

August 16, 2023

Agnes Wittman,  
Director, Environmental Approvals Branch  
Manitoba Environment and Climate  
14 Fultz Boulevard  
Winnipeg, MB, R3Y 0L6

**SUBJECT: Manitoba Environment Act Proposal:  
Shamattawa Winter Road Realignment Project**

Manitoba Transportation and Infrastructure (MTI) is submitting this Environmental Act Proposal (EAP) with respect to the Shamattawa Winter Road Realignment Project. As per the Classes of Development Regulation M.R. 169/88, the Shamattawa Winter Road Realignment is considered a Class 2 Development and will require a license under the *Environment Act*.

Enclosed within this document, please find the following:

- i. An electronic copy of the Shamattawa Winter Road Realignment EAP
- ii. An electronic copy of the EAP Appendices (lettered A – F)
- iii. Copy of the GIS digital data files used for creation of maps

Please note that GIS digital data files for Eastern Migratory Caribou telemetry data and Registered Trapline areas have been excluded from the EAP submission at the request of the Manitoba Wildlife Branch.

- If caribou data is required, please contact Vicki Trim at [Vicki.Trim@gov.mb.ca](mailto:Vicki.Trim@gov.mb.ca).
- If trapline data is required, please contact Dean Berezanski at [Dean.Berezanski@gov.mb.ca](mailto:Dean.Berezanski@gov.mb.ca)

An interbusiness transfer will follow and therefore payment is not included in this package.

For any questions, concerns or additional information regarding this EAP, please do not hesitate to contact the Environmental Services Branch using the attached contact information below.

Sincerely,

Josie Cooke,  
Aquatic / Terrestrial Biologist, Environmental Services  
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# Environment Act Proposal Form



Name of the development: <b>Shamattawa Winter Road Realignment Project</b>	
Type of development per Classes of Development Regulation (Manitoba Regulation 164/88): <b>Class 2 - Transportation and Transmission: Winter road at new location</b>	
Legal name of the applicant: <b>Michael Foth</b>	
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Location of the development: <b>RM of Gillam - Shamattawa, MB</b>	
Contact Person: <b>Michael Foth</b>	
Street Address: <b>N/A</b>	
Legal Description: <b>Shamattawa Winter Road, 22 km E of PR 280.</b>	
City/Town: <b>Winnipeg</b>	Province: <b>Manitoba</b> Postal Code: <b>R3C 3P3</b>
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Webpage address:	
Date: <b>2023-08-16</b>	Signature of proponent, or corporate principal of corporate proponent:  Printed name: <b>Michael Foth</b>

**PRINT**

**RESET**

A complete **Environment Act Proposal (EAP)** consists of the following components:

- Cover letter**
- Environment Act Proposal Form**
- Reports/plans supporting the EAP** (see "Information Bulletin - Environment Act Proposal Report Guidelines" for required information and number of copies)
- Application fee** (Cheque, payable to Minister of Finance, for the appropriate fee)

Per Environment Act Fees Regulation (Manitoba Regulation 168/96):	
Class 1 Developments .....	\$1,000
Class 2 Developments .....	\$7,500
Class 3 Developments:	
Transportation and Transmission Lines ..	\$10,000
Water Developments .....	\$60,000
Energy and Mining.....	\$120,000

**Submit the complete EAP to:**

Director  
Environmental Approvals Branch  
Manitoba Environment, Climate and Parks  
1007 Century Street  
Winnipeg, Manitoba R3H 0W4

**For more information:**

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\$1,000.....	C1 B-02
\$7,500.....	C2 B-02
\$10,000....	TT B-02
\$60,000....	WD B-02
\$120,000...	EM B-02

**MANITOBA ENVIRONMENT ACT PROPOSAL:  
SHAMATTAWA WINTER ROAD REALIGNMENT**

**MANITOBA TRANSPORTATION AND INFRASTRUCTURE  
HIGHWAY PLANNING AND DESIGN**

August 2023



**Manitoba Environment Act Proposal for the Shamattawa Winter Road Realignment Project**

**Submitted to:** Agnes Wittman,  
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Winnipeg, Manitoba, R3Y 0L6

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August 2023

## EXECUTIVE SUMMARY

Manitoba Transportation and Infrastructure (MTI) is planning to reroute a section of the winter road that services Shamattawa First Nation (the Project) in order to improve travel efficiency and safety. Given the project involves the relocation of a section of existing winter road, it is considered a Class 2 development as per the Classes of Development Regulation MR 164/88 (Roads at new locations which are capable of being used only in winter) and is subject to Licensing under *The Environment Act*.

This Environment Act Proposal (EAP) for the proposed Project follows the Environment Act Proposal Report Guidelines (MEC, 2022) and considers a range of potential physical, biophysical and socio-economic factors. Potential Project effects were evaluated, with consideration given to the application of mitigation measures, determination of any residual effects, and their significance. The proposed mitigation measures outlined in this EAP are expected to effectively prevent, avoid or minimize potential effects. Some minor persistent residual effects were identified as part of the analysis including:

- The minor/localized permanent loss of vegetation within the Project ROW; and
- The minor/limited fragmentation of general wildlife habitat within the Project ROW.

Taking into consideration the scope of the Project, associated environmental issues and suggested appropriate mitigation measures, the aforementioned residual effects are considered to be minor and are to be offset by the benefits of improving safety and access of the travelling public. As such, based on the review of the Project in conjunction with the application of mitigation measures, it is determined that the Project is not likely to cause significant adverse environmental effects.

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**Appendix E** – DFO Fish Habitat Type Flowchart

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**LIST OF ACRONYMS**

<b>ASI</b>	Area of Special Interest
<b>CCME</b>	Canadian Council of Ministers of the Environment
<b>COSEWIC</b>	Committee on the Status of Endangered Wildlife in Canada
<b>dBA</b>	Decibels ('A' weight)
<b>DFO</b>	Fisheries and Oceans Canada
<b>ESEA</b>	<i>Endangered Species and Ecosystems Act</i>
<b>EAP</b>	Environment Act Proposal
<b>ECCC</b>	Environment and Climate Change Canada
<b>EM</b>	Eastern Migratory (Caribou)
<b>FML</b>	Forest Management License
<b>FMLA</b>	Forest Management License Agreement
<b>FMU</b>	Forest Management Unit
<b>GER</b>	General Environmental Requirements
<b>GHA</b>	Game Hunting Area
<b>GHGRP</b>	Greenhouse Gas Emissions Reporting Program
<b>ha</b>	Hectare
<b>HRB</b>	Heritage Resources Branch
<b>km</b>	Kilometer
<b>LAA</b>	Local Assessment Area
<b>m</b>	Meter
<b>MB</b>	Manitoba
<b>MBBA</b>	Manitoba Breeding Bird Atlas
<b>MBCDC</b>	Manitoba Conservation Data Centre
<b>MEC</b>	Manitoba Environment and Climate
<b>MEL</b>	Mine Exploration License
<b>MTI</b>	Manitoba Transportation and Infrastructure
<b>NRND</b>	Natural Resources and Northern Development
<b>ON</b>	Ontario
<b>PR</b>	Provincial Road
<b>RAA</b>	Regional Assessment Area
<b>RTL</b>	Registered Trapline
<b>ROW</b>	Right of way
<b>SARA</b>	<i>Species at Risk Act</i>
<b>TUA</b>	Traditional Use Area
<b>VOC</b>	Volatile Organic Compound
<b>WMA</b>	Wildlife Management Area

## 1.0 INTRODUCTION

Manitoba Transportation and Infrastructure (MTI) is proposing to reroute an approximate 38.3 km section of the Winter Road that services the community of Shamattawa First Nation (the Project) located within the northeastern region of Manitoba. Portions of the existing winter road leading to Shamattawa First Nation are misaligned, with some sections travelling in the opposite direction of the community itself. The Project is part of a broader initiative being undertaken by MTI to improve the existing winter roads throughout the province. The Project is considered a Class 2 development under the *Classes of Development Regulation 164/88* (i.e., roads at new locations which are capable of being used only in winter) and is therefore subject to licensing under *The Environment Act C.C.S.M. c. E125*. The following includes a review of the proposed Project and an assessment of potential effects as outlined under the Environment Act Proposal Report Guidelines published by Manitoba Environment and Climate (MEC; 2022).

## 2.0 BACKGROUND

The community of Shamattawa First Nation is only accessible by land via a winter road open, on average, between the months of January to March. As such, this winter road acts as a key route for ground transportation of goods to the community of approximately 1,019, as reported in 2016 (Statistics Canada, 2023). The existing winter road extends approximately 200 km west from Shamattawa where it connects to Provincial Road (PR) 280 between Gillam, MB and Long Spruce, MB. This winter road has been constructed annually since MTI began managing the winter roads in the northeastern region in the early 1990s.

In 2001, an assessment of potential all-weather road servicing options for Shamattawa was reviewed with community members (Dillon Consulting, 2001). Much of the concerns raised were related to the number of stream crossings, steep grades, and narrow roadway widths. Water crossings along the existing winter road at several sites were recognized to be problematic due to fast waters and poor ice conditions which can restrict transport truck loads. Furthermore, steep hills create additional difficulties to navigation and safety during poor driving conditions (Dillon Consulting, 2001). Recent works to the existing Shamattawa Winter Road were completed in 2014/2015 and included spot geometric improvements and cutting down the hill at the Hayes River along with surface improvements to improve traction for heavy traffic climbing the incline. Together, these improvements were determined to have increased the safety and reliability of the road (MIT, 2015).

### 2.1 Project Rationale

Manitoba's winter road system plays an important role in overcoming social and economic challenges facing northern and remote communities (MTI, 2015). Winter roads not only facilitate the hauling of freight to northern and remote communities, but also provide the residents with temporary inter-community travel as well as road access to the rest of the province. Manitoba's winter road season is typically short lasting for a period of about eight weeks from mid-January to mid-March, however, the prevailing weather conditions can shorten or extend this period by as

much as two weeks (MTI, 2015). Since 1999, the Province of Manitoba has increased spending on the winter road system in order to improve safety, extend the operating period, and reduce construction and maintenance challenges.

The proposed Shamattawa winter road realignment is part of MTI's efforts to improve the winter road system in northern Manitoba. The 38.3 km reroute replaces a 58 km section of existing winter road. A portion of the existing winter road is misaligned and leads away from the community of Shamattawa First Nation in several places resulting in longer travel times and increased costs for construction and maintenance. There is also a large hill along the existing route that is difficult for heavy traffic and freight-carrying trucks to navigate and has resulted in stuck vehicles and blockages along the road. The proposed realignment will shorten the winter road by approximately 19.7 km while also reducing the number of watercourse crossings from eleven to six. Reducing overall reliance on watercourse crossings can extend the operating period of the winter road and increase freight load sizes for transport truck. Overall, the proposed Project can reduce travel times, net emissions, construction and maintenance costs, while simultaneously improving driver safety, navigability, and extending the operational period of the winter road.

## **2.2 Evaluation of Alternatives**

The proposed relocation was specifically selected to achieve the most direct route and maintain alignment with the eastern extent of the existing Shamattawa Winter Road. As such, no alternative routes were considered.

## **3.0 PROJECT DESCRIPTION**

The proposed realignment for the Shamattawa Winter Road is an improvement to the existing winter road system. Construction activities for the new section of the Shamattawa Winter Road will primarily involve clearing trees and shrubs for a 20 m-wide right of way (ROW) for the proposed winter road realignment. The Project involves crossings at six perennial streams which demonstrate continuous flow of surface waters under normal conditions. The six stream crossings and proposed relocation of the Shamattawa Winter Road are shown in Figure 1.

### **3.1 Winter Road Construction**

Where possible, the proposed realigned road will follow the natural terrain and will need to be cleared of trees, brush, shrubs, and boulders. Timber and brush cleared from the ROW using dozers (E.g., D5 or D6 types) and will be piled and compacted in windrows situated 1 m from the bush line until it can be removed from site. Timber will be harvested and made available for local use while brush may be either burned or repurposed where possible, or removed off-site for disposal. Clearing will also involve some minor grubbing in order to remove tree stumps along the route in order to create a smoother riding surface. Construction activities will not involve any sub surface work, such as grading or excavations, below the ground surface.

Standard practice for annual winter road construction includes the use of lightweight equipment, such as snowmobiles, to pack the snow on both land and ice areas. Packing the snow reduces its insulating properties and allows the frost to penetrate deeper into the ground. Heavy equipment such as graders and plows will then be used to clear, pack, and pave the road out of snow. Additionally, surfaces can be flooded to thicken the layer of ice in an area to accommodate the weights of freight trucks. Winter roads are normally constructed to a standard such that the road will safely support the passing of a 36,500 kg gross load and allow loaded trucks to travel safely at an average speed of 35 km/h. Smaller personal vehicles are restricted to posted speed limits of 40 km/h.

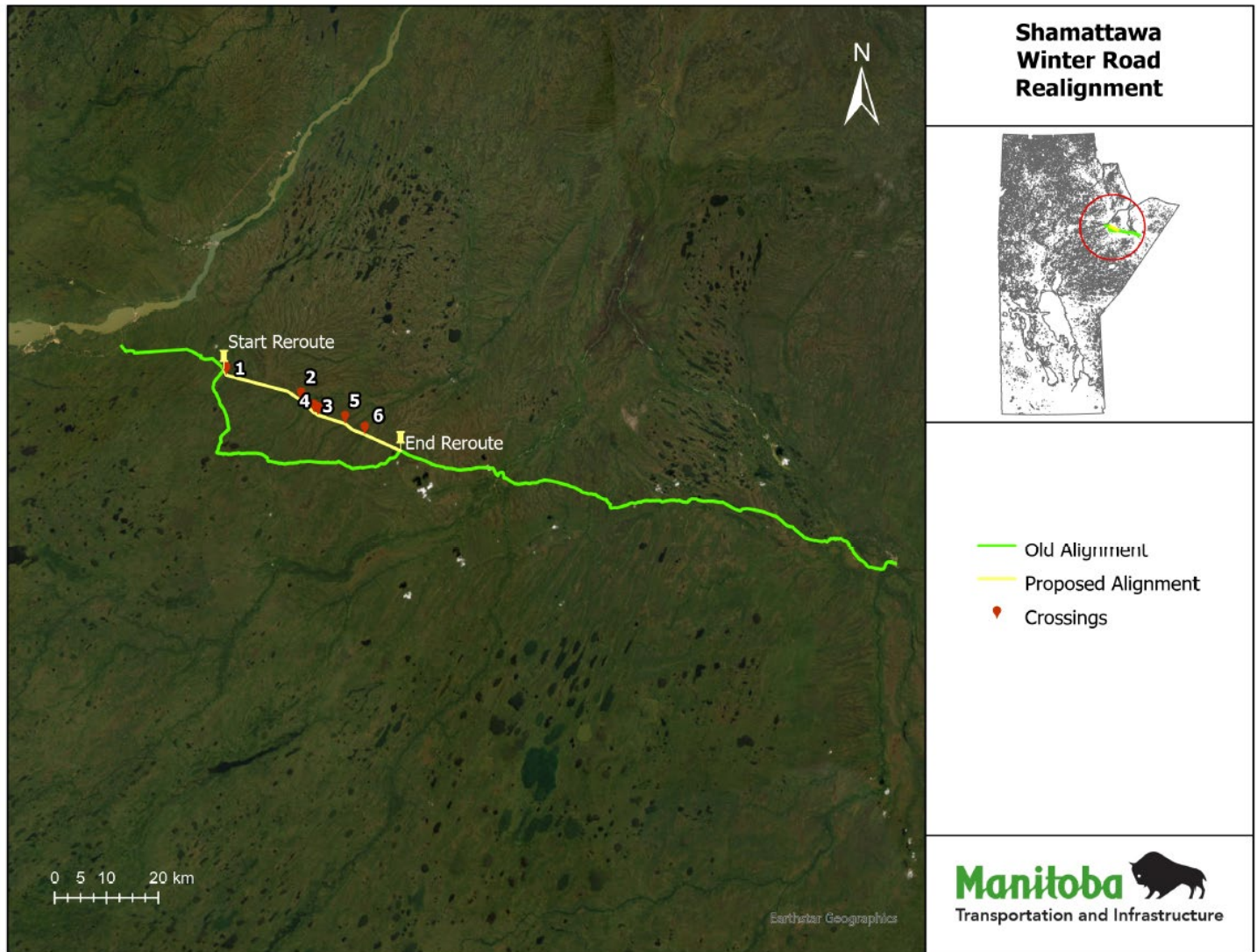
### **3.2 Stream Crossings**

The six stream crossings will be constructed out of snow and then flooded in order to establish a thick ice surface that vehicles can travel on. Streams will be flooded and/or filled with snow as required to thicken the natural ice surface until it is of sufficient thickness to safely support the passing of a loaded truck (i.e., 36,500 kg gross load). Ice crossings are situated in areas of low land elevation, as this is where ice naturally forms to provide a smooth road surface.

### **3.3 Operation and Maintenance Proposed Realignment**

In terms of operation of the proposed realignment, annual construction of the winter road surface depends on local snowfall. Once commissioned, periodic maintenance activities will include grading, the use of snowplows in order to maintain the traveling surface, removal of fallen trees, as well as occasional upkeep and repairs of ice crossings (E.g., additional flooding to increase ice thickness). Additionally, minor clearing efforts may be necessary to remove shrubs that have grown within the 20 m ROW over the spring, summer, and fall seasons. Generally, minor cutbacks to shrubs or saplings are required after five years. In these instances, clearing activities will target emerging sapling and shrubs with no impact to low-laying vegetation such as sphagnum mosses, grasses, and sedges.

Seasonal closure of the winter road generally consists of a final survey of the area to remove any abandoned vehicles or equipment from the route. The six ice crossings will be left to melt during the spring after the winter road closes.



**Figure 1.** Proposed Shamattawa Winter Road relocation with the six perennial stream crossings locations along the proposed new winter road in comparison to the existing winter road.

### **3.4 Decommissioning of the Existing Route**

The proposed realignment is intended for long-term use and MTI does not plan to decommission the new section of the Shamattawa Winter Road in the near future. Plans for decommissioning the existing section of the Shamattawa Winter Road will involve complete discontinued use of the route thus allowing it to revegetate naturally. The existing route does not have any permanent bridges or other crossing structures. Ahead of final closure, the route will be surveyed for any abandoned vehicles or equipment from prior years' use. If found, all materials will be removed to ensure no outstanding anthropogenic impacts persist after decommissioning. Natural revegetation of decommissioned winter roads is common practice in Manitoba, given these roads are constructed with natural materials (i.e., snow and ice pack), have minimal impacts to the environment due to their short-term use (i.e., 3-4 months annually), and largely occur in areas with undisturbed and abundant vegetation. Furthermore, the existing winter road occurs within peatland complexes with open bog areas dominated by sphagnum mosses, sedges, and low-laying shrubs. As such, these environments demonstrate a decreased dependency on contiguous growth of mature forest and support several species adaptable to early successional forest types. For these reasons, decommissioning of the existing winter road by natural revegetation is anticipated to be highly successful.

### **3.5 Schedule**

Construction of the project is planned to occur during the 2023/2024 winter road season. Construction activities will need to occur during the winter given the area is otherwise inaccessible during the warmer months. The existing winter road will be used by the public over the 2024 winter season. The proposed realignment will be complete and prepared for public use for the 2025 winter season at which point the existing route will be fully decommissioned. The operating window for the winter road will generally occur between mid-January and mid-March annually depending on weather conditions.

### **3.6 Project Funding**

The project will be funded by the Province of Manitoba.

### **3.7 Other Regulatory Approvals and Requirements**

The proposed Project is located on provincial Crown land. As such, a Crown Lands Work permit will need to be issued in order to allow MTI to proceed with the work, in accordance with section 7(1) of the *Crown Lands Act*.

Given Crown timber will be cleared as part of Project construction, the Manitoba Forestry Branch was consulted to assess required timber dues and to apply for a Crown timber permit. As such, any Crown timber dues will be fulfilled by the Government of Manitoba ahead of Project completion.

If burning of brush or shrubs are planned to occur as a potential disposal method, the contractor may be required to notify the Gillam District Forestry Office. Under the Manitoba *Wildfires Act*, acquisition of permits to burn are only required for burning taking place between April 1<sup>st</sup> to November 15<sup>th</sup> of any year.

### **3.8 Legal Description**

The land that is planned to be directly impacted by the proposed realignment is Crown Land. Similarly, much of the land surrounding the immediate Project footprint is Crown Land. As such, the necessary regulatory approval to conduct works on Crown Lands will be adhered to and is explained in greater detail in section 3.7.

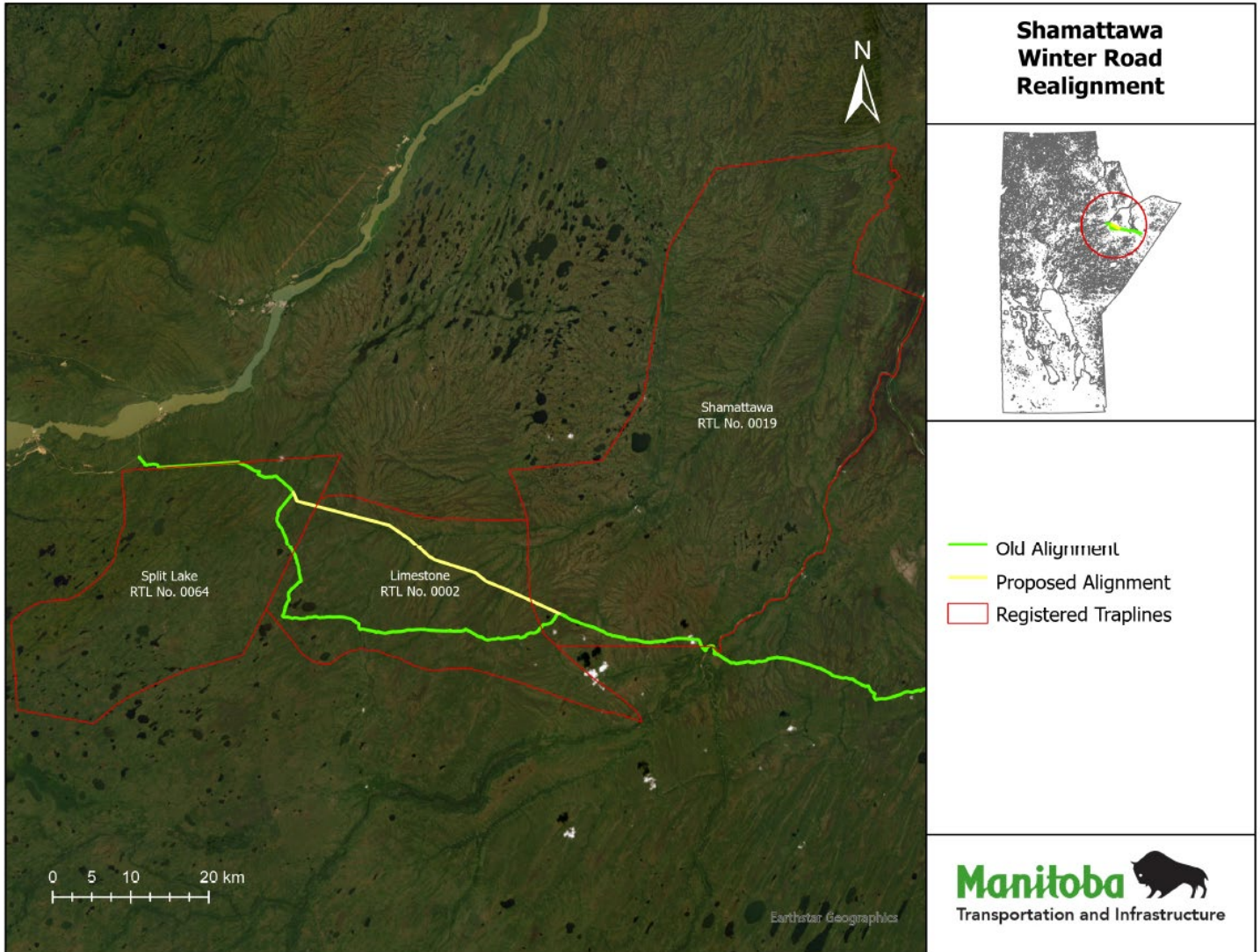
### **3.9 Land Use**

The area in which the proposed realignment of the Shamattawa Winter Road occurs is located in a relatively remote and isolated area that supports little development outside the existing winter road alignment. The proposed project crosses through portions of the Split Lake (Trapline 64), Limestone (Trapline 02), and Shamattawa (Trapline 19) Registered Trapline (RTL) Sections as shown in Figure 2 below.

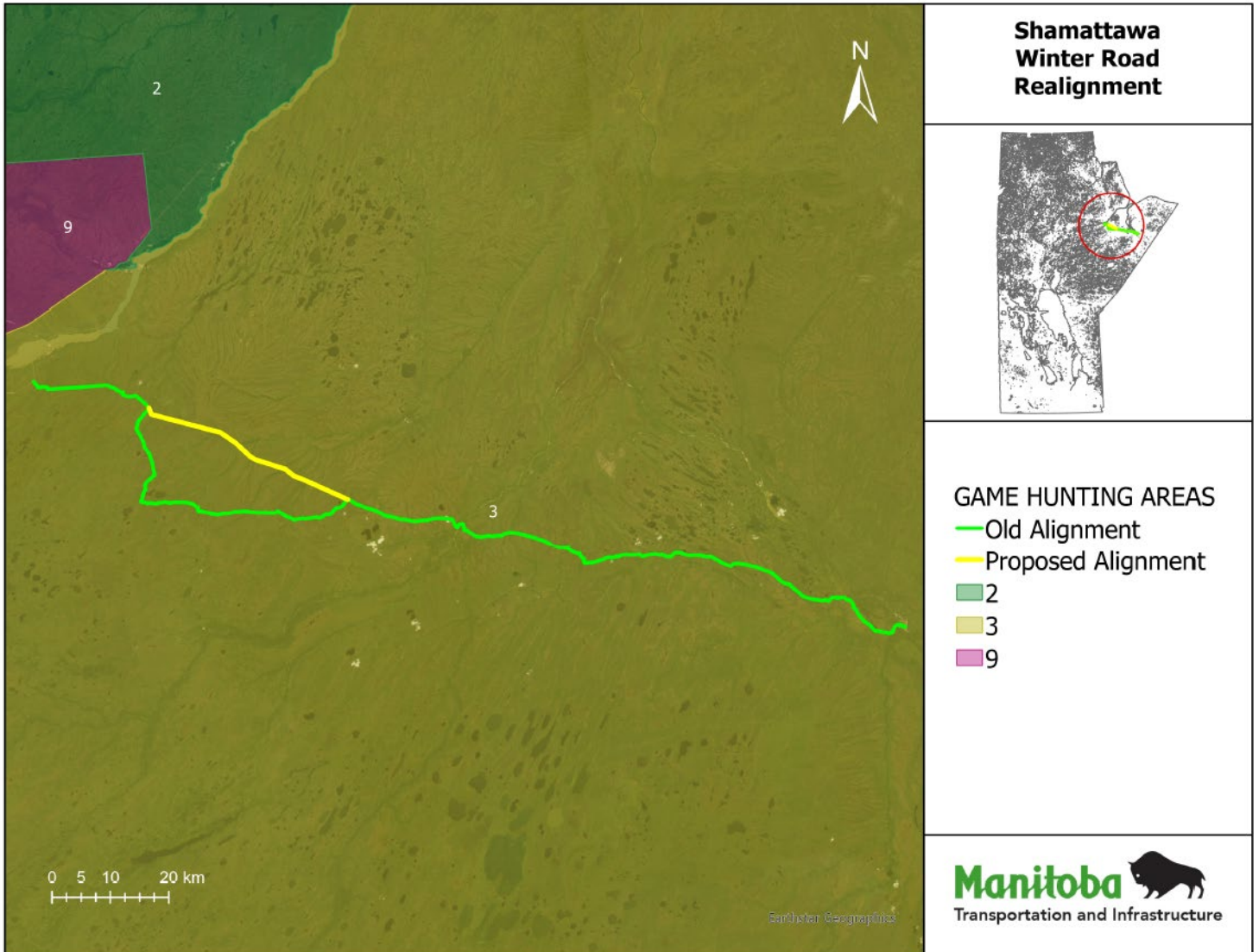
The Project is also located within the recognized Game Hunting Area (GHA) #3. GHA 3 extends from the Hudson Bay in the north and follows the Nelson River south to Ilford, MB. The southern extent of GHA 3 is located approximately 40 km north of Gods Lake, MB and extends west to the MB-ON border. The full extent of the Project with respect to surrounding GHAs can be reviewed in Figure 3.

Forestry is another potential land use within the Project area. Manitoba forested lands are divided into ten Forest Sections that relate to common forest conditions throughout a particular section (ARD, 2021). The proposed Project falls within Management Unit 78 of the Hudson Plain Forest Management Section (Forest Management Section 10). This forest management area is not actively logged and does not fall under a Forest Management License. Figure 4 shows the proposed Project in relation to the Forest Management administrative boundaries.

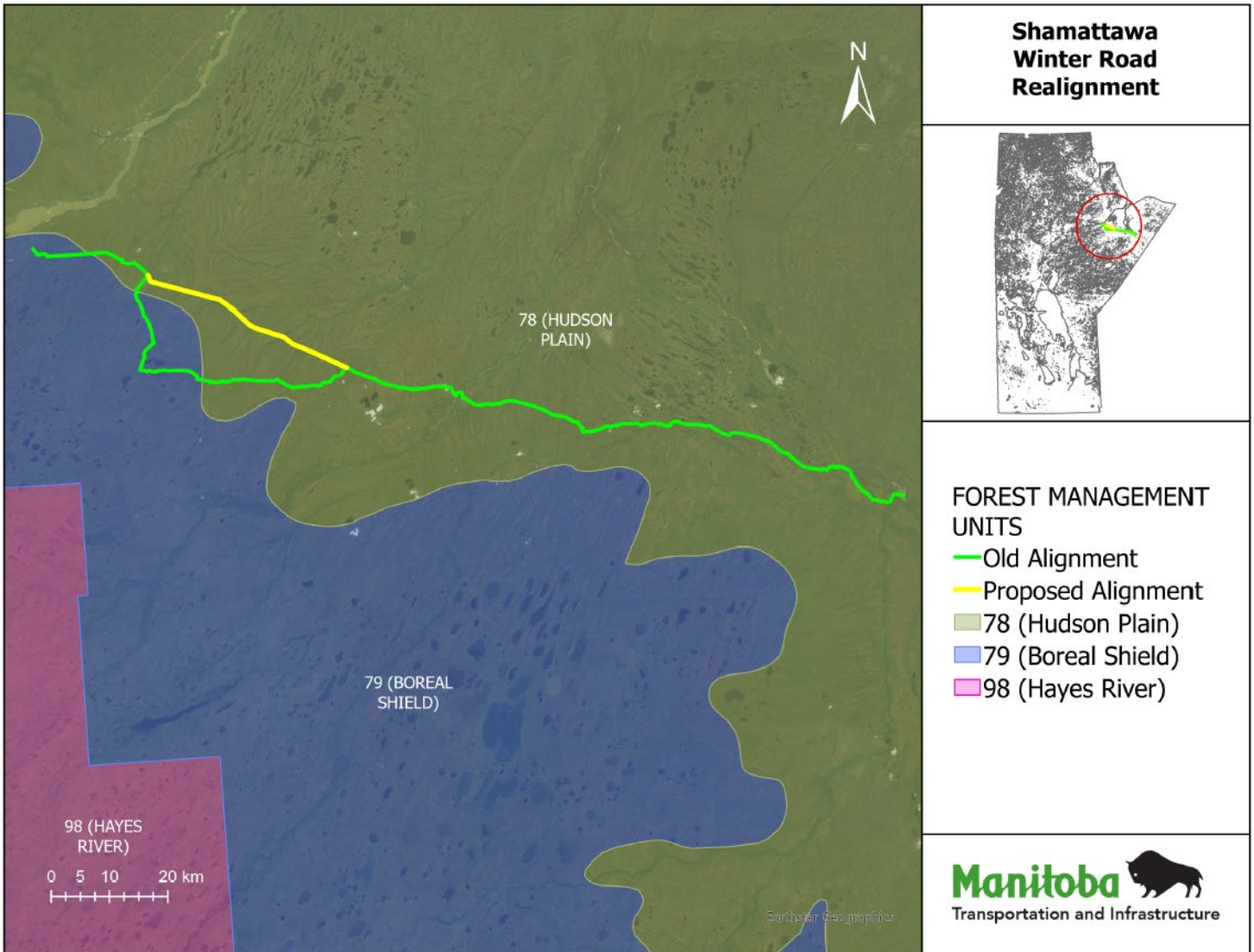
There are no registered land uses nor zoning designations within at least 500 m of the proposed Project area.



**Figure 2.** Proposed Shamattawa Winter Road Realignment Project in relation to existing Registered Traplines.



**Figure 3.** Proposed Shamattawa Winter Road Realignment Project in relation to Game Hunting Areas (GHA). The Project occurs within GHA 3 (Manitoba Government, 2021).



**Figure 4.** Proposed Shamattawa Winter Road Realignment Project in relation to the Forest Management boundaries on Management Unit 78 (Manitoba Land Initiative [MLI], NDb).

