and emergency sectors about what is currently known about the impacts of the project in all its phases in order that they may determine the what is appropriate in assessing potential risks, and preparing for any service provision and resource adjustments. Health impacts that should be discussed at the workshop(s) include:
 - Direct flooding effects (short-term post flood);
 - Indirect flooding effects (medium and longer term – stress, social disruption);
 - Risk communication;
 - Municipal and agricultural wastewater effluents contaminating surface and drinking water sources;
 - West Nile virus;

- o Monitoring programs for socio-economic impacts (population migration, valuation of properties)
 - o Potential for and management of groundwater contamination;
 - o Release of toxic substances into environmental media associated with flooding
 - o Indoor air quality/moulds
 - o The MFA should consult regional health and emergency service providers and Health Canada regarding the agenda, list of participants, information requirements and related details.
-
- o The MFA shall also provide to the RAs, its plans for consultation with the Regional Health Authorities emergency service providers during all phases of the Project and specifically how it intends to consult these groups during operation of the Floodway.
 - o As noted in Section 11.3.4, the CPEPP must include a traffic management plan and the MFA shall consult with the Manitoba Transportation and local communities in regards to the traffic management measures proposed. In addition, the MFA will inform the RAs of its plans to ensure the delivery of emergency service in the RM of St. Clements while the Dunning Crossing is closed.

12. Heritage Resources

12.1 Introduction

The EIS Guidelines required the proponent describe any existing heritage resources and how they may be affected by the proposed project. The EIS Guidelines are provided in Appendix A.

12.2 Summary of Effects – Heritage Resources

The MFA identified that the project-related pathways and sources of effect on heritage resources to include construction excavation, particularly from borrow areas for the Project, increased vehicle and pedestrian traffic at construction sites and changes to water levels and flows and erosion as a result of the operation of the Expanded Project.

12.2.1 Construction

The EIS and supporting materials indicate that during construction of the Project, excavation of borrow materials for the West Dyke is not expected to impact any heritage resources, as source materials are expected to come from roadside ditches. Known archaeological sites are located immediately south of the construction zone at the Outlet Structure. The EIS and supporting materials indicate that one site (a burial mound) is outside of the areas of likely impact from construction of the Project. A portion of the second site (Floodway Village Site) is located at the west end of the south embankment of the Outlet Structure in an area crisscrossed with recreational vehicle trails. The EIS and supporting materials indicated that the site is currently being impacted by casual visitors and fisherman who drive over it, exposing heritage resources. The EIS indicates that during construction of the Project, sightseers will probably access the area to view construction and there is the potential that further impact to this area may occur. The MFA proposes that gravel or fill be placed over the existing vehicle ruts to prevent further damage to and exposure of heritage resources. The MFA concludes that this impact is negligible.

The MFA is also proposing to complete a CPEPP to ensure that any archaeological resources that may be disturbed are identified and measures to conserve the resources are undertaken in accordance with the directions of the Manitoba Historic Resources Branch. The CPEPP will also ensure that a thorough assessment of the deposit is made, recommendations for impact mitigation are made, and reports which clearly document the methods, results and recommendations of the assessment are provided in a timely manner as directed by the Historic Resources Branch.

12.2.2 Operation – Inactive

The MFA indicates that the Project will not have any effect on heritage resources in periods when the expanded floodway is not in active use.

12.2.3 Operation – Active

The MFA predicts that during the active operation of the Project, water levels and flows could result in higher water levels in some areas, particularly downstream of the Outlet Structure. The EIS indicates that it is expected that these occurrences will be rare and short-term. Modifications to the Outlet Structure are expected to reduce water velocities downstream of the Outlet Structure and erosion control measures (rip-rapping) will be undertaken on erosion sensitive areas near the Floodway Outlet. The MFA indicates that these effects will be negligible.

12.3 Proposed Mitigation, Monitoring and Follow-up

The MFA have proposed the following mitigation measures to address predicted effects to heritage resources:

- Construction: CPEPP and gravel fill over ruts south of the Outlet Control Structure;
- Operation – Inactive: no specific measures required, and
- Operation – Active: modifications to the Outlet Control Structure and erosion control measures in sensitive areas south of the Outlet.

MFA have also developed a conceptual level plan for Monitoring and Follow-up (M&F). Separate M&F plans will be prepared for each of the major components identified in the EIS Guidelines, although no specific M&F plans for heritage resources are described.

12.4 Responsible Authority Conclusion

Federal and Provincial departments and agencies, and members of the public made a number of comments regarding heritage resources. Appendix B provides a summary of those comments by environmental category and issue. Many of the comments received related to the potential exposure and destruction of resources during construction and the need to monitor construction for exposed resources. The responsible authorities have considered those comments in assessing the effects of the project and in coming to a conclusion on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the effects to heritage resources predicted by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitments to monitoring and follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding the potential effects to heritage resources

conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA and the following additional management actions are implemented:

- The MFA develops and submits to the RAs for review and approval prior to construction the Environmental Management Plan (EMP) outlining how the commitments related to heritage resources contained in the EIS and supplementary filings and this screening report will be met during construction and operation of the Project, how monitoring and follow-up will be undertaken, the MFA's plans to adaptively manage any adverse effects and the MFA's plans for reporting progress and compliance with the terms and conditions outlined in this screening report. As part of the CPEPP, the MFA shall develop a Heritage Resources Protection Plan, in consultation with provincial authorities and Parks Canada. The Plan should detail the measures to be taken with regards to the discovery, protection and salvage of heritage resources. The CPEPP will also include any contingency measures necessary in the event of a failure of any of the proposed measures;
- The CPEPP shall also include the specific actions to be undertaken during the implementation of the erosion protection measures upstream and downstream of the embankments adjacent to the Inlet Control Structure, including actions necessary to mitigate adverse effects to those resources;
- Where the Floodway Channel is being widened at the Seine River Crossing, the CPEPP should outline whether the widening can be accomplished without disturbing the upper one metre of soil (through widening only the lower slopes of the channel). If such an approach cannot be accomplished, the MFA shall outline the measures to be taken in regards to the discovery, protection and salvage of any heritage resources that may be present;
- At the Outlet Structure, archaeological monitoring should be undertaken in the areas north of the existing channel, where the widening of the structure is proposed to occur. The CPEPP shall outline the measures to be taken in regards to the discovery, protection and salvage of any heritage resources present;
- The CPEPP shall include the specific actions to be undertaken during the implementation of the erosion protection measures on west bank of the Red River downstream of the Outlet Structure, including actions necessary to identify any heritage resources present and any measures necessary to mitigate adverse effects to those resources;
- The CPEPP shall include the specific actions to be undertaken during the construction of new bridges/culverts and associated roads at St. Mary's Road, Trans Canada East bridge, PTH 44, CPR Emerson/Seine River Crossing and CEMR Pine Falls rail bridge, including actions necessary to identify any heritage resources present and any measures necessary to mitigate adverse effects to those resources;
- Inspections and/or installations of any works are to be overseen by a heritage resource expert/archaeologist.
- MFA develop and provide for review and approval by responsible authorities its plans for monitoring and follow-up in relation to heritage resource issues. This should include

reference to the results of discussions between the MFA and appropriate provincial authorities regarding the need to monitor erosion along the Red River subsequent to the operation of the floodway to determine if any previously undocumented heritage resource sites are being exposed;

- The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, to ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required.

13. Navigation

13.1 Introduction

The EIS Guidelines specified that the EIS describe the use of domestic, commercial and recreational use of resources including the Red River and how they may be affected by the Project. The EIS Guidelines are provided in Appendix A.

13.2 Summary of Effects - Navigation

Primary sources of effects to navigation are related to activities during construction at the Inlet Control Structure, Outlet Control Structure, the Seine River Syphon and the Prairie Grove Road Culvert and during operation of the Project.

13.2.1 Construction

Inlet Control Structure

External work proposed for the Inlet Control Structure generally consists of placing additional rock riprap well above the normal water level for enhanced erosion protection during severe flood events. The MFA is proposing to schedule the work during November-December, following the close of the boating season. MFA predicts that there will not be any impact to navigation or public safety as a result of this activity.

The MFA is also proposing to install warning measures/devices during construction of the proposed works. These include:

- Warning signage to Transport Canada's size, colour and marking standards on both sides of the Red River, both upstream and downstream of the Inlet Control Structure. The signage would contain messages warning of 3 potential conditions – Operating, Low Water and Not Operating. Suggested messages would be similar to:
 - “Danger: Operating Control Structure Ahead – Do Not Approach”
 - “Warning: Low Water Level – Proceed with Caution”
 - “Notice: Control Structure Ahead – Safe to Navigate”
- Reflective markings to be installed on structure piers and abutments;
- Flashing warning/hazard beacons to be installed on the structure itself, to be used during operations.

Outlet Structure

Modifications to the Outlet Structure and Channel are proposed to occur over a two-year period. In the first year, cofferdam will be used to prevent water from the Floodway and the Red River from flooding the activities associated with the construction of the new portion of the Outlet Structure. The downstream leg of the cofferdam will consist of binwalls, while the upstream

portion will consist of an impervious core covered with riprap. As noted in Section 4.4 the existing Outlet Structure will remain in place while the new portion is constructed. The cofferdam will be removed upon completion of the new portion of the Outlet Structure. In year two, a cofferdam will be placed around the existing Outlet Structure to permit modifications to the Structure to be completed in the dry. Any water in the Floodway will be diverted through the low flow conduits in the new portion of the Outlet Structure. The MFA is also proposing to excavate and enlarge the Outlet Channel. The excavation is proposed to occur in one construction season and will be performed during low water levels in the late summer and fall. The MFA is also proposing to install warning measures/devices during construction of the proposed works. These include:

- Warning signage to Transport Canada's size, colour and marking standards in the vicinity of the interface between the outlet channel and the Red River;
- Such signage to contain a message warning of fast water and dangerous currents during operations;
- Reflective markings to be installed on the structure;
- Flashing warning/hazard beacons to be installed on the structure itself, to be used during operations.

In addition the MFA indicate that they will investigate the practicality of installing a warning boom across the outlet channel during normal summer conditions to prevent access to the area where energy dissipation baffle blocks could impact boats.

Seine River Syphon

The MFA notes that the existing open overflow structure is not safe for the public who may be in the vicinity of the structure. There are also no warning or safety devices in the area. Immediately upstream of the structure, there is an existing cable and log boom that crosses the Seine River channel and is used to intercept debris that could otherwise clog the overflow structure. The boom poses additional safety concerns for users of the River who could potentially become snagged or entangled in the device. The MFA proposes to install a safety grating system on the Syphon inlet and a parabolic trash rack on the drop structure. The grating generally conforms to the City of Winnipeg's 'Culvert and Drainage Inlet/Outlet Safety Guidelines'. The parabolic shape of the system will also minimize the potential for debris fouling and the MFA also proposes to remove the existing cable and log boom as a result. MFA proposes the modification works at the Syphon to be undertaken in the fall/winter of 2005/2006. The schedule allows for the works to be completed near the end of the navigable season and be completed prior to spring runoff. The MFA is also proposing to install warning signage to Transport Canada's size, colour and marking standards in the vicinity of the structure, some distance upstream and such signage to contain a message warning of the structure ahead. These measures would be installed during construction of modifications to the Syphon. During the construction period, MFA will be required to place a temporary sign/s at the confluence of the natural Seine River and the man-made channel leading to the Seine River Syphon warning canoeists of the impending construction ahead.

Prairie Grove Road

An 1800 mm diameter culvert currently precludes any form of navigation of the Seine River at this location. There are no warning or safety devices in the area of the crossing. MFA proposes to replace the culvert with a new crossing, which would allow for canoe-type navigation to be re-established. The proposed crossing would consist of a multi-plate corrugated metal pipe, with a naturalized bottom (the pipe invert will be bedded and buried in native riverbed material, with grades returned to the original riverbed profile. A minimum of 2m of headroom and a width of 4m will be provided, enabling navigation. MFA proposes that this work be undertaken during the Fall/Winter of 2005/2006. This schedule allows for work to be commenced near the end of the navigable season (October) and be completed prior to spring runoff. The timing also coincides with the proposed work to be done upstream at the siphon inlet and overflow structure. MFA suggests that there will be no impacts to navigation during construction. Since the crossing is proposed to be replaced with a new crossing that meets Transport Canada's guidelines for canoe-type navigation, the MFA does not expect that there would be a need for warning or safety devices. Any requirements for such devices would be reviewed with Transport Canada. During the construction period, MFA will be required to place temporary signs 50 meters upstream and downstream warning canoeists of the impending construction ahead. The MFA will also need to provide safe passage around the construction site, should the construction season extend into periods when navigation of the River is possible.

13.2.2 Operation – Inactive

Inlet Control Structure

The MFA indicate that during periods when the Project is not actively being operated and the gates are resting on the bottom of the River in the down position that boats can and do pass through the Inlet Control Structure. The MFA suggests that there is a minimum of 6 feet of water over the gates in the resting position during normal summer water levels. This provides sufficient depth for boats to navigate through the Structure. With the implementation of the warning and safety devices, MFA suggests that there will be no impacts to navigation during inactive operation of the Project.

Outlet Structure

The MFA indicate that the outlet channel is not boat accessible during low flow periods when the Project is not in active operation. The channel is however accessible by boat and is used for fishing at various other times of the year. Boats cannot pass upstream of the Structure and the low flow channel upstream of the Structure is not considered to be navigable. With the implementation of the warning and safety devices, MFA suggests that there will be no impacts to navigation during inactive operation of the Project.

Seine River Syphon

The Syphon represents an impediment to navigation of the Seine River during inactive operation of the Project. It is one of many interruptions to navigation on the River, including

culverts at railway and roadway crossings and other non-floodway related hydraulic controls. The installation of the safety grating over the overflow structure and the implementation of the warning and safety devices as proposed by the MFA should improve the safety of the structure for River users.

Prairie Grove Road

The proposed culvert replacement at Prairie Grove Road will enable this section of River to be navigated by small non-motorized boats, removing a current impediment to navigation. MFA suggests that there will be no adverse impacts to navigation during inactive operation of the Project.

13.2.3 Operation – Active

Inlet Control Structure

When the Project is in active operation and the gates are in use, the Red River through the Structure is not navigable and the Inlet Control Structure represents an impediment to navigation. Active operation of the Project in the spring usually occurs during a period of year when few boats are on the River and when conditions are potentially hazardous to boaters because of the high flows. The installation of the following warning measures/devices at the Inlet Control Structure should assist in ensuring public safety:

- Warning signage to Transport Canada's size, colour and marking standards on both sides of the Red River, both upstream and downstream of the Inlet Control Structure. The signage would contain messages warning of 3 potential conditions – Operating, Low Water and Not Operating. Suggested messages would be similar to:
“Danger: Operating Control Structure Ahead – Do Not Approach”
“Warning: Low Water Level – Proceed with Caution”
“Notice: Control Structure Ahead – Safe to Navigate”
- Reflective markings to be installed on structure piers and abutments;
- Flashing warning/hazard beacons to be installed on the structure itself, to be used during operations.

During operation of the Project under Rule 4, the River through the Structure is not navigable and the Inlet Control Structure represents an impediment to navigation. Active operation of the Project during this time period also generally coincides with the period of high use of the River by boats. The installation of the above-noted warning measures/devices at the Inlet Control Structure should assist in protecting public safety.

Outlet Control Structure

During the active (Spring) operation phase of the Project, there is a very strong current and severe turbulence in the outlet channel immediately downstream of the Structure. This also coincides with a period when few boats are on the Red River, however, the operation of the Floodway does result in potentially dangerous and hazardous navigation conditions in the Outlet

Channel and directly downstream at the confluence of the Outlet Channel and the Red River. The installation of the following safety measures/devices should assist in protecting public safety during active operations:

- Warning signage to Transport Canada's size, colour and marking standards in the vicinity of the interface between the outlet channel and the Red River;
- Such signage to contain a message warning of fast water and dangerous currents during operations;
- Reflective markings to be installed on the structure;
- Flashing warning/hazard beacons to be installed on the structure itself, to be used during operations.

During the active operation of the floodway under Rule 4, there is a very strong current and severe turbulence in the outlet channel immediately downstream of the Structure. This also coincides with a period when vessel traffic on the River is highest. The operation of the Floodway does result in potentially dangerous and hazardous navigation conditions in the Outlet Channel. The installation of the above-noted safety measures/devices should assist in protecting public safety during operation of the floodway under Rule 4.

Seine River Syphon

The Syphon represents an impediment to navigation of the Seine River during the active operation of the Project. It is one of many interruptions to navigation on the River, including culverts at railway and roadway crossings and other non-floodway related hydraulic controls. With the installation of both the safety grating over the syphon inlet and parabolic trash rack on the drop structure and the implementation of the warning and safety devices as proposed by the MFA, the safety of the structure should be improved for River users.

Prairie Grove Road

As outlined above, the MFA proposes to replace the culvert with a new crossing, which would allow for canoe-type navigation to be re-established. The proposed crossing would consist of a multi-plate corrugated metal pipe, with a naturalized bottom (the pipe invert will be bedded and buried in native riverbed material, with grades returned to the original riverbed profile. A minimum of 2m of headroom and a width of 4m will be provided, enabling navigation. It is unlikely that the proposed structure would be navigable during the active operations phase of the Project, due to the flows expected.

13.3 Proposed Mitigation, Monitoring and Follow-up

As noted above the MFA have proposed a number of mitigation measures to address predicted effects to navigation:

- o Construction: timing of construction to avoid the typical navigation season and installation of safety warning measures/devices at various structures in the Red and Seine Rivers;
- o Operation – Inactive: operation of the safety warning measures/devices at various structures in the Red and Seine Rivers;
- o Operation – Active: operation of the safety warning measures/devices at various structures in the Red and Seine Rivers.

13.4 Responsible Authority Conclusion

Federal and provincial departments and agencies and members of the public made a number of comments regarding navigation. Appendix B provides a summary of those comments by environmental category and issue. The responsible authorities have considered those comments in assessing the effects of the Project and in coming to a conclusion on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the effects related to navigation predicted by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitment to monitoring and follow-up and the comments received from federal and provincial departments and agencies and the public regarding the potential effects related to navigation which may result from the Project, conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA and the following additional management actions are implemented;

- o A reverse gauge must be placed on or near the control structure to clearly indicate to the boating public the available water depth above the Inlet Control gate during low flow conditions;
- o Early warning signs are to be placed and maintained on both sides of the Red River 1 km upstream/downstream of the Inlet Control Structure to advise the boating public of the upcoming structure and the possibility of gate operation. These early warning signs must briefly explain the warning lighting system and must advise the boating public that no thru-passage will be possible for the specified period;
- o “No Thru-Passage” warning signs must be placed and maintained on both sides of the Red River 300m downstream of the structure facing downstream and on both sides of the Red River at the southern extreme of the entrance to the Floodway Inlet Channel facing upstream;
- o The “No Thru-Passage” warning signs located at the Floodway Inlet Channel entrance must display black lettering on a yellow background and be of sufficient size to be clearly legible in all local ambient conditions from a distance of 200m;
- o The “No Thru-Passage” warning signs located at the Floodway Inlet Channel entrance are to include a warning lighting system with a flashing amber light operated for 24hr prior to raising of the Floodway gates and a steady red light at all times when the gates are not in the fully down position;

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- A public boat ramp permitting boaters to either remove their vessels from the waterway will be installed and maintained in close proximity to both the up and down stream " Last Chance " signs located on the west bank of the Red River but out of the "No Thru-Passage" area. The design of the ramp must allow for easy use in all but extreme flood conditions;
- A public announcement will be made on all major local radio stations as well as major local newspapers to advise the boating public of pending gate operation at least 24 hours prior to raising of the gate. This announcement should advise of the restriction to navigation caused by the inlet control structure as well as the potential for turbulent waters at or near the outlet structure;
- Where weather conditions allow, flows through the Seine River Siphon will be maintained at sufficient level to maintain safe navigation along the length of the Seine River, approximately 1m³/s according to the Environment Canada Water Survey of Canada - Archived Hydrometric Survey;
- Signage will be placed upstream of the Seine River Siphon at the junction of the natural river and the man-made channel to advise boaters of the termination to navigation at the siphon structure;
- Signs will be placed on or near the Seine River Siphon warning the boating public to stay clear of the structure;
- "No Thru-Passage" warning signs must be placed and maintained on both sides of the floodway outlet channel at the northern end facing the Red River;
- The "No Thru-Passage" warning signs located at the floodway outlet channel must display black lettering on a yellow background and be of sufficient size to be clearly legible in all local ambient conditions from a distance of 200m;
- The "No Thru-Passage" warning signs located at the floodway outlet channel are to include a warning lighting system with a flashing amber light operated for 24 hr prior to raising of the floodway gates and a steady red light at all times when the gates are not in fully down position;
- Upon completion of all construction on the Prairie Grove Road culvert crossing, there may be a need for, an appropriately/safely placed portage including clearly marked entry and exit points, this portage would be installed on the upstream and downstream side of the work. The need for this portage would be determined through the NWPP regulatory approval process and based on conclusions reached in the NWPA public consultation process;
- Day markers must be placed and maintained on the upstream and downstream sides of the center pier of the inlet control structure;
- No person shall permit any tools, equipment, vehicles, temporary structures or parts thereof used or maintained for the purpose of building or placing a work in navigable water to remain in such water after the completion of the project;
- Where a work or a portion of a work that is being constructed or maintained in a navigable water causes debris or other material to accumulate on the bed or on the surface of such water, the owner of that work or portion of that work shall cause the debris or other material to be removed to the satisfaction of the Minister;

- Any in-water compensation as required under the provisions of the *Fisheries Act* must be reviewed and accepted by the TC-NWPP Office prior to placement/construction and
- The Minister or his representatives are allowed unimpeded access to the site for inspection and/or monitoring purposes.
- The MFA ensure the integrity and functionality of any of the measures implemented to mitigate effects on navigation. This includes maintaining in good working condition, any aids to navigation or warning measures/devices for the life of the project.
- The MFA provide to responsible authorities an “As-Built” Report and drawings within 120 days of completion of construction of the works.
- Further requirements may be required to be implemented by the MFA, once the review of its application for approval under the *Navigable Waters Protection Act* is completed by TC. The MFA shall implement any further measures as required by TC.

14. Cumulative Effects Assessment

14.1 Introduction

The *Canadian Environmental Assessment Act* requires that every environmental assessment shall include consideration of any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out (16.(1)(a)). Cumulative effects assessment is defined in the *Cumulative Effects Assessment Practitioners Guide* (CEA Agency et al, 1999) as “an assessment of the incremental effects of an action on the environment when the effects are combined with those from other past, existing and future actions”. An action is defined by the Agency’s *Practitioners Guide* as, “any project or activity of human origin”.

