WELCOME

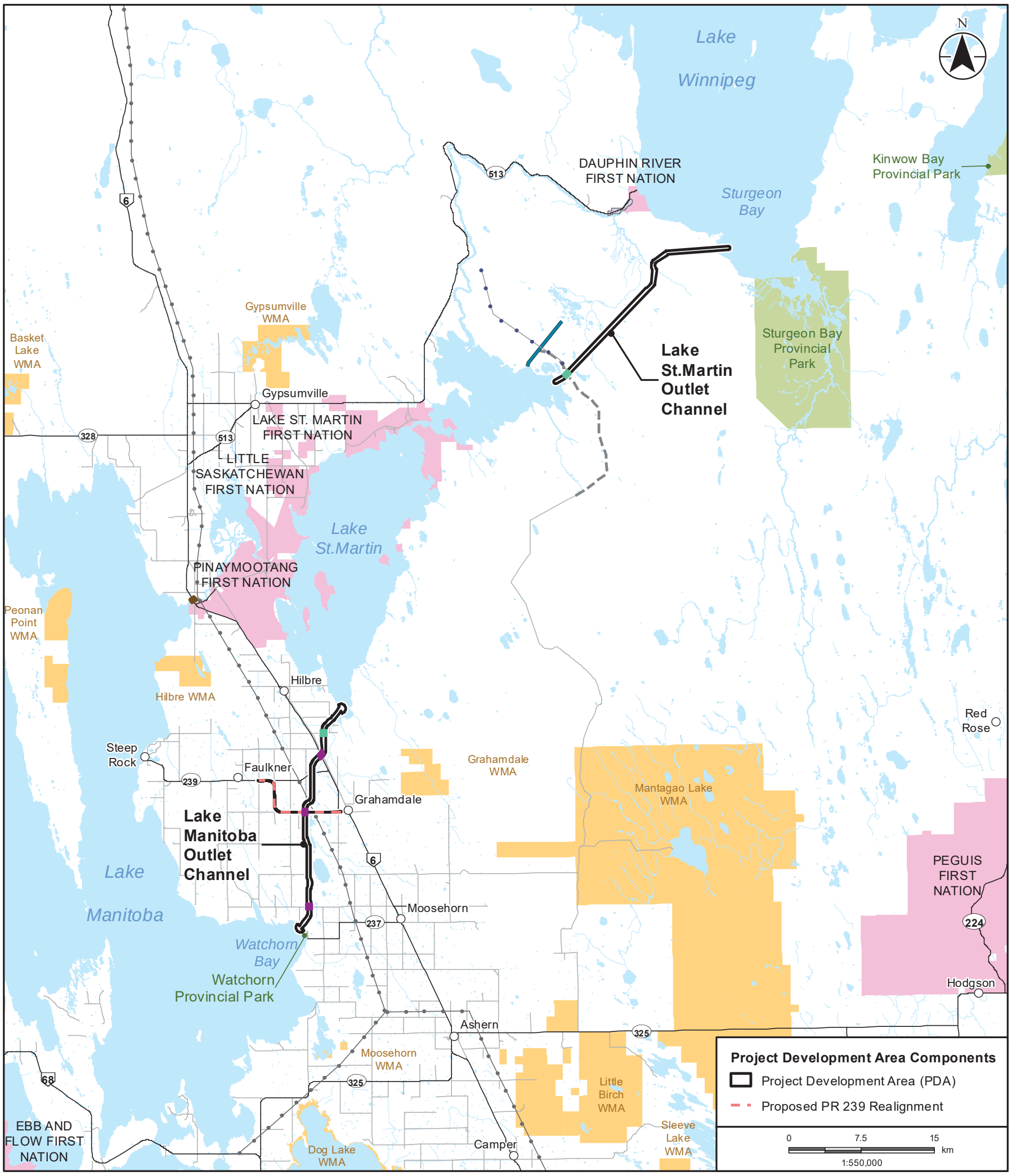
Lake Manitoba
and
Lake St. Martin
Outlet Channels Project

OPEN HOUSE




Manitoba

PROJECT OVERVIEW



Legend

- Fairford Water Control Structure
- Proposed Bridge
- Proposed Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Reach 1 Access Road
- Proposed Transmission Line
- Existing Transmission Line
- Provincial Highway (PTH/PR)
- Municipal Roads
- Northern Affairs Communities (NAC)
- First Nation
- Wildlife Management Areas
- Provincial Parks

PROJECT DESCRIPTION

The purpose of this project is to mitigate flooding on Lake Manitoba and Lake St. Martin.

Project components:

- Diversion channels
  - Lake Manitoba Outlet Channel
  - Lake St. Martin Outlet Channel
- Channel inlets and outlets
- Drop structures
- Water control structures
- Bridges, including combined bridges and water control structures
- Road works including, re-alignment and/or construction of provincial highways and roads and municipal roads that are incidental to the project
- Repurposing of a portion of the unused Reach 3 of the existing Lake St. Martin Emergency Outlet Channel
- Associated Works and Activities (e.g., site clearing, excavation, waste disposal, dust control)

Diversion Channel Details

- Lake Manitoba Outlet Channel:
  - 24.1 kilometres long, 100 metres (328.1 feet) wide diversion channel in a 400 metres right-of-way
  - Combined bridge and water control structure at Iverson Road
  - Realignment and/or construction of Provincial Road 239 and related municipal roads
  - Three road bridge structures
  - Channel runs northwards from Watchorn Bay on Lake Manitoba to Birch Bay on Lake St. Martin
  - Channel Slopes:
    Between 5:1 and 6:1 (Horizontal : Vertical)
  - Depth of Excavation:
    8 – 13 metres
  - Maximum Flow Capacity: 212 metres^3/second
- Lake St. Martin Outlet Channel:
  - 23.8 kilometres long, 120 metres wide (393.7 feet) wide diversion channel in a 400 metres right-of-way
  - Combined bridge and water control structure
  - Multiple drop structures
  - Channel Slopes:
    4:1 (Horizontal : Vertical)
  - Depth of Excavation:
    6 – 10 metres
  - Maximum Flow Capacity: 326 metres^3/second