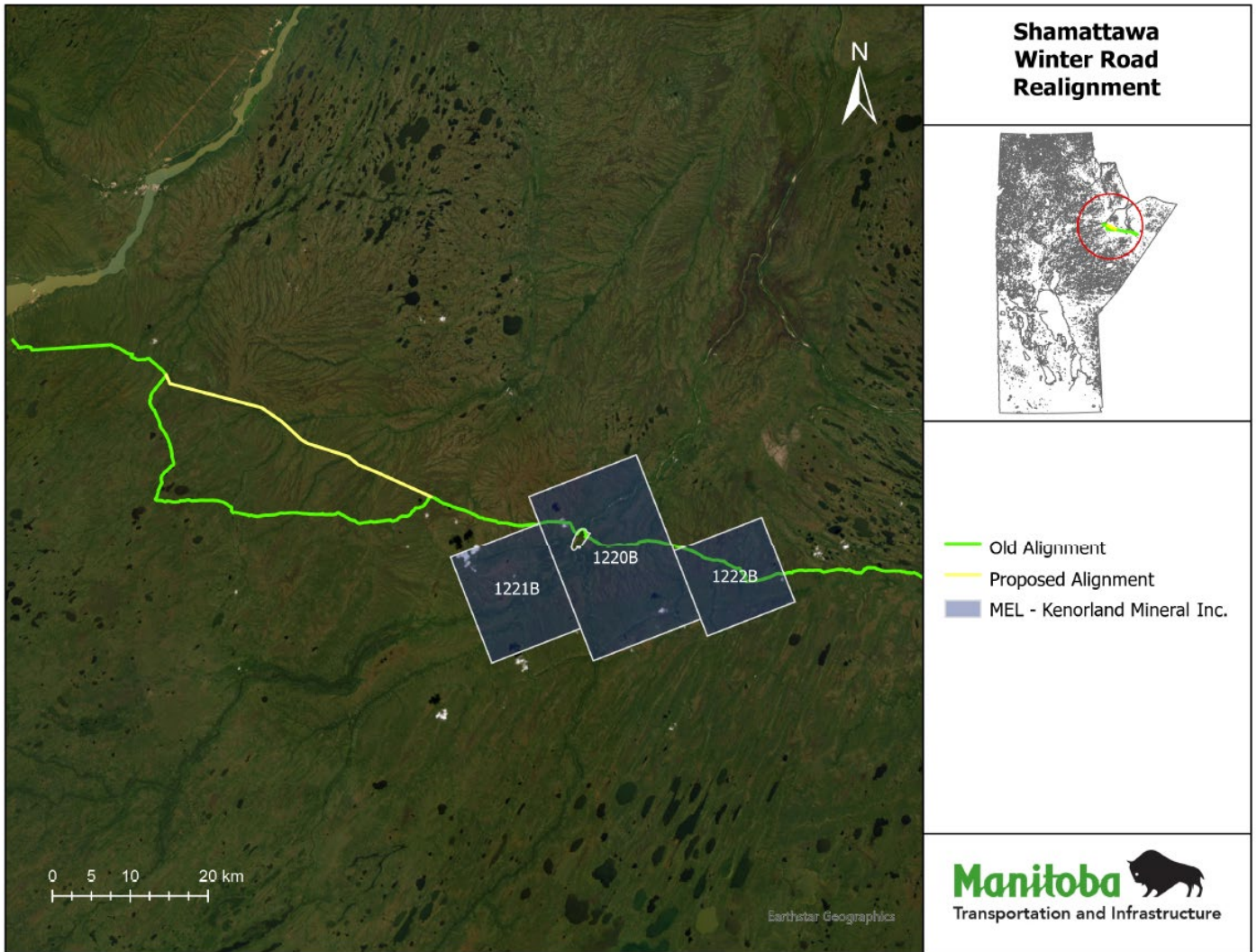
### 3.10 Property Ownership and Mineral Rights

Quarries, mining, and mineral exploration activities are also known to occur within the Project area. Information available on the Province of Manitoba's GIS Map Gallery (NRND, 2023) was reviewed in order to determine if any mineral or quarry dispositions were present within the immediate vicinity of the project area. Currently, there are three pending Mineral Exploration Licenses (MELs) submitted by Kenorland Mineral Inc. The pending MELs are located east of the proposed realignment, and intersects with the existing route of the Shamattawa Winter Road (Figure 5). While these MELs are currently pending, if approved, Kenorland Mineral Inc. would be granted holder exploration rights which may result in drilling or other works to occur in the approved areas.

### 3.11 Public Engagement and Consultation

During the Project Environmental Pre-Screening phase (2015), MTI sent notification of the proposed works to Chief and Council from Shamattawa First Nation. Leadership from Shamattawa First Nation expressed support for the project and a Band Council Resolution (BCR) was obtained. In addition to discussions with Chief and Council, a notification of Project works was distributed to Fox Lake Cree Nation in August 2023. The notification outlined work activities planned to occur (i.e., clearing and grubbing), an approximate schedule of such works (i.e., winter 2023/2024), potential impacts, and proposed completion of work. Additionally, regional MTI staff are committed to coordinating meetings with adjacent communities and trappers. Should it be required, MTI is committed to undertake any additional consultations considered necessary to ensure compliance with Section 35 of the *Constitution Act*.

Additional input will be collected by MTI during the EAP comment period to be considered in the future development of the Project.



**Figure 5.** Proposed Shamattawa Winter Road Realignment Project in relation to existing mineral exploration licenses (pending) held by Kenorland Mineral Inc. within the Project region (Government of Manitoba, ND).

## **4.0 DESCRIPTION OF EXISTING ENVIRONMENT**

The following section presents a description of the existing environment for the Shamattawa Winter Road Realignment Project. Information on the existing environment was compiled using publicly available data from both federal and provincial governments, peer-reviewed literature, internal departmental data-sharing, and local ecological knowledge sources. The existing environment considers environmental conditions of the contemporary period to present-day relating to the physical, biological, and socio-economical environments.

### **4.1 Spatial Boundaries**

The existing environment was assessed under two spatial boundaries, local and regional. Together, these two boundaries provide a comprehensive analysis the existing environment that occurs on a local and regional level. These spatial boundaries can be defined as:

- i. Local assessment area (LAA) – The area surrounding and including the Project, where environmental components have been reported to occur, or are likely to occur within the immediate project area.
- ii. Regional assessment area (RAA) – The greater area surrounding the Project, where environmental components have been reported to occur, or are likely to occur, outside of the immediate project area but may have an influence on a regional scale.

The LAA boundary for the Project is defined as areas occurring within 500 m of the realigned route. This distance was determined by taking into consideration recommended wildlife buffers and set-backs, construction works, mitigations and best management practices.

The RAA boundary for the Project is defined as areas occurring within 50 km of the realigned route. This distance was determined by taking into consideration existing wildlife migratory routes, hunter and trapper activities, community interest zones, and resource development.

### **4.2 Physical Environment**

This section provides a description of the existing physical environmental characteristics of the Project region. Topics are discussed both on a regional and local scale in relations to the proposed Project.

#### **4.2.1 Climate**

The Winisk River Lowland Ecodistrict is situated in the Low Subarctic Ecoclimate Region (Smith et al. 1998). The climate in this area tends to be characterized by short cool summers and long, very cold winters (Smith et al., 1998). The closest climate station is located in the community of Gillam, Manitoba which is approximately 38 km from the Project area, within the RAA, and is situated just outside the Winisk River Lowland Ecodistrict boundary. Climate data spanning 1981

– 2010 for Gillam, MB was obtained from Environment and Climate Change Canada (ECCC) and is considered to be representative of the climate experienced in the Project area for the purpose of this report. A thirty-year period is considered to be representative of the “climate normals” (ECCC, 2020). As such, the 1981-2010 climate normal can be used as a historical reference for present-day climate data (ECCC, 2020). Table 4-2 provides a summary of select climate parameters including temperature and precipitation over the 1981-2010 period for the community of Gillam, MB. With respect to Project changes to climate in the Project area, ECCC has outlined projected increases in daily maximum temperatures under a high, moderate, and low emission scenarios (ECCC, 2023). When modelling projected daily maximum temperatures changes along the Shamattawa Winter Road route, ECCC has projected an increase between 1.4°C to 2.0°C by 2040. By 2100 the daily maximum temperature for this area is projected to increase as much as 2.0°C to 7.1°C. The projected changes to temperature under different emission scenarios can be reviewed in Table 4-1.

**Table 4-1.** ECCC high resolution future climate simulations for annual daily maximum temperatures projected within the Project area.

Time Period	Emission scenario	Projected change
2021-2040	High	+2.0°C
	Moderate	+1.5°C
	Low	+1.4°C
2041-2060	High	+3.3°C
	Moderate	+2.5°C
	Low	+2.0°C
2061-2080	High	+4.9°C
	Moderate	+3.0°C
	Low	+1.9°C
2081-2100	High	+7.1°C
	Moderate	+3.2°C
	Low	+2.0°C

*Adapted from ECCC, 2023. Climate data viewer.*

**Table 4-2.** Selected Summary Climate Statistics 1981-2010 for Gillam, Manitoba.

Parameters	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average
<b>Daily Average (°C)</b>	24.4	-21.7	-14.6	-4.4	3.9	11.6	15.8	14.4	7.9	0.0	-11.6	-21.4	-3.7
<b>Daily Maximum (°C)</b>	-19.7	-16.0	-7.9	1.9	9.9	18.0	21.8	20.0	12.4	3.6	-7.6	-16.9	1.6
<b>Daily Minimum (°C)</b>	-29.0	-27.3	-21.2	-10.6	-2.2	5.1	9.7	8.7	3.3	-3.5	-15.5	-25.9	-9.0
<b>Extreme Max. (°C)</b>	2.9	4.6	12.4	28.7	32.4	36.8	35.2	35.1	31.0	22.4	9.5	2.6	-
<b>Date (yyyy/dd)</b>	2003/ 07	1996/ 22	2010/ 31	1980/ 30	1986/ 27	2002/ 29	2007/ 24	1991/ 11	1996/ 01	1984/ 10	1978/ 01	1999/ 25	-
<b>Extreme Min. (°C)</b>	-46.1	-45.0	-42.6	-33.0	-22.8	-6.1	-1.7	-1.7	-9.1	-26.9	-39.4	-45.1	-
<b>Date (yyyy/dd)</b>	1975/ 21	1972/ 16	1995/ 08	2008/ 05	1983/ 15	1972/ 04	1972/ 02	1979/ 23	1981/ 29	1997/ 30	1989/ 24	2004/ 24	-
<b>Rainfall (mm)</b>	0.0	0.0	0.9	3.8	28.8	54.0	78.6	76.1	53.0	19.0	1.0	0.1	315.3
<b>Snowfall (cm)</b>	25.2	24.6	27.6	22.1	15.7	2.1	0.0	0.0	4.6	26.2	44.2	28.9	221.2
<b>Precipitation (mm)</b>	19.6	19.0	22.7	21.7	42.6	55.8	78.6	76.1	56.8	42.2	38.0	23.3	496.4

Adapted from ECCC 2020. Canadian climate normals.

#### 4.2.2 Greenhouse Gas Emissions

Climate change is linked to GHG emissions that contribute to atmospheric increases in levels of carbon dioxide (CO<sub>2</sub>) and other gases that increase global temperatures, change climate and precipitation patterns, and increase the frequency of extreme weather events. Environment and Climate Change Canada (ECCC) currently tracks six GHG substances as part of Canada's efforts to identify, quantify and reduce sources of GHGs. These include CO<sub>2</sub>, methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), sulphur hexafluoride (SH<sub>6</sub>), perfluorocarbons (PFCs), and hydro-fluorocarbons (HFCs) (ECCC, 2021). Each GHG has a different global warming potential (GWP) and persists for a different length of time in the atmosphere. As such, GHG emissions from different types of gaseous compounds are converted into CO<sub>2</sub> equivalents to be compared and tracked over time (ECCC, 2021).

Industrial activities known to occur throughout northern Manitoba include mining and exploration, fossil fuel generation and paper mills. ECCC monitors GHGs under the Greenhouse Gas Emissions Reporting Program (GHGRP), which is Canada's legislated, publicly accessible inventory of facility-reported GHG data and information. In 2020, there were 40 facilities in Manitoba reporting under the GHGRP, however there were six facilities reporting under the GHGRP within 500 km of the Project (Table 4-3). The nearest facility is the Vale Canada Ltd. Nickel-copper ore mine located approximately 270 km west of the Project site in Thompson, MB. A full list of GHGRP facilities within approximately 500 km of the proposed Project site can be reviewed in Table 4-3. No GHGRP facilities exist within the LAA or RAA.

Other sources of GHGs within the LAA and RAA can mainly be attributed to vehicles travelling the existing Shamattawa winter road limited to the winter season. Pollutants emitted from motor vehicles include NO<sub>x</sub> (nitric oxide and nitrogen dioxide), CO (carbon monoxide), volatile organic compounds, and to a lesser extent SO<sub>2</sub> (sulphur dioxide) and particulate matter.

**Table 4-3.** Summary of GHG emissions reported in 2020 under the GHGRP by facilities within approximately 500 km from the proposed Shamattawa Winter Road Realignment Project.

Company	Facility Type	City, Province	Distance (km)	GHGs (tonnes CO2 eq)				Total GHGs
				CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	
Vale Canada Ltd.	Nickel-copper ore mining	Thompson, MB	270	19,458	71	470	0	19,999
Hydro One Remote Communities Inc.	Fossil-fuel electric power generation	Sandy Lake, ON	350	10,003	7	24	0	10,034
Hudbay Minerals	Copper-zinc ore mining	Snow Lake, MB	450	22,941	29	523	0	23,493
Goldcorp Canada Ltd.	Gold and silver ore mining	Kenora District, ON	500	32,387	42	552	21	33,001
Hudbay Minerals	Copper-zinc ore mining	Flin Flon, MB	515	28,900	44	619	0	29,563
Canadian Kraft Paper Industries Ltd.	Paper mill	The Pas, MB	530	65,372	5,227	6,882	0	77,481

Adapted from ECCC, 2021. Facility-reported greenhouse gas data.

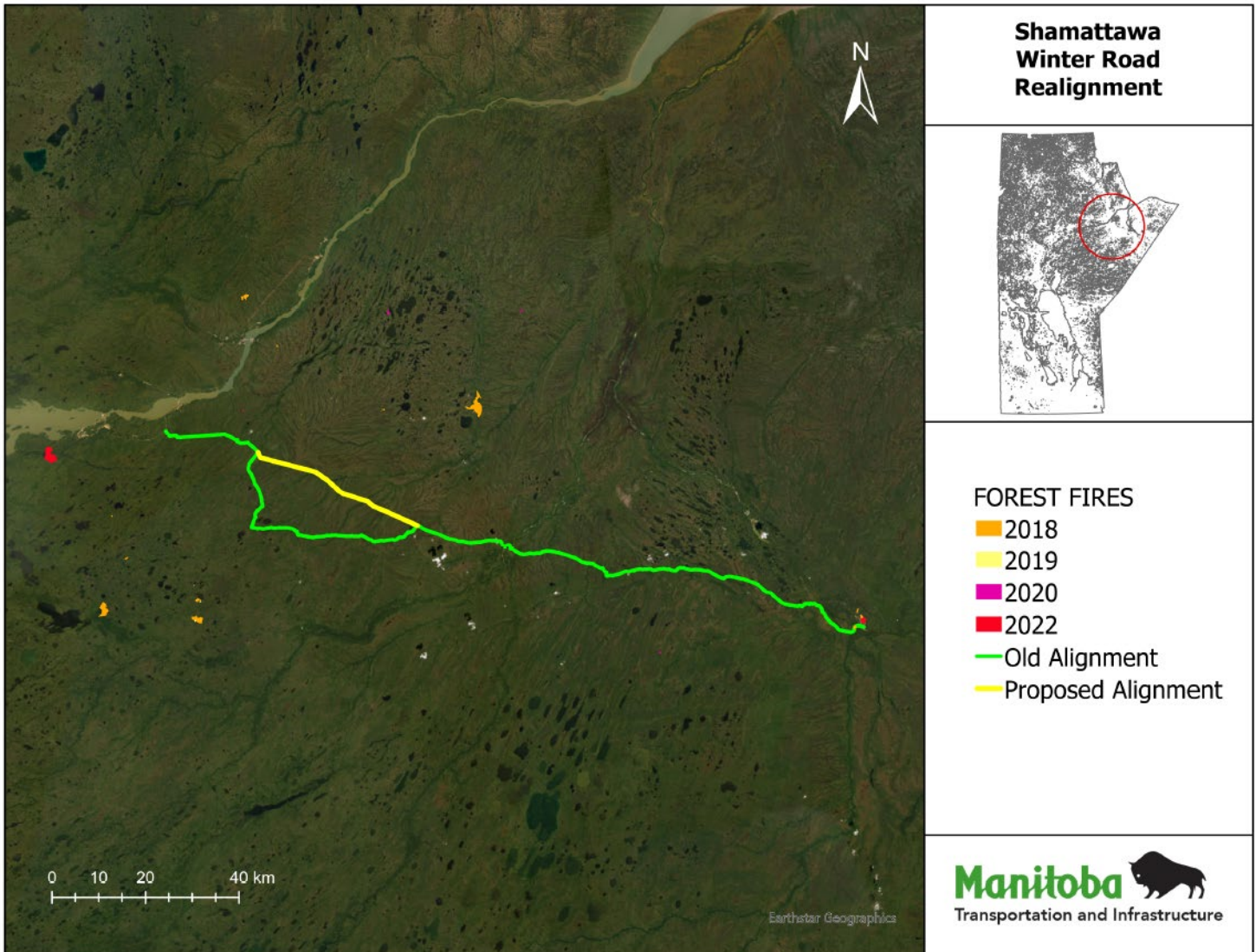
#### 4.2.3 Air Quality

Air quality is an important consideration for human and environmental health. Air quality concerns in Manitoba are typically localized meaning, that in the case of air quality concerns, their effects tend to be limited to local people and the immediate environment (MEC, 2023). Typical human and environmental effects associated with poor air quality are related to nuisance odour, noise, and air pollutants. For example, ground level ozone or smog can cause damage vegetation and degrade various types of materials (MEC, 2023). Poor air quality can generally be linked to a number of health related respiratory problems such as aggravated asthma, lung disease, and reduced lung functioning among others (USEPA, 2009). Key sources of air pollutants affecting air quality and greenhouse gasses in Manitoba are industrial operations, vehicle emissions, and the release of manmade substances into the atmosphere (MEC, 2023).

In Manitoba, air quality is monitored at four locations including Winnipeg, Brandon, Thompson, and Flin Flon. The range of parameters measured include sulfate (SO<sub>4</sub>), sulfur Dioxide (SO<sub>2</sub>), PM<sub>10</sub> (Particulate Matter ≤ 10 microns), PM<sub>2.5</sub> (Particulate Matter ≤ 2.5 microns), ammonia (NH<sub>3</sub>), nitrous oxide (NO<sub>x</sub>), nitrogen dioxide (NO<sub>2</sub>), nitric oxide (NO), ozone (O<sub>3</sub>), carbon monoxide (CO), wind speed, and wind direction. While the suite of air quality parameters measured at each of the four monitoring locations varies, Manitoba Environment and Climate (MEC) indicates that each location collects consistent data on PM<sub>10</sub> and PM<sub>2.5</sub> as a general indicator of air quality (MEC, nd). In terms of proximity to the Project, the closest air quality monitoring station was that located in the Thompson, MB, however this monitoring station was decommissioned in June of 2020.

Appendix B provides a generated report of mean air quality measurements recorded on a 12-hour interval throughout January 2020.

The proposed Project is located in a remote part of northern Manitoba that is primarily undeveloped and in relatively pristine condition. In general, air quality within the winter road relocation project area is assumed to be good. Potential sources of air emissions are likely attributable to mining exploration and quarry activities, seasonal use of the existing Shamattawa Winter Road (trucks, transports, etc.) and naturally occurring forest fires. The RAA has been subject to 35 forest fires of various sizes recorded from 2018 to 2022 (Figure 6). This suggests that as a natural emission source, forest fires contribute to existing air quality. As of EAP submission, no forest fires have occurred within the LAA since 2022.



**Figure 6.** Recorded occurrences of forest fires within the proposed Shamattawa Winter Road Realignment RAA from 2018 (n=17), 2019 (n=7), 2020 (n=9), and 2022 (n=2) (MLI, NDa).

#### 4.2.4 Noise and Vibration

Existing noise and vibration levels in the Project area are expected to be low given the remoteness of the area. Outside of the existing winter road, there is little development within the immediate Project area. As such, the main sources of existing noise and vibration in the vicinity of the Project area include seasonal use of vehicular traffic (cars, light duty and transport trucks, construction equipment, recreational vehicles, etc.) and industry (mineral exploration, mining, quarries), as discussed in section 3.10.

#### 4.2.5 Terrain and Topography

The proposed project is located in the Winisk River Lowland (1024) Ecodistrict of the Hudson Bay Lowland Ecoregion in the greater Hudson Plains Ecozone (Smith et al., 1998). The Hudson Plains Ecozone is centered in northern Ontario but includes portions of Northeastern Manitoba and Quebec. This flat, wetland-dominated plain borders in the south and west on the Severn and Kazan Uplands. This Ecodistrict has been considerably affected by post-glacial marine submergence and isostatic rebound of the land surface. Most of the Ecodistrict contains extensive complexes of wetlands, with peat plateau and string bogs, horizontal and northern ribbed fens, large numbers of unconnected small lakes/ponds, many smaller creeks and rivers, and widespread areas of permafrost (Smith et al. 1998). Dominate vegetation type includes open stunted black spruce forest found on the bogs. Associated vegetation consists of Labrador tea, mosses, and lichens. The fens have vegetation dominated by sedges and brown mosses with varying amounts of dwarf birch, willow and stunted tamarack (Smith et al., 1998). Development throughout the Winisk River Lowland Ecodistrict is inhibited due to severe climate constraints which have limited opportunities for forestry or agriculture (Smith et al. 1998).

#### 4.2.6 Bedrock Geology

The existing relief of the Winisk Ecodistrict is a product of past geological and glacial activities within the Hudson Bay Basin, and was particularly affected by post-glacial marine submergence of the Tyrrell Sea (Matile and Keller, 2006; Smith et. al., 1998). A regional synthesis of stratigraphy of northern Manitoba determined that the region consists of tills and intertill sediment squences representative of a series of ice-flow events occurring throughout several glaciations and interglacial (Dredge and McMartin, 2011). The Hudson Bay Lowland Ecoregion, within which the proposed Project is located, sits along a boundary of distinct Paleozoic bedrock lithology (Dredge and McMartin, 2011).

Specific to the Project's LAA, Amery till can be found exposed along the Gods and Hayes rivers, distinguishable by hard and compact grey till (Dredge and McMartin, 2011). Amery till is recognized as the oldest till that is widespread throughout the region (Dredge and McMartin, 2011). It is characterized by olive grey, calcareous, silty, and moderately stoney. Amery till also contains evidence of abundant cold-water species such as forminifera and molluscs, indicating ice advance across marine sediments (Dredge and McMartin, 2011). Paleozoic strata from the

region consists mainly of limestone, dolomitic limestone (or dolostone) and dolomite (Dredge and McMartin, 2011; AAFC, 2003). Specific to the Winisk River Lowland Ecodistrict, existing glacial till deposits are overlain by remnant alluvial and marine sediments (E.g., sand, gravel, silt, organic detritus) which are further overlain by peat and complexes of wetlands (Matile and Keller, 2006; Smith et. al., 1998).

#### 4.2.7 Soils

The soils occurring throughout the broader Winisk Ecodistrict are dominant in organic cryosols, fibrisols, and mesisols (all of which are recognized as permafrost soils) which overlay clayey and silty glaciolacustrine sediments (Smith et. al., 1998). Organic cryosols are primarily developed from organic materials containing more than 17% organic carbon and which are underlain by permafrost within 1 m of the surface (Soil Classification Working Group, 1998). Fibrisol soils are largely composed of undecomposed fibric organic material. These soil types are extensively found in peat deposits dominated by sphagnum mosses (Soil Classification Working Group, 1998). Fibrisols will demonstrate well preserved fibric material that shows little to no decomposition of organic material. Mesisol soils are similar to fibrisols soils such that they consist of not fully decomposed organic materials but mesisols contain material that is slightly more decomposed than that of fibrisols (Soil Classification Working Group, 1998).

Permafrost and its associated soil types (e.g., organic cryosols, mesisols, and fibrisols) are largely associated with bog peatlands and are widespread throughout the Winisk Ecodistrict (Smith et. al., 1998). The dominant surficial material consists of organic (peat) deposits and is characterized by specific organic landforms related to peatland development processes under the prevailing subarctic environment (AAFC, 2003; Smith et. al., 1998). Derived and interpretive maps have been generated as part of prior research, outlined in the Biophysical Land Classification of the Hayes River (54C) Map Area (AAFC, 2003). These maps have classified select soil and landscape conditions using a generalized approach (AAFC, 2003). Details regarding surface material, drainage, soils, and permafrost characteristics are summarized in Table 4-4.

**Table 4-4.** Summary of surface and soil material, soil drainage, and soil and permafrost classes characterized near the Project area using derived and interpretive maps.

Map Type	Conditions
<i>Surface Material Class</i>	Predominantly organic surface material, with areas of mineral surface materials localized to soils along the Hayes and Gods Rivers
<i>Soil Drainage Class</i>	Predominantly poor and very poor drainage such that water is removed slowly from the soil and excess water is available within the soil for much of the year.
<i>Soil Materials Class</i>	Predominantly permafrost organic followed by deep organic fen peat soils. These types of organic soils are typically poorly to very poorly drained.
<i>Unified Soil Class</i>	Predominantly consisting of organic deposits characterized by varying thicknesses of peat.
<i>Permafrost Class</i>	Predominantly discontinuous permafrost meaning it covers 35% to 85% of the area beneath the exposed land surface. This is followed by patches of sporadic permafrost around the Pennycutaway tributaries such that permafrost occurs in isolated patches between 10% to 35%.

*Adapted from the Biophysical Land Classification of the Hayes River (54C) Map Area (AAFC, 2003).*

#### 4.2.8 Groundwater

There is little available information concerning groundwater resources in the LAA and RAA of the Project due to sparse populations and low levels of development throughout the Hudson’s bay Lowland Ecoregion. Betcher et al. (1995) summarizes that groundwater resources throughout the regional area can be divided into two primary hydrostratigraphic units based on bedrock geology. First is Basal, Precambrian, and Metamorphic rock units characterized by low hydraulic connectivity, limited porosity and with most groundwater movement occurring through the use of secondary permeability features such as joints, faults, shears etc. Groundwater recharge stems from upland areas, occurs slowly, and is likely attributed to direct infiltration. Second is the Carbonate Evaporite Unit where groundwater quality is variable. Groundwater movement also occurs through secondary permeability features such as joints, bedding planes, and solution conduits. Sand and gravel aquifers are present and widely distributed throughout the region, and natural discharge tends to occur in streams, creeks, rivers and lakes (Betcher et al. 1995).

#### 4.2.9 Surface Water

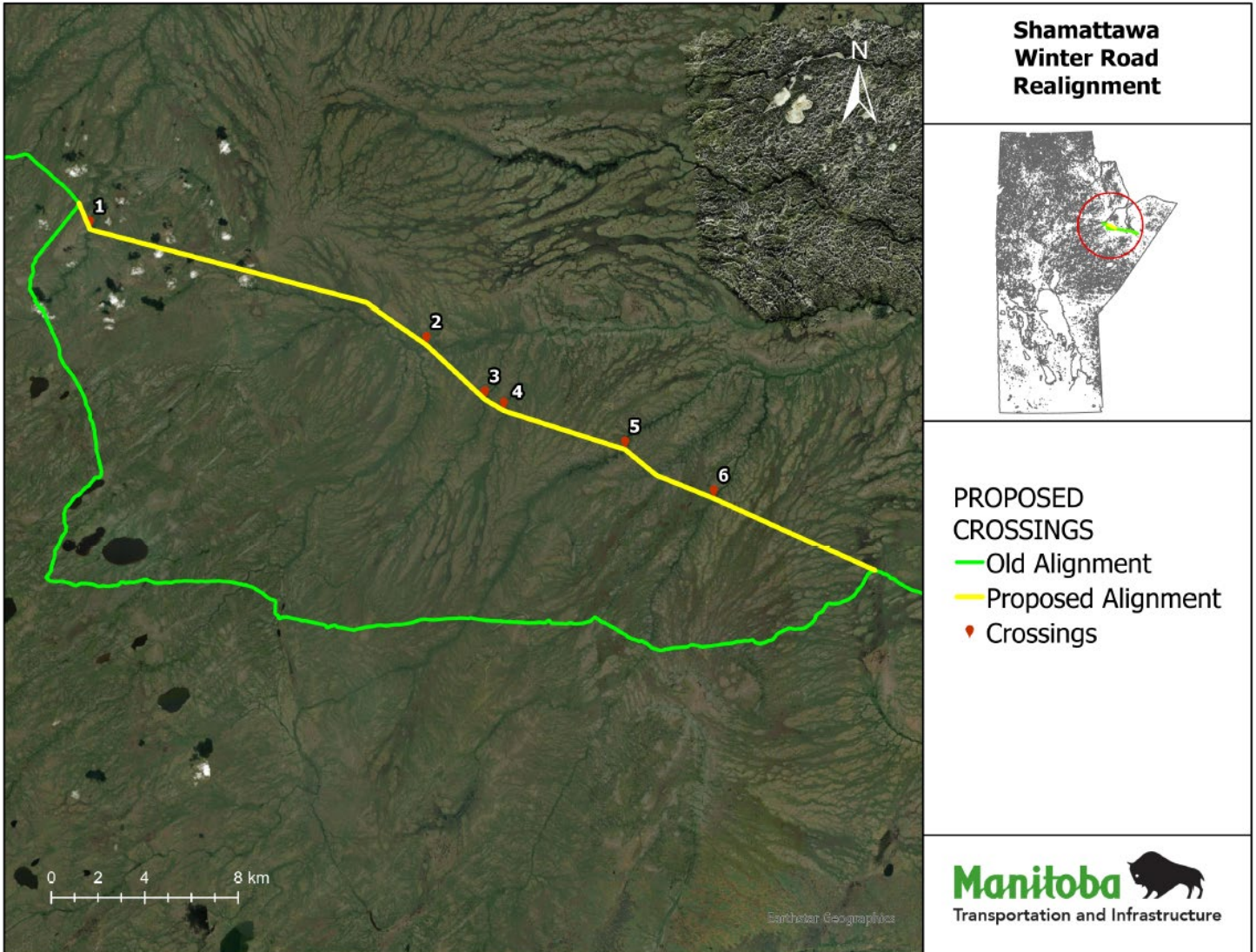
The Winisk River Ecodistrict is characterized by wetland dominated plains with lake, river, and stream systems. Most of the area consists of a complex of peat plateaus, string bogs, and horizontal/ribbed fens. The complexes of wetlands throughout the region are stringed between numerous creeks and small to very small unconnected lakes. The largest watercourses in the region are the Nelson, Hayes (*Kisipikamawi*), and Gods rivers (Smith et al. 1998). The Project will require six ice crossings over perennial water courses. Watercourses that would be crossed include the Angling River, Pennycutaway River (including three of its unnamed tributaries), and

Whelan Creek. Figure 7 identifies the location of the stream crossings associated with the Project and images of each watercourse at the location of the proposed crossings area available in Appendix C.

Limited information could be sourced on surface water properties throughout the LAA. However, some information characterizing water quality in the Angling River was noted as part of the Keeyask Generation Project Environmental Impacts Statement (Keeyask Hydropower Limited Partnership, 2012). Water quality characteristics associated with the Angling River include:

- The Angling River is considered mesotrophic based on CCME trophic categorizations for Total Phosphorus;
- Generally the Angling River is considered to be well oxygenated during open water periods, but may not meet the Manitoba water quality objectives or CCME guidelines during some winters;
- The Angling River is considered alkaline with a pH greater than 8 and consistently within the CCME and Manitoba Water Quality Standards, Objectives, and Guidelines for the protection of aquatic life;
- pH values tend to be lower and specific conductance higher during winter (ice cover) relative to the open water season (Keeyask Hydro Limited Partnership 2012).

No information on water quality could be publically sourced for the Pennycutaway River and its tributaries or Whelan Creek.



**Figure 7.** Locations of the six watercourses that would be crossed by the proposed Shamattawa Winter Road Realignment Project. These include the Angling River (1), Pennycutaway River (5), and three of its unnamed tributaries (2, 3, 4), and Whelan Creek (6).

### 4.3 Biological Environment

This section provides a description of the existing biological environmental characteristics of the Project region. Topics are discussed both on a regional and local scale in relation to the proposed Project.

#### 4.3.1 Vegetation

Vegetation within the Winisk River Lowland Ecodistrict is largely characterized by black spruce forests with dwarf birch (Smith et. al., 1998). Wetland bogs will limit tree growth and therefore trees demonstrating stunted growth is common. Ground cover varies from moss to herbs and forbs. Bog peat lands support ericaceous shrubs and mosses, while fens have sedges, brown mosses and varying amounts of swamp birch, alder, willow and stunted tamarack (Smith et. al., 1998).

The vegetation along the proposed ROW can largely be described as dominated by spruce bog and consisting of old growth forest of undetermined age with widely spaced, small diameter trees. Vegetative growth is highly suppressed due to saturation from the bog conditions of the area. In some cases the dominant vegetation type (i.e. spruce bog) within the LAA and RAA is interspersed with mixed deciduous/coniferous forest cover in drier areas.

#### 4.3.2 Wildlife

The Hudson Bay Lowland Ecoregion provides habitat that supports a wide range of wildlife species. Appendix D includes a listing of mammals, birds, and amphibians known to occur within the Ecoregion. Desktop studies of the Project area considered a review of available information from sources such as Manitoba Conservation Data Centre (MBCDC), The Manitoba Herps Atlas, The Manitoba Breeding Bird Atlas (MBBA), among others.

##### 4.3.2.1 Mammals

Mammals discussed in this report have been selected based on consultation with regional wildlife managers and from species reported from RTLs over the last two decades that intersect with the proposed Project footprint. Furbearer trapline data was provided from biologists with Natural Resources and Northern Development (NRND) as of January 25, 2022. As such, mammals included in this assessment will include Caribou, Moose, Beaver, Fisher, Fox, Lynx, Marten, Mink, Wolf, and Wolverine. While some of these species have been recorded to occur within the LAA, many are migratory or exhibit expansive habitat ranges and are assumed to occur throughout the RAA.

### Woodland Caribou

Woodland Caribou (*Rangifer tarandus*) are listed as a Division 1 Wild Animal under Schedule A of the MB *Wildlife Act*. The caribou population known to occur within the LAA is the Southern Hudson Bay sub-population of the Eastern Migratory (EM) caribou. The southern Hudson Bay sub-population generally occupy a regional habitat range from east of the Nelson River, extending south towards God's Lake, and east into Ontario (COSEWIC, 2017). EM Caribou are regarded as a sensitive species and are further discussed in section 4.2.4.1.

### Moose

Moose (*Alces alces*) are listed as a Division 1 Wild Animal under Schedule A of the MB *Wildlife Act*. Moose are known to occur within RAA (WRCS MB, 2022), and are assumed to also occur within the LAA given their expansive habitat ranges of 200+ km<sup>2</sup> (Hundertmark, 2016). Moose occupy a wide range of habitats, but show preference to second-growth boreal forest with openings of swamps, lakes, and wetlands (Hundertmark, 2016). Accounts of moose within the RAA have been previously reported as a result of moose surveys and population estimate efforts related to the Keeyask Generation Project (WRCS MB, 2022). Moose within the Keeyask region were estimated to have a population of 1,119 individuals and have been deemed stable as of 2015 (WRCS MB, 2022).

### Beaver

Beaver (*Castor canadensis*) are listed as a Division 2 Wild Animal under Schedule A of the MB *Wildlife Act*. Within the LAA and RAA, beavers have been reported by RTL owners which intersect the Project footprint. Beavers are semi-aquatic mammals typically found inhabiting slow flowing streams near forested areas throughout most of Manitoba (Cassola, 2016).

### Fisher

Fisher (*Martes pennanti*) are listed as a Division 2 Wild Animal under Schedule A of the MB *Wildlife Act*. Within the LAA and RAA, fisher have been reported by RTL owners which intersect the Project footprint. Fisher typically occupy forested areas with preference for dense coniferous or mixed forests (Helgen and Reid, 2018). As such the Project occurs within the northern extent of their preferred habitat range in Manitoba.

### Fox

Arctic Fox (*Vulpes lagopus*) are listed as a Division 2 Wild Animal under Schedule A of the MB *Wildlife Act*. Within the LAA and RAA, Arctic fox have been reported by RTL owners which intersect the Project footprint. Arctic fox typically occupy Arctic tundra and northern boreal regions (Angerbjörn and Tannerfeldt, 2014). As such, the Project occurs within the southern extent of their preferred habitat range in Manitoba.