The EIS Guidelines (Project Administration Team, 2004) required that the cumulative effects assessment examine all effects that are likely to result from the Project when they are anticipated to occur in combination with other projects or activities that have been, or will be carried out (Appendix A). The Guidelines specified that the EIS explain the approach and methods used to identify and assess the cumulative effects and provide a record of confidence in the data used in the analysis.

14.2 Summary of Cumulative Effects

The approach used for the cumulative assessment of the proposed Project is described in the EIS (Manitoba Floodway Authority, 2004a). The cumulative effects assessment was done concurrently with all other elements of the assessment without any explicit distinction between the cumulative effects assessment and other elements in the assessment. The MFA concluded in the EIS that “While the floodway expansion is expected to have effects on the physical, aquatic, terrestrial and socio-economic environments, none of the anticipated adverse effects are anticipated to be significant, after taking into account project plans and mitigation measures including cumulative effects of future relevant projects”.

Scoping for the cumulative effects assessment identified past, current and future projects and activities that could potentially overlap with the Project. Past and current projects which were identified and considered (in either the baseline setting or where related to the Project, in the analysis of Project effects) included:

- o the existing Floodway;
- o the Portage Diversion;
- o the Shellmouth Dam;
- o the Seine River Syphon/Overflow;
- o other existing infrastructure in the area of the existing Floodway;
- o groundwater conditions;
- o flood response management and compensation, and

- o population growth and ongoing regional development.

Future projects and activities identified and considered (in either the baseline setting or where related to the Project in the analysis of Project effects) included:

- o summer operation of the expanded Floodway;
- o City of Winnipeg flood protection infrastructure improvements;
- o dredging of the Red River downstream of the Outlet Structure;
- o recreational developments related to Floodway expansion;
- o compensation legislation and administration;
- o other infrastructure and regional developments;
- o Devil's Lake drainage outlet, and
- o upgrade of the Shellmouth Dam.

The cumulative effects assessment for biophysical components indicated that small adverse effects of the Project remained insignificant when the potential cumulative effects of other projects and activities were considered, taking into account the mitigation measures proposed to address those direct biophysical effects. These mitigation measures are outlined and described in the relevant biophysical component sections of this screening report and the EIS and Supplementary Filings prepared by the MFA. The assessment also concluded that indirect socio-economic effects resulting from biophysical effects remained insignificant when considered in combination with other projects and activities and when taking into account the mitigation measures proposed to address those socio-economic effects arising from the biophysical effects. These mitigation measures are outlined and described in the relevant socio-economic component sections of this screening report and the EIS and Supplementary Filings prepared by the MFA.

14.3 Responsible Authority Conclusion

Federal and provincial departments and agencies, and members of the public made a number of comments regarding cumulative effects associated with the Project. Appendix B provides a summary of those comments by environmental category and issue. Comments received in relation to cumulative effects related to the approach taken to determine cumulative effects, ice jams, riverbank stability, groundwater, operating regimes, current and future projects considered, use of an ecosystem-based approach and baseline conditions. The responsible authorities have considered those comments in assessing the effects of the project and in coming to a conclusion on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the cumulative effects predicted by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitment to monitoring and follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding the potential cumulative effects which may result from the

Project, conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA and the following additional management actions are implemented:

- MFA prepare a Cumulative Effects Monitoring and Follow-up Plan for review and approval of RAs in accordance with a schedule to be agreed upon by the RAs. The Plan should include consideration of direct and potential cumulative effects of the Project. It should reference activities, including regional study programs, to be undertaken in respect of ice jams, groundwater quantity and quality, riverbank stability and riparian vegetation and other ecosystem components such as Netley Marsh, as appropriate. In the event that monitoring and follow-up determines that the Project is contributing to adverse cumulative environmental effects, the MFA shall indicate in the Plan, what steps will be taken in accordance with the principles of adaptive management to reduce the Project's contribution to these effects.
- RAs encourage the active participation by the MFA in the regional groundwater study proposed by Manitoba Water Stewardship. RAs also encourage Manitoba Water Stewardship to adopt a scope for the regional groundwater study that considers the potential cumulative effects of regional groundwater developments;
- The Cumulative Effects Follow-up and Monitoring Report is to be prepared and submitted to the RAs for information following any operation of the expanded Floodway during the construction phase and during the initial five years of operation of the Expanded Floodway following construction. This report should detail the effectiveness of mitigation measures relative to cumulative effects implemented by the MFA, the actions necessary to adaptively manage any adverse effects, the need and plans for additional actions in the future and on the overall effectiveness of the Project as implemented.

15. Effects of Accidents and Malfunctions

15.1 Introduction

The EIS Guidelines required that the EIS examine the environmental effects of potential malfunctions or accidents that may occur in connection with the Project. The EIS Guidelines are provided in Appendix A.

15.2 Summary of Effects – Accidents and Malfunctions

The MFA's EIS identifies and considers potential accidents and malfunctions, including operation of the Inlet Control gates, spills of hazardous materials, contaminated discharges into the Floodway Channel when inactive, flood events and dam safety.

The EIS provides a description of measures to improve reliability and redundancy of the Floodway Inlet Control gates. The level of redundant features incorporated into the gate design and the reliability of the operation were reviewed by the MFA based on previous experience, combined with a failure modes and risk analysis. Based on the findings of the review, a number of measures to add redundancy and improve reliability have been identified and incorporated into the preliminary design and planned to be addressed during final design. They include:

- Hoists – Power Supply: Permanent provisions for hooking up a standby generator;
- Hoists – Mechanical: Low-cost improvement to enhance reliability of the hydraulic system and provide further system redundancy;
- Protection Against Oil Contamination: Installation of improved hydraulic fluid filtering on the discharge of each pumping system to provide protection against contamination;
- Provision of Backup Pressure Supply System: Isolation valves and additional feed connectors for each cylinder will provide protection against equipment and system failure;
- Provision of Redundant Hydraulic Power System: Connectors near the power units on the existing hydraulic power supplies to provide backup to existing systems; and
- Provision of Spare Parts: Stock of spare parts to permit access to equipment in case of failure.

The MFA's Supplementary Filing submits that the CPEPP will contain provisions for the construction contractor to take care and caution to prevent spills of dangerous goods or hazardous wastes. The Plan will identify potential accidents that, through natural causes, accidents, human error or improper work practices, are likely to affect the environment. The construction contractor will be required to designate a qualified supervisor as the on-site emergency coordinator for the work area. The emergency response coordinator will have

authority to redirect workers in order to respond in the event of a spill. The Plan will also describe emergency procedures that will be implemented to address potential accidents including contaminant spills, and releases and flood events.

A Dam Safety Review was conducted by the MFA, in accordance with the Canadian Dam Association Dam safety Guidelines. The review confirmed that the stability of the water retaining structures complies with existing standards. It also confirmed that the Inlet Control Structure is capable of performing as required to control water levels up to the 778 ft elevation to achieve protection from Winnipeg against a 1 in 700 year flood. The review identified a number of design deficiencies, including:

- o Riprap erosion protection on the upstream and downstream faces of the embankments adjacent to the Inlet Control Structure;
- o Installation of a modern fire protection system;
- o Improvements and measures to increase the reliability and redundancy of the Inlet Control Gates; and
- o Preparation of an Operation/Maintenance and Surveillance Manual and Emergency Preparedness Plans for a full range of flood magnitudes, including those exceeding the 1 in 700 year flood.

These deficiencies have been or are being addressed by MFA.

The MFA also considered the presence of contaminants in the flow carried by the Floodway to be an accident or malfunction. The EIS considered the potential effects of the Floodway continuing to carry this flow of contaminated surface water and the potential pathway to groundwater and subsequent impact on groundwater for domestic purposes. The EIS indicates that during inactive operation, groundwater flow is upward from the bedrock aquifer through the till into the channel and no surface water infiltration or recharge occurs downward into the till. In the active operation scenario, groundwater modeling was used to examine the possibility of contaminated water intrusion into groundwater. The MFA concluded that this was not a likely path of contamination due to the large distance the water must travel through till or the carbonate aquifer. The MFA indicates that repair work proposed for the low flow channel should help to reduce the possibility of contaminants from within the low flow channel entering the groundwater. The MFA indicated at the Clean Environment Commission hearings that the quality of the groundwater and flow in the low flow channel will be monitored to verify the predictions contained in the EIS and will provide an early warning system in the situation that unpredictable events result in the detection of contaminants in the groundwater. Abnormal conditions in the low flow channel will be investigated by the MFA and if the source can be identified, the appropriate authorities notified.

15.3 Proposed Mitigation, Monitoring and Follow-up

As detailed above, the MFA have proposed a number of mitigation measures to address potential effects associated with accidents and malfunctions. The MFA have also recognized that implementation is critical to the success of the CPEPP and that it is important to have

corporate support and for the staff to have ownership of the Plan. The construction contractor will be made responsible for implementation of the CPEPP over the duration of the Project. The Plan will describe the contractor's responsibilities for the implementation, monitoring, reviewing and adjusting of the Plan through the duration of the Project. The Plan will also contain provisions for training and awareness, documentation, communication, auditing, management review and adjustments to the Plan. The provisions include documentation of accidents, spills and releases, and procedures followed in these events. The Plan will also include a contingency plan that outlines possible actions to be taken in the event that proposed environmental protection actions are not successful.

The MFA's Erosion and Sediment Control Plan for the Project will include a description of emergency plans including responsibilities for identifying emergency situations, contacts for notification, and materials and equipment available on site.

In the Supplemental Filing the MFA also proposed separate M&F Plans for each major component of the environment (physical, aquatic, terrestrial and socio-economic). The M&F Plans are expected to address any effects of accidents and malfunctions.

15.4 Responsible Authority Conclusion

Federal and provincial departments and agencies, and members of the public made a number of comments regarding the potential effects of accidents and malfunctions. Appendix B provides a summary of those comments by environmental category and issue. Comments received in relation to accidents and malfunctions related to the reliability of the Inlet gates, Floodway channel slumping, seismic events, dyke breach, contingency planning and groundwater protection. The responsible authorities have considered those comments in assessing the effects of the project and in coming to a conclusion on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the potential effects of accidents and malfunctions as provided by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitment to monitoring and follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding the potential effects of accidents and malfunctions associated with the Project, conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA and the following additional management actions are implemented:

- o The MFA include details in the CPEPP and Sediment and Erosion Control Plan for each major component of the environment on specific accidents and malfunctions that may arise and measures for responding to potential emergency situations. Plans should be noted a) for monitoring groundwater quality and quantity and for investigating and responding in the event contamination relating to the Project is detected, b) for monitoring contaminated or abnormal discharges into the low flow channel when the

Floodway is inactive. These plans should be developed and provided for the review and approval by the RAs and include how this monitoring will be incorporated into the broader ground and surface water monitoring programs, the protocols for notification regarding findings, actions planned to address any contaminants discovered through the monitoring program and the means by which reporting of monitoring results will be undertaken. The plans should be developed in consultation with key stakeholders.

- o The CPEPP will describe the contractor's responsibilities for the implementation, monitoring, reviewing and adjusting the Plan for the duration of the Project. In addition, the CPEPP should indicate a) how the MFA will monitor and ensure that the work carried out by contractors and subcontractors is compliant with the requirements of the Plan and b) how accidents and malfunctions will be reported.
- o The MFA will report to the RAs on the outcomes of the Dam Safety Review including the measures taken in response to any and all deficiencies identified in the Review, and the preparation and implementation of manuals and Emergency Preparedness Plans, as recommended in the Review.

16. Effects of the Environment on the Project

16.1 Introduction

The EIS Guidelines included a requirement to examine any change to the Project that may be caused by the environment. The EIS Guidelines are provided in Appendix A.

16.2 Summary of Effects

The EIS contains an assessment conducted to determine the risk of erosion during construction. Mathematical modeling was used by the MFA to determine the anticipated velocities and shear stresses that could occur during construction and operation of the Project. Two types of scenarios during the expansion of the Floodway were considered to estimate the effects during construction: 1) a spring flood during construction, and 2) a major rainstorm occurring during construction. These scenarios were further divided into those events that have a higher probability of occurring such as a large flood during construction. The effects from higher probability events are expected to be mitigated to conform to appropriate guidelines. Potential sediment loading effects from contingency events were also determined. However, no additional mitigation measures to prevent significant effects from these unlikely events were proposed.

The MFA predicts a potential increase in TSS concentrations in the Red River from a flood occurring during the construction phase. No noticeable effects are predicted by the MFA for likely floods, but if a 1:33-year or larger magnitude flood occurs, the sediment concentration is expected to exceed Manitoba's Water Quality Standards, Objectives and Guidelines; however, the concentrations are expected to be within the ranges of concentrations historically experienced during flood events. It is proposed to mitigate this effect through construction sequencing. The MFA determined that this event has a low to moderate probability of occurring, it would occur for the duration of the flood event (~1 month), it would be temporary, and not significant.

Potential for incremental increases in TSS concentrations in the Red River is predicted by the MFA due to erosion caused by higher magnitude rainfall events. The risk of a five-year rainstorm event occurring during construction is anticipated to be 60%, resulting in a maximum potential incremental increase in TSS of 400 mg/L. The chance of a 20-year rainstorm occurring during construction is considered to be 18.5%, resulting in a maximum total suspended solids increase of 700 mg/L. It is proposed that this effect would be mitigated through the implementation of measures to be included in the Sediment and Erosion Control Plan. The MFA determined that the magnitude of the residual effect is less than natural variation of TSS concentrations, short-term in duration and reversible.

16.3 Proposed Mitigation, Monitoring and Follow-up

The MFA propose a Sediment and Erosion Control Plan to mitigate any erosion and sedimentation effects associated with the construction phase of the Project. In the Supplemental Filing the MFA also proposed separate M&F Plans for each major component of the environment (physical, aquatic, terrestrial and socio-economic). The M&F Plans are expected to address any effects of the environment on the project.

16.4 Responsible Authority Conclusion

While no comments or questions were made in the review of the EIS, Supplemental Filings or during the CEC public hearing specifically on the effects of the environment on the Project, many comments were made regarding flooding, ice-jamming, summer operation due to intense rainstorms and other related aspects. These issues have been noted in other sections of the EIS, Supplemental Filings and this screening report.

Responsible authorities, having considered the potential effects of the environment on the Project as provided by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitment to monitoring and follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding the potential effects of the environment on the Project, conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA are implemented.

17. Sustainability

17.1 Introduction

The EIS Guidelines required that the MFA incorporate and reflect Manitoba's principles of sustainable development and its land and water policies (Appendix A). The Guidelines also required that an assessment be provided on the balance between environmental/ecological, social, economic, cultural and human health benefits and opportunities, and effects of the Project.

Manitoba's principles and guidelines as scheduled to *The Sustainable Development Act* are listed below:

Principles	Guidelines
<ul style="list-style-type: none"> • Integration of Environmental and Economic Decisions • Stewardship • Shared Responsibility and Understanding • Prevention • Conservation and Enhancement • Global Responsibility 	<ul style="list-style-type: none"> • Efficient Use of Resources • Public Participation • Access to Information • Integrated Decision-Making and Planning • Waste Minimization and Substitution • Research and Innovation

The Sustainable Development Act also provides for the development of financial management guidelines and establishment of sustainability indicators.

Manitoba's water policies regarding surface water, groundwater and water quality are outlined below.

Manitoba Policies Regarding Water	
Category	Policy
Water quality	Protect and enhance our aquatic ecosystem by ensuring that surface water and groundwater quality is adequate for all designated uses and ecosystem needs
Conservation	Conserve and manage the lakes, rivers and wetlands in Manitoba so as to protect the ability of the environment to sustain life and provide environmental, economic and aesthetic benefits to existing and future generations
Use and Allocation	To ensure the long term sustainability of the province's surface water and groundwater for the benefit of all Manitobans
Water Supply	Develop and manage the province's water resources to ensure that water is available to meet priority needs and to support sustainable economic development and environmental quality

Manitoba Policies Regarding Water	
Category	Policy
Flooding	Alleviate human suffering and minimize the economic costs of damages caused by flooding
Drainage	Enhance the economic viability of Manitoba's agricultural community through the provision of a comprehensively planned drainage infrastructure
Education	Enhance the awareness and knowledge of Manitoba's water resources

17.2 Summary of Effects - Sustainability

The MFA outlines in their EIS how the Project is consistent with the principles and guidelines of sustainable development, and land and water strategies. It is the view of the MFA that the Project is an excellent example of sustainable development –balancing social and environmental benefits while protecting the welfare of future generations of Manitobans.

17.3 Responsible Authority Conclusion

Federal and provincial departments and agencies, and members of the public made a number of comments regarding sustainability and the Project. Appendix B provides a summary of those comments by environmental category and issue. Comments received in relation to sustainability related to the scope of the Project, the assessment approach taken, groundwater and the need to consider the principles of sustainable development and environmental protection. The responsible authorities have considered those comments in assessing the effects of the project and in coming to a conclusion on the likely significance of the adverse environmental effects.

Responsible authorities, having considered the issue of sustainability as provided by the MFA, measures proposed by the MFA to mitigate those effects, the MFA's commitment to follow-up, and the comments received from federal and provincial departments and agencies, and the public regarding sustainability and the Project, conclude that the effects are not likely to be significant providing the mitigation measures proposed by the MFA and those outlined in Section 14.3 are implemented.

18. Summary of Mitigation Measures and Follow-up Actions

A summary of the mitigation measures proposed by the MFA and those determined to be necessary by the responsible authorities to ensure that the residual environmental effects of the proposed Red River Floodway Expansion Project are not significant are outlined in Appendix C. As outlined in Section 8.1, responsible authorities consider the development of a comprehensive Environmental Management Plan (EMP) to be a vital component of the “impact” mitigation and management strategy for this Project. The RAs views and requirements for the EMP and its component parts is further discussed in Appendix C.

The EMP would describe how all the various environmental mitigation measures and commitment outlined in the screening report, EIS, Supplemental Filings and other supporting documents would be met during the construction and operation phases of the Project. The Plan would provide the MFA and federal and provincial authorities, with a comprehensive approach for managing the environmental effects of the Project’s components and activities and for ensuring sound environmental management. The EMP should include an overall action plan for preparing and submitting required plans and other documents to the responsible authorities, including the provision of sufficient time for their review, discussion and approval. Given that the MFA will be responsible for construction and ongoing maintenance of the Project and Manitoba Water Stewardship will be responsible for operation of the Project, the EMP should outline which organization will be responsible for which mitigation measures, follow-up and reporting actions and provide for the transfer of those responsibilities to those parties as appropriate.

The EMP should identify and describe the various Environmental Protection Plans which have been proposed, for both construction (CPEPP) and operations (OPEPP) phases of the Project. These plans should build upon the framework identified in the EIS and Supplementary Filings and describe in detail how environmental protection will be provided and maintained during the construction and operation phases of the Project. The EPP should describe the environmental impacts associated with the Project (and its component parts) and the measures to be taken to mitigate those effects. The EPP should describe the monitoring and follow-up actions necessary to verify that the mitigation measures are working as planned, to identify where actions or measures are necessary to address unforeseen results. Emergency or contingency plans should be developed and described, with a clear indication of the steps necessary to adaptively manage to ensure effects are addressed appropriately. The Monitoring and Follow-up Plans should describe in sufficient detail to demonstrate the adequacy and effectiveness of the monitoring plans to be implemented during construction, reclamation and operation of the Project.

The EMP should be based on consultations with stakeholders, reflect the principles of adaptive management and incorporate best management practices. It should also include plans

for consultation with responsible authorities and other affected or interested stakeholders during the Project's construction and operation phases.

The EMP should include an Environmental Inspection Plan to outline how the inspection of the environmental aspects of construction activities is to be undertaken including the roles, responsibilities and authorities of environmental inspectors, lines of communication, reporting requirements and relationships, auditing procedures, dispute resolution mechanisms, and inspector qualifications.

An important element of the EMP is the ongoing reporting of environmental performance. This reporting will provide responsible authorities and other interested stakeholders with a level of confidence that the effects predictions contained in this screening report and in the MFA's submissions were accurate, that the effects associated with the Project are being addressed appropriately and consistent with the principles of adaptive management, provide a basis from which to adjust and refine the mitigation measures to ensure their effectiveness. The EMP should outline how the MFA will report progress in implementation of the EMP and on the results achieved and the need for further action.

Finally, the EMP should identify all other regulatory approvals required by the MFA in relation to the Project and MFA's plans for obtaining these approvals in a timely manner are to be described in the EMP. MFA must obtain all regulatory approvals prior to the commencement of construction. In addition the terms and conditions of any license received from Manitoba Conservation should also be reflected and integrated within the EMP.

19. Conclusion

Following analysis of the nature of the proposed Red River Floodway Expansion Project, the description of the components and activities proposed by the MFA and the environment within which the Project will be located, Infrastructure Canada, the Department of Fisheries and Oceans and Transport Canada, responsible authorities under the *Canadian Environmental Assessment Act*, have assessed the potential environmental effects that the Project is likely to have on the environment. This review was completed based on the information provided by the MFA in its EIS, Supplemental Filings and other documents as well as the information presented before the Clean Environment Commission public hearing, the expert advice provided by federal authorities, the results of discussions with and the advice from provincial departments received through the cooperative review process and comments received from the Aboriginal organizations and public stakeholders through various public communication initiatives.

Considering the mitigation measures proposed by the MFA, identified by the responsible authorities and described in this screening report, Infrastructure Canada, the Department of Fisheries and Oceans, and Transport Canada find that the proposed Project, as defined in the scope, is not likely to cause significant adverse environmental effects. The responsible authorities consider the follow-up activities including monitoring proposed by the MFA and described in this screening report to be adequate to ensure that mitigation measures are implemented, the effectiveness of these measures will be evaluated, and any unforeseen environmental effects will be addressed during the construction and operation of the Project.

The responsible authorities note that while they have concluded that the Project is not likely to result in significant adverse environmental effects for environmental assessment purposes, further federal regulatory requirements remain to be addressed and federal regulatory decisions remain to be made. The environmental assessment conclusion should not be viewed as an indication that these requirements have been satisfied.

Responsible authorities will make their respective determinations in accordance with section 20 of the *Canadian Environmental Assessment Act*, after taking into consideration the screening report and any public comments received in relation to it.

Infrastructure Canada



Cécile Cléroux

Assistant Deputy Minister
Program Operations

Date: 2005/05/16

Fisheries and Oceans Canada



Garry Linsey

Director Habitat Management
and Environmental Assessment

Date: 16/5/05

Transport Canada



David Murray

Regional Director General
Prairie and Northern

Date: 17 May 2005

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21. GLOSSARY OF TERMS AND ACRONYMS/ABBREVIATIONS

LIST OF TERMS

"cumulative environmental effects":

The effect on the environment which results from effects of a project when combined with those of other past, existing and imminent projects and activities. These may occur over a certain period of time and distance.