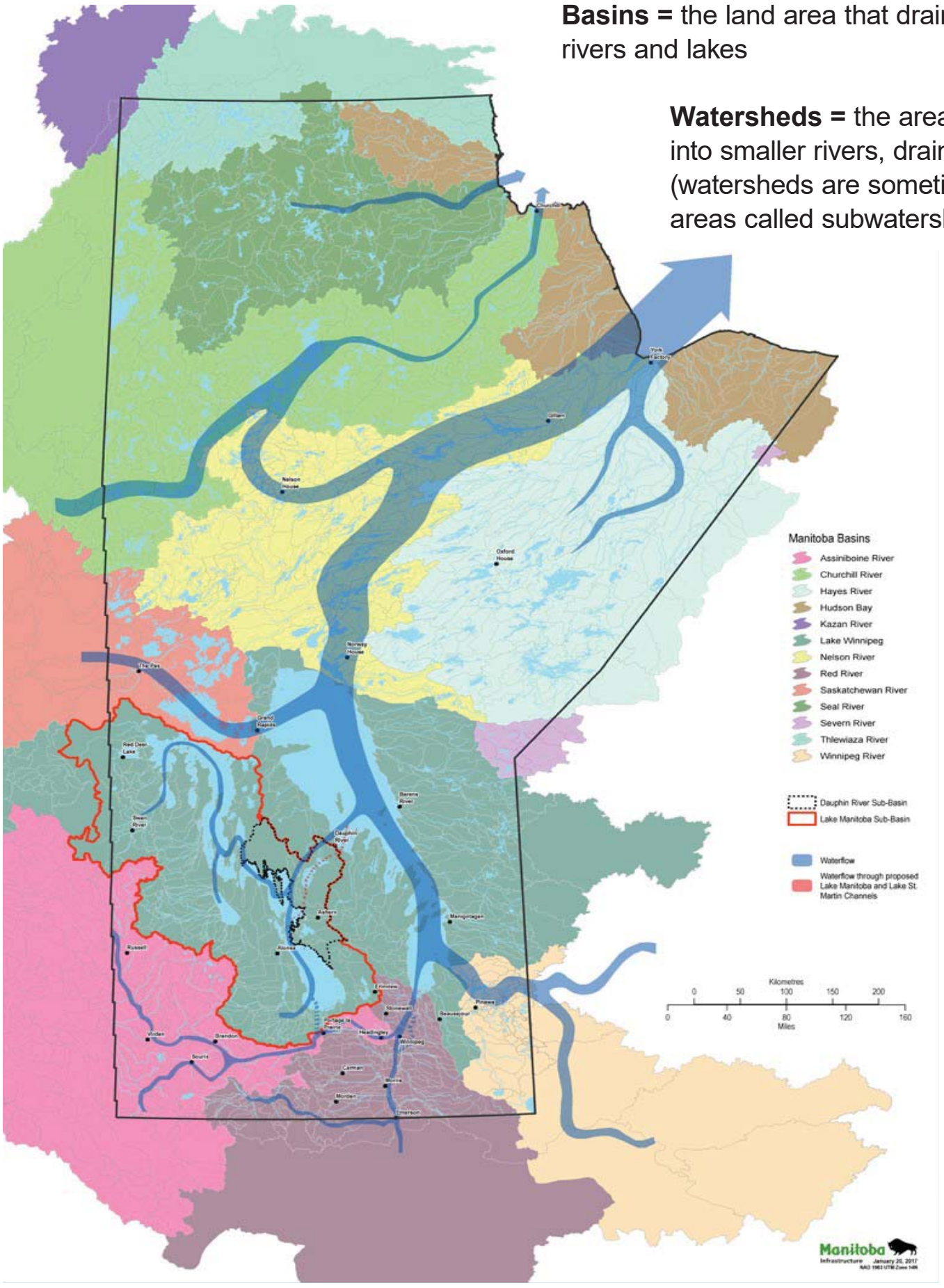
BASINS AND WATERSHEDS OF MANITOBA

Due to its geographic location and topography, many areas of Manitoba are susceptible to flooding. Water moves from the Rocky Mountains, northern United States and the boreal forest through Manitoba on the way to Hudson Bay. Manitoba's landscape was largely shaped by glacial processes and as a result, large portions of the province are relatively flat and subject to flooding during high run-off events.

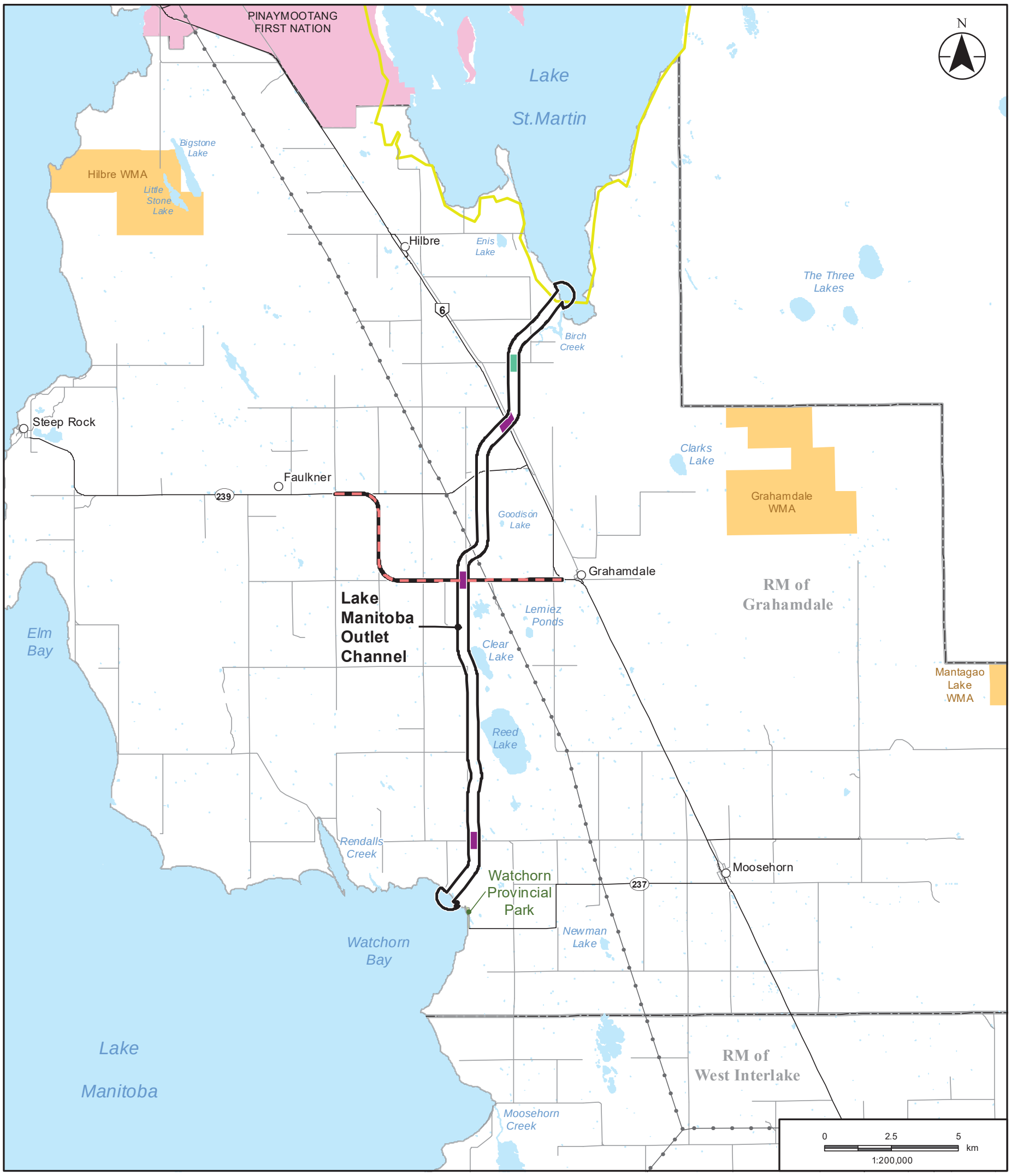
While much of Manitoba is vulnerable, Manitobans are generally well protected due to investments in flood protection infrastructure from previous generations. The project will provide flood mitigation infrastructure to Lake Manitoba and Lake St. Martin, which remain vulnerable.