Red Fox, Cross Fox, and Silver Fox (*Vulpes vulpes*) are listed as a Division 2 Wild Animal under Schedule A of the MB *Wildlife Act*. Cross Fox and Silver Fox are a melanistic variety of Red Fox which are phenotypically different, but genetically all the same species. Cross Fox are discernable by distinct black stripes and dark tones that run along their shoulder, back, and tail, whereas Silver Fox are discernable by their black fur with grey-white tips. The three melanistic varieties occupy a widespread of habitats across the majority of Manitoba including tundra, boreal taiga, boreal

forest, farmlands, and urban areas (Hoffmann and Sillero-Zubiri, 2021). Within the LAA and RAA, Red, Cross, and Silver Fox have been reported by RTL owners which intersect the Project footprint.

#### Lynx

Lynx (or Canada Lynx) (*Felis canadensis*) are listed as a Division 2 Wild Animal under Schedule A of the MB *Wildlife Act*. Within the vicinity of the project, Lynx have been reported within the LAA and RAA by RTL owners which intersect the Project footprint. Lynx primarily occupy boreal forest of multi-aged stands with successional growth (Vashon, 2016). Lynx populations have a strong connection with the population of their main prey, snowshoe hares (Vasho, 2016).

#### Marten

Marten (*Martes americana*) are listed as a Division 2 Wild Animal under Schedule A of the MB *Wildlife Act*. Within the LAA and RAA, Marten have been reported by RTL owners which intersect the Project footprint and are the most commonly targeted species. Marten are part arboreal and primarily occupy late successional coniferous forests (Helgen and Reid, 2016). As such the Project occurs within the northern extent of their preferred habitat range in northeastern Manitoba.

#### Mink

Mink (or American Mink) (*Mustela vison*) are listed as a Division 2 Wild Animal under Schedule A of the MB *Wildlife Act*. Within the LAA and RAA of the project, Lynx have been reported by RTL owners which intersect the Project footprint. Mink are semi-aquatic and largely associated with habitats near streams, lakes, or wetlands (Schiaffini and Schipper, 2016).

#### Wolf

Wolf (or Gray Wolf) (*Canis lupus*) are listed as a Division 1 Wild Animal under Schedule A of the MB *Wildlife Act*. Within the LAA and RAA, Lynx have been reported by RTL owners which intersect the Project footprint. In Manitoba, wolves tend to occupy boreal forest and wetlands, but are strongly associated with ungulate prey (E.g., moose, caribou, deer) and will occupy habitats based on resource availability (Boitana et. al., 2018).

#### Wolverine

Wolverine (*Gulo gulo*) are listed as a Division 2 Wild Animal under Schedule A of the MB *Wildlife Act*. Within the LAA and RAA, Lynx have been reported by RTL owners which intersect the Project footprint. In Manitoba, wolverine occupy northern boreal and boreal taiga forest types. Wolverine are understood to be sensitive to habitat disturbance and do not tend to overlap with human activity (E.g., urban areas, infrastructure) (Abramov, 2016).

#### 4.3.2.2 Reptiles and Amphibians

Review of available information from the Manitoba Herps Atlas identified two observations of an American Toad (*Anaxyrus americanus*) within the RAA. One male American toad was heard calling during a breeding bird survey in June 2007 approximately 6 km north of the existing Shamattawa winter road along the Hayes River. July 2007, an incidental observation was recorded at approximately the same location by a mammal survey crew (The Manitoba Herps

Atlas, 2021). American Toads breed in a diversity of permanent or temporary shallow aquatic features, including marshes, bogs, fens, swamps, ponds, and backwaters of small streams. They are habitat generalists and can be found in a wide range of terrestrial habitats outside of the breeding season, including mixed forests, grasslands, and meadows (Canadian Herpetological Society, 2022).

#### 4.3.2.3 Birds

The Project falls within the MBBA Gillam/Shamattawa Region (12) (Squares: 15VC33, 15VC42, 15VC43, 15VC52, and 15VC62) (MBBA, nd). The purpose of the MBBA is to collect comprehensive and current information on breeding birds throughout Manitoba. However, no surveys have been completed within the five MBBA squares that the Project falls in. Although no specific bird surveys were conducted for the project, existing data collected for the MBBA within the Gillam/Shamattawa Region will provide a reasonable indication of the species likely to be present throughout the RAA. Review of existing information from the MBBA indicates that 153 species of birds were observed throughout Region 12: Gillam / Shamattawa (MBBA, nd). Possible and probable breeding evidence was noted for 41 and 37 of observed bird species, respectively. Breeding evidence was confirmed for 71 of the species observed. Appendix D includes a list of bird species observed in the Gillam / Shamattawa Region.

Eight of these bird species are protected under either the Federal *Special at Risk Act* (SARA) and/or Manitoba's *Endangered Species and Ecosystems Act* (ESEA). Included are the Bank Swallow (*Riparia riparia*), Barn Swallow (*Hirundo rustica*), Common Nighthawk (*Chordeiles minor*), Horned Grebe (*Podiceps auritus*), Olive-sided Flycatcher (*Contopus cooperi*), Rusty Blackbird (*Euphagus carolinus*), and Short-eared Owl (*Asio flammeus*). Additionally, Pileated Woodpecker (*Dryocopus pileatus*) are listed with special protections under Schedule 1 of the Migratory Birds Regulations, 2022, which prohibit the disturbance, damage, removal, or destruction of Pileated Woodpecker nesting cavities within 36 months of occupancy. Of the aforementioned species with protections, habitat preference, habitat suitability, breeding evidence, and relative abundance was considered to determine the likelihood of presence within the LAA. As such, it was determined that three of these species would likely be found within the Project LAA. These three species include the Common Nighthawk, Olive-sided Flycatcher, and Rusty Blackbird and are further discussed in the Sensitive Species section (4.3.4).

#### 4.3.3 Fish and Fish Habitat

As the Project area is situated in a remote location, there is little information available about the existing aquatic environment. The proposed realignment will include six water crossings, including the Angling River, Pennycutaway River and three of its tributaries, and Whalen Creek. Water from these streams flows north-east through numerous peatlands and lakes, before finally draining into Hudson Bay. None of the identified waterways are classified by DFO's *Fish community and fish habitat inventory of streams and constructed drains throughout agricultural areas of Manitoba*

(2002-2006) (Milani, 2013). As such, an attempt was made to characterize each waterway according to DFO Habitat Type in the subsequent sections.

Habitat Types were characterized with use of DFO’s *Habitat Type Decision Flowchart* which provides a grade of A to E depending on fish species present, flow volumes and duration, and channel morphology. Direct fish habitat is indicative of waterways where fish can perform life processes such as spawning, rearing, feeding, migration, or over-wintering. Indirect fish habitat is indicative of ephemeral flowing waters that do not provide reliable habitat for fish to complete at least one life process. Simple habitat is defined as linear channels with uniform substrate, and grassed banks or dikes. All other habitat types are thus considered to be complex. Table 4-5 outlines the characteristics of each Habitat Type. Figure 7 identifies the location of the six proposed crossings and images of each watercourse at the location of the proposed crossings area available in Appendix C. The flow chart referenced to determine the applicable habitat type can be reviewed in Appendix E.

**Table 4-5.** Habitat type characterization scheme used to classify the six water crossings of the proposed Shamattawa Winter Road Realignment Project.

Habitat Type	Characteristics
<b>A</b>	Presence of indicator fish species, direct and complex fish habitat.
<b>B</b>	Presence of indicator fish species, direct and simple fish habitat.
<b>C</b>	Presence of forage fish species, direct and complex fish habitat.
<b>D</b>	Presence of forage fish species, direct and simple fish habitat.
<b>E</b>	No presence of fish, provides indirect fish habitat.

*Adapted from Milani, 2013.*

4.3.3.1 Crossing 1

The Angling River originates at a small headwater lake about 40 km southwest of the crossing. It flows about 63 km northeast from the crossing to Angling Lake and then flows another 55 km or so northeast into the Nelson River. The Angling River is consistent with Type A fish habitat, which is complex habitat containing large-bodied fish species. In the vicinity of the crossing, there are numerous rocky riffles that could provide spawning sites for White Sucker and Walleye. Manitoba Hydro has done extensive fish sampling in the lower Nelson River and its tributaries as part of the Limestone Generating Station’s monitoring program and has reported Lake Sturgeon, Lake Whitefish, White Sucker, Walleye, Sauger and Yellow Perch to occupy the water (Manitoba Hydro, 2012).

Lake Sturgeon

Lake Sturgeon (*Acipenser fulvescens*) migrate up the Angling River in spring to Angling Lake and have been known to remain there for more than five years. There are no known Sturgeon spawning locations upstream of Angling Lake, so it is believed that mature Sturgeon migrate back downstream to the Nelson River to spawn (Manitoba Hydro, 2012). Lake Sturgeon are further discussed in the Sensitive Species section (4.2.4.5).

Lake Whitefish

Lake Whitefish (*Coregonus clupeaformis*) are thought to spawn in the Angling River and Angling Lake, and large fall migrations of Lake Whitefish were observed moving up the Angling River between 1990 and 2003 (Manitoba Hydro, 2012).

White Sucker

White Sucker (*Catostomus commersonii*) are known to migrate up the Angling River in spring to spawn and are assumed to summer in Angling Lake before returning to the Nelson River in the fall to overwinter (Manitoba Hydro, 2012).

Walleye

Walleye (*Sander vitreus*) are abundant in Angling Lake and are found in higher abundance in the Angling River than in the Nelson River or other lower Nelson River tributaries. Walleye, in particular, have been shown to migrate up the Angling River in the spring to spawn (Manitoba Hydro, 2012).

Sauger

Sauger (*Sander canadensis*) are known to be abundant in Angling Lake and are found in higher abundance in the Angling River than in the Nelson River or other lower Nelson River tributaries (Manitoba Hydro, 2012).

Yellow Perch

Yellow Perch (*Perca flavescens*) are known to be abundant in Angling Lake and are found in higher abundance in the Angling River than in the Nelson River or other lower Nelson River tributaries (Manitoba Hydro, 2012).

Northern Pike

Northern Pike (*Esox lucius*) are known to use the Angling River for spawning (Manitoba Hydro, 2012).

4.3.3.2 Crossing 2

The second crossing occurs approximately 15 km east of the Angling River crossing. At this location, the proposed realignment crosses an Unnamed Tributary of the Pennycutaway River. The Unnamed Tributary is a Third Order stream that receives water from three headwater lakes, two of which are Wapoos Lake and Utikumak Lake (which translates to *Whitefish* Lake in Cree). The Unnamed Tributary is likely Type A fish habitat based on size and upstream habitat.

Between Crossings 2 and 3, the new alignment parallels, and comes within 60 m of, an Unnamed Tributary of the Pennycutaway River for a distance of about 9 km. This Unnamed Tributary is a Second Order Stream that feeds into the Third Order Unnamed Tributary at Crossing 2. It is also likely Type A fish habitat.

#### 4.3.3.3 Crossing 3

The third crossing occurs approximately 3 km east of Crossing 2 and is also an Unnamed Tributary of the Pennycutaway River. The Unnamed Tributary is a Second Order stream that joins the Third Order Unnamed Tributary of Crossing 2 (see 4.2.3.2). This tributary is likely Type C fish habitat, which is complex habitat containing forage fish species (i.e. minnows), based on size, boggy upstream habitat, and presence of beaver dams.

#### 4.3.3.4 Crossing 4

The fourth crossing occurs approximately 900 m east of Crossing 3 and is also an Unnamed Tributary of the Pennycutaway River. The Unnamed Tributary is a Second Order stream that joins the Third Order Unnamed Tributary of Crossing 2 (see 4.2.3.2). This tributary is likely Type C fish habitat, which is complex habitat containing forage fish species (i.e. minnows), based on size, boggy upstream habitat, and presence of beaver dams.

#### 4.3.3.5 Crossing 5

The fifth crossing occurs approximately 5.5 km east of Crossing 4 where the proposed Project crosses the Pennycutaway River. The Pennycutaway River is a tributary of the Hayes River, a major waterway in northern Manitoba, although the crossing is about 140 km upstream of the Hayes River. The Pennycutaway River is likely Type A fish habitat based on physical characteristics and watershed area.

#### 4.3.3.6 Crossing 6

The fifth crossing occurs approximately 4.5 km east of Crossing 5 and is a tributary of the Pennycutaway River known as Whalen Creek. Whalen Creek is a Second Order stream that joins the Pennycutaway River about 6 km downstream of the crossing. It is likely Type A fish habitat.

#### 4.3.4 Sensitive Species

For the purpose of this study, sensitive species includes species listed with protections or special provisions under SARA, MBCA, or MB ESEA. Sensitive species may also include species with select environmental requirements that have an increased risk of extirpation, act as an indicator species, or that may require protections to prevent them from becoming at risk. Sensitive species assessed as part of this EAP are limited to those known or likely to occur within the LAA. Review of existing information indicates that five protected and/or sensitive species have the potential to be present throughout the LAA. This includes Eastern Migratory Caribou, Common Nighthawk, Olive-sided Flycatcher, Rusty Blackbird, and Lake Sturgeon. Table 4-6 summarizes the legal status of these species as determined by the Manitoba's ESEA and the federal SARA. The

following subsections provide a brief synopsis of the species under consideration including a brief discussion on habitat preferences for each in relation to the Project Footprint.

**Table 4-6.** Summary of Legal Status of Potential Protected Species

SPECIES			STATUS	REGULATORY PROTECTION	
Common Name	Scientific Name	Population	Provincial (S-Rank)	ESEA	SARA
<b>Mammals</b>					
Caribou	<i>Rangifer tarandus</i>	Eastern Migratory	SNRM	NA	Under consideration
<b>Birds</b>					
Common Nighthawk	<i>Chordeiles minor</i>	NA	S2S3B	Threatened	Threatened
Olive-sided Flycatcher	<i>Contopus cooperi</i>	NA	S2S3B	Threatened	Threatened
Rusty Blackbird	<i>Euphagus carolinus</i>	NA	S3S4B, S2N	NA	Special Concern
<b>Fish</b>					
Lake Sturgeon	<i>Acipenser fulvescens</i>	Saskatchewan – Nelson River	SNR	NA	Under consideration
		Southern Hudson Bay and James Bay	SNR	NA	Special Concern

**Note:** S4=locally secure, S3S4=locally vulnerable to secure, S3=locally vulnerable, S2S3=locally imperiled to vulnerable, S2=locally imperiled, B=breeding population

#### 4.3.4.1 Caribou

The Hudson Bay Lowlands contains the majority of the Manitoba’s caribou population. The southern Hudson Bay subpopulation of the Eastern Migratory (EM) population is found along the Hudson Bay coast at the Manitoba-Ontario border, but mainly further south and east into northern Ontario (COSEWIC, 2017a). EM Caribou are listed as Endangered by the Committee on the Status of Endangered Wildlife In Canada (COSEWIC), an advisory board to SARA, but are currently not listed as Schedule 1 species under SARA, though they are under consideration for addition. COSEWIC has divided the different ecotypes of caribou throughout Canada into 12 Designatable Units (DUs). Under this scheme, the EM population is recognized as DU4 (COSEWIC 2011).

EM caribou mainly use tundra during calving and summer periods, and use boreal forest during the winter. ‘Winter Use Areas’ are associated with soil and forest cover conditions that provide abundant ground lichen, often in association with peatland complexes of fen, bog, and open-treed low conifer forest (COSEWIC, 2017a). The EM subpopulation is known to fluctuate but it is unclear if the populations will increase again because of novel threats. Caribou in this area are associated with lichen and grass-dominated tundra, though changes to the tundra landscape are occurring amidst to climate change and warming of arctic environments. Other threats include industrial development (i.e. mining and associated road networks), human overharvest, and parasites.

Population trends across all EM sub-populations are estimated to have declined by 80% over three generations, however population estimates specific to the Southern Hudson Bay population

are uncertain (COSEWIC, 2017a). Anthropogenic changes to EM habitat include hydroelectric development, mining activities, peat development, and road networks, among others. While most of these developments occur along the western extent of the Southern Hudson Bay population range (along the Nelson River), the previously constructed winter road between Gillam, Shamattawa and Fort Severn bisects the EM Caribou range (COSEWIC, 2017a). These developments have resulted in landscape-level changes to vegetation, surface hydrology, while increasing the breadth of human impacts throughout a relatively pristine area (COSEWIC, 2017a).

MTI acquired EM Caribou telemetry data collected between 2010 and 2018, representing a total of 65 female caribou. This data was collected as part of a collaborative project between Manitoba NRND, Manitoba Hydro, Manitoba Indigenous Reconciliation and Northern Relations, and the Fox Lake, Split Lake and York Factory Resource Management Boards. Tracking collars were used to receive geolocational information at three-hour intervals over a span of months to better understand caribou movement, migration, and areas of interest. This data confirmed that EM Caribou have a distinct presence within the LAA and suggests that the proposed section of the realignment may fall within calving areas used by female caribou. While caribou were evident throughout the RAA, specific attention was placed on caribou located within the LAA between the average operational winter road period of January 15 to March 15 of any given year.

#### 4.3.4.2 Common Nighthawk

The Common Nighthawk (*Chordeiles minor*) is an aerial insectivore that is most active at dawn and dusk. They are known for their camouflage colouring and booming noise during their display flight (Sigurdson and Artuso, 2018). The Common Nighthawk is listed as Threatened under ESEA and SARA. The distribution of the Common Nighthawk is largely province-wide, except the northeast, near the Hudson Bay coast line. The pattern of detections suggests that burned areas and rock outcrops are favoured, although there were some pockets of reasonably high detection along ROWs such as seldom-used railways (Sigurdson and Artuso, 2018). Common Nighthawk are ground nesters (COSEWIC, 2007) and proximity to wetlands or standing water may be an important habitat characteristic given the nighthawk's aerial foraging behaviour and congregations around insect emergences. The species has lost approximately half of its Canadian population since 1968 (Sigurdson and Artuso, 2018). Although the reasons for the decline remains unclear, it may be the result of reduced availability of insect prey, habitat loss, and increased human disturbances. As the RAA is poorly surveyed due to the lack of access, there are no recorded observations within the LAA. However, review of geospatial data obtained from the MBCDC identified at least twelve observations of the Common Nighthawk along an access road near the community of Shamattawa.

#### 4.3.4.3 Olive-sided Flycatcher

The Olive-sided Flycatcher is distinguishable from other Flycatchers by its large size and head. It often perches in the canopy watching for large flying insects. They are found throughout the province, with the highest abundance across the boreal forest. The rate of detection in the Boreal

Hardwood Transition (Region 12) is 30% with  $\geq 3$  hours of effort (Berger, 2018a). The Olive-sided Flycatcher occurs in swampy coniferous forest along wooded shores of streams, lakes, rivers, beaver ponds, bogs, and muskegs where snags are present. It is also found in logged areas with legacy trees and especially in burned forests (Berger, 2018a). They tend to nest in coniferous trees (COSEWIC, 2018). Breeding Bird Survey trend data show it has experienced widespread, consistent decreases since the mid-1960s, and it has recently been listed as Threatened under SARA and ESEA. The causes of the declines are unclear, but may be linked to habitat loss from deforestation, or to changes to insect populations on the breeding and/or wintering grounds (Berger, 2018a). As the LAA is poorly surveyed due to the lack of access, there are no recorded observations within the LAA. However, review of geospatial data obtained from the MBCDC identified at least 20 observations of the Olive-sided Flycatcher within the RAA near Gillam and Long Spruce (along the Nelson River) and one observation near Shamattawa.

#### 4.3.4.4 Rusty Blackbird

The Rusty Blackbird can be hard to distinguish from the Brewer's Blackbird except for the rust-coloured edgings on its black feathers. Rusty Blackbird is one of North America's most rapidly declining species. The population has plunged an estimated 85-99 percent over the past forty years (Berger, 2018b). Its habitat is characterized by forest wetlands, such as slow moving streams, peat bogs, sedge meadows, marshes, swamps, beaver ponds and pasture edges (COSEWIC, 2006). Rusty Blackbird generally nest as an isolated pair within in shrubs or small trees over or near water (COSEWIC, 2017c). Declines are most apparent in the southern reaches of the breeding range. Although the causes of this decline are poorly understood, a combination of factors has been suggested, including loss of wetlands used by wintering individuals, contaminants on breeding grounds, incidental poisoning, and increasing disturbance of boreal wetlands where this species breeds (Berger, 2018b). As the LAA is poorly surveyed due to the lack of access, there are no recorded observations within the LAA. However, review of geospatial data obtained from the MBCDC identified at least six observations of the Rusty Blackbird within the RAA near Gillam and Long Spruce (along access roads and the Nelson River) and six observations near Shamattawa (along Gods River).

#### 4.3.4.5 Lake Sturgeon

Lake Sturgeon is one of Canada's largest freshwater fish and is distinguishable by its pointed snout, ventral protrusible mouth, barbels, and five rows of bony scutes (COSEWIC, 2017b). The Lake Sturgeon has a rich historical significance to First Nations peoples and was also commercially harvested across much of the species' range between the late-1800s and mid-1900s (COSEWIC, 2017b). Lake Sturgeon populations occur in larger rivers and lakes and require several specific habitats to fulfill their life history. Habitat in the Hudson Plains Ecozone consists of shallow and straight single channels. Hydraulic gradient is moderate and consistent over lengthy stretches of river; mainstem rapids may occur, but are generally infrequent with major rapids/falls located at transition zone between Boreal/Taiga Shield and Hudson Plains. Deep pool and backwater areas are limited (COSEWIC, 2017b). The Southern Hudson Bay – James Bay

population is listed as Special Concern federally under SARA. The Saskatchewan - Nelson River population was recently classified as Endangered by COSEWIC and are currently under consideration for listing under SARA. Threats to Lake Sturgeon include habitat alterations, barriers to migration, and entrainment losses, which are all primarily due to dams. Other potential threats include invasive species and pollution.

The Southern Hudson Bay – James Bay population is known to occur in the Hayes River and lower tributaries such as Fox, Bigstone, and Gods rivers. While the Pennycutaway River branches from the Hayes River, no data on the potential presence Lake Sturgeon could be found (Manitoba Hydro, 2019), however, the Pennycutaway River is highlighted on the SARA Aquatic Species at Risk Map, denoting Lake Sturgeon are found (or potentially found) in that watercourse. Given the Pennycutaway River is a tributary of the Hayes River, it is possible that Lake Sturgeon could occur in the watercourse. The Saskatchewan – Nelson River Lake Sturgeon population is known to occur in the Angling River based on Manitoba Hydro environmental studies conducted for Limestone Generating Station (Manitoba Hydro, 2012). As such, Lake Sturgeon are considered to occur within two of the watercourses within the LAA: the Pennycutaway River (Southern Hudson Bay – James Bay population) and the Angling River (Saskatchewan – Nelson River population).

#### **4.4 Socio-Economic Environment**

This section provides a description of the existing socio-economic environmental characteristics of the Project region. Topics are discussed both on a regional and local scale in relation to the proposed Project.

##### **4.4.1 Regional Communities and Population**

The nearest community to the proposed Project is Gillam in the Municipality of Gillam. Sundance is the only other community within the municipality, located approximately 45km northeast of Gillam. Many residents of Gillam are employed by Manitoba Hydro at one of the following facilities: Kettle, Long Spruce, Limestone, and Keeyask generating stations. According to the 2021 Census, the Gillam District has a population of 1,007 people. Overall, the population has declined by 16.2% from 2016 to 2021 (Statistics Canada, 2022).

Employment rates recorded under the 2021 Census indicate a 68.1% employment for Gillam, MB. This demonstrates a decline of 3.5% from the 2016 Census employment rate of 71.6%. Statistical data indicates that the bulk of employment occurs in the following sectors: Trades 29.1%, Sales and Services 24.1%, Social Community and Government 12.8%, Business 9.9%, and Science 7.1% (Statistics Canada, 2022). In 2016 it was reported that a total of 105 persons used cars, trucks, or vans as their main mode of transportation (Statistics Canada, 2017).

#### 4.4.2 Indigenous Population

The Project is located on Treaty 5 territory. Treaty 5 (1875) and the adhesion to Treaty 5 comprises much of northern Manitoba and dozens of Indigenous communities. From the center of the project area, Fox Lake Cree Nation is located approximately 40 km to the northwest, Shamattawa First Nation approximately 115 km to the east, War Lake First Nation approximately 110 km to the west, Tataskweyak Cree Nation approximately 140 km to the west, and York Landing First Nation approximately 142 km to the west. These Nations make up five of the eleven member reserves in the Keewatin Tribal Council which represents a total population of approximately 10,000 people throughout Northern Manitoba (KTC, 2023). Traditional Use Areas (TUAs) have been used as a guide to outline Indigenous land use within the Project region in addition to community locations. TUAs boundaries are informally based on RTL boundaries. Figure 8 shows the location of the five nearest Indigenous communities to the project and adjacent TUAs in relation to the Project's RAA. The following sections provide a brief summary description of the Indigenous communities identified within the Project region.

##### 4.4.2.1 Fox Lake Cree Nation

Fox Lake Cree Nation is located in the town of Bird on the shores of the Nelson River, 149 km northwest of Shamattawa. The community is accessible year round by vehicle via PR 280 and PR 290. Population as of March 2022 was recorded as 1,321 (CIRNAC, 2022).

##### 4.4.2.2 Shamattawa First Nation

Shamattawa First Nation is a remote community located where the Echoing River meets Gods River, approximately 171 km southeast of Gillam, Manitoba. Shamattawa can only be accessed year round by plane. When winter roads are open, Shamattawa can be accessed from the west via PR 280. Population as of March 2022 was recorded as 1,625 (CIRNAC, 2022).

##### 4.4.2.3 Tataskweyak Cree Nation

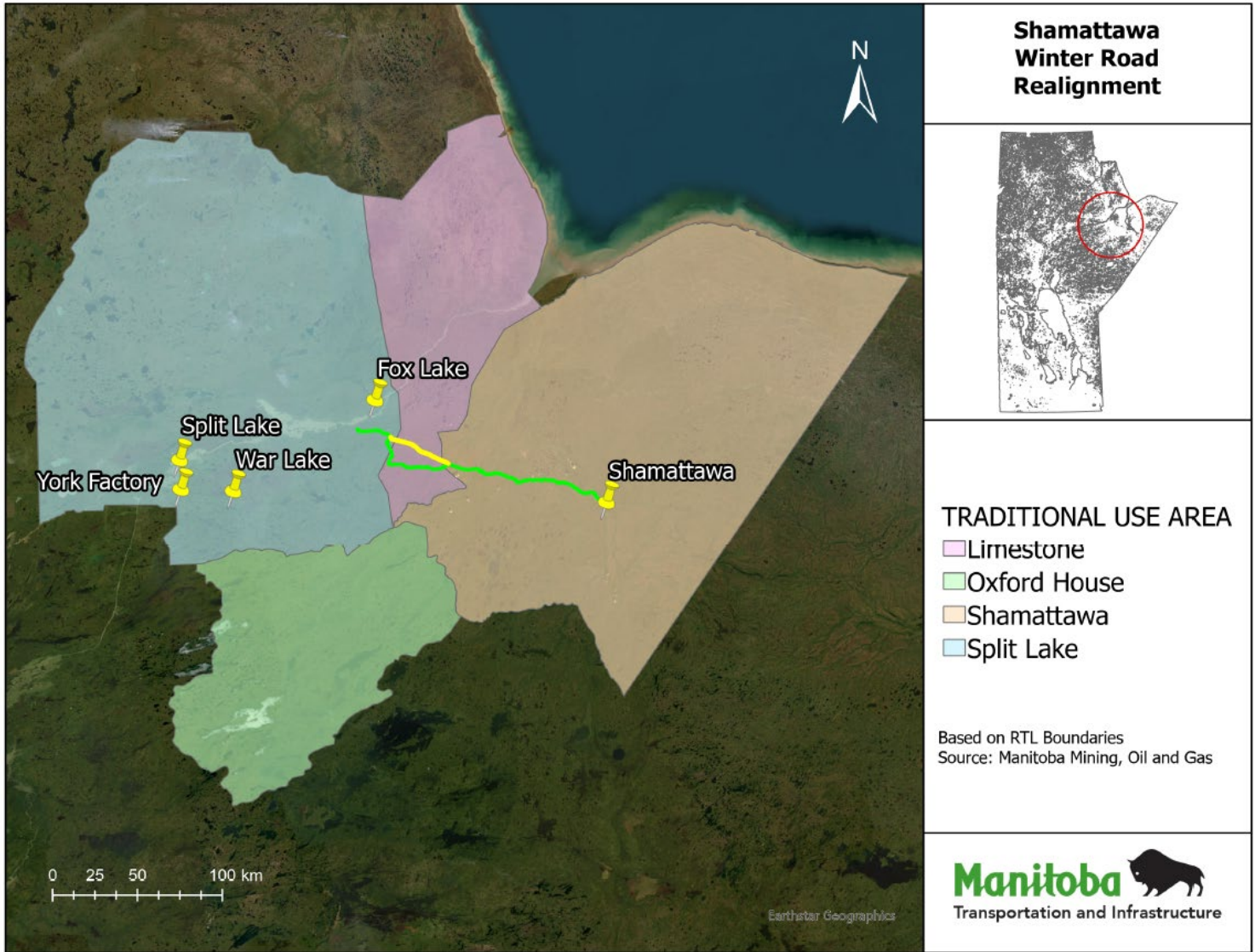
Tataskweyak Cree Nation is a community located approximately 255 km northwest of Shamattawa on the northern shores of Split Lake. The community is accessible year round by vehicle from Gillam or Winnipeg via PR 280. Population as of March 2022 was recorded as 4,063 (CIRNAC, 2022).

##### 4.4.2.4 War Lake First Nation

War Lake First Nation is a community located approximately 220 km west of Shamattawa towards Ilford, MB near the eastern shores of Moose Nose Lake. The community is accessible by a combination of vehicle and boat via PR 280 and Split Lake, or by train from Gillam or Winnipeg. Population as of March 2022 was recorded as 327 (CIRNAC, 2022).

**4.4.2.5**      *York Factory First Nation*

York Factory First Nation, also known as the Crees of York Landing, is located approximately 251 km west of Shamattawa on the eastern shores of Split Lake near the mouth of the Aiken River. The community is accessible by a combination of vehicle and boat via PR 280 and Split Lake, or by plane from Winnipeg and other surrounding communities. Population as of March 2022 was recorded as 1,502 (CIRNAC, 2022).



**Figure 8.** Traditional use areas and adjacent Indigenous communities in relation to the Shamattawa Winter Road Realignment Project (Government of Manitoba, ND).

4.4.3 Resource Use

4.4.3.1 Forestry

The province of Manitoba manages and regulates forestry activities in Manitoba through the establishment of administrative boundaries. Forest Management Units (FMUs) are used to delineate and manage harvestable timber areas. The proposed Project is located in the Hudson Plain Management Section (Section 10) and Forestry Management Unit 78. Forest Management Licenses (FMLs) are generally granted to industries to require the security of continuous timber supply as per the Forest Management License Agreement (FMLA). The RAA is not subject to an FMLA. At the time of the Project proposal, FML-2 and FML-3 are the only two Forest Management License Agreements currently in place within Manitoba (ARD, 2021). FML-2 is currently managed by Canadian Kraft Paper Industries Ltd. and FML-3 is currently managed by Louisiana Pacific Canada Ltd. Neither of the aforementioned FML's are located within 400 km of the Project Area.

The Project itself will require clearing of vegetation (trees, shrubs etc.) in order to facilitate a 20 m ROW for the realigned section of the existing Shamattawa Winter Road. Table 4-7 identifies the primary clearing location and amounts. However, it should be noted that this is likely a large over estimation of the amount of vegetation being cleared given much of this landscape consists of short vegetation such as sphagnum moss, grasses, and sedges that will not be cleared nor grubbed (E.g., Crossing 4 in Appendix C which demonstrates a delineation of timber and ground cover vegetation). Clearing and grubbing activities will strictly target trees, shrubs, stumps and other large woody debris. As such, the total clearing area or 76.52 Ha (Table 4-7) is an approximation of the area included within the proposed clearing zone, and not representative of the total vegetation cover planned for removal.

**Table 4-7.** Clearing locations and approximate cleared areas proposed as part of the Project.

CLEARING LOCATION	DISTANCE (m)	AREA (m <sup>2</sup> )	AREA (Ha)
From the existing winter road to the Angling River	1,220	24,400	2.44
East of the Angling River to the 2 <sup>nd</sup> water crossing	15,326	306,520	30.65
East of the 2 <sup>nd</sup> water crossing to the 3 <sup>rd</sup> water crossing	3,396	67,920	6.79
East of the 3 <sup>rd</sup> water crossing to the 4 <sup>th</sup> water crossing	940	18,800	1.88
East of the 4 <sup>th</sup> water crossing to the Pennycutaway River	5,430	108,600	10.86
East of the Pennycutaway River to Whelan Creek	4,384	87,680	8.77
East of Whelan Creek to the existing winter road	7,566	151,320	15.13
<b>Totals</b>	<b>38,262</b>	<b>765,240</b>	<b>76.52</b>

Area calculated as distance (m) x 20 m (ROW).

In addition to the management of forest resources on Crown Land, a number of Provincial Forests have also been established under *The Forest Act* (Manitoba Conservation, Nd). No Provincial Forests occur within 400 km of the proposed Project area.

#### **4.4.3.2**      *Hunting*

The Project is located within the recognized Game Hunting Area (GHA) #3 which extends from the Hudson Bay in the north and follows the Nelson River south to Ilford, MB. The southern extent of GHA 3 is located approximately 40 km north of Gods Lake, MB and extends west to the MB-ON border. The full extent of the Project with respect to surrounding GHAs can be seen in Figure 3. Depending on its location within the Province and the status of wildlife populations, different rules and/or restrictions may be established in order to assist in managing hunting and trapping activities within each of the GHA's. In 2022, the Manitoba Hunting Guide outlined restrictions on Caribou within GHA 3 (NRND, 2022). Hunting activities in the immediate vicinity of the Project area are unknown although hunters and outfitters are expected to be present throughout the general area.

#### **4.4.3.3**      *Trapping*

The Project is located within the recognized Northern RTL District (6) which covers the majority of northern Manitoba south of Churchill to north of Lake Winnipeg. Trapping activities within the LAA and RAA are known to occur and trappers are expected to be present throughout the area. The Northern RTL District is further divided into separate RTL sections. The proposed Project intersects through sections of the Split Lake, Limestone, and Shamattawa RTL Areas. Of these areas, the proposed Project will intersect the areas of Limestone's Trapline No. 002, Split Lake's Trapline No. 0064, and Shamattawa's Trapline No. 0019 (Figure 2).

The winter road route currently running through the Split Lake RTL (No. 0064) would be reduced by approximately 5.38 km with the proposed realignment (Table 4-8). The total distance of the existing road within this RTL area is approximately 9.19 km (9,186 m). With a 20 m ROW, this accounts for an approximate area of 183,720 m<sup>2</sup> or 18.372 Ha currently affected by the existing route. However, the total distance of the proposed realigned route would be reduced to approximately 3.81 km (3,808 m). With a 20 m ROW, this accounts for a proposed area of approximately 76,160 m<sup>2</sup> or 7.616 Ha to be affected by Project.