"environment" means the components of the Earth, and includes

- (a) land, water and air, including all layers of the atmosphere,
- (b) all organic and inorganic matter and living organisms, and
- (c) the interacting natural systems that include components referred to in paragraphs (a) and (b);

"environmental effect" means, in respect of a project,

- (a) any change that the project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the Species at Risk Act,
- (b) any effect of any change referred to in paragraph (a) on
 - (i) health and socio-economic conditions,
 - (ii) physical and cultural heritage,
 - (iii) the current use of lands and resources for traditional purposes by aboriginal persons, or
 - (iv) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, or
- (c) any change to the project that may be caused by the environment, whether any such change or effect occurs within or outside Canada;

"follow-up program" means a program for

- (a) verifying the accuracy of the environmental assessment of a project, and
- (b) determining the effectiveness of any measures taken to mitigate the adverse environmental effects of the project;

"mitigation" means, in respect of a project, the elimination, reduction or control of the adverse environmental effects of the project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means;

"project" means

- (a) in relation to a physical work, any proposed construction, operation, modification, decommissioning, abandonment or other undertaking in relation to that physical work, or

(b) any proposed physical activity not relating to a physical work that is prescribed or is within a class of physical activities that is prescribed pursuant to regulations made under paragraph 59(b);

LIST OF ACRONYMS and ABBREVIATIONS

ASI:	Area of Special Interest
ASL:	Above Sea Level
C:	Celsius
CCME:	Canadian Council of Ministers of the Environment
CDC:	Manitoba Conservation Data Centre
CEA:	Cumulative Effects Assessment
CEAA:	Canadian Environmental Assessment Act
CEAAgency:	Canadian Environmental Assessment Agency
CEMR:	Central Manitoba Railway
cfs:	cubic feet per second
cms	cubic metres per second
CNR:	Canadian National Railway
CO₂:	Carbon Dioxide
COSEWIC:	Committee on the Status of Endangered Wildlife in Canada
CPEPP:	Construction Phase Environmental Protection Plan
CPR:	Canadian National Railway
CWQI:	Canadian Water Quality Index
DFO:	Department of Fisheries and Oceans
DO:	Dissolved Oxygen
EA:	Environmental Assessment
EIA:	Environmental Impact Assessment
EIS:	Environmental Impact Statement
El:	Elevation
EMO:	Emergency Measures Organization
EMP:	Environmental Management Plan
EMS:	Environmental Management System
EPP:	Environmental Protection Plan
FA:	Federal Authority
ft:	foot
GHG:	Greenhouse Gas
GIS:	Geographic Information System
GUDI:	Groundwater Under the Direct Influence of surface water
GWWD:	Greater Winnipeg Water District
ha:	hectare

HADD:	Harmful alteration, disruption or destruction
HC:	Health Canada
INAC:	Indian and Northern Affairs Canada
INFC:	Infrastructure Canada
IJC:	International Joint Commission
JAPSD:	James Avenue Pumping Station Datum
km:	kilometre
m:	metre
MESA:	Manitoba Endangered Species Act
MFA:	Manitoba Floodway Authority
M&FP:	Monitoring and Follow-up Plan
mg/L:	milligrams per Litre
MSQG:	Manitoba Sediment Quality Guideline
MTS:	Manitoba Telephone Services
MWQSOG:	Manitoba Water Quality Standards, Objectives, and Guidelines
OPEPP:	Operating Phase Environmental Protection Plan
PAH:	Polynuclear Aromatic Hydrocarbons
PAT:	Project Administration Team
PFN:	Peguis First Nation
PIP:	Public Involvement Plan
PRC:	Public Review Committee
PTH:	Provincial Trunk Highway
PWGSC:	Public Works and Government Services Canada
RA:	Responsible Authority
RHA:	Regional Health Authority
RM:	Rural Municipality
RoW:	Right-of-Way
SALD:	St. Andrews Lock and Dam
SARA:	Species at Risk Act
SEIA:	Socio-Economic Impact Assessment
TAC:	Technical Advisory Committee
TC:	Transport Canada
TC-NWPP	Transport Canada – Navigable Waters Protection Program
TCH:	Trans-Canada Highway
TCP:	Trans-Canada Pipeline
TDS:	Total Dissolved Solids
TK:	Traditional Knowledge
TKN:	Total Kjeldahl nitrogen

TLE: Treaty Land Entitlement
TN: Total Nitrogen
TSS: Total Suspended Solids
WMA: Wildlife Management Area
WQ: Water Quality
WQI: Water Quality Index
yd: yard

Appendix A
**GUIDELINES FOR THE PREPARATION OF AN ENVIRONMENTAL
IMPACT STATEMENT
FOR THE
RED RIVER FLOODWAY EXPANSION PROJECT**

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February 5, 2004

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1. PURPOSE

The purpose of this document is to provide guidance to the Manitoba Floodway Expansion Authority on issues that should be considered in the environmental assessment of the Red River Floodway Expansion Project (the Project), and information that should be contained in its Environmental Impact Statement on the Project.

These Guidelines have been prepared pursuant to the requirements of *The Manitoba Environment Act* and the *Canadian Environmental Assessment Act*.

2. INTRODUCTION

2.1 BACKGROUND

Consideration is being given to improving flood protection to the City of Winnipeg for a flood event of approximately 1 in 700 years. This would primarily be achieved by enlarging the current floodway channel.

The Project will be carried out by the Manitoba Floodway Expansion Authority (MFEA). MFEA is represented by:

Ernie Gilroy
Chief Executive Officer
Manitoba Floodway Expansion Authority
200-155 Carlton Street
Winnipeg MB R3C 3H8

Components of the Project as identified by MFEA are:

1. Enlargement of the Floodway Channel;
2. Increasing the freeboard at the existing West Dike;
3. Modification of the bridges over the Floodway Channel;
4. Enlargement of the Outlet Structure;
5. Riverbank fortification and protection at and downstream of the Floodway Outlet;
6. Replacement of drainage structures where necessary along the east bank of the Floodway;
7. Replacement of the Inlet and Outlet structures at the Seine River Inverted Siphon;
8. Replacement of the City of Winnipeg Aqueduct under the Floodway;
9. Extension of a number of transmission lines that cross the Floodway;
10. Replacement of a number of miscellaneous crossings;
11. Improvements at the existing Floodway Inlet Control structure;

12. Incorporation of recreational facilities to the maximum extent practical;
13. Use of Floodway to control summer river water levels in Winnipeg.

Components of the Project are described in further detail in the report “Red River Floodway Expansion Project Description, July 2003” (the Project Description). A schematic showing the location of the existing Red River Floodway and its major components is attached to these Guidelines as Figure 1.

2.2 ENVIRONMENTAL ASSESSMENT REQUIREMENTS AND PROCESS

The Project is a Class 3 development as defined in the *Classes of Development Regulation* under *The Manitoba Environment Act*. Public hearings by the Manitoba Clean Environment Commission will be conducted for the Project in accordance with Manitoba’s environmental assessment and licencing process. The provincial hearings will be conducted to review the environmental impact statement and issues raised by the public in the environmental assessment process. The Clean Environment Commission will report its findings and provide advice and recommendations to the provincial minister on matters considered in its hearings. A licencing decision under *The Environment Act* will consider the advice and recommendations provided by the Clean Environment Commission.

A screening is required for the Project under the *Canadian Environmental Assessment Act* (CEAA). Infrastructure Canada and Fisheries and Oceans Canada have decision making responsibilities in relation to the Project which requires that it first undergo an environmental assessment in accordance with the CEAA. Other federal responsible authorities may be identified as having decision making responsibilities with respect to CEAA in relation to the Project during the course of the assessment.

Under the provisions of the *Canada-Manitoba Agreement on Environmental Assessment Cooperation*, Manitoba and Canada have agreed that a cooperative environmental assessment will be undertaken. A Project Administration Team (PAT) has been established to administer the cooperative environmental assessment process. Accordingly, these Guidelines for the Preparation of an Environmental Impact Statement for the Red River Floodway Expansion Project have been developed to address specific issues and identify information to be considered in the environmental assessment of the Project. The Guidelines have considered public comments and input received from the Federal/Provincial Technical Advisory Committee (TAC).

All information generated in the cooperative environmental assessment process will be provided to federal responsible authorities for consideration in their screening. A draft of the federal screening report will be made available for public review and the comments received will be considered in finalizing the report and making a determination as required under the CEAA.

2.3 INTENT AND SCOPE OF THE ENVIRONMENTAL ASSESSMENT

2.3.1 INTENT:

The intent of preparing the environmental impact statement (EIS) will be to:

- describe the Project including its purpose, need and objectives;
- provide a description of the policy and regulatory framework within which the Project will be planned, built, maintained and operated;
- identify alternatives considered in the planning process and the criteria used in selecting the current Project;
- identify and characterize the existing environment in which the Project would be built and the expected environment within which it would operate;
- identify the potential environmental effects of the Project and their significance, as defined in the CEEA;
- describe the methods used to assess the potential environmental effects of the Project and their significance, including technical and scientific studies, local knowledge and experience of the public;
- provide a summary of the regional, provincial or national objectives, standards, guidelines and relevant land and resource related agreements which have been used in the evaluation of the significance of the environmental effects;
- describe consultations undertaken with the public and stakeholders as part of the assessment, the comments received and the consideration given to those comments;
- identify requirements for mitigation of potential adverse environmental effects, opportunities for enhancing environmental benefits, monitoring of project implementation and the environmental effects of the Project, follow-up to verify the accuracy of assessment predictions and the effectiveness of mitigation, and describe an adaptive management process that would be implemented should the project cause unexpected adverse environmental effects; and

- incorporate and reflect the *Principles of Sustainable Development* as contained in “*Towards a Sustainable Development Strategy for Manitobans*” and the policies under *The Land and Water Strategy* as contained in “*Applying Manitoba’s Water Policies.*”

2.3.2 SCOPE:

The Project:

The environmental assessment for the Project shall include consideration of the environmental effects of all undertakings associated with the site preparation, construction, maintenance, operation and the final disposition of all components of the proposed Red River Floodway expansion, including any required infrastructure modification or development. The assessment must consider the purpose of the project and alternative means of carrying out the project that are technically and economically feasible.

The Assessment:

The scope of the environmental assessment shall include, but not necessarily be limited to, examination of:

- potential changes to the environment that may result from the Project, including consideration of effects to:
 - land, water and air;
 - the biological environment, including terrestrial and aquatic ecosystems, i.e. all organic and inorganic matter and living organisms;
 - present and planned resource use, including land and water; and
 - human health, socio-economic and cultural conditions, physical and cultural heritage, the current use of lands and resources for traditional purposes by Aboriginal persons, or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance that will be affected by any changes to the environment caused by the Project;
- the implications of the Project with respect to climate change and Manitoba’s commitment to the Kyoto Accord;
- the significance of the environmental effects;

- the implications of the Project in terms of land and resource-related agreements;
- the environmental effects of potential malfunctions or accidents that may occur in connection with the Project;
- the environmental effects of any alternative means (including alternative methods of operation) of carrying out the Project that are technically and economically feasible;
- cumulative environmental effects of the Project that are likely to result from the Project when its effects are considered in combination with the effects of other projects or activities that have been or will be carried out;
- the effects of the influx of workers, equipment and materials on residents, land and resources of the region;
- a description of the consideration given to recycling and reuse of materials, energy efficiency, reduction of waste and other means through which the Project can promote sustainable development objectives;
- the technically and economically feasible measures that would mitigate any significant adverse environmental effects of the Project;
- the adequacy of measures proposed to mitigate adverse environmental effects of the Project and to address residual adverse effects, where appropriate;
- any change to the Project that may be caused by the environment;
- the need for, and requirements of, any follow-up program in respect of the Project; and
- the capacity of renewable resources, if any, that are likely to be significantly affected by the Project.

The geographic scope of the investigations shall include those local areas directly impacted by the undertakings associated with the Project and also the zones within which there may be environmental effects that are regional or global in their nature. The EIS should identify the spatial and temporal boundaries used in the assessment and the rationale for the selection of those boundaries.

3. POLICY AND REGULATORY FRAMEWORK

The environmental impact statement shall identify the legislation, policies, necessary approvals, land and resource related agreements and current planning initiatives applicable to the review of the Project. The report shall discuss the primary focus of each regulatory or policy requirement, such as resource allocation, environmental protection, land-use designation or development control.

4. PUBLIC CONSULTATION AND INVOLVEMENT PLAN

Details of the overall public consultation plan for the environmental assessment shall be described. The plan will recognize all interested members of the public and describe the various means to provide for their participation in the assessment process. Generally, the public shall include, but is not limited to: Aboriginal peoples; other local residents; community groups; environmental groups; the private sector; municipal governments; and other interested parties. The public consultation plan shall be included in the environmental impact statement (EIS) and the results of the public's input to date reported and evaluated.

The EIS shall describe the proponent's public consultation plan that will have been undertaken with respect to the Project, including the following:

- the role of community contacts in the consultation program;
- the use of any communication tools employed to provide information to affected communities, including newsletters, television broadcasts, and briefing documents;
- the frequency and outcome of open houses, community meetings, school presentations, and other meetings, that were employed to provide information to, and collect information from the communities consulted; and
- plans for ongoing consultation with the affected publics following completion of the environmental assessment.

The environmental impact statement shall describe how concerns and issues raised by the public were incorporated into the development of the Project including its design, impact mitigation and monitoring. Any unresolved issues that were raised by Manitoba, Canada or stakeholders during the assessment process shall be discussed. In addition, efforts made to involve organizations and persons residing beyond the Project area in issue identification and problem resolution shall be documented and evaluated in the EIS.

5. PROJECT DESCRIPTION

5.1 OVERVIEW OF MANITOBA'S FLOOD PROTECTION SYSTEM

The environmental impact statement shall provide an overall description of Manitoba's flood protection system. Emphasis in the description shall be on those components that relate to the selection of the Project.

5.2 PROJECT ALTERNATIVES AND SITE SELECTION

The environmental impact statement shall include a summary discussion of the alternative means of carrying out the Project that were considered, and that are technically and economically feasible. This includes alternative operating scenarios for the Red River Floodway, including spring and summer operation. A discussion of the reasons for the selection of the preferred alternative shall be provided. A discussion of the potential environmental effects that were considered relative to any such alternative shall also be included. Consideration of alternative means for achieving the goals of the Project, for the purpose of the environmental impact statement, will include discussion of other processes or operations that could have been or could be implemented in the future, or locations that could have been chosen to achieve a similar end result. The purpose of and the rationale for selection of the Project shall be presented.

As well, the site selection process for all significant components of the Project shall be discussed in the EIS. The information presented will include the rationale for selection of the proposed sites (routes) along with how the technical, geotechnical and environmental criteria were considered in the decision making.

5.3 OVERVIEW OF THE RED RIVER FLOODWAY EXPANSION PROJECT

The environmental impact statement shall provide an overview of the Project, including a general description of the site selection process, construction, operation and maintenance of the facilities, and the final disposition of all components of the Project. The analysis must consider accidents, malfunctions and other risks. Included in this overview shall be the designed capacities of the Project, location of all its components on a site-development plan, phasing and sequencing of the various undertakings associated with the components, and a description of activities relating to the Project that have been undertaken to date.

5.3.1 SITE PREPARATION

The environmental impact statement shall describe all undertakings associated with preparing for construction at the sites. Detailed descriptions of timing and the methods associated with the various undertakings that were and are required including surveying, clearing, establishing sediment and erosion control measures, test drilling, establishing dump and borrow areas, setting up camps and work areas, and the development of the infrastructure requirements to access and service the sites. This will include providing:

- topographical maps and aerial mosaics of suitable scale showing the location of all proposed project components, including but not limited to related access roads, work camps, borrow and disposal sites, placement of sediment and erosion control measures, storage and staging areas, power sources and utility corridors with inclusion of the local topography, watercourses, wetlands and lakes; and
- a description of the extent of clearing, excavation, dredging, quarrying and earthworks required to prepare for construction of the control structure, channel, bridges, outlet structure and infrastructure modifications, identification of borrow sites for construction materials such as sand, gravel, clay and stone, and the proposal for removal of waste materials including transportation methods.

5.3.2 CONSTRUCTION

The environmental impact statement shall describe all elements of the construction of the Project. Detailed descriptions of timing and the methods proposed for the various undertakings related to the construction of the principal components and related facilities (including facilities for other uses such as recreation) shall be required including the following:

- plans and descriptions of any existing works, temporary works including work areas, cofferdams, dewatering and control facilities, diversions, detours and the proposed temporary and permanent facilities including the control structure, dykes, channel, outlet structure, roadway and railway bridges, buildings and infrastructure;
- a description of the installation, operation and removal of any temporary infrastructure;
- a description of the proposed construction methods that could have an effect on the environment such as those required for placement and removal of cofferdams, underwater or near-water blasting (if required), large scale clearing, dredging, bank protection, destruction of watercourses, grading or earth removal and disposal, including a discussion of possible alternative construction methods;

- an estimate of the size and composition of the workforce required during different times of construction;
- a description of measures that will be taken to protect the health and safety of workers and the general public in and around the construction areas;
- a description of the work staging areas and facilities provided for construction workers, including potable water supply and waste disposal;
- a description of the character and volumes of waste streams generated during the construction phase of the Project and how each waste stream would be managed, consistent with best industry practices, with specific references to waste oil and other potentially hazardous or recyclable material;
- a description of the proposed environmental surveillance and monitoring proposed during construction along with proposed contingency plans that consider the effects associated with serious malfunctions or accidents;
- a description of the proposed construction schedule including sequencing of the various undertakings; and
- subsequent removal of work staging areas and clean up of construction infrastructure.

5.3.3 OPERATION AND MAINTENANCE

The environmental impact statement shall describe how the floodway, Red River Channel and related infrastructure (including infrastructure related to other uses of the Project) would be operated and maintained under all operating conditions. Any differences in operating rules between the existing and expanded floodway should be discussed. A discussion of river flows and levels with and without the expanded project in place shall be provided. The description will include, but not be limited to:

- discharges above and below the control structure, and in the floodway channel;
- water surface elevations at the same locations and at additional upstream and downstream affected locations under a range of flow conditions; and
- liabilities associated with the various operational scenarios.

The environmental impact statement shall:

- describe how the proposed operation of the floodway would affect the existing operating regime along the Red River and its tributaries, and its relationship to existing regulatory licences/approvals and agreements, including local zoning and land use approvals;
- describe the current and future use of the St. Andrews Lock and Dam; and
- describe the size and composition of the proposed labour force involved in the operation and maintenance of the floodway, along with a description of measures that will be taken to protect the health and safety of workers and the general public in and around the various facilities including spill prevention and contingency planning.

5.3.4 FINAL DISPOSITION

The environmental impact statement shall provide a general description of plans for rehabilitating the operational components of the floodway and related infrastructure at the end of their operational life.

6. DESCRIPTION OF THE EXISTING ENVIRONMENT

The environmental impact statement shall describe the existing environmental setting for the Project. This will include a broad overview of the local area and the spatial and temporal zones within which there may be environmental effects that are regional or global in their nature. The methods used to identify impact areas or zones of influence as local, regional or broader in scope should be specified in relation to specific environmental effects under consideration. This description is intended to provide a context for a detailed understanding of the potential effects of the project. A description of any deficiencies or limitations in the existing environmental database shall be reported. Plans to collect any required additional data shall be described.

The environmental impact statement shall provide a discussion of the rationale for the determinations taken regarding the spatial and temporal boundaries chosen for the study areas used for the assessment.

6.1 PHYSICAL ENVIRONMENT

The environmental impact statement shall describe:

6.1.1 GENERAL:

- general climate conditions with sufficient data provided to predict the effect of the project on climate and the potential effects of climate on the Project over time;
- local air quality potentially affected by the Project;
- ambient noise levels in the project area; and
- local and regional soil, land use and geology.

6.1.2 HYDROLOGY AND HYDROGEOLOGY:

- local and regional hydrogeology;
- existing range of flows and water levels in the context of the operation of the existing flood control system;
- ice conditions, including changes during the winter and variability from year to year;
- existing shoreline environment and the rate of shoreline erosion and recession based on long term monitoring programs; and
- nature and extent of existing sediment deposition and shoreline debris.

6.2 AQUATIC ENVIRONMENT

The environmental impact statement shall describe the existing aquatic biological resources and associated habitat in watercourses, wetlands and other waterbodies. The environmental impact statement should establish a suite of biotic and abiotic indicators for the area including a discussion of the rationale for their selection. The environmental impact statement shall describe:

6.2.1 WATER QUALITY:

- sufficient detail shall be provided regarding the pre-project water quality and temperature parameters to predict the effect of the Project on surface water and groundwater quality and how it would relate to human consumption, recreation and aquatic biota, and to compare post-project water quality conditions.

6.2.2 LOWER TROPHIC LEVELS:

- sufficient detail regarding existing primary producers and decomposers shall be included to provide a basis to predict the potential effect(s) of the Project on energy (food) production.

6.2.3 AQUATIC INVERTEBRATES:

- sufficient detail respecting the existing species composition and abundance of aquatic invertebrates shall be provided in order to assess the overall productivity of the aquatic eco-system, biodiversity, and potential effects on fish populations and their range.

6.2.4 FISH AND CLAM HABITAT:

- sufficient data on bathymetric mapping, groundwater upwelling, erosion and sedimentation patterns, substrates, habitat classification and quantification within the study area shall be required to provide a basis for predicting project effects and to quantify the effects of the Project on fish and clam habitat; and
- a discussion shall be provided on how applicable provincial and federal policies for fish habitat, including the “No Net Loss Guiding Principle” will be achieved.

6.2.5 FISH AND CLAM POPULATIONS:

- sufficient data regarding species composition and relative abundance, critical life stages and requirements of key fish species, movements and migration patterns, habitat use and fish quality (mercury and heavy metal levels/fish health/palatability) shall be provided to predict the effects of the Project on fish populations within the study area.

6.2.6 AQUATIC SPECIES AT RISK:

- Any aquatic species found in the study area that is listed in Manitoba’s *Endangered Species Act*, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), or the federal *Species at Risk Act* shall be identified.

6.3 TERRESTRIAL ENVIRONMENT

The environmental impact statement shall describe:

6.3.1 VEGETATION:

- information on plant communities, “Species at Risk”, and “Rare Species” that may be affected by the Project shall be provided in sufficient detail to predict the effect of the Project on vegetation in the study area. This includes medicinal plants, riparian and wetland vegetation, indigenous vegetation including tall grass prairie, and type(s) of vegetation to be flooded and/or cleared.