Basins = the land area that drains water into the larger rivers and lakes

Watersheds = the area of land that drains water into smaller rivers, drainage systems and lakes (watersheds are sometimes divided into smaller areas called subwatersheds)



PROPOSED LAKE MANITOBA OUTLET CHANNEL

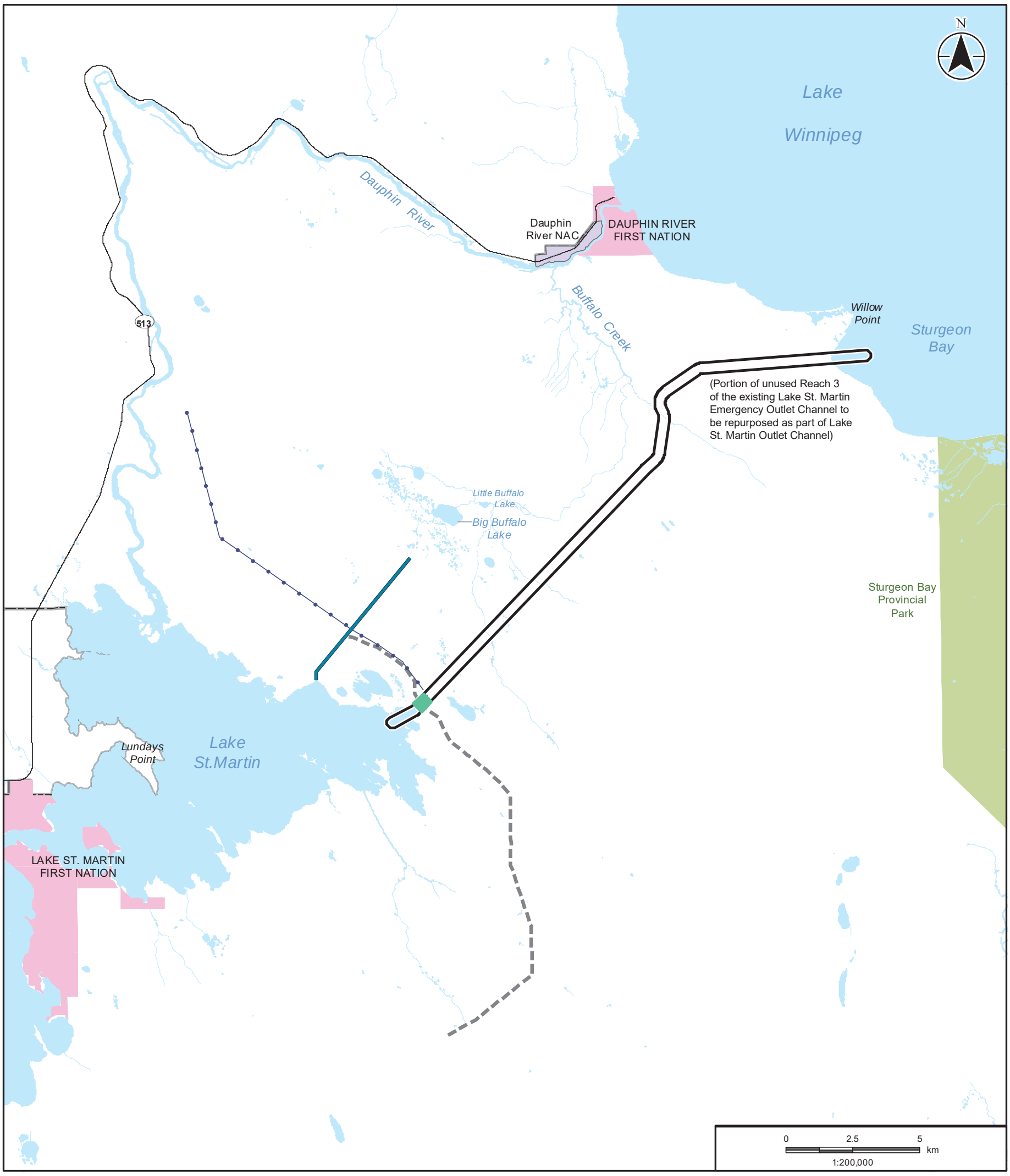


Legend

- Project Development Area
- Proposed PR 239 Realignment
- Proposed Bridge
- Proposed Water Control Structure
- Existing Transmission Line
- Provincial Highway (PTH/PR)
- Municipal Roads
- First Nation
- Wildlife Management Areas
- Provincial Parks
- Important Bird Areas
- Rural Municipality

Manitoba

PROPOSED LAKE ST. MARTIN OUTLET CHANNEL

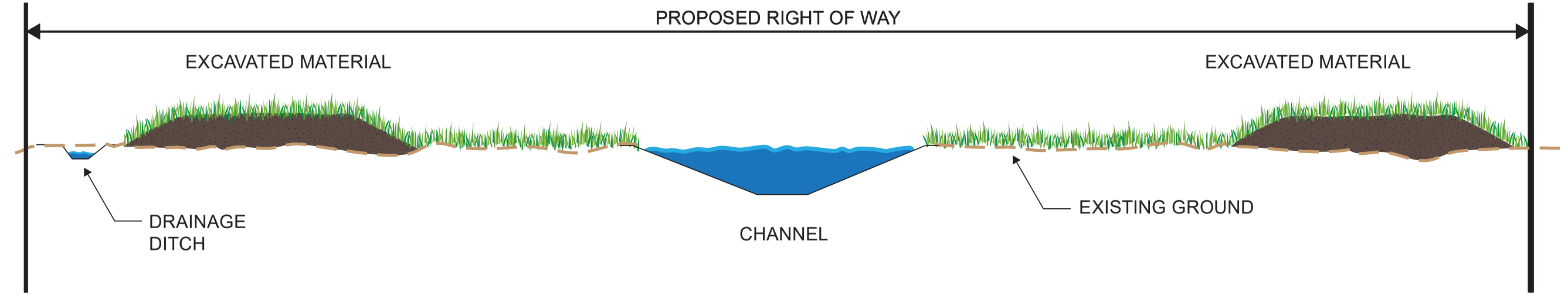


Legend

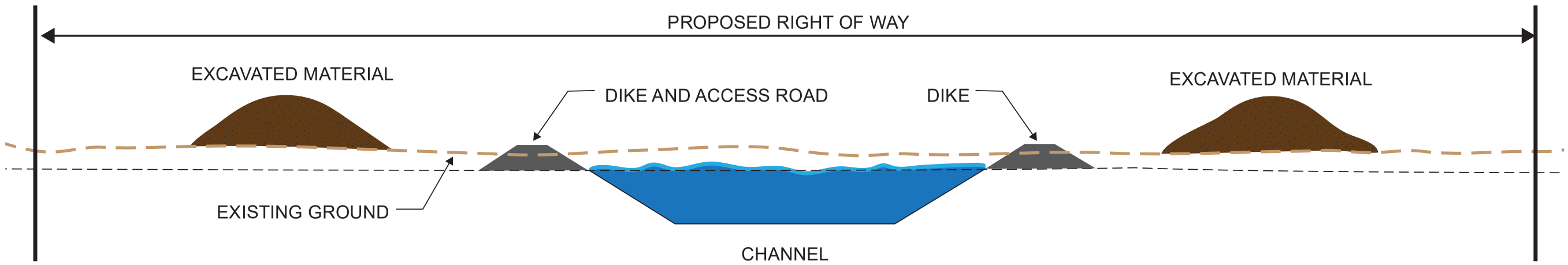
- Project Development Area
- Proposed Transmission Line
- Proposed Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St.Martin Channel Access Road
- Provincial Highway (PTH/PR)
- Northern Affairs Communities (NAC)
- First Nation
- Provincial Parks