The winter road route currently running through the Limestone RTL (No. 0002) would be reduced by approximately 14.66 km with the proposed realignment (Table 4-8). The total distance of the existing road within the RTL area is approximately 45.23 km (45,226 m). With a 20 m ROW, this accounts for an approximate area of 904,520 m<sup>2</sup> or 90.452 Ha currently affected by the existing route. However, the total distance of the proposed route within the RTL area would be reduced to approximately 30.57 km (30,573 m). With a 20 m ROW, this accounts for a proposed area of 611,460 m<sup>2</sup> or 61.146 Ha to be affected by the project.

The winter road route currently running through the Shamattawa RTL (No. 0019) would be increased by approximately 0.78 km with the proposed realignment (Table 4-8). The total distance of the existing road within the RTL area is approximately 3.15 km (3,149 m). With a 20 m ROW, this accounts for an approximate area of 62,980 m<sup>2</sup> or 6.298 Ha currently affected by the existing route. However, the total distance of the proposed route within the RTL area would be approximately 3.93 km (3,928 m). With a 20 m ROW, this accounts for a proposed area of 78,560 m<sup>2</sup> or 7.856 Ha to be affected by the realignment.

**Table 4-8.** Existing and proposed changes to the distance and area occupied by the Project within the RTL areas of Split Lake, Limestone, and Shamattawa.

Section	Trapline No.	Description	Distance (km)		Area (Ha)
			Existing	Proposed	Total Change
Split Lake	0064	Western section of proposed realignment	Existing	9.19	18.37
			Proposed	3.81	7.62
			<b>Total Change</b>	<b>- 5.38</b>	<b>- 10.75</b>
Limestone	0002	Middle section of proposed realignment	Existing	45.23	90.45
			Proposed	30.57	61.15
			<b>Total Change</b>	<b>- 14.66</b>	<b>- 29.30</b>
Shamattawa	0019	Eastern section of proposed realignment	Existing	3.15	6.29
			Proposed	3.93	7.86
			<b>Total Change</b>	<b>+ 0.78</b>	<b>+ 1.57</b>

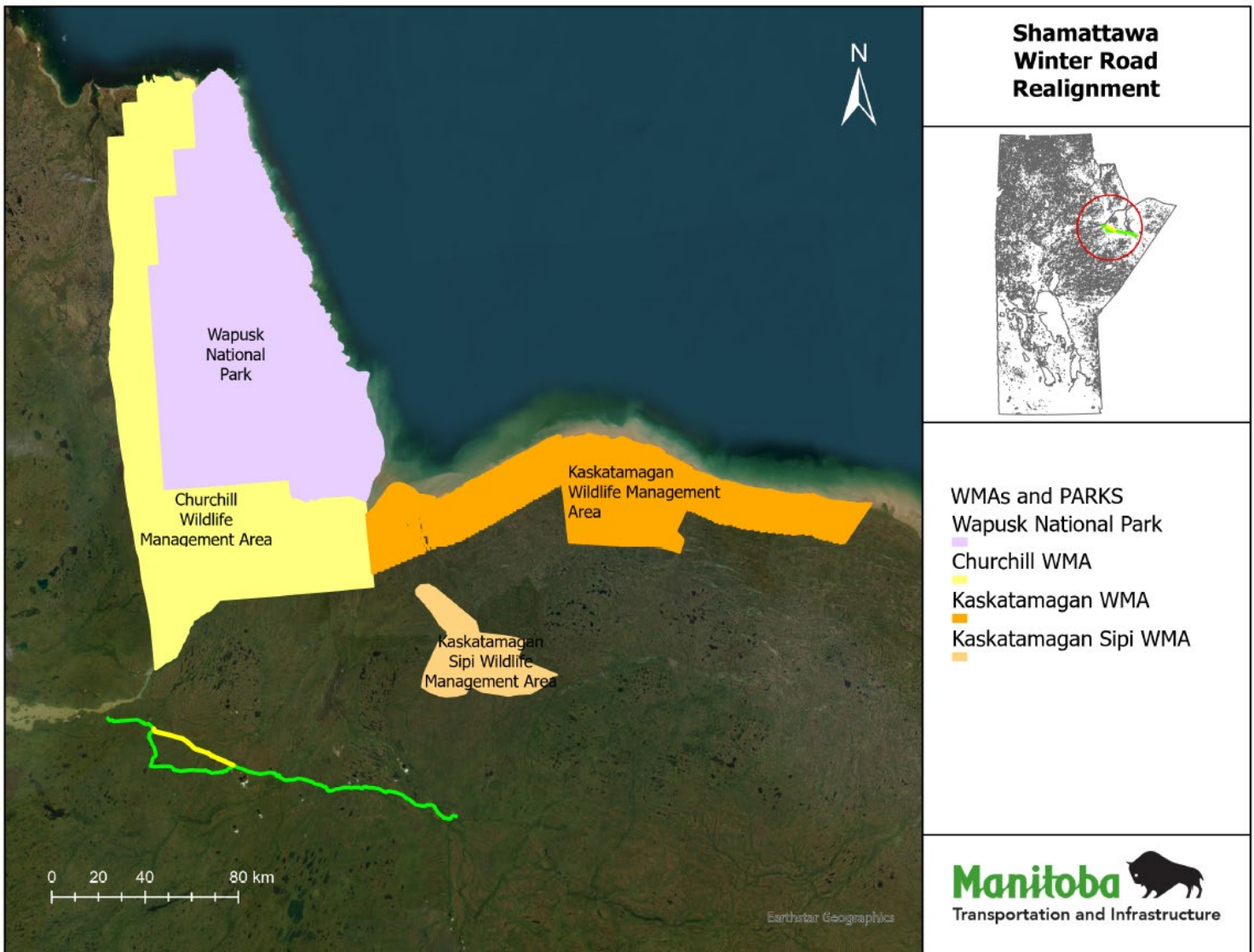
*Note: A negative total change indicates a reduction in the area occupied by the proposed winter road in comparison to the existing route (i.e., the proposed realignment occupies less area). A positive total change indicates an increase in the area occupied by the proposed winter road in comparison to the existing route (i.e., the proposed realignment occupies a greater area).*

#### 4.4.4 Parks, Protected Areas, and Areas of Special Interest

The Project is located adjacent to the current Shamattawa Winter Road, starting from PR 280 to Shamattawa First Nations. There are no other established transportation corridors located in the LAA. There are no parks, protected areas, or Areas of Special Interest (ASIs) situated within the LAA, and one Wildlife Management Area (WMA) within the RAA. Outside the RAA boundaries, there exists several WMAs and ASIs (Table 4-9). However, these are geographically distant from the Project itself (i.e., >50km) and are not considered to be impacted nor considered as part of the Project assessment. The Project location with respect to Parks, WMAs, and ASIs within the region can be reviewed in Figure 9.

**Table 4-9.** Parks, WMAs, and ASIs within 200 km from the Project.

Name	Distance from Project	Details
Churchill WMA	26 km northwest (within the RAA)	From Sundance to the mouth of the Nelson River Estuary
Kaskatamagan Sipi WMA	90 km northeast	East of the Pennycutaway River and North of the Gods River
Kaskatamagan WMA	100 km north	From the Nelson River Estuary and west along the Hudson Bay
Wapusk National Park	105 km north	From the Nelson River Estuary, and east along the Hudson Bay



**Figure 9.** Parks, WMA, ASIs located within 200 km of the Project (MLI, NDc; MLI NDd).

#### 4.4.5 Culture and Heritage Resources

The potential for this project to impact significant heritage resources has been determined to be low as the proposed location has no historical or existing development impacts. MTI has contacted the Heritage Resources Branch (HRB) to inquire about potential concerns related to culture and heritage resources in association with the project. HRB advised that they had no concerns with the project as of their response on December 19, 2019.

#### 4.4.6 Human Health and Safety

As previously discussed throughout section 2.0, the Shamattawa Winter Road is the sole land-based route connecting Shamattawa First Nation to Manitoba's highway network. Winter roads are open, on average, for about an eight-week period between January to March. As such, maintaining the Shamattawa Winter Road is an important component in addressing social and economic challenges that many northern and remote communities face. Particularly as this winter road facilitates freight deliveries to the community as well as provides residents with inter-community travel and road access to the rest of the province.

Concerns raised in prior assessments of the existing Shamattawa Winter Road route were related to the number of stream crossings, steep grades, roadway widths, and navigating difficult areas of the winter road, ultimately raising concerns of safety (Dillon Consulting, 2001). The existing route intersects eleven water crossings where fast waters, above-freezing temperatures, and poor ice conditions can impede the preparation of ice crossings at the start of the winter road season, and in some cases reduce the duration that the winter road is open. This particular section is poorly aligned and, at times, results in travel in an opposite direction of the Shamattawa community. Furthermore, the existing misaligned route traverses higher-risk terrain such as steep hills which create additional difficulties to navigation and safety concerns to an already difficult route. Lastly, it had been reported that sections of the existing inter road have inconsistent road widths such that the narrower sections restrict two-way traffic.

Since 1999, the Province of Manitoba has increased spending on the winter road system in order to improve safety, extend the operating period, and reduce construction and maintenance challenges. The proposed Project is part of MTI's continued efforts to improve the safety and function of the winter road system in northern Manitoba. The proposed realignment would shorten the Shamattawa Winter Road by approximately 19.7 km while also reducing the number of water crossings from eleven to six. In doing so, the Project can reduce travel times, net vehicular emissions, construction and maintenance requirements, while simultaneously improving driver safety, navigability, and extending the operational period of the winter road.

## **5.0 ENVIRONMENTAL EFFECTS ANALYSIS**

The following section presents the environmental effects analysis for the Shamattawa Winter Road Realignment Project and considers potential environmental effects of the Project during construction, operation, and maintenance phases. The proposed realigned route is intended for long-term use and MTI does not plan to decommission the proposed section in the foreseeable future. As such, decommissioning was not considered as part of the environmental effects analysis.

The effects analysis outlines the application of mitigation measures to mitigate any potential impacts resulting from the Project. While many mitigation measures implemented as part of this project will be site-specific, MTI has a list of standard mitigations measures that apply to all departmental infrastructure projects, known as the General Environmental Requirements (GERs). A copy of MTI's GERs is included in Appendix F. Where necessary, additional and/or modified mitigation measures are identified throughout the environmental effects analysis in order to accommodate site-specific concerns.

### **5.1 Spatial Boundaries**

Potential environmental effects were assessed under two spatial boundaries, local and regional. Together, these two boundaries provide a comprehensive analysis of effects that occur on a local and regional level. These spatial boundaries can be defined as:

- iii. Local assessment area (LAA) – The area surrounding and including the Project, where there is potential for Project effects to have immediate environmental impact.
- iv. Regional assessment area (RAA) – The greater area surrounding the Project, where there is the potential for Project effects to have a cumulative or wide-spread impact.

The LAA boundary for the Project is defined as areas occurring within 500 m of the realigned route. This distance was determined by taking into consideration recommended wildlife disturbance buffers and set-backs, construction works, mitigations and best management practices.

The RAA boundary for the Project is defined as areas occurring within 50 km of the realigned route. This distance was determined by taking into consideration existing wildlife migratory routes, hunter and trapper activities, community interest zones, and resource development.

### **5.2 Assessing the significance of effects**

The effects assessment attempts to quantify any potential Project effects and their significance. Assessing the significance of an impact will consider a range of factors such as risk magnitude (e.g., low, medium, high), geographic extent (e.g., local, regional), frequency (e.g., isolated, periodic, continuous), and duration (short-term, long-term), among others. After taking in to

considering all applicable mitigations, the significance of the residual effect (if any) will be determined to be either significant or insignificant (i.e., negligible).

### **5.3 Physical Environment**

This section provides an outlines the effects analysis, potential Project impacts, and mitigation measures for components of the physical environmental within the Project region. Effects area analyzed both on a regional (i.e., RAA) and local (i.e., LAA) scale in relation to the proposed Project.

**Table 5-1.** Shamattawa Winter Road Realignment Project Environmental Effects Assessment Matrix for the Physical Environment.

<b>PHYSICAL ENVIRONMENT</b>									
	<b>Climate</b>	<b>GHGs</b>	<b>Air Quality</b>	<b>Noise &amp; Vibration</b>	<b>Terrain &amp; Topography</b>	<b>Bedrock Geology</b>	<b>Soils</b>	<b>Ground-water</b>	<b>Surface Water</b>
<b>CONSTRUCTION PHASE</b>									
Mobilization of equipment / supplies		X	X						X
ROW clearing and grubbing		X	X	X	X		X		X
Timber and brush disposal		X	X						
Preparation of water crossings (E.g., flooding)		X	X						X
Accidents & malfunctions							X	X	X
<b>OPERATION PHASE</b>									
Preparation of route (E.g., minor clearing, snow packing)					X		X	X	
Preparation of water crossings (E.g., flooding)									X
Maintenance (E.g., graders, snowplows)							X	X	
Seasonal vehicle use							X	X	

### 5.3.1 Climate

#### 5.3.1.1 Construction Effects

On a regional scale, climate can be influenced by GHG emissions, such as those released from vehicles and equipment during the construction phase, as well as by vegetation which can act as a carbon sink and absorb energy. However, these effects to climate are very complex and occur on a much larger regional scale than what is measured as the RAA. As such, no effects to climate are expected to occur from the Project.

#### 5.3.1.2 Operation Effects

On a regional scale, climate can be influenced by GHG emissions, such as those released from vehicles and equipment used during the operation phase. However, these effects to climate are very complex and occur on a much larger regional scale than what is measured as the RAA. As such, no effects to climate are expected to occur from the Project.

#### 5.3.1.3 Mitigation Measures

Given there are no effects on climate expected to occur from the Project, no mitigation measures are being proposed.

#### 5.3.1.4 Residual Effects

No residual or significant adverse effects on climate are likely to occur as a result of the Project.

### 5.3.2 Greenhouse Gases

#### 5.3.2.1 Construction Effects

During construction, the Project is expected to generate additional air emissions primarily associated with the exhaust of vehicles, equipment, and machinery which are a primary emitter of CO<sub>2</sub> and other GHGs. The release of these additional emissions is expected to occur during mobilization, clearing and grubbing, and the general movement of vehicles to and from site. Additionally, should methods of brush disposal include onsite burning, the burning of brush can contribute to the release of GHG emissions such as CO<sub>2</sub> and particulate matter, among others. Effects to GHG emissions during construction are anticipated to be of a low risk magnitude and temporary with negligible effects.

#### 5.3.2.2 Operation Effects

During operation, the Project is not expected to significantly increase the volume of traffic using the winter road. Compared to Manitoba's highway network, winter roads are seasonal and experience low flow volumes of traffic for a short period of time between January to March. The proposed realignment will reduce the length of the Shamattawa Winter Road by approximately 19.7 km. Therefore, on a local scale, reducing the travel distance of the winter road can generally be associated to a reduction in GHG emissions released by vehicles using the winter road. This, however, is difficult to quantify given vehicle emissions are determined by several parameters that are not included as part of this study (e.g., weight, fuel types, vehicle make and model). In general, the effects during operation to GHGs are not anticipated to change beyond current conditions, and may experience a slight reduction in GHG emissions due to a reduction in the overall length of the winter road. As such, the effects from project operation are anticipated to be low in magnitude, and seasonal with negligible significant impacts.

#### 5.3.2.3 Mitigation Measures

The potential effects of GHGs release during construction can be mitigated using provisions outlined in the *Machinery, Fuel Storage and Handling* section of the GERs and using site-specific provisions such as:

- Minimizing the duration of idling by construction vehicles, equipment, and machinery.
- Ensuring all construction equipment and machinery is maintained and in good working condition.
- Minimizing burning of timber and brush as a method of disposal.
- Timber will be harvested and made available for local use by Fox Lake Cree Nation.
- Brush will be repurposed where possible, or burned or removed off-site for disposal.
- Burning of materials are to be conducted in accordance with the Manitoba *Wildfires Act* and with consideration to requirements outlined by the RM of Gillam.

Further information regarding the aforementioned mitigations can be reviewed in the MTI GER's found in Appendix F.

#### 5.3.2.4 Residual Effects

Potential effects of the Project may include a temporary increase in GHG emissions linked to exhaust stemming from vehicles and equipment used during construction. Once complete, GHG emission levels are expected to return to existing conditions or lowered due to a reduced travel distance of the realigned route. As such, any residual effects anticipated as a result of the Project are considered to be negligible.

### 5.3.3 Air Quality

#### 5.3.3.1 Construction Effects

During construction, there is a potential for a localized increase in airborne particulates from equipment and machinery engine emissions. Potential effects to air quality would likely occur during mobilization, clearing and grubbing, and the general movement of vehicles to and from site. A reduction in air quality via emissions has the potential to effect human health (E.g., respiratory complications) for those within the LAA, but is not anticipated to effect air quality outside of the LAA. Effects on air quality from exhaust emissions are expected to be low in magnitude, localized to the LAA, and short-term with no significant impacts.

The release of air borne particles from dust are unlikely to occur, except for during the tree clearing process. Cleared brush and shrubby vegetation will either be burned, hauled, or chipped and spread as required. Timber will be made available for local use by Fox Lake Cree Nation. Burning of brush and shrubs on site has the potential to decrease air quality with the LAA. However, any potential effects are expected to be temporary, localized, and low in magnitude with no significant impacts.

#### 5.3.3.2 Operation Effects

Potential effects to air quality during operation are similar to those outlined in the Greenhouse Gases section (5.3.2.2). In summary, the exhaust emissions from vehicles during preparation, maintenance, and seasonal vehicle use can affect local air quality. Normal exhaust emissions include carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>, NO<sub>2</sub> and NO), volatile organic compounds (VOCs), suspended particulates, inhalable particulate matter (PM<sub>10</sub>), ground level ozone (O<sub>3</sub>) and lead (Pb). In general, the effects to air quality during operation to are not anticipated to change beyond current conditions, and may be lessened due to a reduction in the overall length of the winter road. As such, the effects from project operation are anticipated to be low in magnitude, seasonal, localized to the LAA, with negligible significant impacts.

#### 5.3.3.3 Mitigation Measures

Potential effects to air quality during construction can be mitigated using provisions outlined in the *Dust and Particulate Control* section of the GERs and by using site-specific provisions such as:

- All work shall be conducted in a manner that minimizes the raising of dust from construction operations.
- All vehicles used to haul materials to or from the work site shall have the load covered with a tarpaulin cover during transport to prevent material from falling out.
- Minimizing the duration of idling by construction vehicles, equipment, and machinery.
- Ensuring all construction equipment and machinery is maintained and in good working condition.

- Minimizing burning of timber and brush as a method of disposal.
- Timber will be harvested and made available for local use by Fox Lake Cree Nation.
- Brush will be repurposed where possible, or burned or removed off-site for disposal.
- Burning of materials are to be conducted in accordance with the Manitoba *Wildfires Act* and with consideration to requirements outlined by the RM of Gillam

Further information regarding the aforementioned mitigations can be reviewed in the MTI GER's in Appendix F.

#### 5.3.3.4 Residual Effects

Potential effects of the Project may include a temporary reduction in air quality due an increase in exhaust emissions from vehicles and equipment used during construction, and particulate matter released as part of vegetation clearing and disposal. Once complete, air quality levels are expected to return to existing conditions, or lowered due to a reduced travel distance of the realigned route. As such, there are no residual effects anticipated as a result of the Project.

#### 5.3.4 Noise and Vibration

##### 5.3.4.1 Construction Effects

Sources of noise and vibration during construction would be typical of heavy equipment such as dozers and haul trucks. Construction activities are anticipated to generate intermittent noise over the construction period (January to March 2024) and will likely be associated with clearing activities. The closest human receptors will include construction workers. Noise starts to be harmful at about 80 dBA, particularly for repeated exposures and exposures for long durations (SWMB, 2020). Of equipment planned for use during Project construction, dozers typically emit a noise levels from 86 to 106 dBA (IHSA, nd). For environments where a worker is likely to be exposed to a noise that exceeds 80 dBA, standard hearing conservation and noise prevention practices, as outlined by Safe Work Manitoba (2020), would mitigate risk to workers. The nearest community where residents of the public generally reside would be Long Spruce, MB located approximately 20 km (western-most extent) to 60 km (eastern-most extent) from the Project. As such, the effects of noise are expected to be limited to the LAA. Noise levels are expected to be temporary, limited to the LAA, low in magnitude and expected to return to existing levels once Project construction is complete.

##### 5.3.4.2 Operation Effects

During operation, sources of noise will generally be associated with vehicle use along the winter road, by personal vehicles, transport trucks, and equipment such as graders during route preparation and maintenance. The Project is not projected to significantly increase the volume of traffic using the winter road. As such, noise and vibrations during operation are expected to remain

similar to existing conditions. Project effects to noise and vibrations are expected to be low in magnitude, localized to the LAA, with negligible significant impacts.

#### 5.3.4.3 Mitigation Measures

Potential effects of noise and vibrations during construction will be mitigated using the provisions outlined in the *Noise and Noise Limitations* section of the GERs including:

- All plant and equipment supplied for use on the Project shall be effectively “sound-reduced” by means of proper silencers, mufflers, acoustic linings, acoustic shields or acoustic sheds.

Further information regarding the aforementioned mitigations can be reviewed in the MTI GER’s in Appendix F.

#### 5.3.4.4 Residual Effects

Potential effects to noise and vibration are expected to be a result of a temporary construction activities such as clearing and movement of vehicles. Upon completion of the work, no residual changes are anticipated during operation. As such, the Project is not expected to result in any residual effects associated with noise and vibration.

### 5.3.5 Terrain and Topography

#### 5.3.5.1 Construction Effects

Potential effects of the Project on terrain and topography during construction includes clearing of select local vegetation. Clearing activities will result in a relatively permanent loss of trees and shrubs along the route and within the ROW. Clearing of a 20 m ROW will target trees, shrubs, and stumps, thus excluding low-laying vegetation such as grasses, sedges, and sphagnum mosses which will already be covered below snow. Should rocks or boulders be encountered during construction, they may either be relocated outside of the ROW (if possible), or slight deviations to the route will be considered. Rock cuts (minor blasting) is not a construction component associated with the Project. No subsurface works are taking place and thus, no significant effects to soils are expected. The preparation of ice crossings will be constructed using snow and ice fill. As such, no alterations to drainage patterns or other hydrological aspects are expected as part of Project construction. With the implementation of appropriate mitigation measures, effects to terrain and topography during construction will be limited to vegetation and expected to be long-term, localized to the Project footprint and low in magnitude.

#### 5.3.5.2 Operation Effects

Potential effects from operation are largely associated with the preparation and maintenance of the winter road from continued clearing of vegetation. While vegetation will be able to grow during the spring, summer, and fall months, preparation and maintenance activities will continue to keep the ROW clear of emerging trees and shrubs. As such, the natural regrowth of vegetation within the ROW will be restricted throughout the lifetime operation of the winter road. With the implementation of appropriate mitigation measures, effects to terrain and topography during operation will be limited to vegetation and expected to be long-term, localized to the Project footprint and low in magnitude.

#### 5.3.5.3 Mitigation Measures

Potential effects of clearing and grubbing to trees and shrubs during construction and operation will be mitigated using the provisions outlined in the *Clearing, Grubbing, and Brushing* section of the GERs including:

- Where possible, grubbing shall not occur within 2 m of standing timber in order to prevent damage to root systems of adjacent trees and reduce the occurrence of blow down.
- There shall be no bulldozing of woody debris into standing timber.
- All cleared vegetation and debris shall be piled and/or compacted in windrows as close to the ground as possible in preparation for disposal.
- Windrows shall be no closer than 1 meter to the bush line.

Further information regarding the aforementioned mitigations can be reviewed in the MTI GER's in Appendix F.

#### 5.3.5.4 Residual Effects

Residual effects to terrain and topography will include a relatively permanent loss and alteration of tree and shrub cover within the Project ROW. This loss is regarded to be relatively permanent due to the fact that while, the area will be left to grow naturally throughout the spring, summer, and fall seasons, maintaining a cleared ROW will continue throughout the lifetime of the winter road. While vegetation within the Project footprint will be impacted, there are no concerns of a significant effects to terrain and topography within the greater LAA or RAA. In considering the application of mitigation measures, Project effects are anticipated to be long-term, localized, and low in magnitude thus resulting in low significant residual effects.

### 5.3.6 Bedrock Geology

#### 5.3.6.1 Construction Effects

There are no anticipated works related to bedrock or rock cuts (minor blasting of rock outcrops) blasting as part of the Project. As such, no potential construction-related effects to bedrock geology are expected to occur as a result of the Project.

#### 5.3.6.2 Operation Effects

There are no anticipated works related to bedrock or blasting as part of the Project. As such, no potential operation-related effects to bedrock geology are expected to occur as a result of the Project.

#### 5.3.6.3 Mitigation Measures

As there are no effects to bedrock geology expected to occur from the Project, no mitigation measures are being proposed.

#### 5.3.6.4 Residual Effects

No residual or significant adverse effects to bedrock geology are likely to occur as a result of the project.

### 5.3.7 Soils

#### 5.3.7.1 Construction Effects

Potential effects of the Project to soils during construction are likely to be limited to disturbance during clearing and grubbing activities, and spills as a result of equipment accidents or malfunctions. The Project does not include subsurface work or excavation of soil materials, however disturbance to soils may occur during tree, shrub and stump removal. Uprooting these types of vegetation can pull up soils, or leave minor potholes where vegetation had been pulled. Any such disturbances would be limited to surface and top soil. Following construction, these areas will be left to revegetate in the future seasons with minor disturbances. With the implementation of mitigation measures, any potential effects on soils from disturbance are anticipated to be temporary, localized to the Project footprint, low in magnitude.

Potential effects on soil chemistry could occur from accidents or malfunctions during construction due to accidental spills or releases of deleterious substances such as oil, fuel (diesel and gasoline), solvents, hydraulic, or other fluids used to maintain and operate equipment during construction. The potential for spills would, however, be limited to the local Project footprint where

construction activities are occurring. A spill or release of toxic substances can have an effect on soil chemistry and quality. However, any impairment to soils is reversible in the long term with the implementation of spill response planning and remediation efforts. With the implementation of mitigation measures, the risk of accidental spills or releases of deleterious substances is expected to be isolated instances, with short-term effects localized to the Project footprint and low in magnitude.

#### 5.3.7.2 Operation Effects

Potential effects to soils during operation are likely to be associated with disturbance during preparation activities, and releases of deleterious substances as part of vehicle use and maintenance. While clearing activities are not planned during operation, winter road preparation activities will need to keep the ROW clear of emerging trees and shrubs. As such, these minor removals have the potential to disturb surface top soils by uprooting vegetation. However, this will not be a frequent activity as generally cutbacks are required after five years. Otherwise, soils will remain relatively undisturbed throughout operation of the winter road. With the implementation of appropriate mitigation measures, disturbance to soils during operation will occur in isolated instances, localized to the Project footprint and low in magnitude.

Potential effects on soil chemistry could occur from leaks, collisions, and accidental releases of deleterious substances during seasonal preparation, vehicle use, and maintenance activities. A spill or release of toxic substances can have an effect on soil chemistry and quality. However, any impairment to soils is reversible in the long term with the implementation of spill response planning and remediation efforts. With the implementation of mitigation measures, the risk of accidental spills or releases of deleterious substances is expected to be isolated instances, with short-term effects localized to the Project footprint and low in magnitude.

#### 5.3.7.3 Mitigation Measures

Any additional potential effects of clearing and grubbing to soils during construction will be mitigated using the provisions outlined in the *Erosion and Sediment Control, Clearing, Grubbing, and Brushing* and *Other* sections of the GERs including:

- The duration of soil exposure shall be minimized and run-off shall be diverted away from the exposed soil.
- Where possible, grubbing shall not occur within 2 m (2.5 yards) of standing timber in order to prevent damage to root systems of adjacent standing trees and reduce the occurrence of blow down.
- The disturbed area shall be minimized to the greatest extent possible and limited to the Department's ROW unless otherwise permitted by the Department.

The potential effects of spills and releases of deleterious substances during construction and operation will be mitigated by following the provisions outlined in the *Machinery, Fuel Storage, and Handling* and *Emergency Response Plan for Spills* sections of the GERs including:

- Machinery shall arrive on site in a clean condition and maintained free of fluid leaks.
- Designated Area(s) shall be established for fuel storage and handling, equipment cleaning, refueling and servicing.
- Any Designated Area shall be located at least 100m away from any waterbody or wetland and shall be kept clear of snow and/or miscellaneous materials to allow clear access, routine inspection and leak detection.
- All fuel storage containers and tank vehicles shall be inspected daily for leaks and spillage.
- Damaged or leaking fuel storage containers shall be promptly removed from site.
- A spill kit or sufficient supply of materials for clean-up or spill containment shall always be available on site.
- In the event that there is a spill, the entire affected area shall be cleaned up and all contaminated soil shall be appropriately disposed of offsite at an appropriate licensed facility.
- Any reportable spills shall be reported pursuant to Manitoba Regulation 439/87.
- All spills shall be reported to the Engineer within 24 hours.

Further information regarding the aforementioned mitigations can be reviewed in the MTI GER's in Appendix F.

#### 5.3.7.4 Residual Effects

In considering the potential Project effects on soils from disturbance and/or accidental spills, and the application of the aforementioned mitigation measures, no residual effects to soils are anticipated as a result of the Project.

#### 5.3.8 Ground Water

##### 5.3.8.1 Construction Effects

While there was little available information related to groundwater resources within the LAA and RAA, it was indicated that groundwater recharge likely stems from upland areas and occurs slowly via direct infiltration through secondary permeability features such as joints, faults, shears, and bedding planes (Betcher et al., 1995). Potential effects during construction could include groundwater contamination occurring from accidents or malfunctions due to accidental spills or releases of deleterious substances from equipment and machinery use. However, groundwater contamination from infiltration of deleterious substances is not anticipated given these are unlikely to be spills of large quantities and surface spills would be remediated following mitigation measures. With the implementation of mitigation measures, the risk of groundwater contamination from accidental spills or releases of deleterious substances is expected to be isolated instances, with short-term effects localized to the Project footprint and low in magnitude.

#### 5.3.8.2 Operation Effects

Potential effects on soil groundwater could occur as result of leaks, collisions, and accidental releases of deleterious substances during seasonal preparation, vehicle use, and maintenance activities. However, groundwater contamination from infiltration of deleterious substances is not anticipated given any spills are unlikely to occur in large quantities and surface spills would be remediated following mitigation measures. With the implementation of mitigation measures, the risk of groundwater contamination from accidental spills or releases of deleterious substances during operation is expected to be isolated instances, with short-term effects localized to the Project footprint and low in magnitude.

#### 5.3.8.3 Mitigation Measures

The potential effects of spills and releases of deleterious substances during construction and operation will be mitigated by following the provisions outlined in the *Machinery, Fuel Storage, and Handling* and *Emergency Response Plan for Spills* sections of the GERs including:

- Machinery shall arrive on site in a clean condition and maintained free of fluid leaks.
- Designated Area(s) shall be established for fuel storage and handling, equipment cleaning, refueling and servicing.
- Any Designated Area shall be located at least 100m away from any waterbody or wetland and shall be kept clear of snow and/or miscellaneous materials to allow clear access, routine inspection and leak detection.
- All fuel storage containers and tank vehicles shall be inspected daily for leaks and spillage.
- Damaged or leaking fuel storage containers shall be promptly removed from site.
- A spill kit or sufficient supply of materials for clean-up or spill containment shall always be available on site.
- In the event that there is a spill, the entire affected area shall be cleaned up and all contaminated soil shall be appropriately disposed of offsite at an appropriate licensed facility.
- Any reportable spills shall be reported pursuant to Manitoba Regulation 439/87.
- All spills shall be reported to the Engineer within 24 hours.

Further information regarding the aforementioned mitigations can be reviewed in the MTI GER's in Appendix F.

#### 5.3.8.4 Residual Effects

In considering the potential effects on groundwater from accidental spills and releases of deleterious substances, and the application of the aforementioned mitigation measures, there are no residual effects to groundwater anticipated as a result of the Project.

### 5.3.9 Surface Water

#### 5.3.9.1 Construction Effects

During construction, mobilization, clearing and preparation of water crossings has the potential to cause disturbance to banks and destabilize slopes which may lead to erosion and sedimentation concerns. Erosion of stream banks can increase sediments and fines entering and being carried by the waterway, and risks increasing turbidity levels at the site of a crossing. Turbidity is considered in surface water quality and the CCME outline guidelines to turbidity based on classification of the waterway as being either clear-flowing or turbid-flowing (CCME, 1999). Additionally, the clearing of trees and shrubs has the potential to destabilize slopes, particularly at locations where stream crossings are bordered by significant tree cover (E.g., see Crossing 1 in Appendix C). The loss of these trees and their associated root systems can destabilize the banks and contribute to erosion. Similarly, sediments can enter the water way through the use of dirty snow used as fill to pack and construct a water crossing. As snow melts, the suspended sediments can enter the stream, accrue within the waterways, and alter the geomorphology of a stream and turbidity. With the implementation of appropriate mitigation measures, any potential effects associated with sedimentation and turbidity are expected to be localized to the Project footprint and low in magnitude with negligible effects overall.

Potential effects to surface waters from accidents or malfunctions can occur from accidental spills or releases of deleterious substances such as oil, fuel (diesel and gasoline) or hydraulic fluids during construction. A spill or release of fuels and other potentially toxic substances can have a direct adverse effect to surface waters by decreasing water quality at the site of a release, along with an array of indirect effects related to exposure, consumption and use of contaminated surface waters by wildlife and humans (see sections 5.4.2, 5.4.3, and 5.5.6). However, with the implementation of mitigation measures, these risks can be temporary, short-term and reversible and are thus considered low in magnitude and negligible.

#### 5.3.9.2 Operation Effects

During operation, potential effects to surface waters are similar to those of construction, particularly disturbance to banks and spills as part of route and water crossing preparation. Preparation of the route and water crossings has the potential to cause disturbance to banks which can lead to erosion and sedimentation concerns via sediments entering the waterway and increasing turbidity levels at the site of a crossing. Similarly, the use of dirty snow used as fill to pack and construct a water crossing can result in fines entering waterway as it melts, with potential effects to the turbidity and geomorphology of a stream. With the implementation of appropriate mitigation measures, any potential effects associated with sedimentation and turbidity are expected to be localized to the Project footprint and low in magnitude with negligible effects overall.

Additionally, the preparation of the route and water crossings during operation will require the use of machinery and equipment that risk accidental spills or releases of deleterious substances into surface waters. A spill or release of toxic substances can have a direct adverse effect to surface waters by decreasing water quality at the site of a release. However, with the implementation of mitigation measures, these risks can be temporary, short-term and reversible and are thus considered low in magnitude and negligible.