6.3.2 WILDLIFE AND WILDLIFE HABITAT:

- animal species (birds, including waterfowl and non-waterfowl species, mammals, plus available data for microorganisms, insects, reptiles and amphibians), populations, habitat and seasonal use patterns shall be provided;
- threatened and endangered animal species found in the study area shall be identified;
- important ecological communities representative of the study area by key species shall be provided;
- a description of the seasonal use of wetlands by waterbirds for breeding and moulting and spring and fall staging shall be included;
- migratory populations including migratory birds in the study area shall be identified, including a description of seasonal habitat usage;
- known habitat and critical areas for deer and furbearers;
- any animal species found in the study area that is listed in Manitoba’s *Endangered Species Act*, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), or the federal *Species At Risk Act* shall be identified;
- sufficient information on wildlife populations and wildlife habitat in the study area to predict, avoid and mitigate, to the extent practicable, the effects of the Project on wildlife habitat and populations in the study area shall be provided; and
- a discussion of the Manitoba Protected Area Initiative as it relates to the Project, including references to the Capital Region and to natural regions impacted by the Project.

6.4 SOCIO-ECONOMIC ENVIRONMENT

The environmental impact statement shall describe:

6.4.1 RESOURCE USE:

- sufficient detail regarding domestic, commercial and recreational use of resources, including fish, clams, wildlife, vegetation and water shall be provided to predict project related effects; and
- lands and resources uses for traditional purposes by Aboriginal communities.

6.4.2 ECONOMY:

- a general description of the economic base of communities potentially affected by the Project shall be provided including the state of the labour force, employment, unemployment, and a profile of existing economic sectors; and
- sufficient detail regarding the existing economy of the region shall be provided in order to predict the effect of the Project on the economy of affected communities.

6.4.3 INFRASTRUCTURE AND SERVICES:

- a general description of the infrastructure and services of communities affected by the Project under all operating conditions shall be provided in sufficient detail to predict the effect of the Project on infrastructure and services of affected communities, including road networks and utilities.

6.4.4 PERSONAL, FAMILY AND COMMUNITY LIFE:

- a general description of the personal, family and community life of communities potentially affected by the Project shall be provided, including a population and demographic profile, outdoor recreation and travel, aesthetics, health status and health issues, way of life, culture and spirituality and community cohesion and organization;
- a general description of the personal, family and community life of Aboriginal communities potentially affected the Project; and
- sufficient detail on the noted items shall be provided to predict the effect of the Project on personal, family and community life.

6.5 HERITAGE RESOURCES

The environmental impact statement shall describe:

- historic land use and occupancy in the study area;
- archaeological sites and culturally important sites in the study area, including shoreline sites that could potentially be affected by erosion;
- location of potential burial sites in the study area (if any);
- archaeological sites and culturally important sites located on or near shoreline areas in the study area that could potentially be affected by erosion. Identification of these sites shall be provided using the work of the Historic Resources Branch as the basis for this description;
- any structure, site or thing that is of historical, archaeological, paleontological or architectural significance in the study area that will be affected by any changes to the environment caused by the Project; and
- a ranking of any archaeological sites identified in order of importance.

7. ENVIRONMENTAL AND SOCIO-ECONOMIC EFFECTS AND MITIGATION

The environmental impact statement shall provide information on all environmental, social and economic effects including socioeconomic effects arising from the biophysical effects associated with the Project, including effects on public health and safety. Both positive and adverse effects shall be described quantitatively and qualitatively. The following criteria will be used to evaluate the significance of adverse effects:

- nature of the effect;
- magnitude of the effect;
- duration of the effect;
- frequency of the effect;
- reversibility of the effect;
- temporal boundaries (short or long term);
- spatial boundaries (project site, local area or regional);

- ecological context (sensitivity to environmental disturbance – for environmental effects); and
- non-compliance with legislation, regulations and policies.

The environmental and socio-economic effects and associated mitigation shall relate to each phase of the Project including site preparation, construction and post construction, operation, maintenance and final disposition, and shall assess all components of the environment in the context of section 6 of these guidelines entitled DESCRIPTION OF THE EXISTING ENVIRONMENT. The assessment shall consider scientific analysis of ecosystem effects, along with local knowledge and available experience in determining the significance of potential effects. Mitigation and habitat enhancement measures to manage or avoid adverse effects shall be described for these components and for each undertaking in relation to the Project.

Cumulative effects assessment (CEA) shall form an integral part of the environmental and socio-economic assessment. The cumulative effects assessment shall examine all effects that are likely to result from the Project when they are anticipated to occur in combination with other projects or activities that have been, or will be carried out. The environmental impact statement shall explain the approach and methods used to identify and assess the cumulative effects and provide a record of all assumptions and analysis that support the conclusions, including the level of confidence in the data used in the analysis.

All assessment conclusions shall be supported by technical information based on experience in Manitoba and elsewhere as well as local knowledge. Any deficiencies in the information about potential effects shall be clearly noted and addressed as stated in section 9 of these guidelines entitled ENVIRONMENTAL MONITORING, FOLLOW-UP AND MANAGEMENT.

8. RESIDUAL EFFECTS

The environmental impact statement shall describe the nature and extent of any residual environmental effects of the Project (after the full implementation of the mitigation), and include a characterization as to whether residual environmental effects are significant or insignificant, and the rationale for such characterization. It shall provide a detailed plan for responding to any known or predicted residual effects, and provide a procedure for identifying and responding to effects that were not predicted or foreseen.

9. ENVIRONMENTAL MONITORING, FOLLOW-UP AND MANAGEMENT

The environmental impact statement shall provide a detailed description of the proposed monitoring and follow-up activities should the project proceed. These activities should focus on the effects of the project on the physical, aquatic, terrestrial and socio-economic environments arising from the site preparation, construction, maintenance and operation of the Project. The environmental impact statement shall describe the equipment to be used, the parameters to be measured, the methodology and frequency of measurement and the mechanism for reporting results of proposed monitoring of the environmental conditions affected by the Project.

The environmental impact statement shall describe how the proposed monitoring and follow-up activities will help to verify and manage environmental effects, confirm the performance of mitigation and habitat enhancement measures to be employed, and/or contribute to the resolution of compensation issues. The EIS should also describe an adaptive management process that could be implemented in the event that the project has unexpected adverse effects or when mitigation measures may not be effective.

If regulatory approval for the Project is provided, a project-specific Environmental Protection Plan (EPP) shall be developed prior to construction. The EPP will be designed to commit the proponent to a long term monitoring and mitigation program, including accountability and reporting requirements, that would encompass both the construction and operational phases of the Project in order to confirm predictions of effects and to determine whether unexpected effects are occurring. The EPP should commit to the principles of adaptive management in addressing any unexpected effects. The EPP shall be developed to accomplish the following goals:

- to facilitate the mitigation of environmental effects throughout the full lifecycle of the Project by providing field construction and operating personnel with clear instructions on the mitigation measures to be implemented and on the appropriate lines of communication and means of reporting to be followed;
- to identify modifications to construction methods or schedules, summarize environmental sensitivities and mitigation actions, list emergency response plans and reporting protocols, describe a closure plan for aggregate quarries, including mitigation of potential hazards to public safety and mitigation to address land reclamation concerns;
- to provide specific information on waste management practices to be utilized during the construction phase of the Project, including consideration of all liquid and solid wastes generated;
- to provide specific information on the management of hazardous materials;

- to plan for the management of contingencies; and
- to monitor construction practices to ensure that the work proceeds in accordance with the EPP.

10. PROJECT SUSTAINABILITY

An assessment shall be provided of the balance between the environmental/ecological, social, economic, cultural and human health benefits and opportunities and impacts of the Project. Indicators and methodologies used in this assessment shall be explained.

11. SOURCES OF INFORMATION

All assessment conclusions shall be backed up by credible technical information and local knowledge. The environmental impact statement shall describe the primary sources of information used to conduct the environmental assessment of the Project. This information shall include:

- technical studies of similar facilities and processes which are operating elsewhere;
- original studies performed by qualified engineers or scientists commissioned by the proponent specific to the Project;
- identification of facility design documents prepared by qualified engineers as they become available;
- scientific and technical reports and papers on topics relevant to the Project; and
- local knowledge.

Credible analysis and documentation shall support all conclusions of “no or insignificant effect”.

12. REPORT FORMAT

The Environmental Impact Statement for the Project shall include an executive summary to be written with a minimum of technical terminology and shall include a glossary of terms used throughout the document.

The information in the environmental impact statement shall maximize the use of maps, charts, diagrams and photographs for presentation. To the extent possible, maps and diagrams shall be presented at a common scale, appropriate to represent the level of detail

considered, and where possible, allowing for direct overlay for ease of reference. Specifically, maps indicating zones of effect on land and water use and habitat areas shall be on maps of a common scale.

Deficiencies in scientific evidence shall be identified, including areas where there is no evidence specific to Manitoba.

For clarification of these Guidelines please contact PAT through Mr. Bruce Webb at:

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Toll Free: 1-800-282-8069
E-mail: bwebb@gov.mb.ca

Appendix B

Summary of Public and Agency Comments – EIS, Supplemental Filing and CEC Public Hearings

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
Physical Environment	Water Regime	Effects of springtime operations	Details should be provided on the effects of springtime operations
		Operating Rules	Governments have repeatedly undertaken to offset the shortfalls of the City of Winnipeg’s wastewater system by the use of the floodway
			Concerned that under the new rule 1 call for a lower level (24.5 ft instead of 25.4) before artificial flooding of upstream communities is allowed
			Funding was not granted to investigate the revision to the operating rules and effects
			Serious concerns with operating rules and their effects
			Change to rule 1 (24.5 to 25.5 ft) is a detriment to the residents living in the forebay area
			Concern with MWS statement that operation rules are only guidelines and not legal rules
			The evidence supports only part of the claim that the rules are hard and fast – it supports the fast part of fast and loose
			Upstream mitigation measures must be included in the project so as to eliminate the backwater effects of floodway operations
			Rules of operation need to be assessed and not included in the baseline
			Approval of operating rules should be part of environmental assessment process
		Effects of summer operations	The impact of summer operations has not been previously assessed
Physical	Water Regime	Effects of summer	Summer operations could act as a biological trap for birds

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
Environment		operations	
			The summer operation issue is related to a future project
			No discussion is included on the potential summer operations
			All instances of the operation should be considered including summer operations
			No details are provided regarding the mitigation measures for the impacts of summer operations
			Concerned about summer operations
			No information is provided regarding the impacts of summer operations on water quality and aquatic habitat
			Additional information will be required to adequately assess the impacts of summer operations on riverbank stability and fish passage
			Summer operations could have deleterious effects to wildlife due to dislocation of their habitat
			Summer operations could create anxiety and stress for residents along the Red River
			Summer operations could create a sense of vulnerability and lack of security for the affected residents
			Potential impacts on St. Andrew's Lock and Dam including summer operations could be examined
			Concerned about the investigation of changes to summer operations for summer water level controls

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
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Physical Environment	Water Regime	Effects of summer operations	More details are needed in relation to how emergency summer operations have impacted existing conditions
			Operating rules suggested by the proponent do not discuss the emergency summer operations to prevent basement flooding within the City of Winnipeg
			There is concern about increased riverbank erosion, which can contribute to increased immediate and incipient loss of farmland and private property during the summer operation
			Inhibited drainage of farmland because of elevated river water backing up into the drainage system and causing increasing economic hardship to the farming community during the summer operations
			The proposed expansion of the Floodway does not provide for the summer operations
			Summer floodway operations should not be allowed to occur until a feasible engineering solution that mitigates the effects of such operations is put in place
			There is insufficient information and the information that is provided is ambiguous and contradictory
			Manitoba and Canada have put upstream and downstream residents at risk through operation of the floodway
			Manitoba and Canada have undertaken the floodway project circumventing democratic rights of property owners in the Red River Valley

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
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Physical Environment	Water Regime	Effects of summer operations	The evidence presented is so contradictory that huge uncertainty remains about what may or may not happen and why – uncertainty that has not been addressed in the project assessment
			It is unreasonable to suggest that after completion of the new floodway that the existing floodway will continue to produce environmental effects that somehow are not connected to the expanded floodway
			Summer operations should not be allowed under any circumstances unless the inlet of the channel is widened and deepened to the extent necessary
			Summertime use of the floodway control structure should be expressly forbidden
			Approval of summer operations should be part of the environmental assessment process
			Summer flooding kills trees and other vegetation that is submerged
			Loss of tree roots from summer flooding makes the riverbanks unstable and prone to erosion – large sections of the riverbank are lost at once
			Summer floodway operation has become a reality because of Winnipeg’s sewage system shortfalls
			A new rule for floodway operation should prohibit use for anything other than potential catastrophic flood
		Emergency operations	Need to address the effects of emergency operations on water levels and flow
			What is the expected rise of water level?

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
Physical Environment	Water Regime	Mitigation measures	Summer floodway operations should not be allowed to occur until a feasible engineering solution that mitigates the effects of such operations is put in place
		Seine River Syphon	Examinations, analysis and assessments of the river crossing design team to be reviewed
			MFA to examine project enhancements with respect to augmenting Seine River flows, developing of wetland habitat upstream and downstream of the floodway
			Involvement in early stages of design phase for Prairie Grove Road and CPR Emerson Subdivision to ensure canoe, riffle and trail compatibility
		Artificial Flooding	No guarantee that flood gates will be operated within the rules, government will admit to artificial flooding and residents will be compensated fairly
			Detailed plan on how the residents immediately south of Winnipeg will be protected from artificial flooding
			All reasonable efforts must be made to protect residents south of Winnipeg from artificial flooding including investigating all other options
			For Ritchot the real concerns start at much lower water levels and floods that occur much more frequently
			Operation of the expanded floodway will put Ritchot flood protection under water by forcing water levels artificially high some time between the 1997 flood and the 1 in 225 flood
			The benefit of reduced artificial upstream flooding occurs after upstream flood protection levels have been topped

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
Physical Environment	Water Regime	Artificial Flooding	At no time has approval ever been given for artificial flooding
		Dredging	Resumption of dredging of the river bottom and its outlet must be resumed – build-up of sediment is considered to contribute towards ice jamming
			Support re-starting dredging program and make sure agencies responsible for dredging follow through on their commitment
		Overland Flooding	Concern that properties on Southside Drive in RM of Ritchot could be flooded due to construction of the Seine River diversion and proposed gapping of the floodway embankment around its drop structure
		Flood Pattern	CEC gives the MFA an undertaking to provide detailed information regarding scenarios of increasing flood frequency and magnitude
		Overland Flows	Study must be done to determine capacity of the historical overland flow from north of Winnipeg and west of Selkirk to Lake Winnipeg
		Information Deficiencies	Prediction of water levels and velocities as well as determination of natural water levels throughout the floodplain requires complete topographic data and best available model
			Upstream residents are guaranteed to be flooded artificially in the future
		Accuracy of data	The impact of summer operation has not been previously assessed
		Adequacy of data	No details are provided regarding the mitigation measures for the impacts of summer operations

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
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Physical Environment	Water Regime	Quantification of data	Will there be an opportunity to review the HEC 6 calculations?
			Where are the calculations used for the HEC 6 model
			The assumptions used in HEC 6 are not discussed
			The reliability of the results from HEC 6 is very low
			Don't know if regional factors were taken into consideration during the use of HEC 6 model
	Groundwater	Effects	Groundwater issues do not receive the deserved attention
			Concerned about the tendency in the EIS to treat groundwater issues as having only local impacts
			The expansion of the floodway will have adverse effects on groundwater
			There is a possibility that the higher-capacity floodway may introduce contamination into the aquifer
		Mitigation measures	What steps will be taken to mitigate groundwater changes and to protect the water quality in the event that channel deepening is considered necessary?
		Groundwater Quality and Quantity	Proactive measures must be put in place to safeguard and preserve the groundwater along the entire reach of the expanded floodway
			Must be a commitment to provide clean safe drinking water to any resident or community whose water becomes tainted or drawn down
			MFA to provide PRC a proactive water quality and quantity monitoring and mitigation program prior to construction dewatering

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
Physical Environment	Groundwater	Groundwater Quality and Quantity	MFA to provide a reactive procedure and protocol to deal with adverse water quality and quantity effects prior to construction
			MFA to continue reactive procedure and protocol to deal with adverse effects during operation phase
			The ALARA principle should guide the PRC and be applied to reduction of risk of long-term aquifer contamination and reduction of groundwater flow into the channel
			The ALARA principle should apply to conservation and protection of groundwater and MFA should evaluate alternatives to achieve these objectives
			MFA be required to comply with all legislative requirements for groundwater management in Manitoba
			MFA be subject to all regulations that govern all other water uses and be subject to public review during water rights applications
			One of the main environmental concerns is that if any changes to aquifers occurs during construction it could affect the flow of groundwater
		Groundwater Quality	MFA to do a human health risk assessment baseline
			MFA to complete a human health risk assessment including baseline monitoring program
			Human health risk assessment to include vulnerability assessment and ranking
			Human health risk assessment be conducted over 3 flood scenarios

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
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Physical Environment	Groundwater	Groundwater Quantity	Groundwater under the Direct Influence of Surface Water (GUDI) study to be done
			Well head protection zone to be established
			MFA to complete a comprehensive characterization and hydrogeological evaluation of each spring or blowout along the floodway channel
			MFA to complete a detailed predictive model to evaluate surface water to groundwater interaction at each location and submit results to PRC
			There are environmental concerns that the aquifers might be contaminated during a flood year when the floodway is in operation
			The expanded floodway will exacerbate the pollution of the aquifer and will necessitate construction of separate water systems on both sides of the river
			Ensure that no floodway waters can transfer into either of the two aquifers
			Absolute sealing of bedrock cracks with substantive materials must be found
			MFA to determine the existing amount of groundwater seepage to the floodway channel
			MFA to address the issue of loss of groundwater from the aquifer and provide mitigation measures to use water and submit analysis to PRC
			Further deepening of the floodway will exacerbate the already substantial loss of potable water and a further loss of area wells
	Erosion/	Erosion and	Why and how would there be a reduced capacity of the

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
	Sedimentation	sedimentation	Red River to dilute the sediment-laden discharges?
Physical Environment	Erosion/ Sedimentation	Erosion and sedimentation	The proponent should address the issue of river erosion at the toe of the channel in the case of abnormal erosion conditions
			There is concern about increased riverbank erosion, which can contribute to increased immediate and incipient loss of farmland and private property during the summer operation
			EIS does not describe how to mitigate erosion and sediment transport
			EIS is not consistent with current prudent practices of erosion and sediment control
			Have not received any detailed information regarding the plans for providing erosion and sediment control
			It is not clear how erosion and sediment control will be dealt with
			An adequate preliminary erosion and sediment control has not been provided
			Qualified CPESC be included in the development of erosion and sediment control plans
			No details about the erosion control plan have been documented in the EIS
			There is a lack of erosion control practices
		Use of literature and references	There are no papers listed in the references regarding bank erosions
		Riverbank Erosion	Adequacy of studies on how increased flow levels will affect erosion levels south of the floodway

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
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Physical Environment	Erosion/ Sedimentation	Riverbank Erosion	Concern that increasing the flow of the river due to greater capacity of the floodway will put a further strain on erosion prevention measures
			Restriction of the Red River at Lower Fort Garry will result in greater river velocities and greater riverbank erosion will result
			The riverbank near Lower Fort Garry is especially susceptible to erosion and all efforts must be made to preserve this national treasure as well as other valuable properties along the Red River north of the floodway exit
			CEC to determine where thresholds are and whether there is going to be significant riverbank and floodway bank erosion due to the expanded floodway
			Increased riverbank erosion from artificial flooding
			Loss of trees and root systems accelerates riverbank slumping
			Adequacy of studies on how increased flow levels will affect erosion levels south of the floodway
	Drainage	Drainage Structures	There is a need to improve drainage into the floodway when expansion is completed
			Inhibited drainage of farmland because of elevated river water backing up into the drainage system and causing increasing economic hardship to the farming community during the summer operations
			Higher river levels and the loss of efficiency of drains can contribute to standing water in coulees and provide an excellent breeding ground for mosquitoes

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
Physical Environment	Drainage	Drainage Structures	Hydraulic capacities on the new outlet structures and the diversion drains on floodway properties needs more attention
			There is a lack of consideration for drainage drop structures on the west side of the floodway
			Impacts related to improved drainage are ignored
			The general potential of the development to impact drainage is such that the geographic scope of the EIS region may be too small
			There is no information on the design data that have been incorporated into the design of agricultural drain drop structures
			Adequate provision of surface water drainage infrastructure to meet the present and future needs of agriculture
			Number of existing drop structures not appropriate for current conditions along the floodway
			Require the MFA to construct drop structures that incorporate the ability to handle further upgrading of the drains that feed the structures with the suggested sill elevation being 1.4 m lower than the current elevation
			Require the MFA to investigate and report on all matters pertaining to feasibility including cost of adding new drop structures
			Need for significant capacity increase with respect to the Centre Line drop structure to provide the potential for future flood protection and drainage enhancement
			Concerned about drainage access to the floodway for

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
			RMs nearby and for farm producers in the area
Physical Environment	Drainage	Drainage Structures	Water flow through proper drop structures and adequate flow through infrastructure are essential to ensure viability of agricultural sector
	Ice processes	Ice processes	What are the effects of the increased water flow during an ice jam?
			What will get flooded during an ice jam?
			What properties will be damaged during an ice jam?
			What environmental issues are related to an ice jam?
			There is a lack of consideration for measures to combat ice-induced flooding in the spring
			Ice jams on the Red River are a known factor and should be addressed thoroughly in the EIS as to impacts and mitigation
		Ice-jamming downstream	- Morphology of the Red River downstream of Lockport contributes to more frequent ice-related flooding than upstream
			Ice jamming downstream of Lockport is most likely due to the reduced river slope and the backwater effects of Lake Winnipeg
			Breakup has tended to occur earlier over the last forty years but this would not contribute to an increase in ice jamming
			Typical spring flood peaks have been about 50% greater in the 30 years of record – increasing perception that the floodway has caused ice jams
			Ice issues downstream of the floodway appear to be evident at flows that would occur during rule 1 operating

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
			criteria
			The concept of a Red Sea being drained more efficiently because of the floodway is false
Physical Environment	Ice Processes	Ice-jamming downstream -	The floodway does not exacerbate ice jamming and ice related flooding downstream
			The expanded floodway will not exacerbate ice jamming and ice related flooding downstream
			There are no simple short term measures that can be taken on an annual basis to mitigate the effects of ice jams at Selkirk
			A more extensive review of historical ice-related flood levels at Selkirk should be carried out
			A field program to observe breakup and measure ice process downstream should be undertaken
			Effects of ice on water levels on the Red River at the floodway entrance should be carried out
			A cursory estimate of the changes in channel storages caused by construction of the dikes throughout Winnipeg should be carried out
			An immediate study of the phenomena of ice jamming must be initiated and measures must be taken against this escalating problem
			Concern that ice jamming appears to get worse every year
			Ice jams appear to be the primary cause of flooding north of the floodway and have a large effect on bridges in Selkirk
			If the north end of the Red River is dredged and the ice