OUTLET CHANNEL
CONCEPTUAL CROSS SECTION

Lake Manitoba Outlet Channel

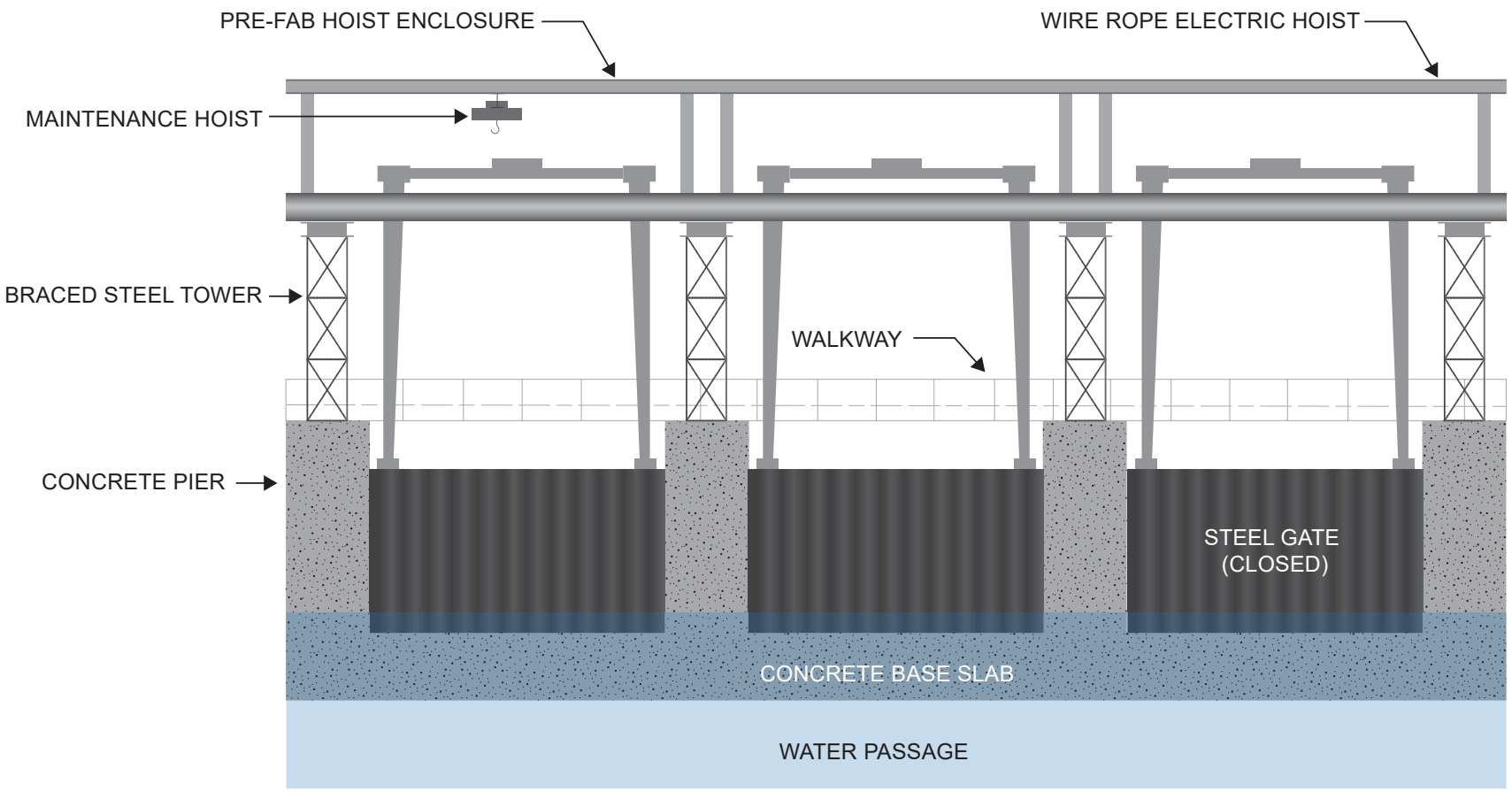


Lake St. Martin Outlet Channel

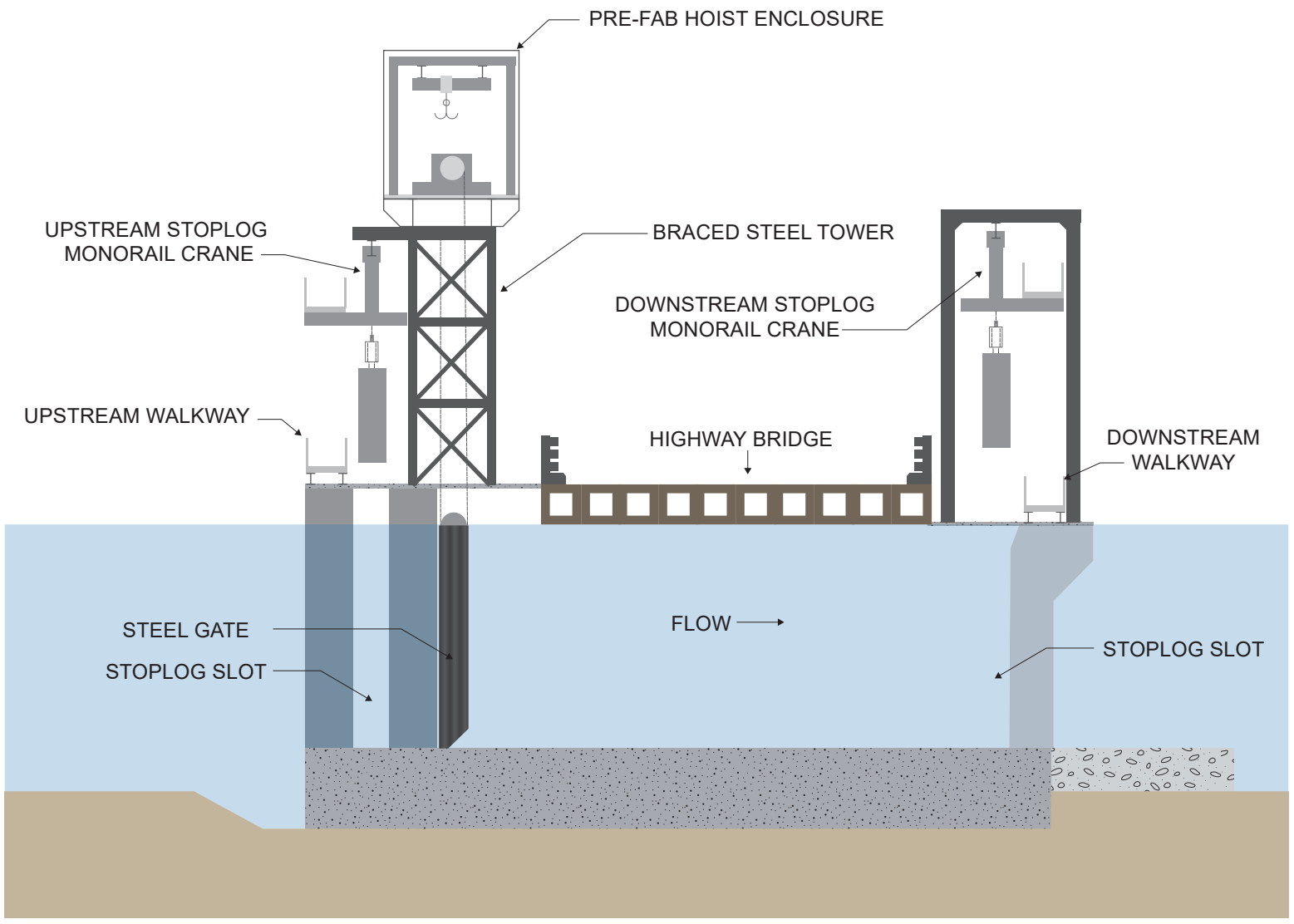


PROPOSED WATER CONTROL STRUCTURES: CONCEPTUAL DESIGN

Water Control Structure (Three Bay) Conceptual Cross Section



Water Control Structure Conceptual Side Profile

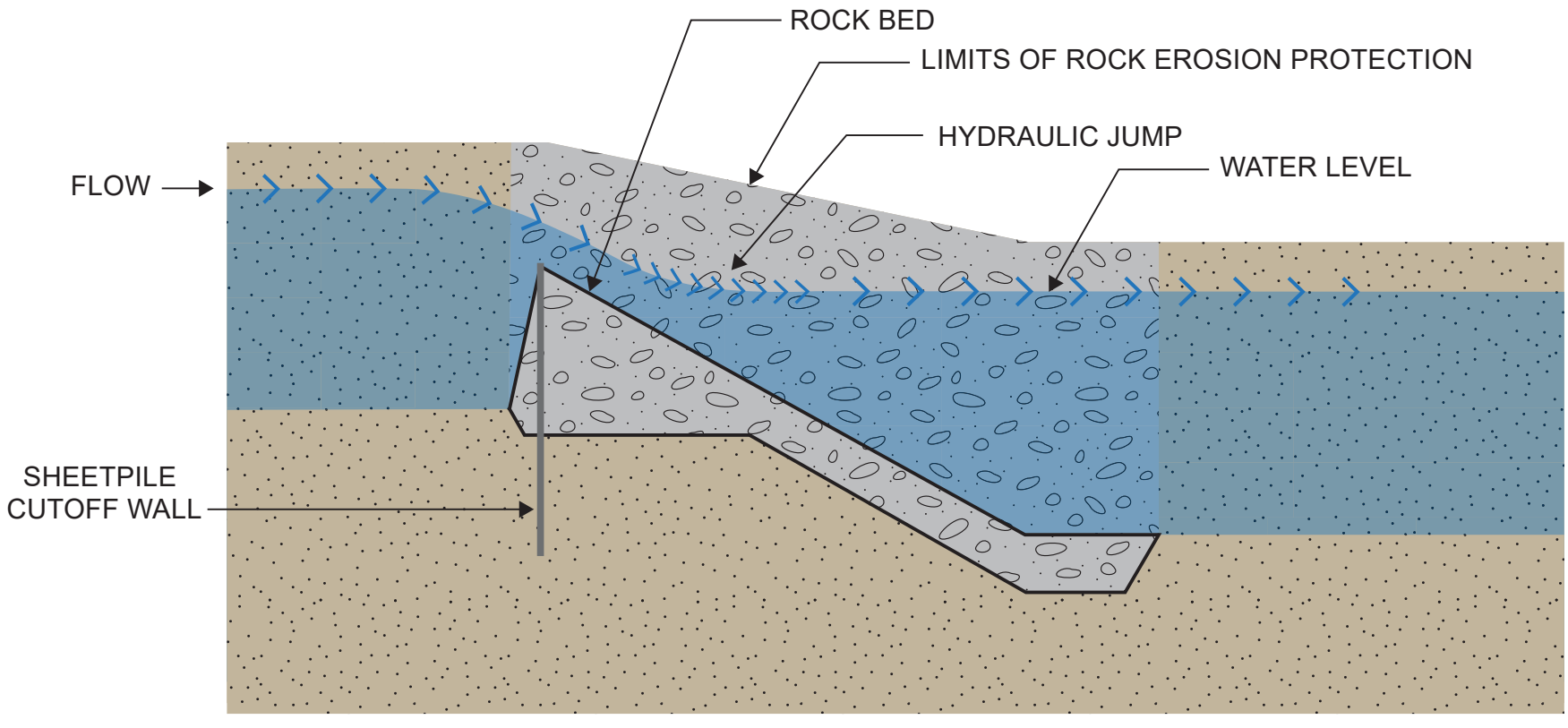


PROPOSED DROP STRUCTURE DESIGN

The St. Martin Outlet Channel will require several drop structures to minimize channel velocity in areas of steep sloping terrain.

The drop structures are proposed to be constructed of rockfill, with a sheet pile cutoff at the upstream crest.

While the high velocities and elevation difference through the drop structures will prevent the movement of fish in the upstream direction from Lake Winnipeg, they have been designed to safely accommodate any downstream fish passage and minimize any fish stranding. For example, a notch will be designed into the top of the structures, with minimum flow provided and a deep pool upstream to allow overwintering.



PROPOSED OUTLET CHANNEL OPERATING GUIDELINES: LAKE MANITOBA

Operating guidelines for the Lake Manitoba and Lake St. Martin Outlet Channels were developed in February 2019 by the Lake Manitoba and Lake St. Martin Outlet Channels Operating Guidelines Technical Committee.

The proposed guidelines are based on previous work in 2003 and 2013 by the Committees for Lake Manitoba and Lake St. Martin Regulation. Revisions from previous work are bolded and are a result of new information from hydrologic modelling. These guidelines were selected as the optimal operating regime to maximize flood protection.

Fairford River Water Control Structure

1. The target regulation range on Lake Manitoba is 812.5 feet to 810.5 feet.
2. During recovery from flood conditions on Lake Manitoba, the Fairford River Water Control Structure is kept wide open until Lake Manitoba recedes to the middle of the range after which is should be cut back to a normal setting (50-60 per cent capacity).