### 5.3.9.3 Mitigation Measures

Potential effects to surface related to bank disturbance, erosion, and sedimentation during both construction and operation will be mitigated using the provisions outlined in the *Erosion and Sediment Control* section of the GERs and the *Manitoba Stream Crossing Guidelines – 2.8 Temporary Crossings*, including:

- Disturbance to the bed and banks of the watercourse or wetland shall be minimized and confined to the immediate work site.
- Effective sediment and erosion control measures shall be installed before starting work near water to prevent the entry of sediment into any water course or wetland.
- Minimize disturbance by locating ice bridges at an area that requires the minimum approach grading and the shortest crossing route.
- Avoid using debris as reinforcement material, to prevent downstream siltation problems during spring break up.

Potential effects to surface waters related to the preparation of water crossings, during both construction and operation will be mitigated using the provisions outlined in the DFO *MB Operational Statement for Ice Bridges and Snow Fills*, including:

- Ice bridges are constructed of clean (ambient) water, ice and snow.
- Snow fills are constructed of clean snow, which will not restrict water flow at any time.
- Operate machinery on land or on ice and in a manner that minimizes disturbance to the banks of the lake, river or stream.

Potential effects to surface waters related to the release of deleterious substances during both construction and operation will be mitigated using the provisions outlined in the *Machinery, Fuel Storage and Handling*, and *Emergency Response Plan for Spills* sections of the GERs including:

- Machinery shall arrive on site in a clean condition and shall be maintained free of fluid leaks.
- All fuel storage containers and tank vehicles shall be inspected daily for leaks and spillage. Damaged or leaking fuel storage containers shall be promptly removed from site.
- A spill kit or sufficient supply of materials for clean-up or spill containment shall always be available on site.

- In the event that there is a spill, the entire affected area shall be cleaned up and all contaminated soil shall be appropriately disposed of offsite at an appropriate licensed facility.
- Any reportable spills shall be reported pursuant to Manitoba Regulation 439/87.
- All spills shall be reported to the Engineer within 24 hours.

Further information regarding the aforementioned mitigations can be reviewed in the MTI *GER's*, DFO's *Manitoba Operational Statement for Ice Bridges and Snow Fills*, and the *Manitoba Stream Crossing Guidelines - 2.8 Temporary Crossings* found in Appendix F.

#### 5.3.9.4 Residual Effects

Residual effects associated with the operation of the proposed Project include the potential release of deleterious substances such as oil, fuel (diesel and gasoline) or hydraulic fluids from personal vehicles (e.g., cars, snowmobiles). Where members of the public may not inspect their personal vehicles for leaks, these leaks and subsequent releases of deleterious substances may go unnoticed. Winter roads are open for an average of 8-weeks between January and March and do not experience heavy traffic flow. As such, any releases of deleterious substances are anticipated to be in small volumes and localized to the LAA. The impacts of such are therefore anticipated to be infrequent, low in magnitude and thus negligible.

In considering the potential Project effects on surface waters and the application of the aforementioned mitigation measures, residual Project effects are anticipated to have negligible significant residual effects.

## 5.4 Biological Environment

This section provides an outlines the effects analysis, potential Project impacts, and mitigation measures for components of the biological environmental within the Project region. Effects area analyzed both on a regional (i.e., RAA) and local (i.e., LAA) scale in relation to the proposed Project

**Table 5-2.** Shamattawa Winter Road Realignment Project Environmental Effects Assessment Matrix for the Biological Environment.

<b>BIOLOGICAL ENVIRONMENT</b>				
	<b>Vegetation</b>	<b>Wildlife</b>	<b>Fish &amp; Fish Habitat</b>	<b>Sensitive Species</b>
<b>CONSTRUCTION PHASE</b>				
Mobilization of equipment / supplies	X	X	X	X
ROW clearing and grubbing	X	X	X	X
Timber and brush disposal		X		
Preparation of water crossings (E.g., flooding)			X	X
Accidents & malfunctions	X	X	X	X
<b>OPERATION PHASE</b>				
Preparation of route (E.g., minor clearing, snow packing)	X	X		
Preparation of water crossings (E.g., flooding)		X	X	X
Maintenance (E.g., graders, snowplows)	X	X	X	X
Seasonal vehicle use	X	X	X	X

#### 5.4.1 Vegetation

##### 5.4.1.1 Construction Effects

During construction, impacts to vegetation will be localized as the effects of clearing are to remain within the designated 20 m ROW. That being said, the effects of clearing the ROW will include a relatively permanent alteration of tree and shrub cover. Clearing activities will largely target standing and fallen trees, shrubs, and stumps. Low-laying vegetation such as sphagnum mosses, grasses, and sedges will already be covered and compacted below natural snowfall. As such, the winter road will build upon the already compacted low-laying vegetation. The potential effects of clearing and grubbing trees and shrubs during construction will result in a relatively permanent loss of trees and shrubs along the route and within the ROW. With the implementation of appropriate mitigation measures, effects to vegetation during construction is expected to be long-term, localized to the Project footprint and low in magnitude.

There is also potential for invasive or non-native plants to establish themselves in the area through seed transport from the mobilization and use of equipment. Introduction of invasive and/or non-native vegetation have the potential to temporarily or permanently alter the local vegetation community. However, works will be conducted under winter conditions which can reduce seed viability and development. With the implementation of mitigation measures, the risk of introducing invasive or non-native species to the area is expected to be low with negligible effects.

The potential occurrence of accidents or malfunctions from the operation of machinery in the area could result in the loss or impairment of vegetation due to accidental spills or releases of deleterious sub-stances such as oil, fuel (diesel and gasoline) or hydraulic fluids during construction. The potential for spills would, however, be limited to the local Project footprint where construction activities are occurring. A spill or release of fuels and other potentially toxic substances can have an effect on vegetation species or communities and could occur when vegetation is trying to establish or flower. However, vegetation loss and impairment is reversible in the long term with the implementation of spill response planning and remediation efforts. With the implementation of mitigation measures, the risk of accidental spills or releases of deleterious substances is expected to be isolated instances, with short-term effects localized to the Project footprint and low in magnitude.

##### 5.4.1.2 Operation Effects

During operation, preparation of the route may require minor clearing efforts to remove shrubs that have grown within the 20 m ROW of the winter road route over the spring, summer, and fall seasons. Generally minor cutbacks to shrubs or saplings are required after five years. In these instances, clearing activities will largely target emerging sapling and shrubs with no impact to low-laying vegetation such as sphagnum mosses, grasses, and sedges. As such, the effects of occasional clearing and grubbing trees and shrubs during operation will contribute to the relatively permanent loss of trees and shrubs along the route and within the ROW. With the implementation

of appropriate mitigation measures, effects to vegetation during construction and operation is expected to be long-term and localized to the Project footprint and moderate in magnitude.

Despite the operational window being short-term, preparation of the route, maintenance and use by personal vehicles introduce the potential for accidental spills or releases of deleterious substances. At the start of each winter road season, the route will need to be prepared and maintained with the use of lightweight equipment such as snowmobiles to prepare the surface and snowplows to maintain the surface. Similarly, during operation of the winter road, the route will be frequented by personal vehicles travelling along the road. All of these vehicles have the potential to experience minor leaks or release the aforementioned deleterious substances along the roadway. Additionally, public use of the road has the potential for accidents and collisions between travelling vehicles. A spill or release of fuels and other potentially toxic substances can have an effect on vegetation species or communities and could occur when vegetation is trying to establish or flower. The resulting effects would be limited to the local Project footprint and vegetation loss and impairment is deemed to be reversible in the long term with the implementation of spill response planning and remediation efforts. With the implementation of mitigation measures, the risk of accidental spills or releases of deleterious substances is expected to be isolated instances, with short-term effects localized to the Project footprint and low in magnitude.

#### 5.4.1.3 Mitigation Measures

Any additional potential effects of clearing and grubbing to trees and shrubs will be mitigated using the provisions outlined in the *Clearing, Grubbing, and Brushing* section of the GERs including:

- Where possible, grubbing shall not occur within 2 m of standing timber in order to prevent damage to root systems of adjacent trees and reduce the occurrence of blow down.
- There shall be no bulldozing of woody debris into standing timber.
- All cleared vegetation and debris shall be piled and/or compacted in windrows as close to the ground as possible in preparation for disposal.
- Windrows shall be no closer than 1 meter to the bush line.

The potential effects of introducing invasive or non-native plants into the area during construction will be mitigated using the provisions outlined in the *Machinery, Fuel Storage, and Handling* section of the GERs including:

- Ensuring all machinery entering the construction site shall arrive in a clean condition.

The potential effects of spills and releases of deleterious substances during construction and operation will be mitigated by following the provisions outlined in the *Machinery, Fuel Storage, and Handling* and *Emergency Response Plan for Spills* sections of the GERs including:

- Machinery shall arrive on site in a clean condition and maintained free of fluid leaks.
- Designated Area(s) shall be established for fuel storage and handling, equipment cleaning, refueling and servicing.

- Any Designated Area shall be located at least 100m away from any waterbody or wetland and shall be kept clear of snow and/or miscellaneous materials to allow clear access, routine inspection and leak detection.
- All fuel storage containers and tank vehicles shall be inspected daily for leaks and spillage.
- Damaged or leaking fuel storage containers shall be promptly removed from site.
- A spill kit or sufficient supply of materials for clean-up or spill containment shall always be available on site.
- In the event that there is a spill, the entire affected area shall be cleaned up and all contaminated soil shall be appropriately disposed of offsite at an appropriate licensed facility.
- Any reportable spills shall be reported pursuant to Manitoba Regulation 439/87.
- All spills shall be reported to the Engineer within 24 hours.

Further information regarding the aforementioned mitigations can be reviewed in the MTI GER's in Appendix F.

#### *5.4.1.4      Residual Effects*

Residual effects from construction and operation will include a relatively permanent loss and alteration of tree and shrub cover within the Project ROW. This loss is regarded to be relatively permanent due to the fact that there is no permanent roadway and no permanent structures as part of the winter road. As such, the area will be left to grow naturally throughout the spring, summer, and fall seasons. Additionally, while the realigned route is planned for long-term use, decommissioning of the route in the future would allow for the growth of saplings and shrubs, and allowing the ROW to revegetate naturally. These alterations to tree and shrub cover may also result in minor permanent changes to species composition within the ROW. However, vegetation outside of the ROW will remain in a natural state and may allow for passive regeneration and recolonization. As such, there are no concerns of a significant loss to biological or ecological function within the LAA or RAA.

While not a mitigation for clearing activities, the 58 km route planned for decommissioning will no longer be maintained for winter road usage and vegetation within the existing ROW will be able to revegetate via natural recolonization and return to pre-disturbance conditions.

In considering the potential Project effects on vegetation and the application of mitigation measures, residual Project effects are anticipated to be long-term, localized, and low in magnitude resulting in low significant effects.

## 5.4.2 Wildlife

### 5.4.2.1 Construction Effects

During construction, the mobilization of equipment and clearing activities can disrupt wildlife and result in avoidance of habitats within the LAA. Disruptions from construction activities are likely to be restricted to noise and vibrations. Any potential effects are most likely to be experienced by mammals and resident birds within the LAA. Because the winter road operates between January and March, migratory birds and breeding birds are not at risk of being impacted. With the application of mitigation measures, potential effects to these birds are expected to be localized the Project footprint, low in magnitude, with no significant impacts on a population level. In general, mammals known to occupy the LAA (see section 4.3.2.1) will mate in the winter months and offspring will be born in the spring months (March to May). As such, disruption to any offspring and/or occupied dens by mammals are unlikely to occur during their most sensitive periods. With the implementation of appropriate noise management and mitigation measures, the potential effects to mammals is expected to be localized to the Project footprint (20 m ROW) and low in magnitude.

The effects of tree and shrub clearing as part of construction will include a relatively permanent alteration to the local vegetation and has the potential to affect wildlife which occur within the LAA. As such, the removal of trees and shrubs can reduce viable foraging and nesting habitat within the Project footprint. Ungulates known to occur within the RAA, such as Moose, consume available winter vegetation such as twigs (Hundertemark, 2016). Removal of trees and shrubs, will alter available food resources within the Project footprint, however the potential effects to moose are expected to be localized the Project footprint, low in magnitude, with no significant impact on a population level. Thus, amidst proper mitigations, any potential effects to these birds are expected to be localized the Project footprint, low in magnitude, with no significant impact on a population level.

Timber and brush disposal has the potential to effect terrestrial wildlife in the case where material is placed in a manner that creates a barrier to migration. With the implementation of brush disposal methods and mitigation measures, any potential effects are expected to be short-term, localized to the Project footprint and low in magnitude.

Food kept onsite can attract certain species such as scavenging birds and mammals if proper disposal methods are not practiced. With the implementation of attention to site cleanliness and mitigation measures, any potential effects are expected to be short-term, localized to the Project footprint and low in magnitude.

Lastly, the potential effects of accidents or malfunctions from the operation of machinery in the LAA could result in contamination of waterways and vegetation due to accidental spills or releases of deleterious sub-stances such as oil, fuel (diesel and gasoline) or hydraulic fluids during construction. If wildlife were directly or indirectly exposed to contamination, serious impacts to the health and wellbeing of the mammal, reptiles, amphibians and/or bird species could occur. The

potential for spills would, however, be limited to the local Project footprint where construction activities are occurring. With the implementation of spill response planning and associated mitigation measures, the risk of accidental spills or releases of deleterious substances is expected to be low risk. If such did occur, it is expected to occur as isolated instances, with short-term effects localized to the Project footprint and low in magnitude.

#### 5.4.2.2 Operation Effects

During operation, the preparation, maintenance and use of a new winter road ROW will contribute to habitat fragmentation and create additional forest-edge habitats. This type of ROW may act as an access corridor for hunters and predators which can effect mortality rates for wildlife within the LAA, primarily for ungulates and furbearers. Trapping and hunting are known to occur within the LAA and RAA and it can be assumed the ROW may increase mortality for targeted species. Additionally, predators such as wolves, will commonly follow edge habitats in search of ungulate prey. The potential effects from increased fragmentation and accessibility are expected to be localized to the RAA and low in magnitude, with no significant impacts to mammals on a population level.

During the operational phase of the winter road, preparation of the winter road, maintenance and vehicular use of the route has the potential to effect wildlife within the LAA due to risks of collisions. While the flow of traffic along the proposed Shamattawa Winter Road is expected to be infrequent and minimal, some mammals, such as moose or wolves are attracted to habitat edges, including ROWs. As such, these species may be at a higher risk of mortality by collisions or through increased accessibility by hunters and/or predators. With the implementation of appropriate mitigation measures, any potential effects are expected to be infrequent, localized to the Project footprint and low in magnitude.

#### 5.4.2.3 Mitigation Measures

Potential effects to wildlife related to noise and clearing disturbances during construction will be mitigated by following the provisions outlined in the *Clearing, Grubbing, and Brushing and Noise and Noise Limitations* sections of the GERs, along with site specific mitigations for active nests including:

- Clearing and grubbing shall not be undertaken between April 1st and August 31st of any year in order to avoid disturbance to nesting birds and other wildlife species.
- All plant and equipment supplied for use on the Project shall be effectively “sound-reduced” by means of proper silencers, mufflers, acoustic linings, acoustic shields or acoustic sheds.

Potential effects to wildlife related to timber and brush disposal during construction will be mitigated by following the provisions outlined in the *Clearing, Grubbing, and Brushing* section of the GERs, including:

- Existing trails, portages and other travel ways shall not be permanently blocked as a result of clearing and grubbing activities so as not to interfere with other users.
- All cleared vegetation and debris shall be piled and/or compacted in windrows as close to the ground as possible in preparation for disposal. Windrows shall be no closer than 1 meter to the bush line.

Potential effects to wildlife related to site cleanliness during construction will be mitigated by following the provisions outlined in the *Wildlife* section of the GERs, including:

- Construction camps and worksites shall be kept clean and tidy.
- All food and garbage waste shall be stored in a secure manner to prevent access and exposure to local wildlife.
- Nuisance wildlife shall be immediately reported to Manitoba Sustainable Developments local District Office and the Project Engineer.

Potential effects to wildlife related to site cleanliness during construction will be mitigated by following the provisions outlined in the *Machinery, Fuel Storage, and Handling* and *Emergency Response Plan for Spills*, sections of the GERs including:

- Machinery shall arrive on site in a clean condition and shall be maintained free of fluid leaks.
- All spills shall be reported to the Engineer within 24 hours whether it was necessary to report the spill to Manitoba Sustainable Development or not.
- In the event that there is a spill, the entire affected area shall be cleaned up and all contaminated soil shall be appropriately disposed of offsite at a licensed facility.

Potential effects to wildlife related to increased predations and collisions during operation can be mitigated with the implementation of site-specific mitigation measures, including:

- Implementation of barrier(s) (e.g., berms/brush piles) at ingress / egress points to the decommissioned winter road to limit access to wildlife in the area (as requested by the Wildlife Branch biologists to deter movement of EM Caribou into active-use areas).
- Application of speed limits (40 km/h) to adjust driving to surrounding conditions and reduce the likelihood of collision.

Further information regarding the aforementioned mitigations can be reviewed in the MTI GER's in Appendix F.

#### 5.4.2.4 Residual Effects

Residual effects associated with the construction and operation/maintenance of the proposed Project includes a relatively permanent loss and alteration of trees and shrubs within the Project footprint (20 m ROW) (i.e., indirect impact to forage food sources and habitat). This loss is regarded to have negligible effects to wildlife population due to the fact that the loss of vegetation will be localized to the proposed ROW. Vegetation, habitat and food sources adjacent to the ROW

will remain abundant and undisturbed for use by wildlife. In considering the potential Project effects on wildlife, and the application of the aforementioned mitigation measures, residual Project effects are anticipated to be short-term, localized, and low in magnitude resulting in negligible significant residual effects.

### 5.4.3 Fish and Fish Habitat

#### 5.4.3.1 Construction Effects

During construction, the mobilization of equipment has the potential to cause disturbance to the banks at the six rivers and stream crossing locations. Heavy machinery will be required to cross the waterways in order to access the full proposed Project route. With the implementation of appropriate mitigation measures, any potential effects are expected to be infrequent, localized to the Project footprint and low in magnitude with negligible effects overall.

Additionally, the clearing of trees and shrubs as part of construction has the potential to destabilize slopes if proper erosion control methods are not practiced. Particularly in cases where stream crossings are bordered by significant tree cover (E.g., see Crossing 1 in Appendix C), the loss of these trees and their associated root systems can destabilize the banks and contribute to erosion. With the implementation of appropriate mitigation measures, any potential effects are expected to be localized to the Project footprint and low in magnitude with negligible effects overall.

The preparation of water crossings during construction has the potential to reduce water quality at the site of water crossings should eroded soils, sediments, or other fines enter the waterway. Sediments which enter a waterway can be carried downstream and increase sediment load, representing a reduction in the quality of water and aquatic habitats. Suspended sediments can affect fish directly by obstructing normal life processes and behaviour. Additionally, sediments can settle and have an adverse effect to benthic invertebrates, fish eggs and larvae. During the construction of winter roads, sediments can enter the water way through the use of dirty snow used as fill to pack and construct a water crossing. As the impacted snow melts, the suspended sediments can enter the stream, accrue within the waterways, and act as a bottleneck to stream flows. This can also block fish passage through a waterway and may lead to situations where stream beds and banks become scoured. With the implementation of appropriate mitigation measures, any potential effects are expected to be low in magnitude with negligible effects overall.

Potential effects to water quality from accidents or malfunctions can occur from accidental spills or releases of deleterious substances such as oil, fuel (diesel and gasoline) or hydraulic fluids during construction. A spill or release of fuels and other potentially toxic substances can have an effect on freshwater communities and decrease water quality at the site of a release. Deleterious substances can result in fish mortality and/or mortality of fish eggs as well as interrupt other important life history traits. However, with the implementation of mitigation measures, these risks can be temporary, short-term and reversible and are thus considered low in magnitude and negligible.

5.4.3.2 Operation Effects

The preparation of water crossings during construction has the potential to reduce water quality at the site of water crossings should eroded soils, sediments, or other fines enter the waterway. Sediments which enter a waterway can be carried downstream and increase sediment load, representing a reduction in the quality of water and aquatic habitats. Suspended sediments can affect fish directly by obstructing normal life processes and behaviour. Additionally, sediments can settle and have an adverse effect to benthic invertebrates, fish eggs and larvae. During the construction of winter roads, sediments can enter the water way through the use of dirty snow used as fill to pack and construct a water crossing. As the impacted snow melts, the suspended sediments can enter the stream, accrue within the waterways, and act as a bottleneck to stream flows. This can also block fish passage through a waterway and may lead to situations where stream beds and banks become scoured. With the implementation of appropriate mitigation measures, any potential effects are expected to be low in magnitude with negligible effects overall.

Furthermore, the preparation of water crossings will often require the crossing ROW to be flooded such that the road surface is built up with ice to increase its thickness. Without proper mitigations, the uptake of water risks entrainment and impingement of fish. With the implementation of appropriate mitigation measures, any potential effects are expected to be low in magnitude with negligible effects overall.

As part of maintenance activities, the use of machinery such as snowmobiles, graders, and snowplows has the potential to cause disturbance to the banks at the six rivers and stream crossing locations. Heavy machinery will be required to cross the waterways in order to access the full proposed Project route. With the implementation of appropriate mitigation measures, any potential effects are expected to be infrequent, localized to the Project footprint and low in magnitude with negligible effects overall.

Lastly, the use of machinery, such as graders and snowplows, along with the use of vehicles, both risk the entry of deleterious substances like oil, fuel (diesel and gasoline) or hydraulic fluids during the operational period. A spill or release of fuels and other potentially toxic substances can have an effect on freshwater communities and decrease water quality at the site of a release. Deleterious substances can result in fish mortality and/or mortality of fish eggs as well as interrupt other important life history traits. However, with the implementation of mitigation measures, these risks can be temporary, short-term and reversible and are thus considered low in magnitude and negligible.

#### 5.4.3.3 Mitigation Measures

Potential effects to fish and fish habitat related to working near water, bank disturbance, and erosion and sedimentation during both construction and operation will be mitigated using the provisions outlined in the *In-Water Work* and *Erosion and Sediment Control* sections of the GERs including:

- No in-water work shall occur within fish bearing streams from April 15th to June 30th of any year to accommodate spawning and nursery periods.
- Disturbance to the bed and banks of the watercourse or wetland shall be minimized and confined to the immediate work site.
- Pump intakes shall be sized and adequately screened to prevent fish mortality in accordance with the DFO *Freshwater Intake End-of-Pipe Fish Screen Guideline*.
- Effective sediment and erosion control measures shall be installed before starting work near water to prevent the entry of sediment into any water course or wetland.

Potential effects to fish and fish habitat related to water quality and the preparation of water crossings, during both construction and operation will be mitigated using the provisions outlined in the DFO MB *Operational Statement for Ice Bridges and Snow Fills*, including:

- Ice bridges are constructed of clean (ambient) water, ice and snow.
- Snow fills are constructed of clean snow, which will not restrict water flow at any time.
- The withdrawal of any water will not exceed 10% of the instantaneous flow, in order to maintain existing fish habitat, water flow is maintained under the ice (if applicable).
- Operate machinery on land or on ice and in a manner that minimizes disturbance to the banks of the lake, river or stream.
- When the crossing season is over and where it is safe to do so, create a v-notch in the center of the ice bridge to allow it to melt from the center and also to prevent blocking fish passage, channel erosion and flooding.
- Compacted snow should be removed from snow fills prior to the spring freshet.

Potential effects to fish and fish habitat related to the release of deleterious substances during both construction and operation will be mitigated using the provisions outlined in the *Machinery, Fuel Storage and Handling*, and *Emergency Response Plan for Spills* sections of the GERs including:

- Machinery shall arrive on site in a clean condition and shall be maintained free of fluid leaks.
- All fuel storage containers and tank vehicles shall be inspected daily for leaks and spillage. Damaged or leaking fuel storage containers shall be promptly removed from site.
- A spill kit or sufficient supply of materials for clean-up or spill containment shall always be available on site.

- In the event that there is a spill, the entire affected area shall be cleaned up and all contaminated soil shall be appropriately disposed of offsite at an appropriate licensed facility.
- Any reportable spills shall be reported pursuant to Manitoba Regulation 439/87.
- All spills shall be reported to the Engineer within 24 hours.

Further information regarding the aforementioned mitigations can be reviewed in the MTI's *GER's*, DFO's *Manitoba Operational Statement for Ice Bridges and Snow Fills*, and the *Manitoba Stream Crossing Guidelines - 2.8 Temporary Crossings* found in Appendix F.

#### 5.4.3.4 Residual Effects

Residual effects associated with the operation of the proposed Project include the potential release of deleterious substances such as oil, fuel (diesel and gasoline) or hydraulic fluids from personal vehicles (e.g., cars, snowmobiles). Where members of the public may not inspect their personal vehicles for leaks, these leaks and subsequent releases of deleterious substances may go unnoticed. Winter roads are open for an average of 8-weeks between January and March and do not experience heavy traffic flow. As such, any releases of deleterious substances are anticipated to be in small volumes and localized to the LAA. The impacts of such are therefore anticipated to be infrequent, low in magnitude and thus negligible.

In considering the potential Project effects on fish and fish habitat, and the application of the aforementioned mitigation measures, residual Project effects are anticipated to have negligible significant effects.

#### 5.4.4 Sensitive Species

##### 5.4.4.1 Construction Effects

As indicated in section 4.3.4, there are five protected and/or sensitive species that have the potential to occur within the LAA including Lake Sturgeon (fish), Common Nighthawk, Olive-sided Flycatcher, Rusty Blackbird (birds), and Eastern Migratory Caribou (mammals).

Potential effects to Lake Sturgeon during construction are similar to those outlined in the *Fish and Fish Habitat Construction Effects* section (5.4.3.1). In summary, these potential effects include:

- Disturbance to banks during mobilization and preparation of water crossings;
- Destabilized slopes from the clearing along riverbanks within the ROW;
- Sediments entering the waterway during ice crossing preparation;
- Harm to fish during ice crossing preparation with improper pump screen methods; and,
- Accidents, malfunctions and releases of deleterious substances into the waterway.

Additionally, sensitive fish species such as Lake Sturgeon are spring spawners and will migrate to rocky bottom spawning habitat. Within the Angling River and Pennycutaway River, it is

unknown if Lake Sturgeon spawn within the LAA. However, given construction and operation activities are planned to occur outside of the spawning restriction window and necessary erosion, sediment, and spill response mitigations will be implemented, any potential effects are expected to be infrequent, localized to the Project footprint and low in magnitude with negligible effects.

Potential effects to sensitive bird species such as Common Nighthawk, Olive-sided Flycatcher, and Rusty Blackbird during construction are similar to those outlined in the *Wildlife* Construction Effects section (5.4.2.1). In summary, these potential effects include:

- Disruption from noise and vibrations during mobilization and clearing;
- Loss of nesting and foraging habitats from clearing of the ROW; and,
- Risk of deleterious substances entering the environment.

Sensitive bird species such as Common Nighthawk, Olive-sided Flycatcher, and Rusty Blackbird are migratory bird species and are thus not anticipated to be within the LAA/RAA during the construction and annual operation of the winter road. However, clearing of trees and shrubs can impact these species outside of winter road operation given clearing will present a relatively permanent alteration to the vegetation within the Project footprint, and thus limit potential nesting habitat within the Project footprint. Rusty Blackbird nest in shrubs or small trees near water (COSEWIC, 2017c), Common Nighthawk are ground nesters and occupy a wide range of ground types (COSEWIC, 2007), and Olive-sided Flycatchers tend to nest in coniferous trees (COSEWIC, 2018). With the implementation of clearing mitigations during breeding periods, the potential effects from clearing within the Project footprint are anticipated to be long-term, localized to the Project footprint and low in magnitude with negligible impacts to the aforementioned bird species on a population level.

Potential effects to sensitive mammal species such as EM Caribou during construction are similar to those outlined in the *Wildlife* Construction Effects section (5.4.2.1). In summary, these potential effects include:

- Disruption from noise and vibrations during mobilization and clearing;
- Loss of foraging habitats from clearing of the ROW; and,
- Risk of deleterious substances entering the environment.

Construction activities including the mobilization of equipment and clearing activities can disrupt Caribou within the LAA. Data received from NRND demonstrates caribou are active in the area, passing through the LAA likely as part of a migratory route. As such, noise and vibrations associated with the mobilization of equipment and clearing activities may disrupt and deter Caribou from the local area. Caribou can experience sensory distress from anthropogenic operations (COSEWIC, 2017) and may be deterred from the area, thus altering their migration routes and habitat ranges. With the implementation of appropriate noise management and mitigation measures, the potential effects to Caribou is expected to be short term, localized to the Project footprint, and low in magnitude.

Potential effects to Caribou related to clearing of trees is the removal of arboreal lichens, a significant source of food for Caribou (COSEWIC 2017). Clearing will result in a relatively permanent loss of trees within the Project ROW. However, trees and arboreal lichens outside of the ROW are not anticipated to be effected with mitigation for clearing in place. Furthermore, the Project footprint (20 m ROW) proposed for clearing represents a small area of impact in comparison to the remaining intact habitat throughout the larger LAA and RAA and addition of the existing route upon decommissioning. As such, the potential loss of arboreal lichens within the Project footprint expected to be long-term, localized to the Project footprint, low in magnitude with negligible impacts to Caribou on a population level.

Potential effects to Caribou from accidents or malfunctions during construction in the LAA could include contamination of vegetation due to accidental spills or releases of deleterious sub-stances such as oil, fuel (diesel and gasoline) or hydraulic fluids during construction. The potential for spills would, however, be limited to the local Project footprint where construction activities are occurring. With the implementation of spill response planning and associated mitigation measures, the risk of accidental spills or releases of deleterious substances is expected to be low risk. If such did occur, it is expected to occur as isolated instances, with short-term effects localized to the Project footprint and low in magnitude.

#### 5.4.4.2 Operation Effects

Potential effects to sensitive fish species such as Lake Sturgeon during operation are comparable to the potential effects from construction. These effects are outlined for Lake Sturgeon above, and further explained in the *Fish and Fish Habitat* Operation Effects section (5.4.3.2). In summary, these potential effects include:

- Disturbance to banks during mobilization and preparation of water crossings;
- Destabilized slopes from the clearing along riverbanks within the ROW;
- Sediments entering the waterway during ice crossing preparation;
- Entrainment and impingement of fish from improper pump screen methods; and,
- Accidents, malfunctions and releases of deleterious substances into the waterway.

Potential effects to sensitive bird species such as Common Nighthawk, Olive-sided Flycatcher, and Rusty Blackbird are comparable to the potential effects outlined in the *Wildlife* Operation Effects section (5.4.2.2). In summary, these potential effects include:

- Habitat fragmentation and additional forest-edge habitat from a maintained ROW;
- Seasonal disturbances from maintenance activities and vehicle use; and,
- Risk of wildlife-vehicular collisions.

Potential effects to sensitive mammal species such as EM Caribou are comparable to the potential effects outlined in the *Wildlife* Operation Effects section (5.4.2.2). In summary, these potential effects include:

- Habitat fragmentation and additional forest-edge habitat from a maintained ROW;
- Seasonal disturbances from maintenance activities and vehicle use; and,
- Risk of wildlife-vehicular collisions.

Potential effects to Caribou during the annual operation of the winter road include disturbance to Caribou within the LAA. Caribou can experience sensory distress from anthropogenic operations and tend to avoid linear features and infrastructure (COSEWIC, 2017). As a result, caribou may alter their selected migration routes to avoid the winter road. With the implementation of mitigation measures related to the decommissioning of the existing route, potential effects are expected to be periodic, localized to the LAA, and low in magnitude. Furthermore, while the proposed winter road will overlap with caribou migration routes and home ranges, caribou calving periods generally begin in April and are thus outside of the winter road operational period. As such, potential effects to caribou calving activities are not expected to occur.

Additional potential effects to Caribou during the annual operation of the proposed winter road can include habitat fragmentation. ROWs may act as an access corridor for hunters and predators which can effect mortality rates for Caribou within the LAA. Hunting is known to occur within the LAA and RAA and it can be assumed the proposed ROW may increase mortality for targeted Caribou. Additionally, predators such as wolves, will commonly follow edge habitats in search of ungulate prey. With the implementation of appropriate mitigation measures, potential effects from increased fragmentation and accessibility are expected to be localized to the RAA and low in magnitude, with no significant impacts to Caribou on a population level.

Lastly, while the flow of traffic along the proposed Shamattawa Winter Road is expected to be infrequent and minimal, annual operation of the winter road risks collision with Caribou. Though, it should be noted that previous studies have determined mortality to Caribou from vehicular collisions was not recognized as a significant threat as EM Caribou habitat range intersects with very few roads (COSEWIC, 2017). As such, with the use of site-specific mitigations for vehicle speeds, any potential effects are expected to be infrequent, localized to the Project footprint, low in magnitude with negligible impacts on a population level.

#### 5.4.4.3 Mitigation Measures

Potential effects to Lake Sturgeon during both construction and operation are similar to those outlined in the *Fish and Fish Habitat* section (5.4.3). In summary, these effects will be mitigated using the provisions outlined in the following sections of the GERS, including:

- *In-Water Work;*
- *Erosion and Sediment Control;*
- *Clearing, Grubbing, and Brushing;*
- *Machinery, Fuel Storage and Handling;* and
- *Emergency Response Plan for Spills.*

Additionally, potential effects to Lake Sturgeon during both construction and operation will also be mitigated using the provisions outlined in the following documents related to temporary water crossings:

- *DFO MB Operational Statement for Ice Bridges and Snow Fills*; and,
- *Manitoba Stream Crossing Guidelines - 2.8 Temporary Crossings*

Potential effects to Common Nighthawk, Olive-sided Flycatcher, and Rusty Blackbird during both construction and operation are similar to those outlined in the *Wildlife* section (5.4.2). In summary, these effects will be mitigated using the provisions outlined in the following sections of the GERS, including:

- *Noise Limitations*;
- *Clearing, Grubbing, and Brushing*;
- *Wildlife*;
- *Machinery, Fuel Storage and Handling*; and
- *Emergency Response Plan for Spills*.

Potential effects to Caribou during both construction and operation are similar to those outlined in the *Wildlife* section (5.4.2). In summary, these effects will be mitigated using the provisions outlined in the following sections of the GERS, including:

- *Noise Limitations*;
- *Clearing, Grubbing, and Brushing*;
- *Wildlife*;
- *Machinery, Fuel Storage and Handling*; and
- *Emergency Response Plan for Spills*.

Additionally, potential effects to Caribou related to disturbance, predation, and collisions will be mitigated using caribou-specific and site-specific mitigations, as directed by NRND wildlife biologists, including:

- Construction activities, including clearing and grubbing, shall not be undertaken between April 15 and July 31 of any year in order to avoid disturbance to caribou during the calving season.
- When caribou are observed using or migrating through the Project area, construction activities are to be ceased until caribou are outside of the visible area.
- Implementation of barrier(s) (e.g., berms/brush piles) at ingress / egress points to the decommissioned winter road to limit access to the area (as requested by the Wildlife Branch biologists to deter movement of EM Caribou into active-use areas).
- Implementation of caribou crossing signage at roadway points of entry.
- Application of speed limits (i.e., 40 km/h) to adjust driving to surrounding conditions and reduce the likelihood of collision.