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
			broken up by hovercraft the water would flow into Lake Winnipeg sooner
			Explain why ice jamming occurs on the Red River
			Concerned that flooding from ice jamming can affect well water quality
Physical Environment	Ice Processes	Ice buildup at floodway entrance	Request a device that prevents ice from flowing into the floodway channel – like that used for the Portage diversion
			Engineering solutions revealed through scientific analysis of the problem
	Climate, Air Quality & Noise	GHG	The EIS should include a discussion about carbon stocks, GHG, and other climate change issues and key indicators
			The EIS does not provide any discussion or information on emissions from the increased capacity of the expanded Floodway
			The EIS should include a detailed description of options for the minimization and / or elimination of GHG emissions
			The EIS should include a comparative analysis of the carbon effects of the Floodway expansion project
			The MFA does not provide any comparison in terms of GHG emission for other projects where large amounts of earth are moved
			No strategy to minimize GHG emissions is discussed
		Climate change	Impacts of climate change has not been adequately addressed
			EIS provides no information in terms of climate variability and extreme weather over time
			There is no analysis or data to support the assertion that

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
			the proposed Floodway expansion will afford adequate protection under scenarios of more extreme changes in climate
			The EIS does not address the requirements of EIS Guidelines to predict the effects of climate change on the project over time

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
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Physical Environment	Climate, Air Quality & Noise	Climate change	No information on whether the proponent applied climate change models to their assertions is provided
			The proponent should include details regarding the compliance with the Gov. of Manitoba state policy on climate change
			It would be more useful to provide more recent information regarding the climate change
			Climate change modeling and literature that is relevant to Manitoba's situation has not been examined
			The Supplementary Filing does not include analysis of the total impacts of all phases in relation to climate change
			Both Manitoba's and Canadian public policy on climate change should be part of the assessment
			CEC should direct MFA to conduct a more thorough search of the literature, address deficiencies, assess assumptions and make information public
			CEC should direct MFA to develop a plan that will result in the project being a carbon neutral project
			CEC should direct MFA to develop a comprehensive policy on climate change
			CEC should seek input from an ecological economist and a climate change expert regarding large infrastructure and earth moving projects and how to mitigate climate change effects
			CEC should require the MFA file a public climate change mitigation and adaptation strategy with the goal of making the Project carbon neutral

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
Physical Environment	Climate, Air Quality & Noise	Climate change	CEC should require the MFA to undertake research into the effects of global warming and how that would affect the operation of the floodway
		Use of literature and references	All public policy documents related to the issue of climate change should be listed in the EIS
		Adequacy of data	Impacts of climate change have not been adequately addressed
	Physiography, Geology, Soils	Adequacy of data	The section on physiography and geology are not very detailed
			It is not evident that the seismic loading is considered in the slope stability studies
			It is not evident that landslide conditions along riverbanks upstream of the intake were investigated
			It is not evident that landslide potential downstream of the Floodway Outlet were investigated
			The proponent should address the long-term creeping behavior of the slope and justify that landslide is not a concern from the deformation point of view
		Regional Study	Area north of the outlet to Lake Winnipeg should receive careful study so that accurate flood predictions can be made
Aquatic Environment	Surface Water Quality	Water quality	The proponent has not provided information to support the conclusion that it is unlikely that current recreational use of Floodway Channel has affected water quality
			The proponent should provide a more thorough consideration of other impacts of Floodway Operations on water quality
			The proponent has not considered any negative impacts

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
			of Floodway on water quality
Aquatic Environment	Surface Water Quality	Water quality	Concerns are focused primarily on the potential for risks to water quality and safety
			Are there potential concerns for water quality and safety secondary to construction activities?
			What steps will be taken to mitigate ground water changes and to protect the water quality in the event that channel deepening is considered necessary?
			There are concerns about the impacts that possible oil / fuel or chemical spills during construction phase on the health of Lake Winnipeg and the population in general
			There is a potential for negative impacts on aquatic, habitat, and water quality
			The sustained and/or improved water quality and quantity for the residents of Springfield is crucial
		Mitigation measures	EPP should include a discussion on the potential impacts of fertilizers and herbicides use on water quality and any mitigation measures to be employed
			What steps will be taken to mitigate ground water changes and to protect the water quality in the event that channel deepening is considered necessary?
		Sewage in Floodway	Possibility of domestic sewage entering the floodway must be reduced to zero
		Livestock Operations	Flooding livestock operations south of Winnipeg could result in further surface water contamination
		Adequacy of data	The proponent has not provided information to support the conclusion that it is unlikely that current recreational use of Floodway Channel has affected water quality

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
			Water quality data for the Floodway should be filed if available

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
Aquatic Environment	Lower Trophic Levels/Aquatic Invertebrates	Lower Trophic Levels/Aquatic Invertebrates	The EIS offers almost nothing on primary producers and invertebrates
			The EIS does not confirm the status of Potamogeton for the Red River and does not confirm the existence for the Low Flow Channel
			The proponent should be required to conduct pre- and post-construction monitoring within the Floodway Channel to assess the changes in aquatic invertebrates diversity and species richness
		Mosquito Breeding	MFA must address concerns about stagnant water especially in mosquito season in the months after the flood season
	Fish and Clams	Impacts on fish	Additional information will be required to adequately assess the impacts of summer operations on riverbank stability and fish passage
			Restoration of fish passage at the St. Andrews Dam is critical to the overall effort of removing obstacles to fish passage in the basin
			Additional studies are needed to understand fish passage issues
			The proposed project will interfere with fish passage
			Plans for expanding the floodway should also include plans for modifying existing structures so that they are no longer an impediment to fish passage
			EIS information and conclusions are inconsistent relative to fish and clams
			The EIS ignores the potential benefits of high flood events

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
			for some species of fish (e.g. northern pike)
Aquatic Environment	Fish and Clams	Impacts on fish	The EIS ignores the potential of the greater opportunity for drainage to impact fish
			There is a possibility that the project is contravening the Fisheries Act
		Seine River Siphon	Seine River Crossing be replaced to permit adequate flows to allow flushing of the floodplain and to comply with Fisheries Act
Terrestrial Environment	Birds, Mammals other wildlife	Protected areas	There is a variety of deficiencies in the EIS with respect to protected areas policy and regulatory regimes
			There is an incomplete identification of crown land designations
			The EIS does not mention any information as to which Acts of the legislature and which definitions under legislation pertain to protected areas
			The EIS does not identify sites that are under review for protected areas
			The EIS does not identify the sites inside Manitoba that are protected areas
			The proponent has not addressed the absence of any discussion of the Action Plan for a Network of Special Places for Manitoba
		Small Mammals	Drowning of small mammals in burrows due to artificial flooding
		Large Mammals	Displacement of large mammals due to artificial flooding
		Shore birds	Loss of shore bird nests due to artificial flooding
		Rare species	The examination for rare or endangered plants and ecosystems was not comprehensive

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Environment Component	Category of Comment	Issue	Comment
		Accuracy of data	Figure 4-2-1 shows incorrect boundaries for Bird's Hill Provincial Park

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
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Terrestrial Environment	Birds, Mammals other wildlife	Use of literature and references	The recent and current policies regarding water and protected areas are not referenced or discussed in EIS
		Adequacy of data	There is not sufficient information on the habitat usage of the floodway by migratory birds
	Vegetation	Quantification of data	There is no quantification or calculation of the total area cleared or disturbed during construction
		Recommendation	Provide rationale for choosing glyphosate and 2.4D
			Attempts should be made to preserve the genetic stock through the collection of seeds for the rare species <i>Amorpha fruticosa</i>
			A chemical usage appendix is required for outlining the amounts, along with the temporal and spatial distribution of herbicides and pesticides to be used in the landscaping aspect of the project
		Adequacy of data	The proponent did not provide adequate justification for the use of herbicides
			Manitoba narrative guidelines for phosphorous are missing
			No justification was provided for the rates of fertilizers and pesticide applications
			The proponent should provide information on the issue of the statistical significance of temporal and geographic variation in nitrogen and phosphorous
			Field inventory charts and details provide little analysis or assessment
			Include justification for the quantities of fertilizers and herbicides to be used in re-vegetation

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Environment Component	Category of Comment	Issue	Comment
Terrestrial Environment	Vegetation	Mitigation measures	EPP should include a discussion on the potential impacts of fertilizers and herbicides use on water quality and any mitigation measures to be employed
		Temporary and permanent works	There is no reference to the amount of vegetation, trees that will be permanently and / or temporarily removed or degraded as part of the construction work
			There is no quantification or calculation of the total area cleared or disturbed during construction
		Other	The EIS ignores any potential benefits of large flood events on "floodplain forests" and other ecosystems
			Further assessment should occur in relation to the: impact of the development on floodplain forests, documentation of the value of high flood events to biota, the impact of the enhanced drainage on important habitats outside of the Floodway RoW and beyond the West Dyke, the impact of the altered substrate and ponds in the Low Flow Channel on leopard frog
			Is there a plan to limit willow growth in the base of the Floodway Channel?
			An Environmental Monitor should be in place to determine the location of any sensitive plant communities prior to construction
			The proponent has not addressed loss of trees (not only vegetation)
		Trees	Trees killed due to artificial flooding
		Protected Areas	CEC report directs the MFA to deal with deficiencies and inaccuracies in EIS regarding protected areas
Socio-Economic	Economy	Land use	The increase in recreational opportunities will have

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
Environment			impacts on agricultural land
Soci-Economic Environment	Economy	Land use	Agricultural land could be severely restricted in proximity to recreational areas
			All proposals for recreation and other non-agricultural developments under this project should be submitted to the Dep. of Agriculture, Food and Rural Initiatives for review prior to development
			No assessment of significance of recreation impact has been included in the EIS
	Infrastructure and Services	Waterway usage	Explain the purpose of the horn and why the rules regarding the horn were amended?
			Identify the target audience for the horn
			Explain how the public is educated regarding the meaning of the horn
			Identify and explain all other mitigation measures that are currently in place or are proposed as part of the project to notify waterway users of the navigation hazards created by floodway gate operation
			Identify any measures that are currently in place or proposed to notify downstream waterway users of floodway operations
		Navigation	Potential impacts on waterway use and navigation do not appear to have been addressed
			Provide a thorough analysis of the existing navigation uses of all potentially impacted navigable waters
			Explain the impacts of floodway operations on navigation safety at the outlet and any mitigation measures that are in place to reduce potential impacts

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Environment Component	Category of Comment	Issue	Comment
Soci-Economic Environment	Infrastructure and Services	Navigation	Identify any mitigation or navigation safety measures currently in place along with any additional proposed measures to improve navigation or navigation safety at Seine River Syphon
			Explain how navigation on the Red River within the City of Winnipeg as well as upstream of the floodway inlet gates and downstream of the city are affected by the operation of the floodway
			Clarify any potential impacts to boating safety during construction, and any measures that will be employed to reduce the effects
			Identify any proposed alterations to existing crossings over navigable waterways resulting from West Dyke enhancement work
			Identify any new crossings over navigable waterways
			An assessment of impacts on navigation resulting from the floodway operations must be completed
		Transportation, railway and highway	The railway right-of-way should be addressed
			The Railway Safety Act and Notice of Railway Works Regulation are missing
			More details are needed regarding the operation and maintenance of railway bridges
			More details are needed regarding the increase in traffic volume and changes in type of vehicles
			Provision of required transportation services during and after construction of the floodway
			Measures must be taken to protect the lift bridge at Selkirk

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Environment Component	Category of Comment	Issue	Comment
			from damage by ice
Soci-Economic Environment	Infrastructure and Services	Transportation, railway and highway	Upgrade Selkirk's bridges or find other solutions, services or infrastructure
			Upgrade existing bridges and investing in additional bridges that can withstand higher waters than existing ones
			Upgrade Selkirk's bridges to prevent effects during spring floods or ice jams
			Concern that faster flows will cause a greater strain on bridges crossing the Red River south of the floodway
			Year round access at Dunning Crossing required for emergency response, schools, residents
		Temporary and permanent works	Indicate whether or not portable or temporary asphalt plants are expected
			Information is required regarding all the proposed physical works to occur on navigable waterways
			Any work completed must be identified and an application and review under NWPA should be completed
			Potential impacts of the existing floodway infrastructure should be identified and assessed
			The potential impacts of all phases of the proposed project including both construction and operation of any temporary works and permanent works should be assessed
			Identify the proposed timing and duration of the construction
			Identify the need for any temporary in-stream works
			Provide details regarding any proposed temporary

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
			infrastructure in or affecting the Red River channel along with the proposed timing and duration of such works

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
Socio-Economic Environment	Infrastructure and Services	Temporary and permanent works	Clarify any potential impacts to boating safety during construction, and any measures that will be employed to reduce the effects
			The proponent has not provided a comprehensive plan for minimizing the impacts of construction on water quality
			There is no reference to the amount of vegetation, trees that will be permanently and/or temporarily removed or degraded as part of the construction work
			There is no quantification or calculation of the total area cleared or disturbed during construction
		Mitigation measures	Mitigation should include dust control on access roads
			Identify and explain all other mitigation measures that are currently in place or are proposed as part of the project to notify waterway users of the navigation hazards created by floodway gate operation
			Explain the impacts of floodway operations on navigation safety at the outlet and any mitigation measures that are in place to reduce potential impacts
			Identify any mitigation or navigation safety measures currently in place along with any additional proposed measures to improve navigation or navigation safety at Seine River Siphon
		City of Winnipeg flood protection	Improve east embankment of primary dikes
			Sewer systems need to be protected to the flood protection level of 27.8 JAPSD
			Upgrade sewage pumping stations
			City, provincial and federal governments work together to

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
			permanently raise the primary dikes in Winnipeg
Socio-Economic Environment	Infrastructure and Services	City of Winnipeg flood protection	City, provincial and federal governments work together to upgrade other critical flood infrastructure in Winnipeg
		Emergency Services	Need to plan for speedy evacuation of area residents should a major malfunction occur – refer to IJC recommendations
			Add improved emergency services to both sides of the floodway and the Red River
		Flood Protection	CEC clarify the number of sites in the Red River Valley and north of Winnipeg that will require material, sand bagging, etc. should a flood similar to 1997 occur
			Measures must be taken to prevent, mitigate against and/or protect residences, municipal and city infrastructure, historical sites, churches, graveyards, etc.
		Flood-Proofing	CEC address the effects of the expansion of the floodway in relation to the flood-proofing undertaken after the 1997 flood and make recommendations
			Not fair to further burden RMs with flood proofing costs for infrastructure and services
		Sewer Outfalls	Transcona Kildare outfall be mitigated immediately
		Increased Snow Accumulation	Increased height of west dike will result in greater snow accumulation and more time required until spring seeding can be carried out
		Transportation	Raising the west dike will result in further deterioration of rural roads
		Hazardous Substances	Require current hazardous materials storage sites be removed for the Red River floodplain prior to any expansion of the Red River floodway

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Environment Component	Category of Comment	Issue	Comment
		Accuracy of data	Discrepancies are noted regarding the amount of deepening and widening
			PR 332 at Brunkild appears to be in the wrong location
Socio-Economic Environment	Infrastructure and Services	Adequacy of data	Little or no information is provided on the maintenance of the floodway banks, inlet and outlet structures, drainage drop structures, and West Dyke
			Design and maintenance of the West Dyke should be better addressed
			The information and analysis provided is insufficient to adequately assess the potential impact on navigation
			Information is required regarding all the proposed physical works to occur on navigable waterways
			More details are needed regarding the operation and maintenance of railway bridges
			There is insufficient information in the EIS to identify whether the following watercourses would be considered navigable. These water courses are: Ashfield Drain, Shkoiny Drain, Country Villa Estates Drain, Springfield Road Drain, Cooks Creek Diversion, Prairie Centerline Drain, Grande Pointe Drop Structure, and Kildare Drain
	Personal, Family and Community Life	Lack of flood protection	There are two areas in the Red River that require flood protection to bring them above the level of 1826 flood. These are the City of Winnipeg and the Rural Municipality of Ritchot
			Île-des-Chênes has no flood protection infrastructure
			Approximately 500 homes in the rural area of the Rural Municipality of Ritchot that have individual flood protection will not be protected against a 1 in 700-year flood

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
			While Ritchot benefits from the project, it is left without some flood protection infrastructure that it requires

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Environment Component	Category of Comment	Issue	Comment
Socio-Economic Environment	Personal, Family and Community Life	Lack of flood protection	The municipal water plant outside of St. Agathe is vulnerable to floods exceeding the 1997 level
			Expansion does not provide for redundancy in flood protection
			The EIS does not address the issues of prevention, protection from and mitigation against flooding in the rest of Red River Valley
			Selkirk has the same issues of combined sewers as Winnipeg
		Compensation for damages	Affected landowners should be compensated for property and material damage
			The provincial government is in a conflict of interest as the same agency that operates the Floodway structures would also be administering and arbitrating compensation for damages resulting from Floodway operations
			EIS does not deal with compensation for those who cannot or will not be protected to the same level as Winnipeg
			The EIS does not assess the magnitude and the character of the property damages
			Some upstream residents not able to take advantage of flood proofing assistance after the 1997 flood
			Flood agreement must be developed so that persons affected by flooding upstream and downstream are automatically compensated without going through the claims process including the courts
			CEC requires MFA to provide a full set of figure as to the

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
			cost of the next flood of 1997 levels
Socio-Economic Environment	Personal, Family and Community Life	Compensation for damages	The proposed compensation legislation be amended to provide an objective program and to provide citizens due process of law through the courts
			Government acknowledge their responsibility for both spring and summer flooding and provide full compensation accordingly
			No guarantee that flood gates will be operated within the rules, government will admit to artificial flooding and residents will be compensated fairly
			Compensation cannot address the emotional psychological effects
			Social consequences persist – cannot be redressed through replacing damaged goods
			MFA should establish a compensation dispute resolution mechanism
			Regulations to be developed for the area downstream of the floodway for access by residents, city and municipal authorities for flood protection and compensation
			Mediation process initiated in 2004 is restrictive and unfair
		First Nations	The EIS does not satisfactorily deal with the rights of First Nations
		Population health, health services and health infrastructure	Unable to establish if adverse impacts will occur
			Should look more closely on the potential impacts on elderly and vulnerable people
			There are concerns about the impacts that possible oil /

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Environment Component	Category of Comment	Issue	Comment
			fuel or chemical spills during construction phase on the health of Lake Winnipeg and the population in general

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
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Socio-Economic Environment	Personal, Family and Community Life	Population health, health services and health infrastructure	Social impacts and other psychological factors of the Floodway operations have not been addressed
		Mitigation measures	Proper mitigation is not being put in place to protect citizens immediately outside of the planned project
			Mitigation measures in relation to water supply for human and livestock consumption needs to be comprehensively included for the whole study area
		Use of references and literature	There is a need to acknowledge literature on the effects of flooding on human populations
		Adequacy of data	Does not identify the risk on health infrastructure
			How will the determination of damage costs from the flooding be made?
			On what basis is the decision to shift the flood risk from one population to the other is made?
			Details should be provided on the compensation program for landowners
		Property Rights	Designation of a flood emergency must be one of necessity not convenience in order to prevent the province from acknowledging property rights
			Landowners must have their property rights protected
		Flood Easements	Purchase affected properties along the river as part of the government's proposed greenway
			Development of easements and compensation program would cost less than 0.5% of the expansion project or \$3.3M

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
Socio-Economic Environment	Personal, Family and Community Life	Buy-Outs	The only alternative to recommendations would be the buy-out of thousands of homes and hundreds of businesses
		Equality	Residents inside and outside the floodway must be afforded equal, non-discriminatory flood protection
			Residents of Selkirk and others downstream must receive equal flood protection as that of Winnipeg
		Red River Floodway Act	A federal-provincial financial compensation agreement must not be replaced by the flawed Red River Floodway Act
			The Red River Floodway Act is not proclaimed, there are no regulations and no details
		Flood Protection	Residents south of Winnipeg have had to pay up to 25% of flood protection while Winnipeg's protection is paid out of tax dollars
			Red River Floodway Act must be abandoned since it is not worth the paper it is written on – a federal-provincial flood compensation agreement must be developed and brought to signature by both levels of government
			Flood control offers two benefits – prevention of actual flood damages and annual flood risk reduction
		Disaster Assistance	CEC investigate the status of negotiations between Canada and Manitoba regarding disaster assistance
			Government provide guidance and advice regarding flood protection in view of changing standards and flooding expectations
		Flood Proof Deductible	Canada and Manitoba should refund the flood proofing deductible to all Ritchot residents residing outside the ring

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
			dike communities
Socio-Economic Environment	Personal, Family and Community Life	Mould	Outstanding anomalies from 1997 such as mould in homes or shifting flood-proofing causing socio-economic effect should be investigated and mitigated
		Health	Health and socio-economic effects brought about by changes in the environment are critical to upstream residents
		Recreation	Incorporating recreation facilities and greenway into the project licence is necessary to protect the public interest by ensuring that recreation and greenway are addressed
			MFA obliged to deliver on recreation and greenway as part of the Project
			Licence for the project to include recreation facilities and greenway development
			MFA to establish the Recreation Project Team within one month of the issuance of this Licence. The Recreation Project Team membership be made up of an equal number of representatives from the MFA and the RRFTC. The responsibilities of the Recreation Project Team be determined by the MFA and the RRFTC
			MFA provide for safe crossings for recreation purposes across the floodway channel as warranted by existing and potential future demonstrable needs as identified in the Master Plan.
			MFA ensure the Master Plan is finalized and approved by the Recreation Project Team by no later than March 31, 2006. The MFA provide a copy of the Master Plan to the Director.

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
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Socio-Economic Environment	Personal, Family and Community Life	Recreation	MFA, if floodway construction work is to start before completion of the Master Plan, consult with the Recreation Project Team in the planning stage and before the detailed design of such work is concluded.
			MFA to support RRFTC in applying for and obtaining funding for the RRFTC's costs for participating (technical, consulting, and other) in the Recreation Project Team. If no such funding is obtained by May 31, 2005, MFA to fund the RRFTC's costs of participating back dated to the date of establishment of the Recreation Project Team.
			MFA to construct the recreation facilities and greenway developments identified in phase one of the Master Plan. The construction costs shall be no less than 1% and no more than 3% of the overall project costs (excluding bridge enhancements). The Recreation Project Team operation costs are included in this amount. The timing for such construction must be as set out in phase one of the Master Plan.
			MFA to apply for and obtain required approvals, permits, or licences from Canada and Manitoba as is necessary to construct, operate and maintain the recreation facilities and greenway developments.
			MFA to operate and maintain the recreation facilities and greenway developments constructed under phase one of the Master Plan in good condition. MFA may enter into agreements with third parties to provide for such operation and maintenance, providing the required standard of operation and maintenance is met.