3. During recovery from drought, the Fairford River Water Control Structure is kept at 800 cubic feet per second until Lake Manitoba levels increase to middle of the range after which point the structure will be operated to achieve normal outflow (50–60 per cent capacity).
4. Under normal operating conditions, once outflow reaches normal, there are no further stop-log adjustments, as long as Lake Manitoba remains within the range.
5. The minimum flow on the Fairford River should be 800 cubic feet per second with a desirable flow of 1,000 cubic feet per second as often as practicable.

Lake Manitoba Outlet Channel

1. The Lake Manitoba Outlet Channel will be opened to maximum capacity when Lake Manitoba is above the top of the regulation range (812.5 feet),
2. **The Lake Manitoba Outlet Channel may be opened pro-actively (when the water level is below 812.5 feet) if the water level on Lake Manitoba is forecasted to be above 813 feet in the same season (REV 1).**
3. The outflow from the Lake Manitoba Outlet Channel will be reduced when the water level on Lake Manitoba recedes to the middle of the regulation range (811.5 feet), so that the combined flow through the Fairford River Water Control Structure and in the Lake Manitoba Outlet Channel, insofar as practicable, matches the inflow into Lake Manitoba.
4. The Lake Manitoba Outlet Channel will be closed once the Lake Manitoba water level recedes below 811.5 feet and the flow through the Fairford River Water Control Structure is greater than the total inflow into Lake Manitoba. **During Outlet Channel shutdown, consideration will be given to ensuring that the drawdown rate within the Outlet Channel does not compromise channel embankment stability (REV 1).**
5. Initial operation of the outlet control structure will not be initiated during the period in which there is solid ice cover in the channel (typically from Dec 1 – April 30th). **However, operation may be considered if severe flooding is forecasted for the following spring (REV 1).**

PROPOSED OUTLET CHANNEL OPERATING GUIDELINES: LAKE ST. MARTIN

Operating guidelines for the Lake Manitoba and Lake St. Martin Outlet Channels were developed in February 2019 by the Lake Manitoba and Lake St. Martin Outlet Channels Operating Guidelines Technical Committee.