Further information regarding the aforementioned mitigations for Lake Sturgeon, Common Nighthawk, Olive-sided Flycatcher, Rusty Blackbird, and Caribou can be reviewed in the MTI GER's, DFO's *Manitoba Operational Statement for Ice Bridges and Snow Fills*, and the *Manitoba Stream Crossing Guidelines - 2.8 Temporary Crossings* found in Appendix F.

#### **5.4.4.4 Residual Effects**

Residual effects associated with the operation of the proposed Project include the potential release of deleterious substances such as oil, fuel (diesel and gasoline) or hydraulic fluids from personal vehicles (e.g., cars, snowmobiles). Where members of the public may not inspect their personal vehicles for leaks, these leaks and subsequent releases of deleterious substances may go unnoticed. Winter roads are open for an average of eight weeks between January and March and do not experience heavy traffic flow. As such, any releases of deleterious substances are anticipated to be infrequent, in small volumes and localized to the Project LAA and thus negligible.

Residual effects associated with the construction and operation/maintenance of the proposed Project includes a relatively permanent loss and alteration of trees and shrubs within the Project footprint (20 m ROW) (i.e., indirect impact to forage food sources and habitat). These alterations to trees and shrubs will have subsequent effects on nesting habitats for sensitive bird species (i.e., Common Nighthawk, Olive-sided Flycatcher, Rusty Blackbird) and on food resources such as arboreal lichens for Caribou. However, vegetation affected within the Project footprint (20 m ROW) represents a small area of impact in comparison to the remaining intact habitat throughout the larger LAA and RAA and addition of the existing route upon decommissioning. As such, these areas outside of the Project footprint is regarded to remain undisturbed and available for use by sensitive bird and mammal species. These residual impacts are anticipated to be long-term, localized to the Project footprint, and low in magnitude with negligible impacts to sensitive bird and mammal species.

Additionally, there will be residual impacts to caribou movement and migration within the LAA as a result of minor fragmentation and disturbance from vehicles within the ROW. The winter road season is relatively short spanning approximately eight weeks between January and March, and occur outside of caribou calving season (April to July). While the proposed Project route does create additional fragmentation of general wildlife habitat in a known caribou range, the existing 58 km section of the winter road will be decommissioned and barricaded from continued human use as a main transportation route. Thus, the area gained by decommissioning the existing winter road can be made available for use by caribou. This area gained will therein reduce additional habitat fragmentation, and potentially reduce use by corridor predators (e.g., wolves). Additionally, operation of the proposed winter road falls outside of the Caribou calving sensitivity window. As such, impacts to caribou movement, migration and disruption are not expected to be greater than what currently exist within the region. These residual impacts are anticipated to be periodic, localized to the Project footprint, and low in magnitude with negligible impacts.

In considering the potential Project effects on sensitive species, and the application of the aforementioned mitigation measures, residual Project effects are anticipated to have low significant effects.

## **5.5 Socio-economic Environment**

This section provides an outlines the effects analysis, potential Project impacts, and mitigation measures for components of the socio-economical environmental within the Project region. Effects area analyzed both on a regional (i.e., RAA) and local (i.e., LAA) scale in relation to the proposed Project.

**Table 5-3.** Shamattawa Winter Road Realignment Project Environmental Effects Assessment Matrix for the Socio-Economical Environment.

<b>SOCIO-ECONOMICAL ENVIRONMENT</b>						
	<b>Regional Communities &amp; Population</b>	<b>Indigenous Population</b>	<b>Resource Use</b>	<b>Parks, Protected Areas &amp; ASIs</b>	<b>Culture &amp; Heritage Resources</b>	<b>Human Health &amp; Safety</b>
<b>CONSTRUCTION PHASE</b>						
Mobilization of equipment / supplies						X
ROW clearing and grubbing	X	X	X			X
Timber and brush disposal	X	X				X
Preparation of water crossings (E.g., flooding)						
Accidents & malfunctions						X
<b>OPERATION PHASE</b>						
Preparation of route (E.g., minor clearing, snow packing)			X			
Preparation of water crossings (E.g., flooding)						
Maintenance (E.g., graders, snowplows)	X	X				X
Seasonal vehicle use	X	X				X

## 5.5.1 Regional Communities and Population

### 5.5.1.1 Construction Effects

Effects from construction such as noise, vibrations, emissions from machinery use, are not anticipated to have effects to communities outside of the LAA. As such, with the appropriate mitigation measures for noise management and machinery use, effects are anticipated to be localized to the LAA, short-term, with negligible effects.

Cleared timber will be harvested and made available for local use by Fox Lake Cree Nation. Cleared brush may be either repurposed where possible (e.g., formation of natural barriers as discussed in section 5.4.2.3), or burned or removed off-site for disposal. On-site burning of brush will be conducted in a manner that reduces the risks of uncontrolled fires within the RAA by only being conducted under winter conditions and under appropriate permits in accordance with the Manitoba *Wildfires Act* and with consideration to requirements outlined by the RM of Gillam. With the implementation of mitigation measures, effects related to brush disposal are anticipated to be localized to the LAA, short-term, with negligible effects.

### 5.5.1.2 Operation Effects

During the operation of the proposed winter road, potential effects will likely be related to increased accessibility between the community of Shamattawa and other communities in the region (E.g., Gillam, Fox Lake Cree Nation, and Long Spruce). Current use and flow of traffic along the winter road is low and limited to the winter road season between January to March and generally includes maintenance activities and public use. The proposed realignment may see an increased number in vehicles, however any increases are not anticipated to significantly increase the flow of traffic to moderate or high use, given the main use will be from community members in the region. Similarly, the proposed realigned route was selected to improve driver safety and navigability with transport truck safety being raised as a priority (Dillon, 2001). As such, increased use and load sizes by transport trucks are anticipated. Reducing winter road reliance on water crossings (i.e. reducing the number of watercourse crossings from eleven to six) will allow for larger load sizes to be hauled across the ice bridges. Any potential effects to the flow of traffic during the operation of the winter road are expected to be localized to the RAA with negligible effects.

### 5.5.1.3 Mitigation Measures

Potential effects to regional communities and population related to noise and machinery use during construction will be mitigated using the provisions outlined in the *Noise Limitations and Machinery, Fuel Storage and Handling* sections of the GERs including:

- All plant and equipment supplied for use on the Project shall be effectively “sound-reduced” by means of proper silencers, mufflers, acoustic linings, acoustic shields or acoustic sheds.
- Tank vehicles used to deliver fuel to the work site and/or used to move fuel around the work site shall meet the requirements for highway tanks for the shipment of dangerous goods by road set out in CSA Standard B620-14, Highway Tanks and TC Portable Tanks for the Transportation of Dangerous Goods.

Potential effects to regional communities and population related to timber and brush disposal during construction be mitigated with the implementation of site-specific mitigation measures, including:

- Minimizing burning of timber and brush as a method of disposal.
- Timber will be harvested and made available for local use by Fox Lake Cree Nation.
- Brush will be repurposed where possible, or burned or removed off-site for disposal.
- Burning of materials are to be conducted in accordance with the Manitoba *Wildfires Act* and with consideration to requirements outlined by the RM of Gillam.

Further information regarding the aforementioned mitigations can be reviewed in the MTI *GER's* found in Appendix F.

#### 5.5.1.4 Residual Effects

No residual or significant adverse effects on regional communities and population are likely to occur as a result of the Project.

#### 5.5.2 Indigenous Population

##### 5.5.2.1 Construction Effects

The effects from construction to Indigenous Populations within the RAA are similar to the anticipated effects outlined for Regional Communities and Population (section 5.5.1). As such these include effects from construction work related to noise, vibrations, and emissions which are likely to be localized to the LAA, short-term, with negligible effects.

Cleared timber will be harvested and made available for local use by Fox Lake Cree Nation. Cleared brush may be either repurposed where possible (e.g., formation of natural barriers as discussed in section 5.4.2.3), or burned or removed off-site for disposal. On-site burning of brush will be conducted in a manner that reduces the risks of uncontrolled fires by only being conducted under winter conditions and under appropriate permits in accordance with the Manitoba *Wildfires Act* and with consideration to requirements outlined by the RM of Gillam. With the implementation of mitigation measures, effects related to brush disposal are anticipated to be localized to the LAA, short-term, with negligible effects.

#### 5.5.2.2 Operation Effects

The effects from winter road operation to Indigenous Populations within the RAA are similar to the anticipated effects outlined for Regional Communities and Population (section 5.5.1). In summary, given the proposed Project is prepared to improve road and navigability conditions and access with the community of Shamattawa. Given current conditions have proven challenges to transport trucks (i.e., load size limitations due to water crossings), these improvements are anticipated to allow transport trucks to increase possible load sizes being delivered to Shamattawa. It is not anticipated that the proposed realigned route will result in significant changes in the flow volumes of personal vehicles. Any potential effects to accessibility, safety, navigation, and traffic flow during the operation of the winter road are expected to be localized to the RAA with negligible adverse effects.

#### 5.5.2.3 Mitigation Measures

Potential effects to the Indigenous population related to noise and machinery use during construction will be mitigated using the provisions outlined in the *Noise Limitations* and *Machinery, Fuel Storage and Handling* sections of the GERs including:

- All plant and equipment supplied for use on the Project shall be effectively “sound-reduced” by means of proper silencers, mufflers, acoustic linings, acoustic shields or acoustic sheds.
- Tank vehicles used to deliver fuel to the work site and/or used to move fuel around the work site shall meet the requirements for highway tanks for the shipment of dangerous goods by road set out in CSA Standard B620-14, Highway Tanks and TC Portable Tanks for the Transportation of Dangerous Goods.

Potential effects to Indigenous populations related to timber and brush disposal during construction be mitigated with the implementation of site-specific mitigation measures, including:

- Minimizing burning of timber and brush as a method of disposal.
- Timber will be harvested and made available for local use by Fox Lake Cree Nation.
- Brush will be repurposed where possible, or burned or removed off-site for disposal.
- Burning of materials are to be conducted in accordance with the Manitoba *Wildfires Act* and with consideration to requirements outlined by the RM of Gillam

Further information regarding the aforementioned mitigations can be reviewed in the MTI GER's found in Appendix F.

#### 5.5.2.4 Residual Effects

No residual or significant adverse effects on the Indigenous population are likely to occur as a result of the Project.

### 5.5.3 Resource Use

#### 5.5.3.1 Construction Effects

During construction, effects to forestry resources are not anticipated as there are no existing commercial timber or forestry activities occurring within the LAA.

Potential effects as a result of construction activities will likely be limited to hunting and trapping. Potential Hunting and trapping activities are known to occur within the LAA and RAA and are anticipated to continue to occur during Project construction. The LAA intersects with three RTLs (Split Lake, Limestone, and Shamattawa). Potential effects to trappers within the LAA may include disturbance to wildlife in the area as a result of construction noise and/or vibrations. Construction-related disturbances will largely be associated with clearing and grubbing activities which may cause increased noise levels and disturb wildlife within the LAA. Depending on the species, some mammals such as Caribou are sensitive to human activity and tend to avoid such areas. However, other mammals such as fox or wolves, are relatively adaptable to such areas and may use these ROWs as a type of access corridor to other areas. Construction is planned to span a short period of time from January to March 2024, with existing noise and vibration conditions anticipated to return to normal post-construction. As such, any potential effects to hunting and trapping activities are anticipated to be short-term, localized to the LAA, low in magnitude with negligible significant impacts.

#### 5.5.3.2 Operation Effects

Operation of the winter road will result in a relatively permanent loss of trees and shrubs within the ROW. As a result, this area may decrease in suitability for hunting and trapping activities. With the implementation of appropriate mitigation measures, effects to hunting and trapping within impacted areas during operation is expected to be long-term and localized to the Project footprint.

The maintained winter road ROW may be used by local hunter and trappers throughout the year to access exterior forested areas for hunting and trapping, both during and outside of the winter road operational period. As such, a change to the existing access points to adjacent forested areas may occur as a result of the Project. However, this will be countered with reduced accessibility to the existing route once it is decommissioned, barricaded, and left to naturally revegetate. This change in accessible routes potentially used by hunters and trappers is not anticipated to pose a significant change in the ability of hunters and trappers to access and conduct hunting and trapping activities. As such, any potential effects are anticipated to be localized to the LAA, low in magnitude, with negligible adverse effects.

### 5.5.3.3 Mitigation Measures

Potential effects to resource use, particularly disturbance to hunting and trapping activities, related to construction activities will be mitigated using the provisions outlined in the *Noise Limitations* sections of the GERs including:

- All plant and equipment supplied for use on the Project shall be effectively “sound-reduced” by means of proper silencers, mufflers, acoustic linings, acoustic shields or acoustic sheds.

Additionally, potential disturbances to wildlife and associated hunting and/or trapping activities within the RAA can be mitigated with the implementation of Project-specific measures, including:

- Distribution of Project notification and estimated construction time period to regional communities to allow for changes to hunting and/or trapping routes within the RAA.

Further information regarding the aforementioned mitigations can be reviewed in the MTI GER’s found in Appendix F.

### 5.5.3.4 Residual Effects

Annual operation of the Project will require ongoing maintenance of a ROW which intersects three RTL areas. As such, potential effects from operation may include an alteration to existing and accessible hunting and trapping areas within the Project footprint and LAA. However, this change will be balanced by the decommissioning of the existing winter road which will no longer be maintained or used moving forward. As such, the area of the existing winter road route will be available for use for hunting and/or trapping activities. Additionally, the annual maintenance of the proposed realigned route may result in a change in access points to adjacent forested areas that may be used to for hunting and/or trapping activities. As such, the residual Project effects to hunting and trapping activities are anticipated to be localized to the LAA, long-term, with low significant effects.

## 5.5.4 Parks, Protected Areas, and Areas of Special Interest

### 5.5.4.1 Construction Effects

There are no parks or protected areas located within Project LAA. No potential construction related effects on Parks, Protected Areas, and Areas of special Interest are expected to occur as a result of the Project.

5.5.4.2 Operation Effects

There are no parks or protected areas located within the LAA. No potential operation related effects on Parks, Protected Areas, and Areas of special Interest are expected to occur as a result of the Project.

5.5.4.3 Mitigation Measures

The Parks and Protected Spaces Branch was contacted as part of Project pre-screening and engagement. Parks and Protected Spaces Branch indicated there were no concerns related to provincial parks, park reserves, ecological reserves, areas of special interest, or proposed protected spaces. As no effects on Parks, Protected Areas, and Areas of Special Interest are expected to occur no mitigation measures are being proposed.

5.5.4.4 Residual Effects

No residual or significant adverse effects on Parks, Protected Areas, and Areas of Special Interest are likely to occur as a result of the Project.

5.5.5 Culture and Heritage Resources

5.5.5.1 Construction Effects

No known heritage resources or potential for heritage resources were identified in the LAA. No potential effects are expected to occur on cultural or heritage resources during construction of the Project.

5.5.5.2 Operation Effects

No known heritage resources or potential for heritage resources were identified in the LAA. No potential effects are expected to occur on cultural or heritage resources during operation of the Project.

5.5.5.3 Mitigation Measures

No known heritage resources or potential for heritage resources were identified in the immediate vicinity of the Project. Historic Resources Branch was contacted as part of Project pre-screening and engagement. The Historic Resources Branch indicated there were no concerns with the Project.

Should any heritage resources be discovered as the Project proceeds, the potential effects will be mitigated using the provisions outlined in the *Heritage Resources* section of the GERS including:

- Work shall immediately cease and be suspended at the location where archaeological or historic artifacts are encountered during construction activities.
- The discovery shall be reported to the Engineer and work at this location shall not resume unless otherwise authorized by the Engineer.
- Work at the location shall be suspended until a Historic Resource Consultant can assess archaeological or historic artifacts that are encountered, and mitigation measures are confirmed with the Manitoba Historic Resources Branch.

Further information regarding the aforementioned mitigations can be reviewed in the MTI *GER's* found in Appendix F.

#### 5.5.5.4 Residual Effects

No residual or significant adverse effects on heritage resources are likely to occur as a result of the Project.

#### 5.5.6 Human Health and Safety

##### 5.5.6.1 Construction Effects

The proposed winter road will be constructed “offline” and existing traffic flows will continue to use the existing route until the realignment has been completed. However, there may be a minor increase to construction vehicles and equipment navigating the approximate 20 km stretch of existing winter road from PR 280 to the start point of the proposed realignment. The flow of construction-related traffic will largely be associated with the mobilization, clearing and grubbing, and materials disposal. Construction vehicles and equipment will be held to existing road safety requirements, such as speed limits. Similarly, the contractor will implement construction worker safety measures as necessary, such as use of flag persons and restricting access to construction areas. With the appropriate mitigation measures for traffic management and road safety, effects are anticipated to be localized to the RAA, short-term, with negligible effects and to return to normal traffic conditions post-construction.

During construction there is an increased risk of elevated disturbances from noise, vibration and emissions associated with the use of construction equipment. Increased emissions, noise, and vibration levels can be a nuisance to those situated within the LAA which occur in close proximity to the work sites. However, the Project is geographically distant from any major community settlements with the nearest being PR 280 and the community of Long Spruce, MB both located over 20 km away. Any potential effects related to increases in emissions, noise and vibration are expected to be short-term and return to pre-construction conditions once construction work is complete.

Cleared timber will be harvested and made available for local use by Fox Lake Cree Nation. Cleared brush may be either repurposed where possible (e.g., formation of natural barriers as discussed in section 5.4.2.3), or burned or removed off-site for disposal. On-site burning of brush will be conducted in a manner that reduces the risks of uncontrolled fires by only being conducted under winter conditions and under appropriate permits in accordance with the Manitoba *Wildfires Act* and with consideration to requirements outlined by the RM of Gillam. With the implementation of mitigation measures, effects related to brush disposal are anticipated to be localized to the LAA, short-term, with negligible effects.

Potential effects to water quality from accidents or malfunctions can occur from accidental spills or releases of deleterious substances such as oil, fuel (diesel and gasoline) or hydraulic fluids during construction. A spill or release of fuels and other potentially toxic substances can have an effect on human health and safety as the consumption of deleterious substances can result in adverse effects to human health. However, all existing communities are geographically distant from the Project footprint and there are no communities located downstream within either the LAA or RAA. With the implementation of mitigation measures, the risks of accidental spills or releases of deleterious substances to human health are temporary, short-term and reversible and are thus considered low in magnitude and negligible.

#### **5.5.6.2**      *Operation Effects*

Potential effects of the Project on human health and safety during operation include transportation-related risks, such as vehicle collisions. The risk of vehicle collisions is a common issue for all roads managed as part of the provincial transportation network. The level of risk varies based on traffic volumes and type of vehicles using the road. Vehicles driven generally include personal vehicles such as sedans or 4x4 trucks, as well as larger transport truck for the delivery of goods. The proposed route of the realignment creates a more direct route of travel and removes the number of hills and turns required to complete the full route. As such, overall driver safety is expected to improve as a result of the Project.

Another common risk to human health and safety related to winter roads is crossing water ways which can cave in or fail below heavy vehicles. The proposed realignment will reduce the number of water crossings from eleven to six thus reducing the number of dangerous ice crossings required to complete the full route. Therefore, overall driver safety is expected to improve as a result of the Project.

Given the overarching goal of the Project is to increase driver safety and navigability by realigning the winter road through a terrain with fewer hills, water crossings, and turns, no additional potential effects to driver safety during winter road operation is expected.

#### **5.5.6.3**      *Mitigation Measures*

Potential effects to human health and safety related to traffic during construction and operation can be mitigated with the implementation of site-specific mitigation measures, including:

- Application of speed limits (40 km/h) to adjust driving to surrounding conditions and reduce the likelihood of collision.
- Implementation of traffic barriers (e.g., fences, gates) to the proposed winter road to restrict access to construction areas and decommissioned routes.

Potential effects to human health and safety related to noise and machinery use during construction will be mitigated using the provisions outlined in the *Noise Limitations* sections of the GERs including:

- All equipment supplied for use on the Project shall be effectively “sound-reduced” by means of proper silencers, mufflers, acoustic linings, acoustic shields or acoustic sheds.

Potential effects to human health and safety related to timber and brush disposal during construction be mitigated with the implementation of site-specific mitigation measures, including:

- Minimizing burning of timber and brush as a method of disposal.
- Timber will be harvested and made available for local use by Fox Lake Cree Nation.
- Brush will be repurposed where possible, or burned or removed off-site for disposal.
- Burning of materials are to be conducted in accordance with the Manitoba *Wildfires Act* and with consideration to requirements outlined by the RM of Gillam

Potential effects to human health and safety related to the release of deleterious substances during construction will be mitigated using the provisions outlined in the *Machinery, Fuel Storage and Handling*, and *Emergency Response Plan for Spills* sections of the GERs including:

- Machinery shall arrive on site in a clean condition and shall be maintained free of fluid leaks.
- All fuel storage containers and tank vehicles shall be inspected daily for leaks and spillage. Damaged or leaking fuel storage containers shall be promptly removed from site.
- A spill kit or sufficient supply of materials for clean-up or spill containment shall always be available on site.
- In the event that there is a spill, the entire affected area shall be cleaned up and all contaminated soil shall be appropriately disposed of offsite at an appropriate licensed facility.
- Any reportable spills shall be reported pursuant to Manitoba Regulation 439/87.
- All spills shall be reported to the Engineer within 24 hours.

Further information regarding the aforementioned mitigations can be reviewed in the MTI *GER's* found in Appendix F.

#### 5.5.6.4 Residual Effects

No residual or significant adverse effects on human health and safety are likely to occur as a result of the Project.

5.6 Summary Effects Analysis Table

Table 5-4. Effects Assessment Summary Table for the Shamattawa Winter Road Realignment Project.

Environment	Component	Construction	Operation	Mitigation Measures	Residual Effects	Significance
Physical	Climate	No measurable impact	No measurable impact	Not required	No residual effects	Negligible
	Greenhouse Gases	Temporary minor increase in emissions released as part of site mobilization.	No change beyond current conditions.  Potential to be reduced given a reduced route length.	Adherence to MTI's GER's for: <ul style="list-style-type: none"> <li>Machinery, Fuel Storage and Handling</li> </ul> Application of site specific mitigations, including: <ul style="list-style-type: none"> <li>Reducing idling;</li> <li>Maintaining machinery in good working condition; and,</li> <li>Minimize on-site burning of brush.</li> </ul>	Minor temporary release of GHG emissions into the atmosphere during construction phase.	Negligible
	Air Quality	Temporary minor increase in airborne particulates within the LAA from machinery-related emissions and potential on-site burning.	No change beyond current conditions.  Potential to be reduced given a reduced route length.	Adherence to MTI's GER's for: <ul style="list-style-type: none"> <li>Dust and Particulate Control</li> </ul> Application of site specific mitigations, including: <ul style="list-style-type: none"> <li>Reducing idling;</li> <li>Maintaining machinery in good working condition; and,</li> <li>Minimize on-site burning of brush.</li> </ul>	No residual effects	Negligible
	Noise & Vibration	Intermittent and minor increase in noise and vibration levels within the LAA from clearing.	No change beyond current conditions.	Adherence to MTI's GER's for: <ul style="list-style-type: none"> <li>Noise and Noise Limitations.</li> </ul>	No residual effects	Negligible
	Terrain & Topography	Removal of trees and shrubs within Project footprint.	ROW maintenance of emerging vegetation within Project footprint.	Adherence to MTI's GER's for: <ul style="list-style-type: none"> <li>Clearing, Grubbing, and Brushing.</li> </ul>	Loss of trees and shrubs within the Project footprint.	Low
	Bedrock Geology	No anticipated effects to bedrock geology.	No anticipated effects to bedrock geology.	Not required	No residual effects	Negligible

<b>Physical</b>	<b>Soils</b>	<p>Minor disturbance as a result of vegetation removal within the Project footprint.</p> <p>Potential contamination from spills or releases of deleterious substances within the LAA.</p>	<p>ROW maintenance of emerging vegetation within Project footprint.</p> <p>Potential contamination from leaks, collisions, or accidental releases in the LAA by vehicles.</p>	<p>Adherence to MTI's GER's for:</p> <ul style="list-style-type: none"> <li>• <i>Erosion and Sediment Control;</i></li> <li>• <i>Clearing, Grubbing, and Brushing;</i></li> <li>• <i>Machinery, Fuel Storage and Handling;</i> and,</li> <li>• <i>Emergency Response Plan for Spills.</i></li> </ul>	No residual effects	<b>Negligible</b>
	<b>Groundwater</b>	<p>Potential contamination from spills or releases of deleterious substances within the LAA.</p>	<p>Potential contamination from leaks, collisions, or accidental releases in the LAA by vehicles.</p>	<p>Adherence to MTI's GER's for:</p> <ul style="list-style-type: none"> <li>• <i>Machinery, Fuel Storage and Handling;</i> and,</li> <li>• <i>Emergency Response Plan for Spills.</i></li> </ul>	No residual effects	<b>Negligible</b>
	<b>Surface Water</b>	<p>Potential disturbance to banks and erosion within the Project footprint from clearing and preparation of stream crossings.</p> <p>Potential contamination from spills or releases of deleterious substances within the LAA.</p>	<p>Disturbance to banks and erosion within the Project footprint from ROW maintenance and preparation of stream crossings.</p> <p>Potential contamination from leaks, collisions, or accidental releases within the LAA by vehicles.</p>	<p>Adherence to MTI's GER's for:</p> <ul style="list-style-type: none"> <li>• <i>Erosion and Sediment Control;</i></li> <li>• <i>Machinery, Fuel Storage and Handling;</i> and,</li> <li>• <i>Emergency Response Plan for Spills.</i></li> </ul> <p>Adherence to <i>the DFO-MB Operational Statement for Ice Bridges and Snow Fills</i> including:</p> <ul style="list-style-type: none"> <li>• Ice bridges and snow fills are constructed of clean water, ice and snow.</li> <li>• Ice and snow fills will not restrict water flow.</li> <li>• Minimize disturbance to the stream banks.</li> </ul> <p>Adherence to Section 2.8 of the <i>Manitoba Stream Crossing Guidelines – Temporary Crossings.</i></p>	Potential release of deleterious substances.	<b>Negligible</b>

<b>Biological</b>	<b>Vegetation</b>	<p>Removal of trees and shrubs within Project footprint.</p> <p>Potential introduction of invasive / non-native vegetation in the LAA.</p> <p>Potential contamination from spills or releases of deleterious substances within the LAA.</p>	<p>ROW maintenance of emerging vegetation within Project footprint.</p> <p>Potential contamination from leaks, collisions, or accidental releases within the LAA by vehicles.</p>	<p>Adherence to MTI's GER's for:</p> <ul style="list-style-type: none"> <li>• <i>Clearing, Grubbing, and Brushing;</i></li> <li>• <i>Machinery, Fuel Storage and Handling;</i> and,</li> <li>• <i>Emergency Response Plan for Spills.</i></li> </ul>	<p>Loss of trees and shrubs within the Project footprint.</p>	<b>Low</b>
	<b>Wildlife</b>	<p>Temporary disturbance to wildlife within the LAA from noise and vibrations associated with mobilization and construction works.</p> <p>Alteration to habitat and food sources from vegetation loss within Project footprint.</p> <p>Potential barriers to movement/migration from cleared material in the Project footprint.</p> <p>Potential exposure to deleterious substances from spills or releases within the LAA.</p>	<p>Minor habitat fragmentation and creation of forest-edge habitat as a result of ROW maintenance within the Project footprint.</p> <p>Seasonal disturbance to wildlife from noise and vibrations associated with vehicular use.</p> <p>Potential mortality from wildlife-vehicular collisions.</p>	<p>Adherence to MTI's GER's for:</p> <ul style="list-style-type: none"> <li>• <i>Clearing, Grubbing, and Brushing;</i></li> <li>• <i>Noise and Noise Limitations;</i></li> <li>• <i>Wildlife;</i></li> <li>• <i>Machinery, Fuel Storage and Handling;</i> and,</li> <li>• <i>Emergency Response Plan for Spills.</i></li> </ul> <p>Application of site specific mitigations, including:</p> <ul style="list-style-type: none"> <li>• Barricade access to the decommissioned road;</li> <li>• Application of speed limits.</li> </ul>	<p>No residual effects</p>	<b>Negligible</b>

<b>Biological</b>	<b>Fish &amp; Fish Habitat</b>	<p>Potential destabilization from disturbance to banks and erosion within the Project footprint from clearing and preparation of stream crossings.</p> <p>Potential contamination from spills or releases of deleterious substances within the LAA.</p>	<p>Disturbance to banks and erosion within the Project footprint from ROW maintenance and preparation of stream crossings.</p> <p>Potential contamination from leaks, collisions, or accidental releases within the LAA by vehicles.</p> <p>Potential stranding of fish in the Project footprint during water uptake for ice road surfacing.</p>	<p>Adherence to MTI's GER's for:</p> <ul style="list-style-type: none"> <li>• <i>In-Water Work; Erosion and Sediment Control;</i></li> <li>• <i>Machinery, Fuel Storage and Handling;</i> and,</li> <li>• <i>Emergency Response Plan for Spills</i></li> </ul> <p>Adherence to <i>the DFO-MB Operational Statement for Ice Bridges and Snow Fills</i> including:</p> <ul style="list-style-type: none"> <li>• Ice bridges and snow fills are constructed of clean water, ice and snow.</li> <li>• Ice and snow fills will not restrict water flow.</li> <li>• Withdrawal will not exceed 10% of instantaneous flow.</li> <li>• Minimize disturbance to the stream banks.</li> </ul> <p>Adherence to Section 2.8 of the <i>Manitoba Stream Crossing Guidelines – Temporary Crossings.</i></p>	<p>Potential release of deleterious substances.</p>	<b>Negligible</b>
	<b>Sensitive Species</b>	<p>Potential effects to sensitive fish species include:</p> <ul style="list-style-type: none"> <li>• Disturbance to banks;</li> <li>• Destabilization of banks;</li> <li>• Sedimentation;</li> <li>• Release of deleterious substances.</li> </ul> <p>Potential effects to spring spawning Lake Sturgeon on rocky bottom waterways within the LAA as a result of sedimentation and erosion.</p>	<p>Potential effects to sensitive fish species include all effects mentioned in the Fish &amp; Fish Habitat component including:</p> <ul style="list-style-type: none"> <li>• Disturbance to banks;</li> <li>• Destabilization of banks;</li> <li>• Sedimentation;</li> <li>• Entrainment and Impingement; and,</li> <li>• Release of deleterious substances.</li> </ul>	<p>Adherence to MTI's GER's for:</p> <ul style="list-style-type: none"> <li>• <i>Erosion and Sediment Control;</i></li> <li>• <i>Noise Limitations;</i></li> <li>• <i>In-Water Work;</i></li> <li>• <i>Clearing, Grubbing, and Brushing;</i></li> <li>• <i>Wildlife;</i></li> <li>• <i>Machinery, Fuel Storage and Handling;</i> and,</li> <li>• <i>Emergency Response Plan for Spills.</i></li> </ul> <p>Adherence to <i>the DFO-MB Operational Statement for Ice Bridges and Snow Fills</i> including:</p>	<p>Potential release of deleterious substances.</p> <p>Alteration to existing nesting and foraging habitat.</p> <p>Habitat fragmentation and additional forest-edge habitat.</p>	<b>Low</b>

		<p>Potential effects to sensitive bird and mammal species include:</p> <ul style="list-style-type: none"> <li>• Disruption from noise and vibrations;</li> <li>• Loss of nesting/foraging habitat; and,</li> <li>• Release of deleterious substances.</li> </ul>	<p>Potential effects to sensitive bird and mammal species include all effects mentioned in the Wildlife component, including:</p> <ul style="list-style-type: none"> <li>• Disruption from noise and vibrations;</li> <li>• Habitat fragmentation;</li> <li>• Increased forest-edge habitat; and,</li> <li>• Release of deleterious substances.</li> </ul>	<p>Adherence to Section 2.8 of the <i>Manitoba Stream Crossing Guidelines – Temporary Crossings</i>.</p> <p>Application of site specific mitigations, including:</p> <ul style="list-style-type: none"> <li>• Construction activities restricted during caribou calving periods;</li> <li>• Cease construction works if Caribou are observed on site;</li> <li>• Barricade access to the decommissioned road;</li> <li>• Caribou crossing signage at access points; and,</li> <li>• Application of speed limits.</li> </ul>		
Socio-economical	<b>Regional Communities &amp; Population</b>	<p>Cleared timber will be made available for local use by Fox Lake Cree Nation.</p> <p>Potential risks of on-site burning of brush.</p> <p>Intermittent and minor increase in noise and vibration levels within the LAA from machinery clearing activities.</p>	<p>Improved accessibility between the community of Shamattawa First Nation and other regional communities (e.g., Fox Lake, Gillam, Long Spruce, etc.).</p>	<p>Adherence to MTI's GER's for:</p> <ul style="list-style-type: none"> <li>• <i>Noise Limitations</i>; and,</li> <li>• <i>Machinery, Fuel Storage and Handling</i>; <p>Application of site specific mitigations, including:</p> <ul style="list-style-type: none"> <li>• Minimize on-site burning of brush.</li> </ul> </li></ul>	No residual effects	<b>Negligible</b>
	<b>Indigenous Population</b>	<p>Cleared timber will be made available for local use by Fox Lake Cree Nation.</p> <p>Potential risks of on-site burning of brush within the LAA.</p> <p>Intermittent minor increase in noise and vibration levels within the LAA.</p>	<p>Improved accessibility between the community of Shamattawa First Nation and other regional communities (e.g., Fox Lake, Gillam, Long Spruce, etc.).</p>	<p>Adherence to MTI's GER's for:</p> <ul style="list-style-type: none"> <li>• <i>Noise Limitations</i>; and,</li> <li>• <i>Machinery, Fuel Storage and Handling</i>; <p>Application of site specific mitigations, including:</p> <p>Minimize on-site burning of brush.</p> </li></ul>	No residual effects	<b>Negligible</b>

<b>Socio-economical</b>	<b>Resource Use</b>	Temporary disturbance to hunting and/or trapping activities within the LAA from construction noise and/or vibrations.	Alteration to hunting and/or trapping habitat due to clearing of new ROW within the Project footprint.  Change to access points to adjacent hunter/trapping areas with maintenance of new route and decommissioning of the existing route.	Adherence to MTI's GER's for: <ul style="list-style-type: none"> <li>• <i>Noise Limitations.</i></li> </ul> Application of site specific mitigations, including: <ul style="list-style-type: none"> <li>• Distribution of Project notification to regional communities.</li> </ul>	Alteration to existing and accessible hunting and trapping areas within the Project Footprint and LAA.	<b>Low</b>
	<b>Parks, Protected Areas, &amp; ASI</b>	No anticipated effects to parks, protected areas, or areas of special interest.	No anticipated effects to parks, protected areas, or areas of special interest.	Not required	No residual effects	<b>Negligible</b>
	<b>Culture &amp; Heritage Resources</b>	No anticipated effects to known or potential heritage resources.	No anticipated effects to known or potential heritage resources.	Adherence to MTI's GER's for: <ul style="list-style-type: none"> <li>• <i>Heritage Resources.</i></li> </ul>	No residual effects	<b>Negligible</b>
	<b>Human Health and Safety</b>	Temporary minor increase in traffic levels as part of mobilization.  Intermittent minor increase in noise and vibration levels in the LAA.  Temporary minor effects to air quality from construction-related emissions in the LAA.  Potential risks of on-site burning of brush within the LAA.  Potential contamination from spills or releases of deleterious substances within the LAA.	Improved accessibility between the community of Shamattawa First Nation and other regional communities (e.g., Fox Lake, Gillam, Long Spruce, etc.).  Improved driver safety with the reduction of water crossings.  Improved driver safety with the realignment of a shortened route and avoidance of difficult terrain (e.g., hills).	Adherence to MTI's GER's for: <ul style="list-style-type: none"> <li>• <i>Noise Limitations;</i></li> <li>• <i>Machinery, Fuel Storage and Handling; and,</i></li> <li>• <i>Emergency Response Plan for Spills.</i></li> </ul> Application of site specific mitigations, including: <ul style="list-style-type: none"> <li>• Speed limits; and,</li> <li>• Traffic barriers to restrict access to construction areas and/or decommissioned routes;</li> <li>• Minimize on-site burning of brush.</li> </ul>	No residual effects	<b>Negligible</b>

## **6.0 FOLLOW-UP MONITORING**

Where the described mitigation measures, standards of procedures, and best management practices are applied throughout the construction activities outlined as part of the proposed Shamattawa Winter Road Realignment Project, MTI is not proposing any follow-up monitoring as a component of the Project.