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
Socio-Economic Environment	Personal, Family and Community Life	Recreation	MFA to use its best efforts to implement and carry out the long term Master Plan recommendations.
			MFA to promote other funding to complement phase one implementation and implementation of the Master Plan's long term recommendations.
		Recreational Trails	Trails are an important infrastructure when the economy and public health are concerned
			The benefit of incorporating a trail and building a trail along with the Project will enhance the quality of life for Manitobans
			Provide motorized recreational vehicle use on the east bank of the floodway and non-motorized trails on the west bank
		Agriculture	Construction of the west dike will result in loss of good agricultural land
		Agriculture	Loss of farmland will mean that producers will have to travel farther to spread manure
	First Nations (Peguis First Nation)	Compensation	Extend compensation downstream to include communities regularly affected by artificial flooding
		Benefits	Through participation in the environmental assessment process PFN will also benefit
		Aboriginal Interests	MFA to fully consider and accommodate PFN needs when finalizing plans for the project
			Flood protection to be provided to PFN in an equitable manner

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
Socio-Economic Environment	First Nations (Peguis First Nation)	Aboriginal Set-aside	Due to fact that the project is located within PFN's traditional territory and that effects on PFN lands may occur MFA to guarantee a minimum set-aside for employment
		Red River Lands	Protection initiatives should be explored and implemented for the St. Peter's Dynevor Church and graveyard
	First Nations (Peguis First Nation)	Red River Lands	PFN may complement its Crown and acquisitions by acquiring lands along the Red River downstream from the floodway outlet
		EIS Adequacy	EIS should have considered and respected the rights of First Nations – Treaty, Aboriginal, inherent and human
		EIS Scope	Geographic scope of flood study region is limited – reduces any potential for assessing full effects of the project
		Cumulative effects assessment	Cumulative effects must be considered in connection with the ecosystem-based approach
			TSS, sedimentation and downstream effects on Netley Marsh and Lake Winnipeg not considered
	Heritage Resources	Heritage Resources	As the result of the erosion that might occur, cultural resources may be exposed and damaged
			Monitoring for cultural resources in the areas of potential erosion has not been identified
		Compliance	CEC direct MFA regarding responsibilities under Manitoba's Heritage Act are fulfilled during planning, construction and operation of the project
	EA Process	Incorporation of input	Concerns raised in the October letter have not been addressed
Socio-Economic	EA Process	Incorporation of input	MFA and the authors of EIS did not address the issue

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings			
Environment Component	Category of Comment	Issue	Comment
Environment			raised in the October 8, 2004 letter
			None of the section in the Supplementary Filing addresses the concerns raised
			The information provided by the MFA does not address the original comments
Environmental Assessment Process	EA Process	Incorporation of input	In terms of public involvement, none of the commitments of the Framework Agreement has been met
			The concerns of residents regarding recreational use of Floodway berms have not been taken into consideration
	Public Policy Context	Adequacy	CEC have independent reviewers identify all errors of fact and claims regarding the public policy framework the project needs to fulfill
	Public Hearing Process / procedures	Proponent Assistance	CEC petition Manitoba Conservation to adopt a policy of providing assistance to any new proponent that will ensure that previous standards for responding to comments, requests, etc. are adhered to
		Public Registry	CEC include in its deliberations the contents of the Manitoba Conservation public registry file
		Information Availability	CEC take action to make all information concerning a project available in paper and electronic form
			CEC clearly state its standards and methods for making its own information available to the public
		Responsibility	CEC cannot fulfill its mandate unless the floodway operator is formally involved in the hearing process
		Procedures	CEC procedures should be developed and/or enforced to ensure that respect for all perspectives, knowledge and information is a guiding principle

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
Environmental Assessment Process	Public Hearing Process / procedures	Access to Information	CEC provide a credible, consistent level of access to information inside and outside the hearing room
		IJC Recommendations	CEC review all IJC recommendations pertinent to the hearings and articulate those being fulfilled by the MFA
			Process is not consistent with what IJC envisioned and is an affront to upstream residents
		Scope	CEC hearing is too restrictive to cover all of the aspects that will need to be covered under CEAA
		Language and timing	Not enough time available to review the documents
			The language used in the EIS is too technical
	EIS	Public policy and regulatory framework	The proponent must indicate how the project is in compliance with public policy and regulatory framework
			Missing from the EIS guidelines is an explicit requirement for the proponent to provide an assessment of how the proposed Floodway expansion will comply with each element of the overall federal and provincial policy and regulatory framework
			The discussion of public policy and regulatory framework is restricted
			The recent and current policies regarding water and protected areas are not referenced or discussed in EIS
			Many key public documents are ignored, not mentioned or referenced
			The EIS ignores the existence of Manitoba Water Strategy
			There is no connection to public policy or the regulatory framework regarding species
			The proponent has not indicated how the project is in

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
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			compliance with the public strategies and policies
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Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
Environmental Assessment Process	EIS	Public policy and regulatory framework	The proponent has not described how it reflects the principles described in the Manitoba Water Strategy
		Adequacy	Collate numerous deficiencies in the EIS and recommend that they be addressed by the proponent
			Logical sequencing of a rights and ecosystem-based approach along with a more detailed cumulative effects assessment would enhance the EIS
			Send the EIS back to satisfy all aspects of an environmental hearing
		Peer Review	Subject all aspects of the EIS for peer review – forget egos
		Referral	Recommend the revised EIS go to a joint federal/provincial panel where requirements of CEAA can be fully considered
		Deficiencies	<ul style="list-style-type: none"> - consideration of structural and operational alternatives - scoping the project - defining the signification of effects - assessing biophysical, sociological, economic, health, psychological and recreational issues - lack of meaningful consultation and dialogue with stakeholders in project design and operation - transparency and candor
			MFA/EIS ignores serious aspects of a proper environmental assessment and promised to conduct studies on some effects such as bank stability and wildlife damage caused by summer operations – that defeats the purpose of an environmental assessment
			Flood study region upstream did no include the areas

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
			between Morris and Emerson that will experience artificial flooding

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
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Environmental Assessment Process	EIS	Information Gaps	<ul style="list-style-type: none"> - groundwater - bank stability - effects on fish - effects on wildlife - artificial flooding (past and future) - economic effects - sociological effects - environmental assessment
		Scope of EIS	The geographic scope of the project must be broadened
			There is a need to utilize an ecosystem-based approach in the preparation of the EIS
			It is unfortunate that the scope of the assessment focuses primarily on the right-of-way for the existing floodway
			The EIS incorrectly scopes some of the most serious socio-economic and health impacts out of the review
			The EIS wrongly defines the project as a modification
			Socio-economic impacts of the project on upstream residents were sidestepped
		Scope	Project should be referred to a federal environmental review – province has intentionally excluded all the really important issues from the review
			The environmental effects at elevation 778 ft at the inlet control structure have never been quantified
			Complete the LIDAR survey and assess effects of flooding on low-lying areas north of Winnipeg
		Operating Rules	No hearings have taken place to assess the rules at either the provincial or federal level
			Program of operation developed concurrently with the rest of the expansion project without due process but which

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
			have upstream effects that have not been examined
Environmental Assessment Process	EIS	Significance	The significance of the effects of operations of the floodway have been ignored and trivialized by the proponent because they were excluded by its flawed stance on what the environment is and what constitutes an environmental effect or a cumulative effects assessment
		Strategic Assessment	Manitoba must embark on a strategic planning process to review all the issues (past, present and future) and involve all the necessary parties to create a sound and cost-effective solution in lieu of the proposed Project
		Mitigation measures	The EIS avoids mitigation issues
		Accuracy of data	Terms "monitor" and "follow-up" should be more consistent with the definitions of the CEAA
		Adequacy of data	No information is provided on the responsibility and accountability of the Environmental Protection Plans
	Public consultation/ Involvement	Adequacy	Process for public information, for public recognition was neither inclusive nor comprehensive
		Effectiveness	The public participation process in the upstream area did not result in a single beneficial change to the project
		Community Liaison Committee	Community Liaison Committee (CLC) to receive and review information to make recommendations to the PRC
			Volunteers be recruited and paid a per diem to assist with PLC and its objectives
			CLC have authority to request technical support from either MFA and MWS
		Transparency	MFA and MWS increase transparency of scientific data

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
			and rationales upon which decisions are based
			MFA and MWS to communicate results to the CLC
Environmental Assessment Process	Public consultation/ Involvement	Transparency	Data and rationales for risk assessment and decisions should be made available to the public
			MFA to exercise care to maintain an objective and neutral stance to the public debate about risks and benefits of the human health risk assessment
		Floodway Advisory Board	Floodway Advisory Board to adequately represent RMs along the Red River and Floodway channel
	Alternatives	Range of Options	All reasonable alternatives to artificial flooding have not been addressed
			There is a range of options between all the benefit going to Winnipeg and all of it going to Ritchot
			There are many ways the whole system could be used to share the benefit of the Shellmouth Dam and Portage Diversion
			Project should be rejected as the alternatives have not been properly researched
		Cost Benefit Analysis	The MFA should be given the mandate to take alternative projects seriously. Alternatives require study, cost analysis and cost benefit ratios that do not exclude thousands of residents who should be included
		Independence	Engage an independent consulting firm to independently review all viable options for flood protection
		Scenarios	Use the newly developed modeling ability to study the area in detail under various scenarios including the Red, Seine and floodway

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
		Lake Winnipeg By-Pass	Province should be required to do an engineering study of a wide, shallow diversion channel direct to Lake Winnipeg

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
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Environmental Assessment Process	Alternatives	Lift Station	Province should be required to do an engineering study of a lift station at the floodway entrance to control summer flows
			Large pumps put at the entrance of the floodway could keep the water at a lower level and make it safer for Winnipeg
			A pumping station at the inlet would allow the floodway to be operated at any time without creating artificial flooding and affecting upstream properties, wildlife and fish passage
		Water Storage	A small portion of the Project budget should be devoted to the further exploration of wetland restoration and micro storage as key elements of a Red River basin solution
			Local watershed-based answers for flood control, water quality and other goals may ultimately be the most effective approach for achieving both Red River flooding and Lake Winnipeg water quality policy objectives
	Scope	Narrow scope	The scope of the EIS is too narrow
			The project by definition should be the floodway as a whole and not just the incremental effects
			Should include operating rules in the scope of the project
			Existing floodway should be that which existed just prior to the 1997 flood
			Effects of the existing floodway have not been assessed
		Operating Rules	The rules do not precede the project under review, they are integral to the project and within the scope of the EIS

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
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Environmental Assessment Process	Baseline	Date of Baseline	Baseline should be that which existed just prior to the 1997 flood
			The 1996 promise that the floodway would not be operated to cause artificial flooding should be used as the baseline for the environmental assessment
			Existing floodway interpreted to mean anything in place prior to 1997
			The environmental baseline must be either pre-floodway or the existing floodway as designed and built – not as operated
		Baseline Data	CEC set exactly how the baseline data will be collected immediately after completion of the expansion project and how public information will be undertaken and provided
	Baseline	Operating Rules	How something created unilaterally by the Province while the Project is under review can be seen as baseline environment boggles the mind
			The rules are not part of a past activity but are in fact concurrent with the physical expansion of the floodway and must be part of the review
	Mitigation	Costs	Costs of mitigating construction and operation effects of the project accrue to MFA and not RMs and residents
	Follow-up	Baseline	Conduct a proper monitoring program with a proper baseline not an evolving baseline
		Monitoring	Prepare a thorough monitoring program to include active and inactive operational periods for the floodway right-of-way
		Monitoring	Develop a thorough monitoring program for the area

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings			
Environment Component	Category of Comment	Issue	Comment
			serviced by the two aquifers
Environmental Assessment Process	Follow-up	EPPs	MC establish an independent peer review committee (PRC) for QA/QC in the implementation of the EPP
		Public Review Committee	PRC be given task of reviewing human health risk assessment and environmental construction and operation issues
			PRC be a non government independent panel of experts with representatives from MFA and RMs
			PRC report findings to the Community Liaison Committee
		Legislated Committee	Legislated committee to be given the responsibility and the funding to monitor and care for the health of the environment affected by the Red River north of the floodway and the communities it runs through
	Licencing	Approval	Evidence does not support recommending approval for an Environment Act licence for floodway expansion at this time
			CEC must take into account the full economic, social and human costs before recommending approval
			CEC recommend that the construction of the Project proceed without delay
		Conditions	Any licence for the project must be conditional on the province or the MFA or appropriate body setting up and funding a comprehensive compensation program including easements for adverse effects
			The CEC oversee application of the compensation program to outstanding claims
			All recommendations be binding on the operator as well

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
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			as the proponent
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Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
Environmental Assessment Process	Licencing	Review of Licence	Licence be reviewed in 5 years to determine if there are any adverse effects – public to be involved
	Cumulative Effects	Cumulative Effects	The potential and cumulative impacts on groundwater have not been adequately addressed
			Concerned about the narrow, restrictive approach taken regarding the cumulative impacts
			The EIS does not contain sufficient data and information about the existing Floodway to conduct an adequate cumulative effects assessment
			The EIS should acknowledge the incomplete nature of the information available to assess the cumulative impacts
			An Environmental Advisory Panel must be established to monitor cumulative effects
			The EIS does not conduct either a proper assessment or a cumulative effects assessment
			The EIS avoids the assessment of cumulative effects
			The EIS does not include any cumulative effects in combination with other projects
			The EIS is inadequate in its consideration for cumulative effects and socio-economic impacts
		Definition	CEAA requirements not satisfied
		Adequacy	Much of the information presented in the EIS comes from a misinterpretation and misrepresentation of the CEAA guidance information
			The approach advocated by the proponent is so patently unreasonable that it merits complete rejection

Summary of Public & Agency Comments – EIS, Supplemental Filing & CEC Public Hearings

Environment Component	Category of Comment	Issue	Comment
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Environmental Assessment Process	Cumulative Effects	Scope	The rules of operation are a key component of a proper cumulative effects analysis
		Operating Rules	The creation and application of the operating rules interact with the expansion of the floodway then they are part of the cumulative effects assessment
		Artificial Flooding	Upstream residents experience any number of these events and therefore must endure the cumulative frequency of these events

Appendix C

Summary of

Mitigation/Compensation/Follow-up

and Reporting Requirements

Environmental Management Plan

Approach

Throughout the EIS and Supplemental Filings, the MFA have proposed the development of a range of plans and actions for mitigating, monitoring and follow-up, as a means of ensuring that the adverse effects associated with the Project are properly addressed. In order to ensure that these plans are developed in a comprehensive and coordinated way, that they achieve the results desired and that the responsible and federal authorities are able to review and respond to the plans in a timely way, the responsible authorities will require the MFA to develop an overall environmental management plan (EMP) for the Project. The purpose of the EMP will be to describe how all of the environmental commitments (including but not limited to mitigation, monitoring and follow-up) outlined in this screening report, the EIS, Supplemental Filings and other documents provided by the MFA will be met during all phases of the Project. The EMP will provide the MFA with a management tool for ensuring that the adverse environmental effects associated with the Project are addressed appropriately. Elements to be addressed by the EMP include:

- o Construction Phase Environmental Protection Plans (CPEPP);
- o Operation Phase Environmental Protection Plans (OPEPP);
- o Environmental Inspection Plans;
- o Monitoring and Follow-up Plans;
- o Reporting Plans, and
- o Any other conditions of the environmental assessment approval and other environmental approvals and related conditions as appropriate.

The EMP will identify roles and responsibilities for ensuring that the EMP and its component parts are developed and completed and for ensuring the implementation of the required management actions to address potential adverse effects. The EMP will also identify an overall action plan for the preparation and submission of the required plans and other documents for review and approval. This action plan shall incorporate sufficient time for responsible authorities and appropriate federal authorities to review and discuss the plans with the MFA and other stakeholders as appropriate. The EMP should be developed and be based on consultation with stakeholders and reflect the principles of adaptive management and best management practices. It shall also describe how the MFA plans to consult with responsible authorities and other stakeholders during the construction, operation and maintenance phases of the Project.

The EMP shall also describe all of the other regulatory approvals required for the Project and the MFA's plans for obtaining these approvals. The EMP shall be provided to the responsible authorities for review and approval a minimum of 120 days prior to the initiation of construction. Should the MFA wish to initiate construction of specific components of the Project prior to the completion, review and approval of the EMP, it should notify the RAs of its intentions

Screening Report - Red River Floodway Expansion Project

Summary of Mitigation/Monitoring and Follow-up Requirements and provide component specific plans to the RAs for review and approval, reflecting the overall approach to environmental management described in this section.

Construction and Operation Phase Environmental Protection Plans (CPEPP & OPEPP)

As outlined in the EIS and Supplemental Filings, the MFA have proposed the development of environmental protection plans to provide and maintain environmental protection during the construction and operation phases of the Project. These Plans will describe the potential environmental impacts associated with the construction and operations phases of the Project and outline the measures to be implemented to mitigate those effects and to control pollution and environmental degradation that may occur. The Plans will also describe the plans and measures to be implemented during construction and operations to adaptively manage any adverse effects that may arise. Contingency plans outlining the actions necessary to address failure of any of the measures proposed in the Plans will also be an important element.

Environmental Inspection Plan

The responsible authorities consider that the approach to environmental protection must also include appropriate oversight during construction of the Project. Such oversight will help to ensure that mitigation measures are implemented according to plan and timely action can be taken to address unforeseen or unexpected situations during construction. The MFA will be required to develop an Environmental Inspection Plan, as a component of the Environmental Management Plan. The Environmental Inspection Plan shall outline in sufficient detail to demonstrate adequacy and effectiveness, how during the construction phase of the Project, the MFA intends to ensure compliance with the various environmental commitments outlined in this screening report, the EIS, Supplemental Filings and other documents submitted. The plans shall also:

- Identify positions accountable and responsible for environmental monitoring and ensuring compliance;
- Describe inspection procedures, including the authority of environmental inspectors and procedures for ensuring compliance and resolving conflicts; and
- Indicate required qualifications, including training and experience of individuals who will be undertaking inspection and monitoring responsibilities.

Environmental Monitoring and Follow-up Plan

The MFA shall describe in sufficient detail to demonstrate adequacy and effectiveness, the environmental monitoring plans to be implemented during construction, reclamation and operation phases of the Project. The plans shall be developed on an environmental component basis, as outlined in the EIS and Supplemental Filings and include:

- The objectives of the monitoring and follow-up program;
- Procedures for identifying and tracking environmental issues during construction, reclamation and operation of the Project;

Screening Report - Red River Floodway Expansion Project

Summary of Mitigation/Monitoring and Follow-up Requirements

- Procedures for resolving any environmental issues specific to the Project, including any sampling programs or site-specific investigations as appropriate;
- Procedures for monitoring the effectiveness of the mitigation measures implemented, including any reclamation activities and for assessing the accuracy of the effects predictions contained in this screening report, the EIS, Supplemental Filings and other documents submitted by the MFA;
- Procedures for adaptively managing any unforeseen adverse effects;
- Means for and frequency of reporting on the outcomes of the monitoring and follow-up program, and
- A description of the frequency and schedule for implementing the monitoring programs.

The Environmental Monitoring Plans shall be included within the overall Environmental Management Plan. In addition, environment component specific requirements for monitoring during construction and operation are also outlined in the relevant sections of this screening report.

Environmental Reporting

An important element of the overall environmental management plan for the Project is the ongoing reporting of environmental performance. This reporting will provide responsible authorities and other interested stakeholders with a level of confidence that the effects predictions contained in this screening report and in the MFA's submissions were accurate, that the effects associated with the Project are being addressed appropriately and consistent with the principles of adaptive management, provide a basis from which to adjust and refine mitigation to ensure its effectiveness.

The MFA will be required to outline within the EMP its plans for ongoing reporting of progress in implementing the project and ensuring compliance with the commitments and terms and conditions contained in this screening report and as outlined in the EIS and Supplemental Filings. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required. Time frames for reporting should be outlined in the EMP. RAs expect that where the Expanded Floodway is operated during the construction phase (if any), reports would be submitted to RAs for every operation. Following construction, reporting is expected on any operations during the first five years after completion of construction.

The methods of reporting could include, for example the development and submission of As-Built Reports following the completion of construction. These As-Built Reports could be completed by phase of project, by component, by season of construction. The MFA should specify in the EMP how and when it plans to report on progress. An As-Built Report would focus on the issues that arise during construction of the Project. As such it would be an

Screening Report - Red River Floodway Expansion Project

Summary of Mitigation/Monitoring and Follow-up Requirements
important building block upon which any additional post-construction reports will be based. The As-Built Report would discuss the mitigation measures implemented during construction and reclamation. It would discuss the effectiveness of the mitigation measures implemented and if measures were not successful, provide a description of the remedial measures implemented to accomplish the mitigation goal. Any outstanding issues would be outlined and the plans for their resolution described. Discussions with interested or affected stakeholders would also be described. An As-Built Report would also identify subsequent reporting requirements. There may also be a need for post-construction reporting annually for a minimum of two years following construction. The MFA should identify any such reporting requirements. Such post-construction reports (e.g. One-year After and Two-year After) would focus on the applied measures and status of issues since the last report and the effectiveness of those measures as appropriate.

Screening Report - Red River Floodway Expansion Project

Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Environmental Management Plan (EMP)	<ul style="list-style-type: none"> ○ The MFA shall provide to the RAs for review and approval prior to construction, a plan describing how all of the environmental commitments outlined in the screening report, EIS, Supplemental Filing and other supporting documents will be met during all phases of the project. ○ This plan should include an overall action plan for preparing and submitting the required plans and documents for review and approval, including the provision of sufficient time for RAs to review and approve. ○ The EMP should be based on consultation with stakeholders, reflect the principles of adaptive management and best management practices. It should also include plans for consultation with RAs and other affected stakeholders during construction and operation of the Project. ○ The EMP shall outline the MFAs plans for and content of the environmental protection plans to be implemented during construction (CPEPP) and during operation (OPEPP). The 	<ul style="list-style-type: none"> ○ See specific elements listed below. 	<ul style="list-style-type: none"> ○ See specific elements listed below. 	<ul style="list-style-type: none"> ○ See specific elements listed below.