The proposed guidelines are based on previous work in 2003 and 2013 by the Committees for Lake Manitoba and Lake St. Martin Regulation. Revisions from previous work are bolded and are a result of new information from hydrologic modelling. These guidelines are were selected as the optimal operating regime to maximize flood protection.

Lake St. Martin Outlet Channel

1. The target regulation range for Lake St. Martin is 797–800 feet.

2. The Lake St. Martin Outlet Channel will be operated to full capacity:

   a. when the Lake St. Martin water level rises above 800 feet

   or

   b. when the Lake Manitoba Outlet is opened for initial operation, Lake St. Martin is above 797 feet, **and Lake St. Martin is forecasted to go above 800 feet without operation of the Lake St. Martin Outlet Channel (REV 1).**

   Consideration may be given to opening the Lake St. Martin Outlet Channel to less than full capacity if Lake St. Martin is forecasted to go only slightly above 800 feet (REV1).

3. The outflow from the Lake St. Martin Outlet Channel will be reduced when the lake level decreases below 800 feet, to the greater of the following:

   a. **25 per cent (REV 1)** of channel capacity,

   b. the outflow required to ensure the combined flows in the Dauphin River and the Lake St. Martin Outlet Channel matches the total inflow into Lake St. Martin

4. **The flow in the Lake St. Martin Outlet Channel will be further reduced when the water level on Lake St. Martin recedes below 798 feet, so that the combined flows in the Dauphin River and in the Lake St. Martin Outlet Channel, insofar as practicable, matches the inflow into Lake St. Martin (REV 1).**

ENVIRONMENTAL ASSESSMENT STEPS

Scoping of the Assessment

Step 1	**Selection of Valued Components (VC)** • Rationale for Selection, Influence of Consultation and Engagement on the Assessment, Issues Identification, Regulatory Setting
Step 2	**Project Interactions with the Environment** • Identification of Environmental Effects and Pathways • Screening of Project-Environment Interactions • Selection of Measurable Parameters
Step 3	**Identification of Environmental Assessment Boundaries** • Spatial, Temporal • Identification of Other Future Foreseeable Project and Activities
Step 4	**Residual Effects of Characterization and Significance Definition** • Characterization of Residual Environmental Effects • Establishment of Standards of Thresholds for determining Significance of Residual Environmental Effects

Existing Conditions

Step 5	**Description of Existing Conditions**

WE ARE HERE

VC Assessment

Step 6	**Assessment of Project Environmental Effects** • Description of Potential Project Environmental Effects and Pathways • Mitigation of Project Environmental Effects • Characterization of Residual Project Environmental Effects
Step 7	**Assessment of Cumulative Environmental Effects** • Screening of Cumulative Environmental Effects • Characterization of Residual Cumulative Environmental Effects • Describing the Project's contribution to the Residual Cumulative Environmental Effect
Step 8	**Determination of Significance** • Residual Project Environmental Effects and Prediction Confidence • Residual Cumulative Environmental Effects and Prediction Confidence
Step 9	**Follow-Up**
Step 10	**Summary**
Step 11	**Assessment of Potential Accidents and Malfunctions**
Step 12	**Assessment of the Effects of the Environment on the Project**

Repeat for Each Value Component and Environmental Effect

STEP 1: SELECTION OF VALUED COMPONENTS

To identity a preliminary list of Valued Components, environmental (i.e., biophysical and socio-economic) components in the project region were initially screened using the following criteria:

- Potential for the environmental component to occur within the local assessment area (LAA) and regional assessment area (RAA)
- Potential for the environmental component to interact with the project
- The environmental component was identified by local Indigenous communities
- The environmental component was identified by regulatory authorities
- The environmental component was identified by other stakeholders

As a result, the Environmental Assessment will review the potential effects of the project on the components under each group:

Physical Environment

- Atmospheric Environment
  - Air Quality
  - Acoustic Environment
  - Lighting
- Geology and Soil
- Groundwater and Surface Water

Aquatic Environment

- Fish and Fish Habitat

Terrestrial Environment

- Vegetation and Wetlands
- Wildlife and Wildlife Habitat

Human Environment

- Land and Resource Use
- Infrastructure and Services
- Economy
- Health
- Heritage Resources
- Indigenous Peoples
  - Current Use of Lands for Indigenous Purposes
  - Health and Socio-economic Conditions
  - Physical and Cultural Heritage (Traditional Land Use)

STEP 2: INTERACTIONS BETWEEN VALUED COMPONENTS AND THE PROJECT

Project Components and Physical Activities	Atmospheric Environment	Geology and Soil	Groundwater and Surface Water	Fish and Fish Habitat	Vegetation and Wetlands	Wildlife and Wildlife Habitat	Land and Resource Use	Infrastructure and Services	Economy	Health	Heritage Resources	Indigenous Peoples
Construction												
Site Preparation of Project Components (development of the project development area prior to construction activities [e.g., removal of existing infrastructure, vegetation clearing and initial earthworks, development of temporary construction camp and staging areas])	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Project-related transportation within the LAA (movement of trucks, equipment, bulk materials, supplies, and personnel within the LAA)	✓	✓	—	—	—	✓	—	✓	✓	✓	—	✓
Construction of Project Components (physical construction of utilities, infrastructure, and other facilities as well as reclamation of temporary construction areas)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Water Development and Control (dewatering and realignment of existing water works)	—	—	✓	✓	✓	✓	✓	—	✓	✓	✓	✓
Operations and Maintenance												
Operation and Maintenance of the Outlet Channels (normal operational conditions when the outlet channels and associated infrastructure [e.g., water control structures] are either actively conveying water or are non-operational)	✓	—	✓	✓	—	✓	✓	✓	✓	—	—	✓
Operation and Maintenance of other Project Components (normal operations conditions associated with Provincial Road 239 and municipal road realignments, and bridges and culverts)	✓	—	✓	✓	✓	✓	✓	✓	✓	—	✓	✓
Project-related Transportation within the LAA (movement of trucks, equipment, bulk materials, supplies, and personnel within the LAA)	✓	—	—	—	—	✓	—	✓	✓	—	—	✓

✓ means Potential Interaction that might cause an effect
— means no interactions are expected