## **7.0 CONCLUSION**

The potential physical, biological and socio-economical effects of the proposed Project have been evaluated, with consideration given to the application of mitigation measures, residual effects and the significance of potential adverse environmental effects. The proposed mitigation measures outlined in this Environment Act Proposal are expected to effectively prevent, avoid or minimize potential effects. Nonetheless, some residual effects were identified as part of the analysis including:

- The minor/localized permanent loss of vegetation within the Project ROW; and
- The minor/limited fragmentation of general wildlife habitat within the Project ROW.

With consideration of the benefits that the proposed Winter Road Realignment will bring in terms of improved access and safety for the traveling public to regional northern communities, these residual effects are considered to be minor and limited within the broader environmental context in which the Project will occur. Based on the environmental review of the Project in conjunction with the application of mitigation measures, MTI has determined that no significant adverse environmental effects are expected.

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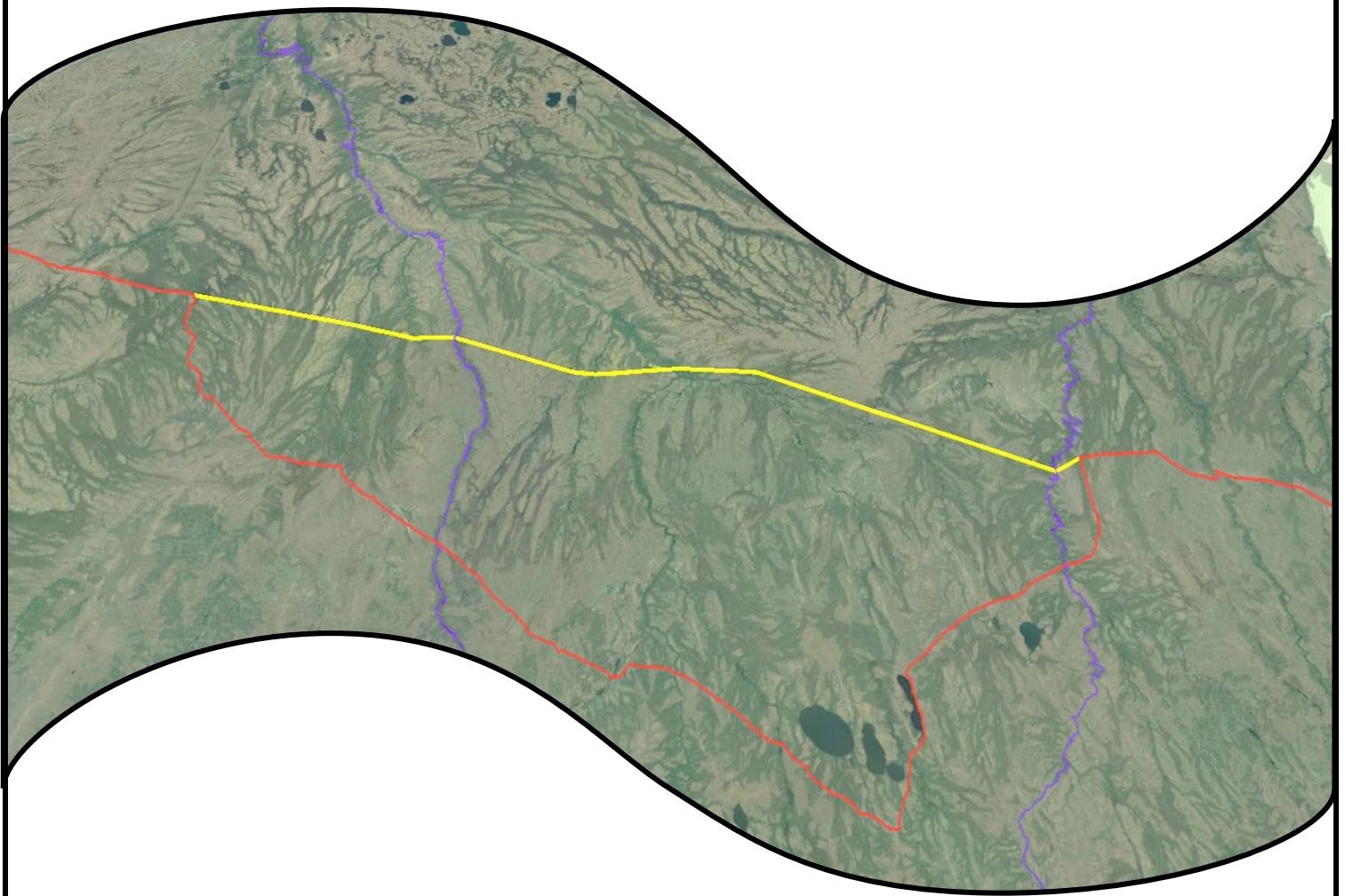
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# Shamattawa Winter Road Realignment Project Environmental Assessment Proposal

## Appendix A: Public Engagement & Pre-Screening Documents



Manitoba Transportation and Infrastructure  
Highway Planning and Design

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## SUMMARY OF THE ENVIRONMENTAL PRE-SCREENING INTERDEPARTMENTAL REVIEW RESULTS

### Shamattawa Winter Rd Realignment

Manitoba Infrastructure and Transportation (MIT) has undertaken an Interdepartmental Review of this project. The following is the summary of review and comments received:

#### **A. Manitoba Conservation (CON)**

**Aboriginal Relations Branch** sent the following comments on February 4, 2015:

This proposed project may affect an Aboriginal right; and as such, the Aboriginal Relations Branch recommends an initial assessment of the proposal be completed to determine if it will require consultation.

For more information on the consultation process please refer to:

[http://www.gov.mb.ca/ana/crown\\_consultations](http://www.gov.mb.ca/ana/crown_consultations).

<http://gww.internal/mcacr/>

**Lands Branch, North Eastern Region** sent the following comments on February 9, 2015:

- The NE IRMT has reviewed the information and have no concerns with the realignment.
- The section that is being decommissioned may have items on the landscape and must be removed during the decommission.
- MIT should coordinate/notify with the Gillam district NROs during that process as to what, if any, items that are or were removed.

**B. Water Stewardship Division (WSD)** replied on January 8, 2015 that they do not have any concern.

**C. Manitoba Culture, Heritage and Tourism (CHT)** sent the following on February 5, 2015:

The potential to impact significant heritage resources is low, and, therefore, the Historic Resources Branch has no concerns with the project.

If at any time however, significant heritage resources are recorded in association with these lands during development, the Historic Resources Branch may require that an acceptable heritage resource management strategy be implemented by the developer to mitigate the effects of development on the heritage resources.

Please contact Myra Sitchon at (204) 945-6539 if you have any questions.

**D. Manitoba Minerals Resources (MMR)** replied on January 1, 2015 that they do not have any concern.

**E. Manitoba Agriculture and Food (MAFRI)** replied on January 27, 2015 that they do not have any concern.

**F. Manitoba Municipal Government (MMG)** did not send any response.

**G. MTS** sent the following on February 3, 2015:

MTS does have concerns in regards to this proposal. In order to proceed ensure the following conditions are met and adhered to:

- A “cable locate” is obtained prior to any excavating. A minimum of 72 hours notice is provided to MTS prior to any work being undertaken in the vicinity of MTS cables. This notice is required so that MTS can arrange for their personnel to locate the necessary cables and stake it to ensure that no service disruptions occur to any MTS customers. To arrange for the cable locates please call our “Cable Locate” service at 611.
- If an actual verification that MTS has buried cable in the vicinity is required please provide a drawing indicating the exact location of the excavation prior to excavating.

If you require any additional information please call Scott Ferguson at 204-729-4259.

## **SUMMARY OF THE ENVIRONMENTAL PRE-SCREENING INTERDEPARTMENTAL REVIEW RESULTS**

### **Shamattawa Winter Rd Realignment**

Manitoba Infrastructure (MI) has undertaken an Interdepartmental Review of this project. The following is the summary of review and comments received:

#### **A. Manitoba Sustainable Development (SD)**

##### ***Environmental Approvals***

- Replied on June 12, 2019 indicating that an Environment Act Licence would be required for the Shamattawa Winter road Realignment Project.

##### ***Water***

- Replied on June 12, 2019 that there were no concerns from the Water Power Act Licensing Section; and
- Replied on June 13, 2019 that the Drainage and Water Rights Licensing Branch, there are no concerns.

##### ***Wildlife and Fisheries Branch***

- Wildlife and Fisheries Branch replied on July 9<sup>th</sup> and 10<sup>th</sup>, 2019 indicating that it is important to eliminate old access when new access is being created. This is a high-use area by Pen Island eastern migratory caribou and harvest in the area can be significant when these caribou migrate through. Eastern migratory caribou were recently assessed by COSEWIC as endangered. Environment and Climate Change Canada is currently conducting consultations on the potential to list eastern migratory caribou under the federal Species At Risk Act. The assessment for this project should include some form of restriction of access to the old section of road, at both ends. The potential berm should be substantial enough to restrict access by road vehicles and potentially snowmobiles. This could be completed by using brush created from construction of the new road and combining it with some earth/soil.

##### ***Parks and Protected Spaces***

- Parks and Protected Spaces Branch replied on July 9, 2019 indicating they have no comments or concerns as the Project does not affect any provincial parks, park reserves, ecological reserves, areas of special interest, or proposed protected areas.

##### ***Lands***

- Lands Branch replied on July 10, 2019 indicating that they have no concerns. There are no encumbrances along the new route. It is noted there may be some cleanup of items left along the old route.

### **Forestry**

- Regional Forestry Branch replied on July 10, 2019 indicating that there are no concerns beyond a timber damage appraisal will be required for the re-aligned road if there is any merchantable timber.

**Fisheries** did not provide a response

**Enforcement** did not provide a response.

**Fires** did not provide a response.

### **B. Manitoba Culture, Heritage and Tourism (CHT)**

- The Heritage Resources Branch (HRB) responded on July 9, 2019 indicating it has heritage concerns with the winter road realignment and is requesting a heritage resource impact assessment or monitoring dependent upon the potential to disturb unmodified terrain. HRB is requested MI .shp/.kmz files of the old winter road and the proposed new alignment so that it can assist with clearly identifying areas that may have heritage resource potential and may require further assessment prior to development. Kmz file was provided on August 13, 2019.
- Updated response from Perry Blomquist, Archeological Services Officer (HRB), on December 19, 2019:

Based on that updated info sent to us on the reroute, my colleague and I re-reviewed the file in detail and determined that as it is, the reroute has low potential for impacting heritage resources. Therefore, the Historic Resources Branch has no concerns with the reroute project at this time and the project has our go-ahead. If at anytime however, heritage resources are encountered during any phase of development, the project work must halt until an assessment by HRB can be conducted.

**C. Manitoba Agriculture** did not provide a response.

**D. Municipal Relations** did not provide a response.

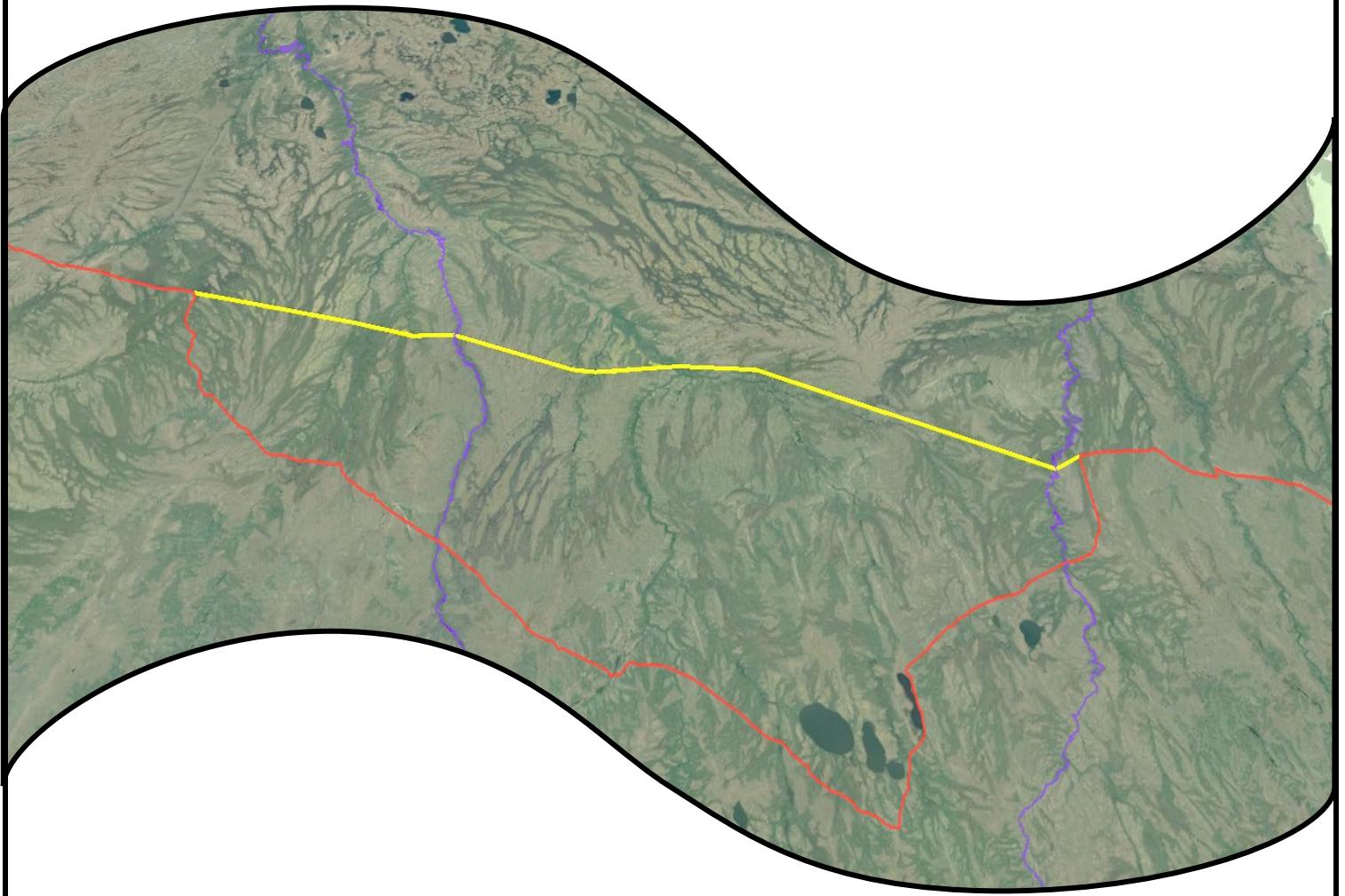
**E. Bell-MTS** did not provide a response. However previous circulation results (2015) indicated the following:

- MTS does have concerns in regards to this proposal. In order to proceed ensure the following conditions are met and adhered to:
  - A “cable locate” is obtained prior to any excavating. A minimum of 72 hours notice is provided to MTS prior to any work being undertaken in the vicinity of MTS cables. This notice is required so that MTS can arrange for their personnel to locate the necessary cables and stake it to ensure that no service disruptions occur to any MTS customers. To arrange for the cable locates please call our “Cable Locate” service at 611.
  - If an actual verification that MTS has buried cable in the vicinity is required please provide a drawing indicating the exact location of the excavation prior to excavating.

If you require any additional information please call Scott Ferguson at 204-729-4259.

# Shamattawa Winter Road Realignment Project Environmental Assessment Proposal

## Appendix B: Thompson, Manitoba, Air Quality Monitoring Report (January 2020)



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**Appendix B.** Monthly mean air quality measurements recorded throughout January on a 12-hour interval from the Thompson, MB monitoring station, along with the associated summary statistics.

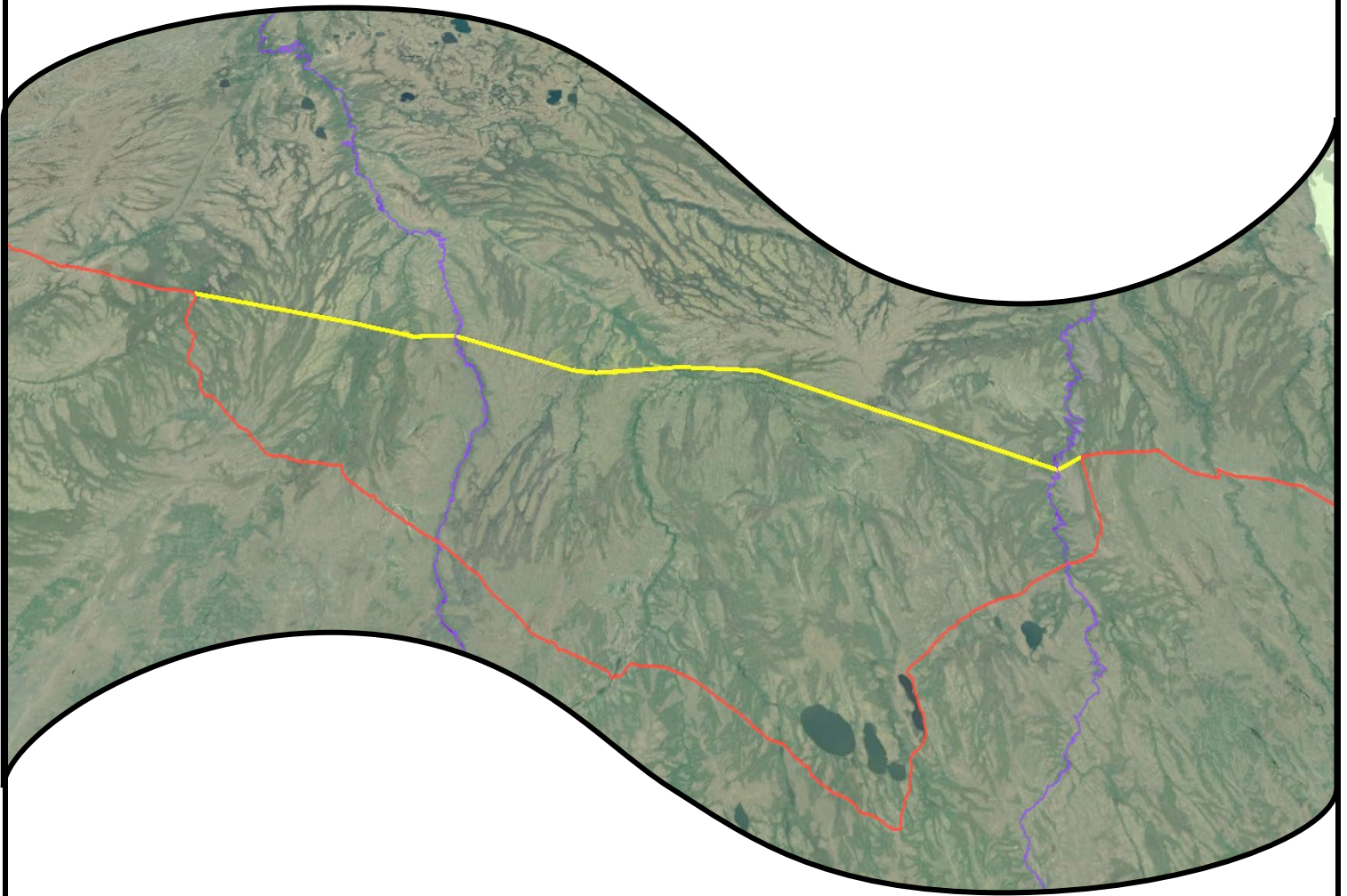
DATE	TIME	SO2	O3	PM 2.5s	PM10s
		ppm	ppb	ug/m3	ug/m3
1/1/2020	12:00 AM	0.022	14.5	2.6	2.4
1/1/2020	12:00 PM	0.001	19	2.2	2
1/2/2020	12:00 AM	0.022	18.8	2.5	1.8
1/2/2020	12:00 PM	0.001	17.2	1.8	1.9
1/3/2020	12:00 AM	0.022	6.7	2.6	4.1
1/3/2020	12:00 PM	0.001	12.5	2.9	2.9
1/4/2020	12:00 AM	0.022	18.9	2.4	3.4
1/4/2020	12:00 PM	0.001	23.4	1	1.4
1/5/2020	12:00 AM	0.022	24	2	2
1/5/2020	12:00 PM	0.001	18.7	1.8	3.4
1/6/2020	12:00 AM	0.022	11.7	1.9	3.4
1/6/2020	12:00 PM	0.001	13	2.1	2.7
1/7/2020	12:00 AM	0.022	21.3	2.6	3.3
1/7/2020	12:00 PM	0.001	19.1	2.4	3.4
1/8/2020	12:00 AM	0.021	14.1	3.4	3.8
1/8/2020	12:00 PM	0.001	10.4	2	3.7
1/9/2020	12:00 AM	0.021	18.2	1.6	1.8
1/9/2020	12:00 PM	0.001	23.7	2.2	6.4
1/10/2020	12:00 AM	0.022	21.9	2	6.2
1/10/2020	12:00 PM	0.001	17.6	5.2	8.6
1/11/2020	12:00 AM	0.021	6.1	11.5	14.4
1/11/2020	12:00 PM	0.001	12	2	3.8
1/12/2020	12:00 AM	0.021	19.8	1.1	2.2
1/12/2020	12:00 PM	0.001	19.1	1.6	1.9
1/13/2020	12:00 AM	0.022	15.4	3.5	3.6
1/13/2020	12:00 PM	0.001	17	3.6	4.5
1/14/2020	12:00 AM	0.022	16.5	2.8	4
1/14/2020	12:00 PM	0.001	19.4	3.6	4.7
1/15/2020	12:00 AM	0.021	18.5	3.1	6.3
1/15/2020	12:00 PM	0.001	19.1	1.8	3.6
1/16/2020	12:00 AM	0.021	19.9	1.5	2.7
1/16/2020	12:00 PM	0.001	16.3	4.2	5.2
1/17/2020	12:00 AM	0.021	13.2	1.7	2.9
1/17/2020	12:00 PM	0.001	19.4	1.3	1.6
1/18/2020	12:00 AM	0.021	23.9	1.6	1.6
1/18/2020	12:00 PM	0.001	7.2	3.9	4.8
1/19/2020	12:00 AM	0.021	10.7	3.5	4.9
1/19/2020	12:00 PM	0.001	23.7	2.8	2.4
1/20/2020	12:00 AM	0.021	20.2	10.5	1.9
1/20/2020	12:00 PM	0.001	20.3	9.7	2.8

DATE	TIME	SO2	O3	PM 2.5s	PM10s
		ppm	ppb	ug/m3	ug/m3
1/21/2020	12:00 AM	0.021	15.4	2.1	3.7
1/21/2020	12:00 PM	0.001	14.6	3.1	4
1/22/2020	12:00 AM	0.023	17.2	2.5	4.7
1/22/2020	12:00 PM	0.001	9.4	2.5	14.9
1/23/2020	12:00 AM	0.021	8.5	2.5	8.3
1/23/2020	12:00 PM	0.001	16.6	2.5	2.3
1/24/2020	12:00 AM	0.022	13.4	2.5	3
1/24/2020	12:00 PM	0.001	17.8	2.5	1.9
1/25/2020	12:00 AM	0.022	11.5	2.5	5
1/25/2020	12:00 PM	0.001	11.8	2.5	7.1
1/26/2020	12:00 AM	0.022	15.3	2.5	6.6
1/26/2020	12:00 PM	0.001	5.8	2.5	13.8
1/27/2020	12:00 AM	0.022	10.1	2.5	6.6
1/27/2020	12:00 PM	0.001	9.2	2.5	4.5
1/28/2020	12:00 AM	0.021	6.2	2.5	3.9
1/28/2020	12:00 PM	0.001	15.7	2.5	1.7
1/29/2020	12:00 AM	0.022	15.3	2.5	1.7
1/29/2020	12:00 PM	0.001	15.1	2.5	1.9
1/30/2020	12:00 AM	0.022	13.7	2.5	1.9
1/30/2020	12:00 PM	0.001	17.1	2.5	2.5
1/31/2020	12:00 AM	0.022	13.8	2.5	5.2
1/31/2020	12:00 PM	0.001	14.5	2.5	5.4

SUMMARY STATISTICS					
	PM 2.5t	SO2	O3	PM 2.5s	PM10s
	ug/m3	ppm	ppb	ug/m3	ug/m3
<b>Minimum</b>		0.001	5.8	1	1.4
<b>Min. Date</b>	01-Jan	01-Jan	26-Jan	04-Jan	04-Jan
<b>Min. Time</b>	12:00	12:00	12:00	12:00	12:00
<b>Maximum</b>		0.023	24	11.5	14.9
<b>Max. Date</b>	01-Jan	01-Jan	05-Jan	11-Jan	22-Jan
<b>Max. Time</b>	12:00	12:00	12:00	12:00	12:00
<b>Avg.</b>		0.011	15.6	2.9	4.2
<b>STD</b>		0	4.6	1.8	2.8

# Shamattawa Winter Road Realignment Project Environmental Assessment Proposal

## Appendix C: Aerial Photos of Proposed Water Crossing Locations



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**Crossing 1:** Angling River (56°17'0.92"N, 94° 5'55.91"W)



**Crossing 2:** Unnamed Tributary of the Pennycutaway River (56°13'49.45"N, 93°52'22.63"W)



**Crossing 3:** Unnamed Tributary of the Pennycutaway River (56°12'28.64"N, 93°50'8.32"W)



**Crossing 4:** Unnamed Tributary of the Pennycutaway River (56°12'11.11"N, 93°49'23.32"W)



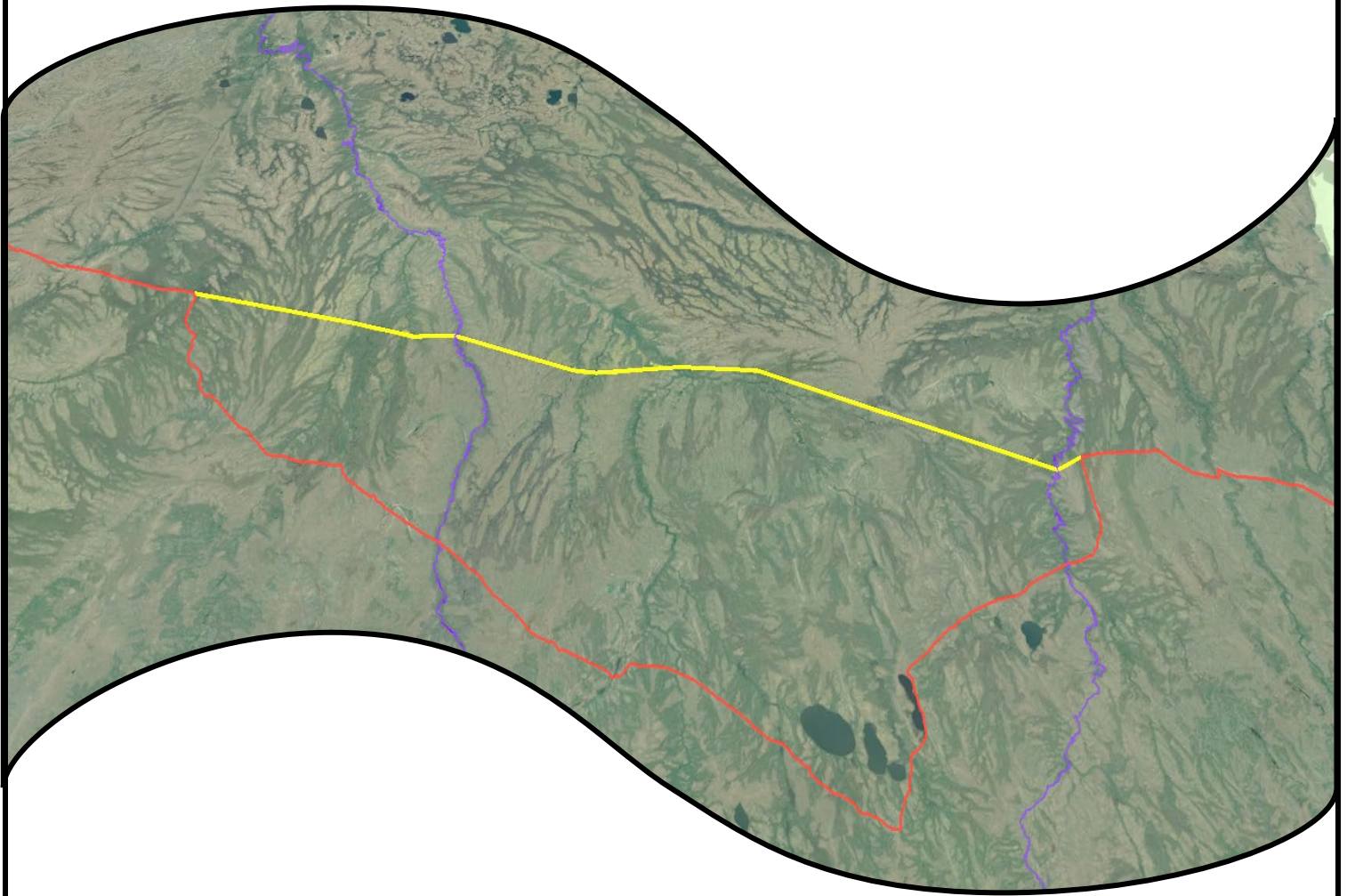
**Crossing 5: Pennycutaway River (56°11'4.99"N, 93°44'30.77"W)**



**Crossing 6:** Whelan Creek, tributary of the Pennycutaway River (56°9'48.41"N, 93°41'0.62"W)

# Shamattawa Winter Road Realignment Project Environmental Assessment Proposal

## Appendix D: Hudson Bay Lowland Wildlife Species List



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**Lists of mammals, amphibians, and birds, known to occur throughout the Hudson Bay Lowland Ecoregion as available by the Manitoba Conservation Data Centre.**

The S-Rank is a provincial conservation status ranking scheme which grades a species' rarity on a scale of 1 (rare) to 5 (common). The definitions for each S-Rank are as follows:

<b>S1 - Critically Imperiled</b>	At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.
<b>S2 - Imperiled</b>	At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
<b>S3 - Vulnerable</b>	At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
<b>S4 – Apparently Secure</b>	At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.
<b>S5 - Secure</b>	At very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats.
<b>SU - Unrankable</b>	Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
<b>B - Breeding</b>	Conservation status refers to the breeding population of the species in the nation or state/province.
<b>N – Non-breeding</b>	Conservation status refers to the non-breeding population of the species in the nation or state/province.