Screening Report - Red River Floodway Expansion Project

Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Environmental Management Plan (EMP)	<p>CPEPP and OPEPP should include any contingency plans necessary in the event of the failure of any measures.</p> <ul style="list-style-type: none"> ○ The EMP shall include as a component, an Environmental Inspection Plan. This plan shall outline how the environmental inspection of construction is to be undertaken, including but not limited to the roles and responsibilities of environmental inspectors, reporting requirements and relationships, auditing requirements, dispute resolution mechanisms and qualifications. ○ The EMP shall describe how the MFA plans to report ongoing progress on the implementation of the Project and on ensuring compliance with the terms and conditions outlined in this screening report and in the EIS and Supplemental Filings. Reports would be provided to RA for information in order to verify the accuracy of the effects predictions and to ensure the effectiveness of mitigation measures. The EMP shall outline a schedule for reporting progress, including both during construction and on operations during the 5 years following the 			

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Environmental Management Plan (EMP)	<p>completion of construction.</p> <ul style="list-style-type: none"> ○ The EMP shall include the MFA's plans for monitoring and follow-up during construction and operations, consistent with the commitments outlined in this screening report, the EIS and Supplemental Filings. ○ The MFA will also provide for review by responsible authorities detailed procedures for administration of the mitigation fund, including processes for determining how funds are to be accessed, when and how decisions will be made and contingency plans in the event the fund is exhausted prior to the adverse effects of the project being fully resolved. ○ All other required regulatory approvals shall be obtained by MFA prior to construction. MFA's plans for obtaining these approvals are to be described in the EMP. ○ All environmental reports and records on the Project must be kept for audit purposes as required by the RAs. ○ MFA must provide reasonable access to the Project site during the construction phase to RA staff and/or their designates for inspection purposes. 			

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
<p>Surface Water Regime</p> <p>Surface Water Regime</p>	<ul style="list-style-type: none"> ○ In accordance with the EMP, the MFA submits to the RAs for review and approval prior to construction the CPEPP describing how surface water conveyance and management will be addressed during construction. ○ In accordance with the EMP, the MFA submits to the RAs for review and approval, the OPEPP for addressing flow regime and surface water conveyance and management issues during operations. ○ The MFA submits to the RAs for review prior to operation of the Expanded Floodway, the details regarding the compensation program provided for under the <i>Red River Floodway Act</i> and under Rule 4. This shall include how the compensation is to be administered and accessed. ○ The MFA to develop and submit for the review and approval by the RAs a plan for ensuring coordination of the operation of the Floodway and of the St. Andrew's Lock and Dam. This plan is to be developed in consultation with Public Works and Government Services Canada. ○ The MFA submits to the RAs for 	<ul style="list-style-type: none"> ○ The MFA implements specific measures identified in the CPEPP to address surface water management and conveyance. ○ The MFA to provide additional sandbags to those properties downstream of the Outlet affected by increased water levels due to the Project. ○ Compensation is implemented in accordance with the <i>Red River Floodway Act</i> and Rule 4. ○ RAs encourage Manitoba Water Stewardship to advance its proposal to acquire low-lying properties south of the Inlet Control Structure, subject to flooding when the Floodway is operated under Rule 4 and to investigate and act upon cost effective means of protecting low-lying lands that are prone to flooding as a result of non-spring emergency operation under Rule 4. 	<ul style="list-style-type: none"> ○ Installations of any measures are to be overseen by a qualified environmental inspector. ○ All measures are to be monitored following their installation to ensure proper functioning and successful mitigation of effects. Contingency plan to address failure to be implemented as appropriate. ○ Operation of the Expanded Floodway shall be monitored in accordance with the plan developed by MFA. 	<ul style="list-style-type: none"> ○ The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required;

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Surface Water Regime	<p>review and approval prior to operation of the Expanded Floodway, a Monitoring and Follow-up Plan for the surface water regime. The Plan shall describe how the operation of the Expanded Floodway will be monitored and any corrective actions required, should monitoring identify effects unanticipated by this assessment.</p>			
Groundwater	<ul style="list-style-type: none"> ○ The MFA develop and provide to the RAs for review and approval prior to construction, the CPEPP dealing with groundwater. The CPEPP shall include the site-specific groundwater protection plans for all sites where groundwater effects are predicted, including but not limited to the Highway 59 N Bridge, the Highway 15 bridge, CNR Redditt and CPR Keewatin Bridges, the Winnipeg Aqueduct, Dunning Road Crossing and in the Birds Hill/Oakbank area. These plans shall specify the specific monitoring and mitigation actions that will be undertaken to protect groundwater resources from adverse effects as a result of the Project. ○ The MFA will provide for review 	<ul style="list-style-type: none"> ○ The MFA implements the site-specific groundwater protection plans and any specific measures outlined in the Groundwater CPEPP. ○ The MFA implement the mitigation fund in accordance with approval provided by the RAs, in relation to unanticipated groundwater effects associated with the Project. ○ The MFA implement protection measures in relation to sensitive groundwater areas along the Floodway Channel, as outlined in the report to RAs. ○ The MFA implements the site-specific groundwater protection plans and any specific measures outlined in the Groundwater OPEPP. 	<ul style="list-style-type: none"> ○ Installations of any measures are to be overseen by a qualified environmental inspector. ○ All measures are to be monitored following their installation to ensure proper functioning and successful mitigation of effects. Contingency plan to address failure to be implemented as appropriate. ○ When the Expanded Floodway is operated it shall be monitored in accordance with the plan developed by MFA. 	<ul style="list-style-type: none"> ○ The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required;

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Groundwater	<p>by responsible authorities detailed procedures for administration of the mitigation fund, including processes for determining how funds are to be accessed, when and how decisions will be made and contingency plans in the event the fund is exhausted prior to the adverse effects of the project being fully resolved.</p> <ul style="list-style-type: none"> ○ The CPEPP shall include any contingency plans for addressing required actions in the event of a failure of any of the proposed mitigation measures or works. ○ The CPEPP shall outline how the MFA, in consultation with Rural Municipalities, will identify sensitive groundwater areas along the Floodway Channel and develop a model for determining whether further mitigation measures are necessary to ensure these areas are protected from effects as a result of the Project. Use of a health-based risk assessment approach should be considered. The MFA shall report to the RAs how it will address sensitive groundwater areas and the results of the consultations with Rural Municipalities, prior to 			

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Groundwater	<p>construction.</p> <ul style="list-style-type: none"> ○ The CPEPP will outline the MFA's plans for on-going and site-specific groundwater monitoring. This plan shall be provided prior to construction. The plan shall include how the MFA intends to consult with stakeholders during the implementation of the plan. The MFA shall also indicate how the MFA's groundwater monitoring program will relate to the proposed regional groundwater study. The RAs note that this study will be an important component in assisting in addressing cumulative effects associated with the project and support its development and implementation. ⊖ MFA develop and provide to the RAs for review and approval, procedures for responding to and addressing any complaints regarding potential effects on groundwater received during construction and operation of the Project. ○ In accordance with the EMP, the MFA submits to the RAs for review and approval prior to operations of the Project, the OPEPP for addressing groundwater issues during 			

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
	<p>operations. The OPEPP will also include any contingency plans necessary in the event of a failure of any of the proposed measures;</p>			
<p>Erosion and Sediment Control Erosion and Sediment Control</p>	<ul style="list-style-type: none"> ○ MFA develop and provide to the RAs for review and approval prior to construction, the Sediment and Erosion Control Plan. This plan shall include the site-specific sediment and erosion control plans for all sites where erosion and sedimentation effects are predicted. These plans shall specify the specific monitoring and mitigation actions that will be undertaken to prevent erosion and sedimentation effects as a result of the Project. The plans shall also describe how the predictive model will be verified with actual data and outline the actions necessary to adaptively manage any adverse effects should results differ from predictions. ○ The MFA provide for the review and approval by the RAs its plans for long-term monitoring of riverbank stability in the areas upstream and downstream of the Inlet Control Structure. The plan should also outline any actions to be taken to adaptively 	<ul style="list-style-type: none"> ○ The MFA implements the site-specific erosion and sediment control plans and any specific measures outlined in the Erosion and Sediment Control Plan and CPEPP. ○ The MFA implements any contingency plans to address failure of any erosion or sediment control mitigation measures or works. ○ The MFA implements the site-specific erosion and sediment control plans and any specific measures outlined in the Erosion and Sediment Control Plan and OPEPP. 	<ul style="list-style-type: none"> ○ Installations of any measures are to be overseen by a qualified environmental inspector. ○ All measures are to be monitored following their installation to ensure proper functioning and successful mitigation of effects. Contingency plan to address failure to be implemented as appropriate. ○ Operation of the Expanded Floodway shall be monitored in accordance with the plan developed by MFA. 	<ul style="list-style-type: none"> ○ The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required;

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Erosion and Sediment Control	<p>manage adverse effects associated with the Project, particularly with operations in accordance with Rule 4.</p> <ul style="list-style-type: none"> ○ In accordance with the EMP, the MFA submits to the RAs for review and approval prior to operations of the Project, the OPEPP for addressing erosion and sedimentation issues during operations. ○ The MFA submits to the RAs for review and approval prior to operation of the Expanded Floodway, a Monitoring and Follow-up Plan for erosion and sediment control. The Plan shall describe how the operation of the Expanded Floodway will be monitored and identify any corrective actions required, should monitoring identify effects unanticipated by this assessment. 			
Drainage	<ul style="list-style-type: none"> ○ MFA develop and provide to the RAs for review and approval prior to construction, the CPEPP detailing the surface water conveyance and management measures to be undertaken, including measures in respect of drainage.. ○ In accordance with the EMP, the MFA submits to the RAs for review and approval prior to 	<ul style="list-style-type: none"> ○ The MFA implements the site-specific surface water conveyance and management plans and any specific measures outlined in CPEPP. ○ The MFA implements the site-specific surface water conveyance and management plans and any specific measures outlined in OPEPP. ○ The MFA maintains existing 	<ul style="list-style-type: none"> ○ Installations of any measures are to be overseen by a qualified environmental inspector. ○ All measures are to be monitored following their installation to ensure proper functioning and successful mitigation of effects. Contingency plan to address failure to 	<ul style="list-style-type: none"> ○ The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Drainage	<p>operations of the Project, the OPEPP for addressing drainage issues during operations.</p> <ul style="list-style-type: none"> ○ The MFA submits to the RAs for review and approval prior to operation of the Expanded Floodway, a Monitoring and Follow-up Plan for the surface water regime. The Plan shall describe how the operation of the Expanded Floodway will be monitored and identify any corrective actions required, should monitoring identify effects unanticipated by this assessment. 	<p>drains until replacements are in place and operational.</p> <ul style="list-style-type: none"> ○ The MFA schedules construction during low flow periods. ○ The MFA installs and maintains pumps at the three downstream drains to prevent backwater flooding during flood events. 	<p>be implemented as appropriate.</p> <ul style="list-style-type: none"> ○ Operation of the Expanded Floodway shall be monitored in accordance with the plan developed by MFA. 	<p>information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required;</p> <ul style="list-style-type: none"> ○
Climate, Air Quality and Noise	<ul style="list-style-type: none"> ○ The MFA develop and provide to the responsible authorities for review and approval prior to construction, the CPEPP detailing dust and noise control measures to be undertaken during construction. Any assessments of noise or dust levels completed to support the CPEPP shall be provided as well. ○ The MFA develop and provide to the responsible authorities for review and approval, procedures for responding to and addressing any dust or noise complaints received during construction of the Project. 	<ul style="list-style-type: none"> ○ The MFA implements the dust control and noise protection measures outlined in CPEPP. ○ The MFA implements any contingency plans to address failure of any mitigation measures or works. ○ The MFA responds to complaints regarding dust or noise effects associated with construction of the Project in accordance with the procedures approved by the responsible authorities. 	<ul style="list-style-type: none"> ○ Installations of any measures are to be overseen by a qualified environmental inspector. ⊖ All measures are to be monitored following their installation to ensure proper functioning and successful mitigation of effects. Contingency plan to address failure to be implemented as appropriate. 	<ul style="list-style-type: none"> ⊖ The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Climate, Air Quality and Noise				being employed and to verify the use of adaptive management if required; ⊖ A report summarizing the complaints received and the actions taken in response to those complaints shall be provided in accordance with a schedule outlined in the EMP to the RAs for information.
Soils	<ul style="list-style-type: none"> ○ MFA develop and provide to the responsible authorities for review and approval prior to construction, the CPEPP detailing the mitigation measures to be implemented during spoil disposal; 	<ul style="list-style-type: none"> ○ The MFA implements the mitigation measures outlined in the CPEPP. ○ The MFA implements any contingency plans to address to address failure of any works related to spoil disposal. 	<ul style="list-style-type: none"> ○ Installations of any works relative to spoil disposal are to be overseen by a qualified environmental inspector. ○ All works relative to spoil disposal are to be monitored following their installation to ensure proper functioning and successful mitigation of effects. Contingency plans to address failure of any mitigation measures to be implemented as appropriate. 	<ul style="list-style-type: none"> ○ The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required; ○ The RAs note that there

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Soils				<p>may be opportunities to improve flood protection in the flood study region through the use of excess spoil materials associated with the expansion of the floodway channel. The RAs encourage the MFA to actively explore the use of this spoil material to improve flood protection in the flood study region.</p>
Surface Water Quality	<ul style="list-style-type: none"> ○ In accordance with the EMP, the MFA submits to the RAs for review and approval prior to construction the CPEPP and Sediment and erosion control plans describing how surface water quality will be addressed during construction. ○ In accordance with the EMP, the MFA submits to the RAs for review and approval, the Maintenance Manual and OPEPP for addressing surface water quality issues during operations. ○ The MFA submits to the RAs for review and approval prior to operation of the Expanded Floodway, a Monitoring and Follow-up Plan for the surface water regime. The Plan shall describe how the operation of the Expanded Floodway will be 	<ul style="list-style-type: none"> ○ The MFA implements the site-specific erosion and sediment control plans and any specific measures outlined in the Erosion and Sediment Control Plan and CPEPP. ○ The MFA implements any contingency plans to address failure of any erosion or sediment control mitigation measures or works. ○ The MFA implements the site-specific erosion and sediment control plans and any specific measures outlined in the Erosion and Sediment Control Plan and OPEPP 	<ul style="list-style-type: none"> ○ Installations of any measures are to be overseen by a qualified environmental inspector. ○ All measures are to be monitored following their installation to ensure proper functioning and successful mitigation of effects. Contingency plan to address failure to be implemented as appropriate. ○ Operation of the Expanded Floodway shall be monitored in accordance with the plan developed by MFA. 	<ul style="list-style-type: none"> ○ The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required.

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
	<p>monitored and identify any corrective actions required, should monitoring identify effects unanticipated by this assessment.</p>			
<p>Fish and Fish Habitat</p> <p>Fish and Fish Habitat</p>	<ul style="list-style-type: none"> ○ The MFA develop and provide to the RAs for review and approval prior to construction, the CPEPP dealing with fish and fish habitat. The CPEPP shall include the site-specific fish and fish habitat protection plans for all sites where effects are predicted, including but not limited to West Bank of the Red River (downstream of the Outlet Structure), Inlet Control Structure, Floodway Channel, Outlet Structure, Floodway Drains, West Dyke Drains and Culverts and the Seine River at Prairie Creek Road. These plans shall specify the specific pre and post-construction monitoring, monitoring in respect to floodway operations and mitigation actions that will be undertaken to protect fish and fish habitat from adverse effects as a result of the Project. The CPEPP will also include any contingency plans outlining actions necessary in the event of a failure of any of the proposed measures. 	<ul style="list-style-type: none"> ○ The MFA implements the mitigation measures outlined in the CPEPP. This shall include the site-specific fish and fish habitat plans for the sites previously noted. This will include, but not be limited to construction scheduling requirements to meet DFO's requirements for in-water construction timing, water management during dewatering, sediment and erosion control measures, fish and clam salvage, revegetation requirements, countersinking culverts into the bed of the drain, construction sequencing, maintenance of sufficient depth of flows and maintenance of fish passage. ○ The MFA implements the habitat compensation measures as prescribed by DFO in any <i>Fisheries Act</i> authorizations. ○ The MFA provides for fish passage at the Inlet Control Structure during operations of the Floodway under Rule 4, as determined by the FTEC. ○ The MFA implements the 	<ul style="list-style-type: none"> ○ Installations of any measures are to be overseen by a qualified aquatic specialist. ○ All measures are to be monitored following their installation to ensure proper functioning and successful mitigation of effects. Contingency plan to address failure to be implemented as appropriate. ○ Operation of the Expanded Floodway shall be monitored in accordance with the plan developed by MFA. 	<ul style="list-style-type: none"> ○ The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required.

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Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Fish and Fish Habitat	<ul style="list-style-type: none"> ○ Detailed design has not been completed for the entire project. Therefore, final HADD determinations cannot be completed. Through the recent submissions (MFA 2005) worst case scenarios have been assumed and mitigation and compensation requirements determined. Details will continue to be developed through the EMP, CPEPP, and the applications for authorizations under the <i>Fisheries Act</i>. MFA to provide these Plans and applications to the RAs for review and approval. ○ Preferred fish habitat compensation priorities and options are listed in DFO (1998) and in order of descending preference are: <ul style="list-style-type: none"> ● Create similar habitat at or near the development site within the same ecological unit. ● Create similar habitat in a different ecological unit that supports the same stock or species. ● Increase the productive capacity of existing habitat at or 	mitigation measures outlined in the OPEPP in relation to fish and fish habitat.		

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Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Fish and Fish Habitat	<p>near the development site and within the same ecological unit.</p> <ul style="list-style-type: none"> • Increase the productive capacity of a different ecological unit that supports the same stock or species. • Increase the productive capacity of existing habitat for a different stock or a different species of fish either on- or off-site. <ul style="list-style-type: none"> ○ Further site-specific investigations of the options will be required for inclusion in the Final Fish Habitat Compensation Plan. This Plan would form part of the applications for authorization submitted to DFO under the <i>Fisheries Act</i>. The MFA will complete the Final Fish Habitat Compensation Plan in consultation with DFO and submit it along with the required applications for authorizations under the <i>Fisheries Act</i>. ○ The MFA is to establish and support a Fisheries Technical Experts Committee with membership/representation from a wide range of disciplines and 			

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Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Fish and Fish Habitat	<p>jurisdictions related to fish and fish habitat. The FTEC would review and provide advice to the Project Oversight Committee on whether the mitigation measures identified in the screening report, EIS and Supplemental Filings, related to fish and fish habitat issues, have been adequately implemented. The FTEC would review and provide advice to the Oversight Committee on all of the plans developed to address fish and fish habitat issues. The FTEC would also examine and provide advice to the Oversight Committee on the further evaluation of fish passage effects and compensation options.</p> <ul style="list-style-type: none"> ○ To ensure that there are no additional impacts due to operation of the Floodway under Rule 4, it is the position of the RA's that unless scientific studies demonstrate otherwise, fish passage must be provided for at the Inlet Control Structure. This passage shall be assessed and designed in collaboration with the FTEC to meet the requirements of the species in the river and to maintain integrity of the flood protection structures. The MFA will 			

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Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Fish and Fish Habitat	<p>continue the study of fish movement at the Floodway Inlet Control Structure and provides the results to DFO and the FTEC for review.</p> <ul style="list-style-type: none"> ○ The MFA submits to the RAs for review and approval prior to operation of the Expanded Floodway, a Monitoring and Follow-up Plan for the surface water regime. The Plan shall describe how the operation of the Expanded Floodway will be monitored and identify any corrective actions required, should monitoring identify effects unanticipated by this assessment. 			
Vegetation	<ul style="list-style-type: none"> ○ The MFA develop and provide to the RAs for review and approval prior to construction, the CPEPP detailing the re-vegetation measures to be undertaken. As part of the CPEPP, the re-vegetation plan shall <ul style="list-style-type: none"> ○ Identify the objectives underlying the plan; ○ Describe the re-vegetation measures to be implemented at the various project locations; ○ Describe the monitoring program to be implemented to 	<ul style="list-style-type: none"> ○ The MFA implements the re-vegetation measures outlined in CPEPP and the OPEPP. ○ The MFA implements any contingency plans to address failure of any mitigation measures or works. ○ The MFA implements the plan for monitoring for and addressing protected plant species found during construction. 	<ul style="list-style-type: none"> ○ Installations of any measures are to be overseen by a qualified environmental inspector. ○ All measures are to be monitored following their installation to ensure proper functioning and successful mitigation of effects. Contingency plan to address failure to be implemented as appropriate. ○ Operation of the Expanded Floodway shall be monitored in accordance with the plan 	<ul style="list-style-type: none"> ○ The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the

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Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Vegetation	<ul style="list-style-type: none"> ensure re-vegetation success; o Describe the measures to be taken to adaptively manage any adverse effects, and o Describe the frequency and approach to reporting progress on the re-vegetation plan; o Prior to the initiation of construction, the MFA complete plant surveys of the areas to be affected by construction. The results of the surveys shall be provided to the RAs and include a description of any measures required to address and adaptively manage any adverse effects. o The MFA develop and provide to the RAs for review and approval procedures for addressing protected plant species should they be found during follow-up activities; o The MFA submits to the RAs for review and approval prior to operation of the Expanded Floodway, a Monitoring and Follow-up Plan for vegetation. The Plan shall describe how the operation of the Expanded 		developed by MFA.	effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required;

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Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Vegetation	<p>Floodway will be monitored and identify any corrective actions required, should monitoring identify effects unanticipated by this assessment. This plan shall include requirements for monitoring re-vegetation success, both immediately following construction and during operation of the Expanded Floodway. The plan should also address weed management.</p> <ul style="list-style-type: none"> ○ MFA develop and provide to the responsible authorities prior to operation of the Project the OPEPP detailing the plans and measures to be undertaken to maintain and manage vegetation; 			
Wildlife and Wildlife Habitat	<ul style="list-style-type: none"> ○ The MFA develop and provide to the responsible authorities for review and approval prior to construction, the CPEPP detailing the measures to be taken in relation to wildlife, wildlife habitat and re-vegetation. ○ The MFA develop and provide to the responsible authorities for review and approval procedures for addressing protected species should they be found during construction activities. ○ The MFA submits to the RAs for 	<ul style="list-style-type: none"> ○ The MFA implements the re-vegetation measures and wildlife and wildlife habitat mitigation measures outlined in CPEPP. ○ The MFA schedules construction to avoid sensitive time periods for wildlife. ○ The MFA implements any contingency plans to address failure of any mitigation measures or works. ○ The MFA implements the plan for monitoring for and addressing protected wildlife species found during construction. 	<ul style="list-style-type: none"> ○ Installations of any measures are to be overseen by a qualified environmental inspector. ○ All measures are to be monitored following their installation to ensure proper functioning and successful mitigation of effects. Contingency plan to address failure to be implemented as appropriate. ○ Operation of the Expanded Floodway shall 	<ul style="list-style-type: none"> ○ The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Wildlife and Wildlife Habitat	<p>review and approval prior to operation of the Expanded Floodway, a Monitoring and Follow-up Plan for wildlife and wildlife habitat. The Plan shall describe how the operation of the Expanded Floodway will be monitored and identify any corrective actions required, should monitoring identify effects unanticipated by this assessment. The Plan shall include requirements for on-going monitoring of re-vegetation success and wildlife and wildlife habitat;</p> <ul style="list-style-type: none"> ○ MFA develop and provide to the responsible authorities prior to operation of the Project the OPEPP detailing the plans and measures to be undertaken to maintain and manage vegetation, wildlife and wildlife habitat. The OPEPP will also include any contingency plans necessary in the event of a failure of any of the proposed measures; ○ The MFA will consult with the RAs, Environment Canada and Manitoba Conservation in the development of a plan and specific measures to minimize the impact to wildlife and wildlife habitat of operations under Rule 	<ul style="list-style-type: none"> ○ The MFA implements the re-vegetation measures and wildlife and wildlife habitat mitigation measures outlined in OPEPP. 	<p>be monitored in accordance with the plan developed by MFA.</p>	<p>Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required;</p> <ul style="list-style-type: none"> ○

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
	those species considered at risk.			
Resource Use	<ul style="list-style-type: none"> ○ MFA develop and provide to the responsible authorities for review and approval prior to construction, the CPEPP detailing the measures to be taken in relation to resource use issues. The CPEPP should include a traffic management plan and the MFA shall consult with the Manitoba Transportation and local communities in regards to the traffic management measures proposed. ○ MFA advise the Peguis First Nation regarding its construction plans, methods and schedules in the area where potential medicinal plants are located (west bank of Red River downstream of the Outlet Structure). The MFA shall enlist PFN members to complete the plant survey and to develop and advise on protection measures, such as replanting or designating plant protected areas. Any plans developed should seek to avoid impacts where possible, then to minimize any effects which cannot be avoided. ○ MFA shall report to the RAs the results of the discussions with 	<ul style="list-style-type: none"> ○ The MFA shall implement the measures relative to resource use outlined in the CPEPP. ○ The MFA shall implement the agreed upon procedures for addressing medicinal plants should they be found during construction. ○ The MFA shall implement the protection measures agreed to with the Peguis First Nation in relation to St. Peter's Oldstone Church and Cemetery. ○ The MFA shall implement any measures agreed to with the Peguis First Nation in relation to gravesites on IR II. ○ The RAs also encourage and support the plans of Manitoba Water Stewardship to acquire those low-lying lands (as requested by some of the property owners) south of the Inlet Control structure that are subject to flooding during operations under Rule 4. 	<ul style="list-style-type: none"> ○ Installations of any measures are to be overseen by a qualified environmental inspector. ○ All measures are to be monitored following their installation to ensure proper functioning and successful mitigation of effects. Contingency plan to address failure to be implemented as appropriate. ○ Operation of the Expanded Floodway shall be monitored in accordance with the plan developed by MFA. 	<ul style="list-style-type: none"> ○ The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required.