LAA = local assessment area

STEP 3: IDENTIFICATION OF ENVIRONMENTAL ASSESSMENT BOUNDARIES

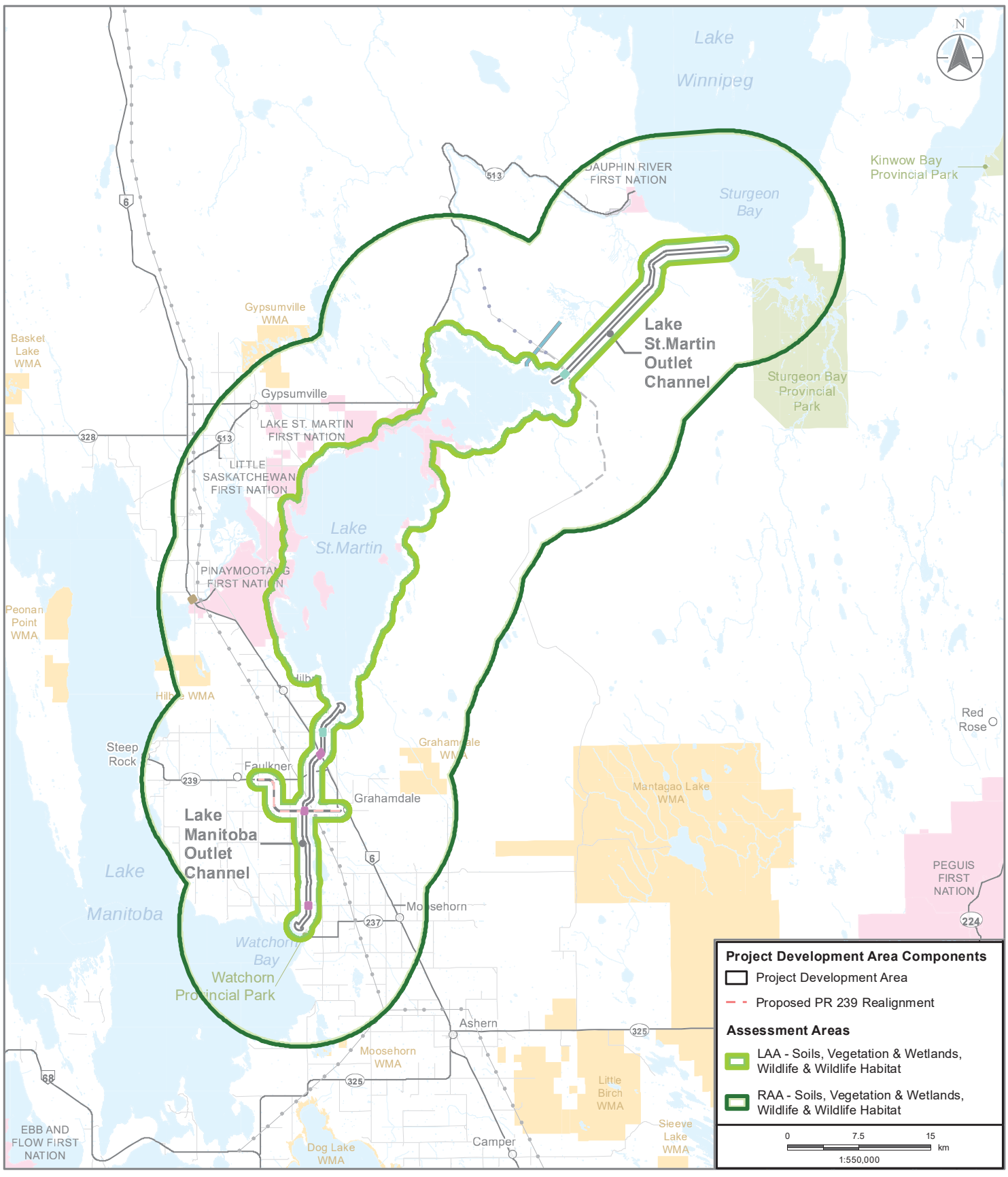
Spatial boundaries are established for the assessment of project environmental effects and cumulative environmental effects for each Valued Component. The primary consideration used is the probable geographical extent of the environmental effects (i.e., the zone of influence) on the Valued Component.

Spatial boundaries may be different from one Valued Component to another, depending on the characteristics of the Valued Component. The spatial boundaries are referred to as the Project Footprint, the local assessment area (LAA), and the regional assessment area (RAA)

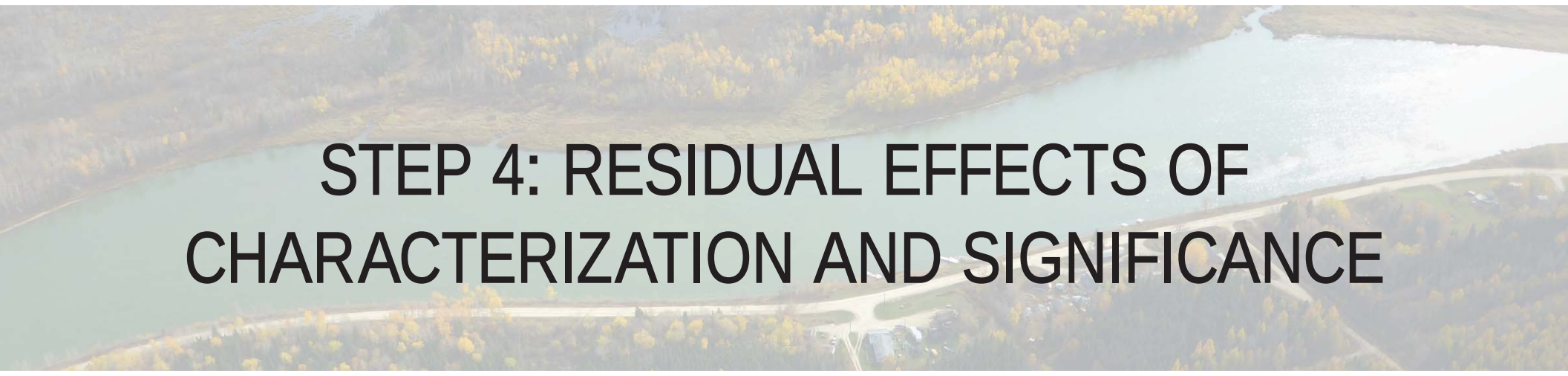
Project Development Area =
the physical space or directly affected area within which project components and activities are located and the immediately adjacent area, including designated right-of-way

Local Assessment Area =
the area where direct environmental effects have the most impact based on baseline (existing) data

Regional Assessment Area =
the area where potential direct, indirect and cumulative effects may occur beyond the LAA



This map shows an example of the LAA and RAA for three Value Components: Soils, Vegetation & Wetlands, Wildlife & Wildlife Habitat.



STEP 4: RESIDUAL EFFECTS OF CHARACTERIZATION AND SIGNIFICANCE

Residual Effect

The analysis to determine residual effects includes both direct and indirect interactions between the project and the Value Component, and it considers mitigation measures to eliminate or reduce environmental effects or to enhance benefits. Once mitigation measures are applied, remaining effects are **residual effects**.

Residual environmental effects of each Valued Component are analyzed for each project phase.

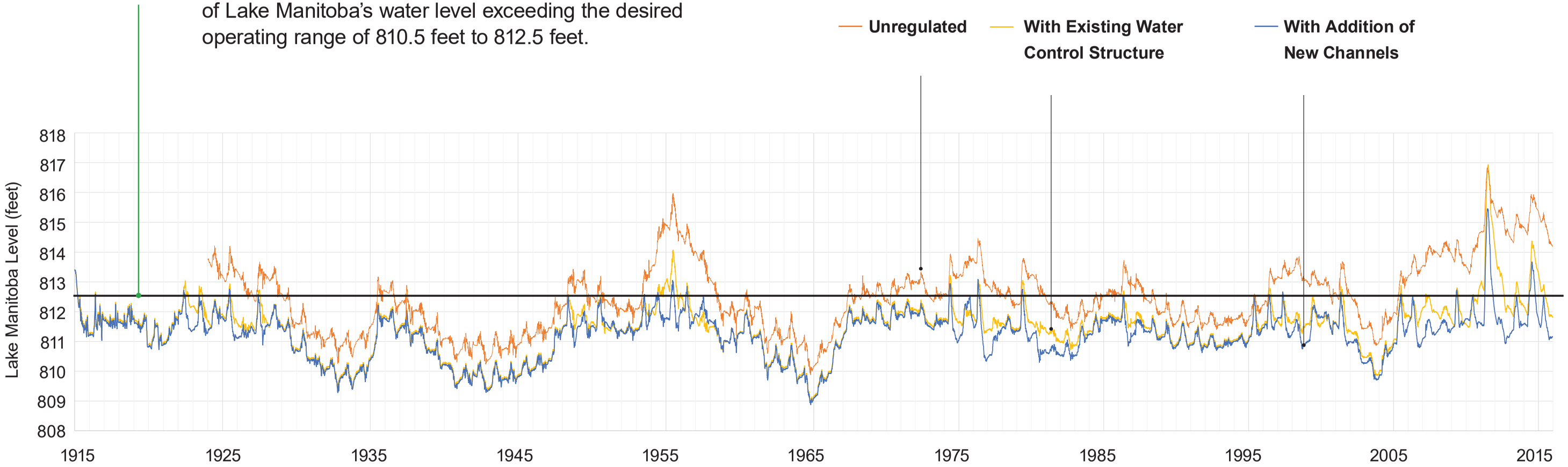
Only residual environmental effects are assessed for significance.

The characterized of residual environmental affects includes:

Direction of change	The long-term trend of the environmental effect (i.e., positive or adverse)
Duration	The period required until the component returns to its existing condition (e.g., short-term, mid-term, or long-term)
Magnitude	The measurable intensity of change relative to existing conditions (e.g. low, medium, high)
Geographic extent	The area where an environmental effect occurs (e.g. spatial boundaries)
Frequency	The number of times during a specific project phase or activity that an environmental effect might occur (e.g., one time or multiple times) in a specified time period
Reversibility	The likelihood that a measurable parameter will recover from an environmental effect (e.g., habitat restoration)
Ecological/ socioeconomic context	The general characteristics of the area in which the project is located, as indicated by past and existing levels of human activity, or the resilience/fragility of the component regarding potential adverse effects
Timing	Periods of time where residual effects from project activities could affect the component (e.g., time of day, seasonal, restricted activity periods)

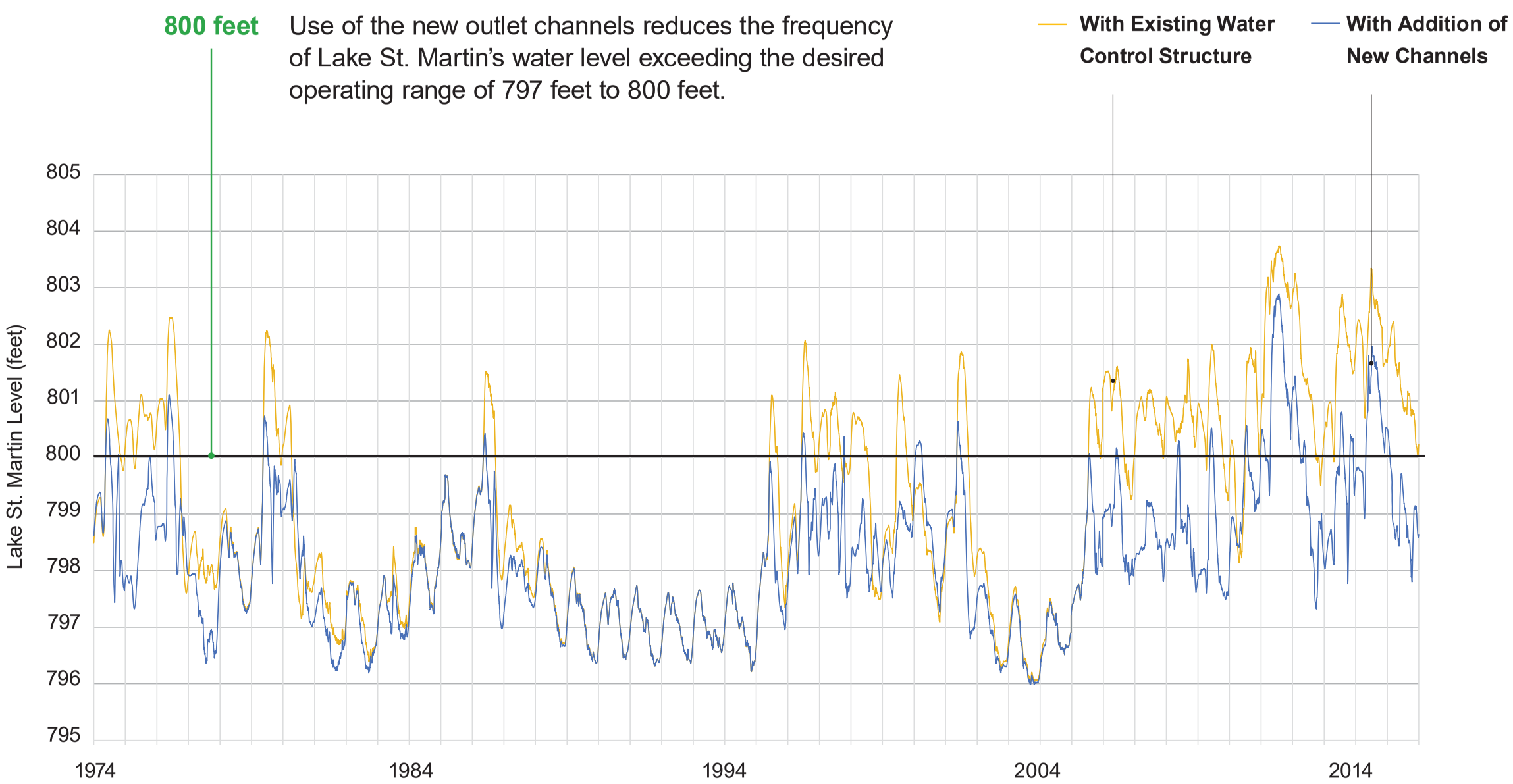
SIMULATED LAKE MANITOBA LEVELS WITH AND WITHOUT NEW OUTLET CHANNELS

812.5 feet Use of the new outlet channels reduces the frequency of Lake Manitoba's water level exceeding the desired operating range of 810.5 feet to 812.5 feet.



SIMULATED LAKE ST. MARTIN LEVELS WITH AND WITHOUT NEW OUTLET CHANNELS

800 feet Use of the new outlet channels reduces the frequency of Lake St. Martin's water level exceeding the desired operating range of 797 feet to 800 feet.



TIMELINE

Planning and Design 2016 – 2019

- Route
- Engineering
- Environmental Design
- Environmental Assessment
- Final Design
- Construction Planning
- Environmental Protection Plans
- Permit License Applications

Submit Environmental Impact Statement to CEAA

CEAA EIS 1 Year Review Period

Construction 2020 – 2023

Prior to construction, the project requires approvals from:

Federal Government:

- Canadian Environmental Assessment Agency (CEAA)
- Fisheries and Ocean Canada
- Transport Canada

Provincial Government

- Manitoba Sustainable Development Environmental Approvals Branch

Ongoing Engagement and Consultation

Manitoba

THANK YOU

For more information:

Visit: **www.manitoba.ca/mit/wms/lmblsmoutlets/environmental.html**

Email: **outletchannel@gov.mb.ca**

Contact Manitoba Infrastructure staff directly at:

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WE WANT TO HEAR FROM YOU!

Leave a sticky note with your comments