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Resource Use	<p>the Peguis First Nation and the procedures agreed upon to identify and protect medicinal plant species should they be found during the plant survey;</p> <ul style="list-style-type: none"> ○ MFA shall consult with the Peguis First Nation on protection measures such as construction of a wall along the riverbank, to afford protection to the St. Peter's Oldstone Church and Cemetery as a result of increased flows downstream of the Outlet Structure. ○ The MFA shall consult with the Peguis First Nation regarding the need for similar protection from increased flows that may be required for gravesites on Indian Reserve (IR) II. The MFA shall report the results of those discussions with the responsible authorities and outline and measures to be taken as a result. ○ MFA develop and provide for review and approval by responsible authorities in accordance with the schedule outlined in the EMP, its plans for monitoring and follow-up in relation to resource use issues; ○ MFA should to the extent possible encourage parties to act promptly in the assessment 			

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
	<p>and payment of claims for flood damages, in order to reduce the stress and financial difficulties experienced by claimants. Any report prepared by the Manitoba Water Commission in relation to a major flood event, should be provided to the RAs with proposals by the MFA to respond to the recommendations, during the construction period and following the initial use of the expanded Floodway;</p>			
<p>Economy</p>	<ul style="list-style-type: none"> ○ The MFA submits to the RAs for review prior to operation of the Expanded Floodway, the details regarding the compensation program provided for under the <i>Red River Floodway Act</i> and Rule 4. This shall include how the compensation is to be administered and accessed. 	<ul style="list-style-type: none"> ○ Compensation is implemented in accordance with the <i>Red River Floodway Act</i> and Rule 4. ○ The RAs also encourage and support the plans of Manitoba Water Stewardship to acquire those low-lying lands (as requested by some of the property owners) south of the Inlet Control structure that are subject to flooding during operations under Rule 4. Where purchase of flood prone properties is not feasible, consideration should be given to the identification and implementation of other cost-efficient measures to enhance flood protection. 	<ul style="list-style-type: none"> ○ Operation of the Expanded Floodway shall be monitored in accordance with the plan developed by MFA. 	<ul style="list-style-type: none"> ○ The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
				management if required.
Infrastructure and Services	<ul style="list-style-type: none"> ○ The MFA develop and provide to the responsible authorities for review and approval prior to construction, the CPEPP detailing the measures to be taken in relation to potential effects to infrastructure and services, including maintenance of access and emergency service provisions. The CPEPP should include a traffic management plan and the MFA shall consult with the Manitoba Transportation and local communities in regards to the traffic management measures proposed. In addition, the traffic management plan should take into account the provision of emergency service in the RM of St. Clements while the Dunning Crossing is closed. ○ The CPEPP will outline the site-specific groundwater protection plans for all sites where groundwater effects are predicted. These plans shall specify the specific monitoring and mitigation actions that will be undertaken to protect groundwater resources from adverse effects as a result of the Project. ○ With respect to water supply, the 	<ul style="list-style-type: none"> ○ The MFA implements the infrastructure and services mitigation measures outlined in CPEPP. ○ The MFA schedules construction to avoid sensitive time periods relative to infrastructure and services (access, traffic, farm equipment and emergency services). ○ The MFA implements any contingency plans to address failure of any mitigation measures or works. ○ The MFA implements the plan for on-going monitoring relative to infrastructure and services issues (see also Groundwater). 	<ul style="list-style-type: none"> ○ Installations of any measures are to be overseen by a qualified environmental inspector. ○ All measures are to be monitored following their installation to ensure proper functioning and successful mitigation of effects. Contingency plan to address failure to be implemented as appropriate. ○ Operation of the Expanded Floodway shall be monitored in accordance with the plan developed by MFA 	<ul style="list-style-type: none"> ○ The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required.
Infrastructure and Services				

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Infrastructure and Services	<p>plans for mitigation should reflect the principle that the project should not disrupt water supply and the MFA should take measures as may be needed to ensure secure and reliable water supply during the construction phase and thereafter as necessary;</p> <ul style="list-style-type: none"> ○ The MFA will provide to responsible authorities and other interested parties detailed procedures for administration of the mitigation fund, including processes for determining how funds are to be accessed, when and how decisions will be made and contingency plans in the event the fund is exhausted prior to the adverse effects of the project being fully resolved. ○ MFA develop and provide for review and approval by responsible authorities in accordance with the schedule outlined in the EMP, its plans for monitoring and follow-up in relation to infrastructure and services issues; 			
Personal, Family and Community Life	<ul style="list-style-type: none"> ○ The MFA develop and provide to the responsible authorities for review and approval prior to construction, the CPEPP detailing the measures to be taken in relation personal, family 	<ul style="list-style-type: none"> ○ The MFA implements the personal, family and community life mitigation measures outlined in CPEPP. ○ Compensation is implemented in accordance with the <i>Red River</i> 	<ul style="list-style-type: none"> ○ Operation of the Expanded Floodway shall be monitored in accordance with the plan developed by MFA. 	<ul style="list-style-type: none"> ○ The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
<p>Personal, Family and Community Life</p>	<p>and community life. The CPEPP should include a traffic management plan as previously noted.</p> <ul style="list-style-type: none"> ○ The MFA develop and provide to the responsible authorities for review and approval prior to construction its plan for on-going stakeholder involvement in construction and operation of the Project. ○ The MFA will provide to the responsible authorities the detailed procedures for administration of the mitigation fund, including processes for determining how funds are to be accessed, when and how decisions will be made and contingency plans in the event the fund is exhausted prior to the adverse effects of the project being fully resolved. ○ The MFA provides the RAs, prior to operation of the Expanded Floodway, the details regarding the compensation program provided for under the <i>Red River Floodway Act</i> and as outlined under Rule 4. This shall include how the compensation is to be administered and accessed. ○ MFA develop and provide for review and approval by 	<p><i>Floodway Act</i> and Rule 4.</p> <ul style="list-style-type: none"> ○ The RAs also encourage and support the plans of Manitoba Water Stewardship to acquire those low-lying lands (as requested by some of the property owners) south of the Inlet Control structure that are subject to flooding during operations under Rule 4. ○ In addition, the RAs encourage the MFA and Manitoba Water Stewardship to develop a plan for flood protection throughout the Red River Valley; engage in ongoing and meaningful consultation with stakeholders who are affected by artificial flooding caused by the Floodway operation in order to develop agreements as a compensation mechanism; and examine the development of a independent, third party appeals process as part of the proposed compensation program. 		<p>and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required.</p>

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
	<p>responsible authorities in accordance with the schedule outlined in the EMP, its plans for monitoring and follow-up in relation to personal, family and community life issues. This should include addressing potential issues of migration and shifts in home valuation related to flood events.</p> <ul style="list-style-type: none"> ○ It has been stated by the MFA that construction of any future approved recreational development would be incorporated into the end of project construction. It is important to note that such proposals are not included in the scope of this assessment and have not been assessed. Any plans to undertake recreational development as part of the Floodway Expansion project should be submitted to the RAs who will determine whether the screening report will require revision to reflect any changes to the Project. 			
Health	<ul style="list-style-type: none"> ○ Responsible authorities, on the advice of Health Canada, believe that collaboration with public health and emergency response authorities within the flood study region is a process that will ensure that prompt 	<ul style="list-style-type: none"> ○ The MFA and public health authorities and emergency services sectors as appropriate implements the mitigation measures identified through the communications initiative and workshop. 	<ul style="list-style-type: none"> ○ Operation of the Expanded Floodway shall be monitored in accordance with the plan developed by MFA. 	<ul style="list-style-type: none"> ○ The MFA report on the on-going progress in implementing the project and in ensuring compliance with the commitments and terms and conditions in

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Health	<p>action will be taken to minimize any adverse effects associated with the Project. To initiate this process, a workshop(s) with the health and emergency services sectors will be organized by the MFA. This proactive measure will promote health protection within the Floodway Study Region by ensuring key stakeholders are involved in the Project.</p> <ul style="list-style-type: none"> ○ The MFA develop and provide to the RAs its communication and consultation plans aimed at promoting compliance with evacuation orders during flood events. ○ The MFA shall also provide to the RAs, its plans for consultation with the Regional Health Authorities emergency service providers during all phases of the Project and specifically how it intends to consult these groups during operation of the Floodway. ○ The MFA and public health authorities as appropriate, develop a plan for health follow-up and monitoring in relation to the Expanded Floodway. 			<p>accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required</p> <ul style="list-style-type: none"> ○
Heritage Resources	<ul style="list-style-type: none"> ○ MFA develop and provide to the responsible authorities for review and approval prior to 	<ul style="list-style-type: none"> ○ The MFA implements the plan for monitoring for and addressing heritage resources found during 	<ul style="list-style-type: none"> ○ Inspections and/or installations of any works are to be overseen by a 	<ul style="list-style-type: none"> ○ The MFA report on the on-going progress in implementing the project

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Heritage Resources	<p>construction, the CPEPP detailing the measures to be taken with regards to the discovery, protection and salvage of heritage resources.</p> <ul style="list-style-type: none"> ○ The CPEPP shall also include the specific actions to be undertaken during the implementation of the erosion protection measures upstream and downstream of the embankments adjacent to the Inlet Control Structure, including actions necessary to identify any heritage resources present and any measures necessary to mitigate adverse effects to those resources; ○ Where the Floodway Channel is being widened at the Seine River Crossing, the CPEPP shall outline whether the widening can be accomplished without disturbing the upper one metre of soil (through widening only the lower slopes of the channel). If such an approach cannot be accomplished, the MFA shall outline the measures to be taken in regards to the discovery, protection and salvage of any heritage resources that may be present; ○ At the Outlet Structure, archaeological monitoring 	<p>construction.</p> <ul style="list-style-type: none"> ○ The MFA implements the site-specific heritage resources protection and management plans and any specific measures outlined in CPEPP. ○ The MFA places gravel or other fill over the vehicle ruts south of the Outlet Structure to protect heritage resources. ○ The MFA implements any contingency plans to address failure of any mitigation measures or works. 	<p>heritage resource expert/archaeologist.</p> <ul style="list-style-type: none"> ○ All works are to be monitored following their installation to ensure proper functioning and successful mitigation of effects. Contingency plan to address failure to be implemented as appropriate. ○ Operation of the Expanded Floodway shall be monitored in accordance with the plan developed by MFA. 	<p>and in ensuring compliance with the commitments and terms and conditions in accordance with the provisions of the EMP. Reports would be provided to RAs for information in order to verify the accuracy of the effects predictions contained in the EIS and Supplementary Filings, the ensure the effectiveness of the mitigation measures being employed and to verify the use of adaptive management if required.</p>

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Heritage Resources	<p>should be undertaken in the areas north of the existing channel, where the widening of the structure is proposed to occur. The CPEPP shall outline the measures to be taken in regards to the discovery, protection and salvage of any heritage resources present;</p> <ul style="list-style-type: none"> ○ The CPEPP shall include the specific actions to be undertaken during the implementation of the erosion protection measures on west bank of the Red River downstream of the Outlet Structure, including actions necessary to identify any heritage resources present and any measures necessary to mitigate adverse effects to those resources; ○ The CPEPP shall include the specific actions to be undertaken during the construction of new bridges/culverts and associated roads at St. Mary's Road, Trans Canada East bridge, PTH 44, CPR Emerson/Seine River Crossing and CEMR Pine Falls rail bridge, including actions necessary to identify any heritage resources present and any measures necessary to 			

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Navigation	<p>policy for any in-water projects located in navigable bodies of water. Habitat compensation plans are being developed and once finalized, the proposed projects will be reviewed under the NWPAs prior to commencement of construction, Transport Canada will review the proposed fish habitat compensation plans and identify any necessary measures to mitigate any potential impacts on navigation safety. These mitigation measures may include but are not limited to marking underwater hazards with buoys or lights and the installation of signage or other public notification tools.</p>	<p>warning lighting system and must advise the boating public that no thru-passage will be possible for the specified period;</p> <ul style="list-style-type: none"> ○ "No Thru-Passage" warning signs must be placed and maintained on both sides of the Red River 300m downstream of the structure facing downstream and on both sides of the Red River at the southern extreme of the entrance to the Floodway Channel facing upstream; ○ The "No Thru-Passage" warning signs located at the Floodway Channel entrance must display black lettering on a yellow background and be of sufficient size to be clearly legible in all local ambient conditions from a distance of 200m; ○ The "No Thru-Passage" warning signs located at the Floodway Channel entrance are to include a warning lighting system with a flashing amber light operated for 24hr prior to raising of the Floodway gates and a steady red light at all times when the gates are not in the fully down position; ○ A public boat ramp permitting boaters to either remove their vessels from the waterway will be installed and maintained in close proximity to both the up and down 		

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Navigation		<p>stream " Last Chance " signs located on the west bank of the Red River but out of the "No Thru-Passage" area. The design of the ramp must allow for easy use in all but extreme flood conditions;</p> <ul style="list-style-type: none"> ○ A public announcement will be made on all major local radio stations as well as major local newspapers to advice the boating public of pending gate operation at least 24 hours prior to raising of the gate. This announcement should advise of the restriction to navigation caused by the inlet control structure as well as the potential for turbulent waters at or near the outlet structure; ○ Where weather conditions allow, flows through the Seine River Siphon will be maintained at sufficient level to maintain safe navigation along the length of the Seine River, approximately 1m³/s according to the Environment Canada Water Survey of Canada - Archived Hydrometric Survey; ○ Signage will be placed upstream of the Seine River Siphon at the junction of the natural river and the man-made channel to advice boaters of the termination to navigation at the siphon structure; ○ Signs will be placed on or near 		

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Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Navigation		<p>the Seine River Siphon warning the boating public to stay clear of the structure;</p> <ul style="list-style-type: none"> ○ "No Thru-Passage" warning signs must be placed and maintained on both sides of the floodway channel at the northern end facing the Red River; ○ The "No Thru-Passage" warning signs located at the floodway exit must display black lettering on a yellow background and be of sufficient size to be clearly legible in all local ambient conditions from a distance of 200m; ○ The "No Thru-Passage" warning signs located at the floodway exit are to include a warning lighting system with a flashing amber light operated for 24 hr prior to raising of the floodway gates and a steady red light at all times when the gates are not in fully down position; ○ Upon completion of all construction on the Prairie Grove Road culvert crossing, there may be a need for an appropriately/safely placed portage including clearly marked entry and exit points. This portage would be installed on the upstream and downstream side of the work. The need for the portage will be determined 		

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Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
		<p>through the NWPP regulatory approval process and based on conclusions reached in the NWPA public consultation process.</p> <ul style="list-style-type: none"> ○ Day markers must be placed and maintained on the upstream and downstream sides of the center pier of the inlet control structure; ○ No person shall permit any tools, equipment, vehicles, temporary structures or parts thereof used or maintained for the purpose of building or placing a work in navigable water to remain in such water after the completion of the project; ○ Where a work or a portion of a work that is being constructed or maintained in a navigable water causes debris or other material to accumulate on the bed or on the surface of such water, the owner of that work or portion of that work shall cause the debris or other material to be removed to the satisfaction of the Minister; ○ Any in-water compensation as required under the provisions of the <i>Fisheries Act</i> must be reviewed and accepted by the TC-NWPP Office prior to placement/construction and ○ The Minister or his representatives are allowed 		

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Navigation		<p>unimpeded access to the site for inspection and/or monitoring purposes.</p> <ul style="list-style-type: none"> ○ Further requirements may be required to be implemented by the MFA once the review of is application for approval under the <i>Navigable Waters Protection Act</i> is completed by Transport Canada. The MFA shall implement any further measures as required by Transport Canada. 		
Cumulative Effects	<ul style="list-style-type: none"> ○ MFA prepare a Cumulative Effects Monitoring and Follow-up Plan for review and approval of RAs in accordance with a schedule to be agreed upon by the RAs. The Plan should include consideration of direct and potential cumulative effects of the Project. It should reference activities, including regional study programs, to be undertaken in respect of ice jams, groundwater quantity and quality, riverbank stability and riparian vegetation and other ecosystem components such as Netley Marsh, as appropriate. In the event that monitoring and follow-up determines that the Project is contributing to adverse cumulative environmental effects, the MFA shall indicate in 	<ul style="list-style-type: none"> ○ See specific environmental components. 	<ul style="list-style-type: none"> ○ Operation of the Expanded Floodway shall be monitored in accordance with the plan developed by MFA. 	<ul style="list-style-type: none"> ○ The Cumulative Effects Follow-up and Monitoring Report is to be prepared and submitted to the RAs for information following any operation of the Expanded Floodway during the construction phase and during the initial 5 years of operation following construction. This report should detail the effectiveness of mitigation measures implemented by the MFA, the actions necessary to adaptively manage any adverse effects, the need and plans for additional actions in the future and on the overall effectiveness of the

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Cumulative Effects	<p>the Plan, what steps will be taken in accordance with the principles of adaptive management to reduce the Project's contribution to these effects.</p> <ul style="list-style-type: none"> ○ RAs encourage the active participation by the MFA in the regional groundwater study proposed by Manitoba Water Stewardship. RAs also encourage Manitoba Water Stewardship to adopt a scope for the regional groundwater study that considers the potential cumulative effects of regional groundwater developments. 			Project as implemented.
Accidents and Malfunctions	<ul style="list-style-type: none"> ○ The MFA include details in the CPEPP and Sediment and Erosion Control Plan for each major component of the environment on the specific accidents and malfunctions that may arise and measures for responding to potential emergency situations. Plans should be noted <ul style="list-style-type: none"> a) for monitoring groundwater quality and quantity and for investigating and responding in the event contamination relating to the Project is detected, b) for monitoring 	<ul style="list-style-type: none"> ○ Adaptively manage any adverse effects identified through the monitoring program. 	<ul style="list-style-type: none"> ○ Implement the monitoring plan and adaptively manage any adverse effects identified through the monitoring program. 	<ul style="list-style-type: none"> ○ Report on results as outlined in the EMP.

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Accidents and Malfunctions	<p>contaminated or abnormal discharges into the low flow channel when the Floodway is inactive.</p> <p>c) These plans should be developed and provided for the review and approval by the RAs and include how this monitoring will be incorporated into the broader ground and surface water monitoring programs, the protocols for notification regarding findings, actions planned to address any contaminants discovered through the monitoring program and the means by which reporting of monitoring results will be undertaken. The plans should be developed in consultation with key stakeholders.</p> <p>o The CPEPP will describe the contractor's responsibilities for the implementation, monitoring, reviewing and adjusting the Plan for the duration of the Project. In addition, the CPEPP should indicate a) how the MFA will monitor and ensure that the work carried out by contractors and subcontractors is compliant with the requirements of the</p>			

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Summary of Mitigation/Monitoring and Follow-up Requirements

Project/Environment Component	Planning Requirements	Mitigation/Compensation	Follow-up	Reporting
Accidents and Malfunctions	<p>Plan and b) how accidents and malfunctions will be reported.</p> <ul style="list-style-type: none"> ⊖ The MFA will report to the RAs on the outcomes of the Dam Safety Review including the measures taken in response to any and all deficiencies identified in the Review, and the preparation and implementation of manuals and Emergency Preparedness Plans, as recommended in the Review. 			
Effects of the Environment on the Project	<ul style="list-style-type: none"> ○ See specific environmental components 	<ul style="list-style-type: none"> ○ See specific environmental components 	<ul style="list-style-type: none"> ○ See specific environmental components 	<ul style="list-style-type: none"> ○ See specific environmental components
Sustainability	<ul style="list-style-type: none"> ○ RAs encourage the active participation by the MFA in the regional groundwater study proposed by Manitoba Water Stewardship. RAs also encourage Manitoba Water Stewardship to adopt a scope for the regional groundwater study that considers the potential cumulative effects of regional groundwater developments. 	<ul style="list-style-type: none"> ○ See specific environmental components 	<ul style="list-style-type: none"> ○ See specific environmental components 	<ul style="list-style-type: none"> ○ See specific environmental components.