**Table 1.** List of terrestrial mammals known to occur throughout the Hudson Bay Lowland Ecoregion.

<b>Category</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>S Rank</b>
Mammal	<i>Vulpes lagopus</i>	Arctic Fox	S5
Mammal	<i>Castor canadensis</i>	American Beaver	S5
Mammal	<i>Ursus americanus</i>	Black Bear	S5
Mammal	<i>Pekania pennanti</i>	Fisher	S5
Mammal	<i>Canis lupus</i>	Gray Wolf	S5
Mammal	<i>Lynx canadensis</i>	Lynx	S5
Mammal	<i>Martes americana</i>	American Marten	S5
Mammal	<i>Vison vison</i>	American Mink	S5
Mammal	<i>Alces alces</i>	Moose	SU
Mammal	<i>Ondatra zibethicus</i>	Common Muskrat	S5
Mammal	<i>Ursus maritimus</i>	Polar Bear	S2
Mammal	<i>Vulpes vulpes</i>	Red Fox	S5
Mammal	<i>Tamiasciurus hudsonicus</i>	North American Red Squirrel	S5
Mammal	<i>Lontra canadensis</i>	North American River Otter	S5
Mammal	<i>Mustela richardsonii</i>	American Ermine	S5
Mammal	<i>Lepus americanus</i>	Snowshoe Hare	S5
Mammal	<i>Gulo gulo</i>	Wolverine	S3
Mammal	<i>Rangifer tarandus</i>	Woodland Caribou	S4

**Table 2.** List of amphibians known to occur throughout the Hudson Bay Lowland Ecoregion.

<b>Category</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>S Rank</b>
Amphibian	<i>Anaxyrus americanus</i>	American Toad	S4
Amphibian	<i>Lithobates pipiens</i>	Northern Leopard Frog	S4

**Table 3.** List of birds known to occur throughout the Hudson Bay Lowland Ecoregion.

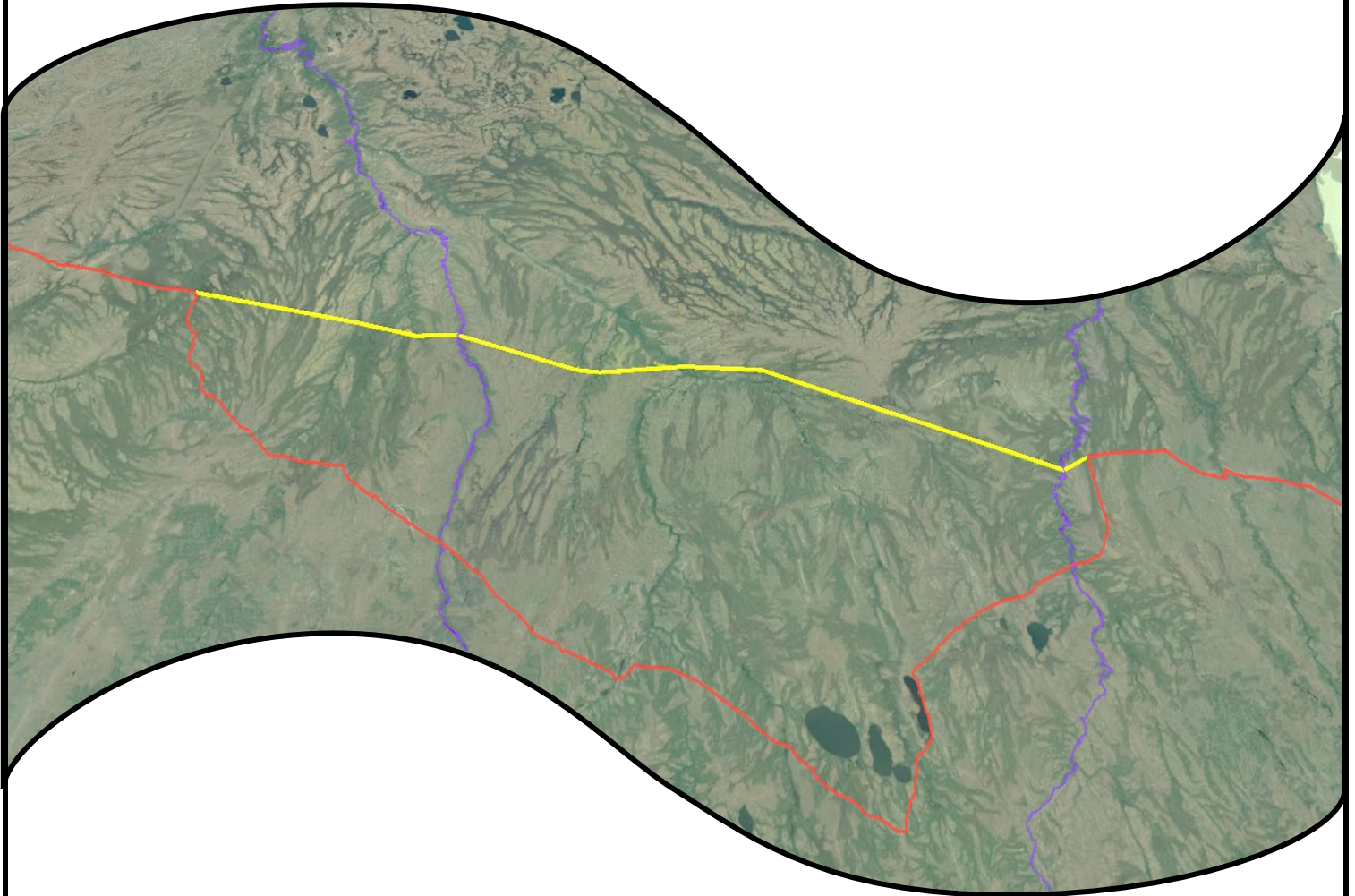
Category	Scientific Name	Common Name	S Rank
Bird	<i>Empidonax alnorum</i>	Alder Flycatcher	S5
Bird	<i>Botaurus lentiginosus</i>	American Bittern	S5
Bird	<i>Anas rubripes</i>	American Black Duck	S2
Bird	<i>Corvus brachyrhynchos</i>	American Crow	S5
Bird	<i>Spinus tristis</i>	American Goldfinch	S5
Bird	<i>Falco sparverius</i>	American Kestrel	S3
Bird	<i>Setophaga ruticilla</i>	American Redstart	S5
Bird	<i>Turdus migratorius</i>	American Robin	S5
Bird	<i>Picoides dorsalis</i>	American Three-toed Woodpecker	S5
Bird	<i>Spizelloides arborea</i>	American Tree Sparrow	S5
Bird	<i>Pelecanus erythrorhynchos</i>	American White Pelican	S4
Bird	<i>Mareca americana</i>	American Wigeon	S4
Bird	<i>Sterna paradisaea</i>	Arctic Tern	S4
Bird	<i>Haliaeetus leucocephalus</i>	Bald Eagle	S3
Bird	<i>Riparia riparia</i>	Bank Swallow	S4
Bird	<i>Hirundo rustica</i>	Barn Swallow	S4
Bird	<i>Setophaga castanea</i>	Bay-breasted Warbler	S4
Bird	<i>Megaceryle alcyon</i>	Belted Kingfisher	S4
Bird	<i>Melanitta americana</i>	Black Scoter	S2
Bird	<i>Chlidonias niger</i>	Black Tern	S4
Bird	<i>Mniotilta varia</i>	Black-and-white Warbler	S5
Bird	<i>Picoides arcticus</i>	Black-backed Woodpecker	S5
Bird	<i>Pluvialis squatarola</i>	Black-bellied Plover	S4
Bird	<i>Setophaga fusca</i>	Blackburnian Warbler	S5
Bird	<i>Poecile atricapillus</i>	Black-capped Chickadee	S5
Bird	<i>Setophaga striata</i>	Blackpoll Warbler	S5
Bird	<i>Vireo solitarius</i>	Blue-headed Vireo	S5
Bird	<i>Spatula discors</i>	Blue-winged Teal	S5
Bird	<i>Bombycilla garrulus</i>	Bohemian Waxwing	S3
Bird	<i>Chroicocephalus philadelphia</i>	Bonaparte's Gull	S5
Bird	<i>Poecile hudsonicus</i>	Boreal Chickadee	S4
Bird	<i>Aegolius funereus</i>	Boreal Owl	S3
Bird	<i>Buteo platypterus</i>	Broad-winged Hawk	S4
Bird	<i>Certhia americana</i>	Brown Creeper	S5
Bird	<i>Bucephala albeola</i>	Bufflehead	S4
Bird	<i>Branta canadensis</i>	Canada Goose	S5
Bird	<i>Perisoreus canadensis</i>	Canada Jay	S5
Bird	<i>Setophaga tigrina</i>	Cape May Warbler	S5
Bird	<i>Bombycilla cedrorum</i>	Cedar Waxwing	S1
Bird	<i>Spizella passerina</i>	Chipping Sparrow	S5
Bird	<i>Spizella pallida</i>	Clay-colored Sparrow	S5
Bird	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	S4
Bird	<i>Bucephala clangula</i>	Common Goldeneye	S5
Bird	<i>Quiscalus quiscula</i>	Common Grackle	S5
Bird	<i>Gavia immer</i>	Common Loon	S5
Bird	<i>Mergus merganser</i>	Common Merganser	S5
Bird	<i>Chordeiles minor</i>	Common Nighthawk	S2S3B
Bird	<i>Corvus corax</i>	Common Raven	S5
Bird	<i>Acanthis flammea</i>	Common Redpoll	S4
Bird	<i>Sterna hirundo</i>	Common Tern	S5
Bird	<i>Geothlypis trichas</i>	Common Yellowthroat	S5

Bird	<i>Oporornis agilis</i>	Connecticut Warbler	S3
Bird	<i>Junco hyemalis</i>	Dark-eyed Junco	S2
Bird	<i>Nannopterum auritum</i>	Double-crested Cormorant	S5
Bird	<i>Dryobates pubescens</i>	Downy Woodpecker	S5
Bird	<i>Tyrannus tyrannus</i>	Eastern Kingbird	S4
Bird	<i>Contopus virens</i>	Eastern Wood-pewee	S3
Bird	<i>Sturnus vulgaris</i>	European Starling	SU
Bird	<i>Sterna forsteri</i>	Forster's Tern	S4
Bird	<i>Passerella iliaca</i>	Fox Sparrow	S5
Bird	<i>Aquila chrysaetos</i>	Golden Eagle	S1
Bird	<i>Regulus satrapa</i>	Golden-crowned Kinglet	S3
Bird	<i>Dumetella carolinensis</i>	Gray Catbird	S5
Bird	<i>Catharus minimus</i>	Gray-cheeked Thrush	S4
Bird	<i>Strix nebulosa</i>	Great Gray Owl	S3
Bird	<i>Tringa melanoleuca</i>	Greater Yellowlegs	S5
Bird	<i>Anas crecca</i>	Green-winged Teal	S5
Bird	<i>Dryobates villosus</i>	Hairy Woodpecker	S5
Bird	<i>Zonotrichia querula</i>	Harris's Sparrow	S3
Bird	<i>Catharus guttatus</i>	Hermit Thrush	S5
Bird	<i>Larus argentatus</i>	Herring Gull	S5
Bird	<i>Lophodytes cucullatus</i>	Hooded Merganser	S5
Bird	<i>Podiceps auritus</i>	Horned Grebe	S3
Bird	<i>Limosa haemastica</i>	Hudsonian Godwit	S2
Bird	<i>Charadrius vociferus</i>	Killdeer	S5
Bird	<i>Empidonax minimus</i>	Least Flycatcher	S5
Bird	<i>Calidris minutilla</i>	Least Sandpiper	S4
Bird	<i>Ammospiza leconteii</i>	LeConte's Sparrow	S5
Bird	<i>Aythya affinis</i>	Lesser Scaup	S5
Bird	<i>Tringa flavipes</i>	Lesser Yellowlegs	S4
Bird	<i>Melospiza lincolnii</i>	Lincoln's Sparrow	S5
Bird	<i>Hydrocoloeus minutus</i>	Little Gull	S2
Bird	<i>Setophaga magnolia</i>	Magnolia Warbler	S5
Bird	<i>Anas platyrhynchos</i>	Mallard	S5
Bird	<i>Falco columbarius</i>	Merlin	S2
Bird	<i>Geothlypis philadelphia</i>	Mourning Warbler	S4
Bird	<i>Leiothlypis ruficapilla</i>	Nashville Warbler	S5
Bird	<i>Colaptes auratus</i>	Northern Flicker	S4
Bird	<i>Accipiter gentilis</i>	Northern Goshawk	S3
Bird	<i>Circus hudsonius</i>	Northern Harrier	S4
Bird	<i>Surnia ulula</i>	Northern Hawk Owl	S3
Bird	<i>Anas acuta</i>	Northern Pintail	S5
Bird	<i>Spatula clypeata</i>	Northern Shoveler	S5
Bird	<i>Lanius borealis</i>	Northern Shrike	S2
Bird	<i>Parkesia noveboracensis</i>	Northern Waterthrush	S5
Bird	<i>Contopus cooperi</i>	Olive-sided Flycatcher	S2S3B
Bird	<i>Leiothlypis celata</i>	Orange-crowned Warbler	S5
Bird	<i>Pandion haliaetus</i>	Osprey	S4
Bird	<i>Seiurus aurocapilla</i>	Ovenbird	S5
Bird	<i>Gavia pacifica</i>	Pacific Loon	S4
Bird	<i>Setophaga palmarum</i>	Palm Warbler	S4
Bird	<i>Vireo philadelphicus</i>	Philadelphia Vireo	S3
Bird	<i>Podilymbus podiceps</i>	Pied-billed Grebe	S5
Bird	<i>Dryocopus pileatus</i>	Pileated Woodpecker	S5

Bird	<i>Pinicola enucleator</i>	Pine Grosbeak	S4
Bird	<i>Spinus pinus</i>	Pine Siskin	S2
Bird	<i>Haemorhous purpureus</i>	Purple Finch	S2
Bird	<i>Loxia curvirostra</i>	Red Crossbill	S3
Bird	<i>Mergus serrator</i>	Red-breasted Merganser	S4
Bird	<i>Sitta canadensis</i>	Red-breasted Nuthatch	S5
Bird	<i>Vireo olivaceus</i>	Red-eyed Vireo	S5
Bird	<i>Podiceps grisegena</i>	Red-necked Grebe	S5
Bird	<i>Phalaropus lobatus</i>	Red-necked Phalarope	S3
Bird	<i>Buteo jamaicensis</i>	Red-tailed Hawk	S5
Bird	<i>Agelaius phoeniceus</i>	Red-winged Blackbird	S5
Bird	<i>Larus delawarensis</i>	Ring-billed Gull	S5
Bird	<i>Aythya collaris</i>	Ring-necked Duck	S5
Bird	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	S5
Bird	<i>Corthylio calendula</i>	Ruby-crowned Kinglet	S5
Bird	<i>Bonasa umbellus</i>	Ruffed Grouse	S4
Bird	<i>Euphagus carolinus</i>	Rusty Blackbird	S3S4B, S2N
Bird	<i>Antigone canadensis</i>	Sandhill Crane	S5
Bird	<i>Passerculus sandwichensis</i>	Savannah Sparrow	S5
Bird	<i>Accipiter striatus</i>	Sharp-shinned Hawk	S4
Bird	<i>Tympanuchus phasianellus</i>	Sharp-tailed Grouse	S5
Bird	<i>Limnodromus griseus</i>	Short-billed Dowitcher	S4
Bird	<i>Asio flammeus</i>	Short-eared Owl	S2
Bird	<i>Calcarius pictus</i>	Smith's Longspur	S2
Bird	<i>Tringa solitaria</i>	Solitary Sandpiper	S4
Bird	<i>Melospiza melodia</i>	Song Sparrow	S5
Bird	<i>Porzana carolina</i>	Sora	S5
Bird	<i>Actitis macularius</i>	Spotted Sandpiper	S5
Bird	<i>Canachites canadensis</i>	Spruce Grouse	S4
Bird	<i>Melanitta perspicillata</i>	Surf Scoter	S3
Bird	<i>Catharus ustulatus</i>	Swainson's Thrush	S5
Bird	<i>Melospiza georgiana</i>	Swamp Sparrow	S5
Bird	<i>Leiothlypis peregrina</i>	Tennessee Warbler	S5
Bird	<i>Tachycineta bicolor</i>	Tree Swallow	S5
Bird	<i>Cygnus columbianus</i>	Tundra Swan	S4
Bird	<i>Sitta carolinensis</i>	White-breasted Nuthatch	S5
Bird	<i>Zonotrichia leucophrys</i>	White-crowned Sparrow	S5
Bird	<i>Zonotrichia albicollis</i>	White-throated Sparrow	S5
Bird	<i>Loxia leucoptera</i>	White-winged Crossbill	S5
Bird	<i>Melanitta deglandi</i>	White-winged Scoter	S3
Bird	<i>Lagopus lagopus</i>	Willow Ptarmigan	S4
Bird	<i>Phalaropus tricolor</i>	Wilson's Phalarope	S4
Bird	<i>Gallinago delicata</i>	Wilson's Snipe	S5
Bird	<i>Cardellina pusilla</i>	Wilson's Warbler	S4
Bird	<i>Troglodytes hiemalis</i>	Winter Wren	S5
Bird	<i>Setophaga petechia</i>	Yellow Warbler	S5
Bird	<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher	S5
Bird	<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker	S5
Bird	<i>Setophaga coronata</i>	Yellow-rumped Warbler	S5

# Shamattawa Winter Road Realignment Project Environmental Assessment Proposal

## Appendix E: DFO Habitat Type Flowchart



Manitoba Transportation and Infrastructure  
Highway Planning and Design

August 2023

**MTI**

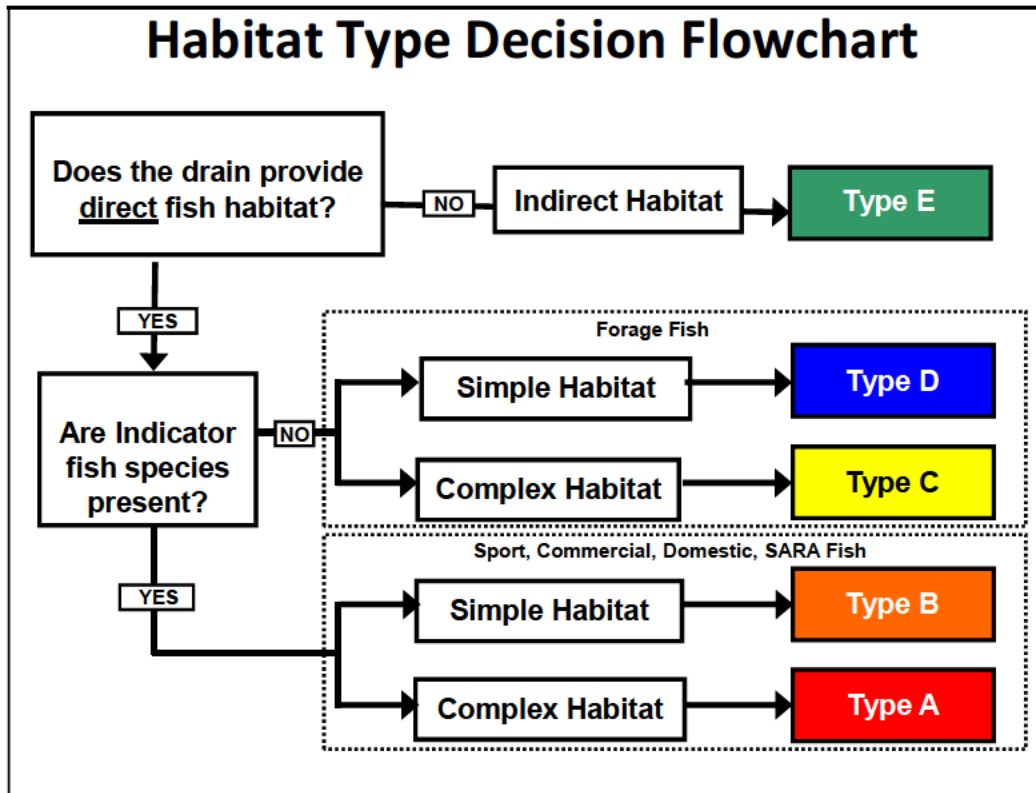


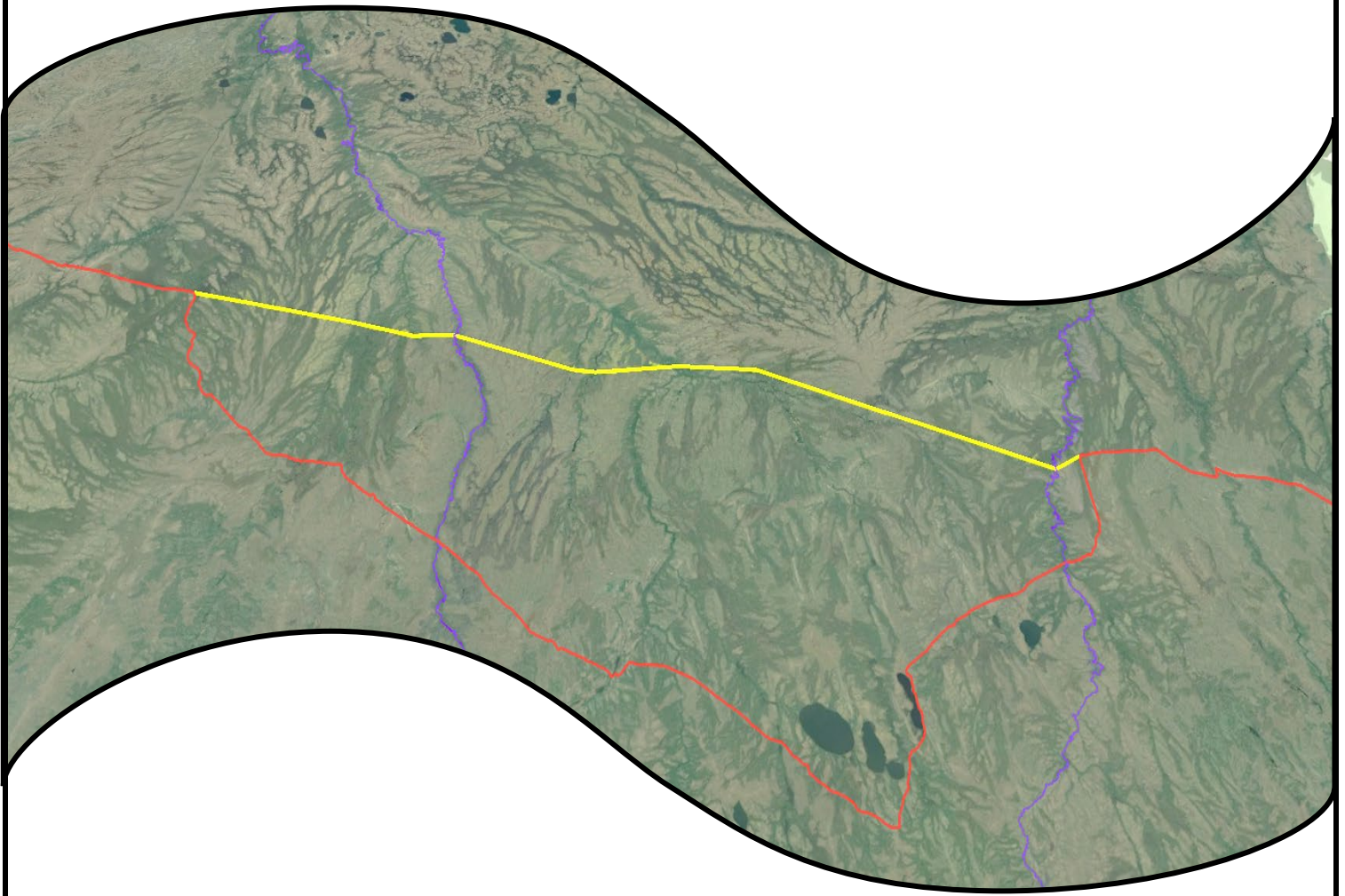
Figure 2: Fish habitat classification decision flowchart applied to streams and drains within the study area.

Direct fish habitat included watercourses where fish can complete any of their life processes, i.e., spawning, rearing, feeding, migration or over-wintering. Indirect fish habitat included ephemeral watercourses that typically have insufficient flow volume or flow duration to allow fish to complete one or more of their life processes. These ephemeral watercourses may not provide habitat for fish to complete one or more of their life processes, but may provide flow and nutrients to downstream areas. These watercourses can also impact downstream areas through the transport of sediment and other deleterious substances.

The fish community decision involved first determining if fish were present in the surveyed reach of the watercourse, and then further defining the fish community based on the presence/absence of "Indicator Species". Indicator Species included large-bodied species with commercial, domestic, or sport fishery value such as Northern Pike (*Esox lucius*), Walleye (*Sander vitreus*) or White Sucker (*Catostomus commersoni*). Indicator Species also included any fish listed in Schedule 1 of the Species at Risk Act (SARA). All other fish were designated as "Non-Indicator" Species.

# Shamattawa Winter Road Realignment Project Environmental Assessment Proposal

## Appendix F: Construction Standards and Protocols



Manitoba Transportation and Infrastructure  
Highway Planning and Design

August 2023

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**General Environmental Requirements**  
**Manitoba Infrastructure**

# General Environmental Requirements

All construction shall be governed by the *Standard Construction Specification* set out in the contract and as modified in the Special Provisions.

## Erosion and Sediment Control

1. Effective sediment and erosion control measures shall be installed before starting work near water to prevent the entry of sediment into any water course or wetland. Final erosion protection measures shall be installed progressively during the project.
2. Erosion and sediment control measures shall be inspected daily during the course of the work. Repairs or adjustments shall be made immediately if any damage is discovered or if these measures are not effective in controlling erosion and sedimentation.
3. Erosion and sediment control measures shall be maintained until complete revegetation of all disturbed areas is achieved. This period may extend beyond the duration of the construction contract, after which the monitoring of revegetation will be the responsibility of MI.
4. The duration of soil exposure shall be minimized and run-off shall be diverted away from the exposed soil.
5. Construction shall be halted during heavy rains with the exception of those works pertaining to erosion and sediment control.
6. Spoil piles shall not be placed within 30m of the ordinary high-water mark or as directed by the Engineer. Spoil piles shall be positioned and maintained in a manner not to increase sediment into the watercourse.

## In-Water Work

7. No in-water work shall occur within fish bearing streams from April 1st to June 15<sup>th</sup> in Southern Manitoba or April 15<sup>th</sup> to June 30<sup>th</sup> in Northern Manitoba of any year to accommodate spawning and nursery periods, unless otherwise noted in the Special Provisions. Boundaries for Northern and Southern Manitoba are identified in the Manitoba Restricted Timing Activity Windows for the Protection of Fish and Fish Habitat (<http://www.dfo-mpo.gc.ca/pnw-ppe/timing-periodes/mb-eng.html>).
8. Duration of in-water work shall be minimized.
9. Where possible in-water works shall be conducted under low flow, frozen, or dry conditions to reduce impacts to fish and fish habitat.
10. If work must proceed under flowing water conditions, then the work site shall be isolated from the water while maintaining downstream flow around the isolated site unless otherwise directed by the engineer. Placement of clean rip rap does not need to be isolated.
11. Disturbance to the bed and banks of the watercourse or wetland shall be minimized and confined to the immediate work site. Unnecessary removal of riparian vegetation shall be avoided. The bed and banks of the watercourse or wetland shall be

restored to pre-disturbance conditions in accordance with the contract documents or as directed by the Engineer.

12. Unless otherwise specified in the contract documents site isolation methods shall be approved by the Engineer based on an accepted plan or design submittal.
13. Where a cofferdam shall be installed:
  - Cofferdams shall be designed to accommodate any expected high flows during the construction period.
  - Cofferdams shall be constructed using clean, non-erodible materials. Silts and clays are not acceptable materials for the surficial zone of the cofferdam.
  - Materials shall not be taken from below the ordinary high-water mark of any water body.
  - All spoil material and debris shall be removed from the isolated area prior to the removal of the cofferdam.
  - Exposed soil on the banks of the isolated area shall be stabilized before the cofferdam or sediment barrier is removed.
  - All cofferdam materials shall be removed and the watercourse shall be restored to its original shape and profile.
14. Any isolated site shall be de-watered using an appropriately sized screened pipe or other suitable method to ensure fish do not become entrained in the pipe. Pump intakes shall be sized and adequately screened to prevent debris blockage and fish mortality in accordance with the Freshwater Intake End-of-Pipe Fish Screen Guideline (<http://www.dfo-mpo.gc.ca/Library/223669.pdf>).
15. Sediment laden dewatering discharge shall be pumped to a stilling basin, filtering system or through dense terrestrial vegetation a minimum of 30 metres away from the watercourse before re-entry downstream of the construction area, or as noted in the Special Provisions. All pump discharge points shall be lined with clean rock or other acceptable flow dissipating applications in order to prevent erosion and the release of suspended sediments.

### **Rip Rap**

16. Where rock is required for rock armouring or stabilization:
  - Rock rip rap placement shall not damage the bed and/or banks of the watercourse
  - Clean rocks shall be placed by machinery operating from outside of the water.
  - No rocks shall be obtained from below the ordinary high-water mark of any water body.

### **Revegetation**

17. Immediately following construction and decommissioning, all disturbed areas shall be covered with local top soil and seeded. If local topsoil is not available, other organic based covers may be used to allow seed germination.
18. Do not plant the following undesirable/invasive species:
  - Smooth Brome (*Bromus inermis*)
  - Downy Brome (*Bromus tectorum*)

- Crested Wheatgrass (*Agropyron cristatum*)
- Reed Canary Grass (*Phalaris arundinacea*)
- Creeping Red Fescue (*Festuca rubra*)
- Kentucky Bluegrass (*Poa pratensis*)
- Birdsfoot Trefoil (*Lotus corniculatis*)
- Yellow Sweet Clover (Melilotus officinalis)
- White Sweet Clover (Melilotus alba)
- Dutch Clover (Trifolium repens)
- Alsike Clover (Trifolium hybridum)
- Alfalfa (Medicago sativa)
- Meadow Foxtail (Alopecurus pratensis)
- Tufted/Cow/Bird Vetch (Vicia cracca)
- Tall Fescue (Festuca arundinacea)

### **Clearing, Grubbing and Brushing**

19. Clearing and grubbing shall NOT be undertaken between April 1st and August 31st of any year unless otherwise specified in order to avoid disturbance to nesting birds and other wildlife species.
20. Where possible, grubbing shall not occur within 2 m (2.5 yards) of standing timber in order to prevent damage to root systems of adjacent standing trees and reduce the occurrence of blow down.
21. Timber stockpile sites shall be located within existing clearings or areas of non-merchantable timber. Stockpile sites shall not be located within 30 meters of a waterbody unless otherwise directed by the Engineer. All stockpiled material shall be removed by April 30 following clearing activities.
22. There shall be no bulldozing of woody debris into standing timber.
23. Existing trails, portages and other travel ways shall not be permanently blocked as a result of clearing and grubbing activities so as not to interfere with other users.
24. All cleared vegetation and debris shall be piled and/or compacted in windrows as close to the ground as possible in preparation for disposal. Windrows shall be no closer than 1 meter to the bush line.

### **Temporary Water Crossings/Access and Pads**

25. Temporary in-water crossings, site access, and pads shall be completely removed prior to April 1st of any given year.
26. Temporary water crossings shall be constructed out of clean stone, rock or crushed rock in accordance with the contract documents or as accepted by the Engineer.
27. Culverts shall be hydraulically sized to accommodate expected flows and fish passage requirements for the duration of the installation. The culvert design must be signed and sealed by a qualified engineer.
28. The temporary crossings, site access and pads shall be removed in their entirety upon completion of the work.
29. Upon removal of the temporary crossings, site access or pads, the site shall be rehabilitated to pre-disturbance conditions.

## Blasting Near a Watercourse

30. Use of explosives in or near fish habitat shall follow DFO's Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (Wright and Hopky 1998) to avoid causing serious harm to fish. This guideline is available online at <http://www.dfo-mpo.gc.ca/Library/232046.pdf>.
31. The use of ammonium nitrate-fuel oil mixtures in or near water frequented by fish shall be avoided to prevent the deposit of toxic by-products (ammonia) in water frequented by fish.

**Table 1. Setback distance (m) from centre of detonation of a confined explosive to fish habitat to achieve 100 kPa guideline criteria for various substrates.**

Substrate Type	Weight of Explosive Charge (kg)							
	0.5	1	2	5	10	25	50	100
	Setback Distance (m)							
Rock	3.6	5.0	7.1	11.0	15.9	25.0	35.6	50.3
Frozen Soil	3.3	4.7	6.5	10.4	14.7	23.2	32.9	46.5
Ice	3.0	4.2	5.9	9.3	13.2	20.9	29.5	41.8
Saturated Soil	3.0	4.2	5.9	9.3	13.2	20.9	29.5	41.8
Unsaturated Soil	2.0	2.9	4.1	6.5	9.2	14.5	20.5	29.0

## Machinery, Fuel Storage and Handling

32. All fuel handling and storage shall comply with Storage and Handling of Petroleum Products and Allied Products Regulation 188/2001 under The Dangerous Goods Handling and Transportation Act C.C.S.M. c. D12.
33. Storage of fuel stored in drums or containers of 230 L or less shall comply with the requirements of Manitoba Fire Code.
34. Designated Area(s) shall be established for fuel storage and handling, equipment cleaning, refueling and servicing. Any Designated Area shall be located at least 100m away from any waterbody or wetland and shall be kept clear of snow and/or miscellaneous materials to allow clear access, routine inspection and leak detection.
  - o Machinery and equipment shall be washed, refueled and serviced in such a manner that washwater shall not contaminate surface water or be discharged into a surface water body.
  - o In the event that a piece of equipment must be refueled or serviced outside a Designated Area, the fuel shall be transported in approved containers. Absorbent pads or other precautions, such as drip trays or a high density polyethylene (HDPE) groundsheet, shall be used to contain the fuel in the event of spillage.

- All mobile equipment that is not in use shall be parked within a Designated Area(s) where possible.
35. Tank vehicles used to deliver fuel to the work site and/or used to move fuel around the work site shall meet the requirements for highway tanks for the shipment of dangerous goods by road set out in CSA Standard B620-14, Highway Tanks and TC Portable Tanks for the Transportation of Dangerous Goods.
  36. All fuel storage containers and tank vehicles shall be inspected daily for leaks and spillage. Damaged or leaking fuel storage containers shall be promptly removed from site. All used petroleum products and other regulated hazardous wastes shall be collected and disposed of at a licensed facility in accordance with applicable legislative requirements.
  37. As refueling, fuel storage and equipment servicing sites are taken out of service, any required remediation shall be conducted, including the disposal of the contaminated material at an appropriate licensed facility to the satisfaction of the Department.
  38. Machinery shall arrive on site in a clean condition and shall be maintained free of fluid leaks.

### **Emergency Response Plan for Spills**

39. Due care and caution shall be taken to prevent spills, at all times.
40. An updated list of key contacts and telephone numbers for reporting spills, problems, etc., shall be kept on-site at all times.
41. A Workplace Hazardous Materials Information System (WHMIS) file shall be maintained on-site for all hazardous materials at the work area. Prior to commencement of the Work, Material Safety Data Sheets (MSDS) shall be available on-site for all hazardous materials to be used. An updated spill response and containment plan for each dangerous good/hazardous waste shall be maintained in the work area at all times.
42. A spill kit or sufficient supply of materials for clean-up or spill containment, for example absorbent material, high density HDPE groundsheets and absorbent oil booms when working near water, shall always be available on site. If necessary, additional material shall be made available on short notice.
43. All personnel responsible for the handling of dangerous goods and hazardous wastes shall be familiar with the on-site response and containment plan.
44. Any reportable spills shall be reported to the Accident Reporting Line at (204) 944-4888 pursuant to Manitoba Regulation 439/87.
45. All spills shall be reported to the Engineer within 24 hours whether it was necessary to report the spill to Manitoba Sustainable Development or not. The spill report shall include the following:
  - personnel responding to the spill
  - material spilled
  - cause of spill
  - estimated amount of material spilled
  - estimated area and volume of soil affected by the spill

- cleanup action undertaken
  - means used to contain, transport and dispose of the materials involved
46. In the event that there is a spill onto the ground surface from any piece of equipment, such as a broken hydraulic hose, the entire affected area shall be cleaned up and all contaminated soil shall be appropriately disposed of offsite at an appropriate licensed facility. Such events shall be reported immediately to the Engineer and proof of appropriate disposal provided. Contractor field staff trained in spill containment and management shall always be on site.

## **Disposal**

47. Dispose of all used petroleum products and other regulated hazardous wastes in accordance with the Manitoba “Dangerous Goods Handling and Transportation Act”.
48. Dispose of non-reusable demolition and construction debris at a waste disposal ground operating under the authority of a permit pursuant to Manitoba Regulation 150/91 respecting Waste Disposal Grounds. Provide proof of appropriate disposal.
49. Any waste and non-salvageable demolition materials removed from the work site shall be stabilized above the Ordinary High-Water Mark to prevent them from entering any watercourse and/or transported to a designated disposal site.
50. Dispose of all sewage and septage from on-site sanitary facilities in accordance with Manitoba Regulation 83/2003, respecting Onsite Wastewater Management Systems Regulation. Provide proof of appropriate disposal.

## **Dust and Particulate Control**

51. All work shall be conducted in a manner that minimizes the raising of dust from construction operations.
52. Only water or approved dust suppressants shall be used for dust control. The use of waste petroleum or petroleum by-products is not allowed.
53. All vehicles used to haul materials to or from the work site shall have the load covered with a tarpaulin cover during transport to prevent material from falling out and creating dust.
54. All material stock piles or spoil piles shall be maintained as to minimize release of particulate matters. This may include, but is not limited to, covering or stabilization of material stockpiled at the work site as required.

## **Noise and Noise Limitations**

55. All plant and equipment supplied for use on the Project shall be effectively “sound-reduced” by means of proper silencers, mufflers, acoustic linings, acoustic shields or acoustic sheds.
56. Noise By-laws of the adjacent communities and municipal authorities shall be complied with.

57. Any operation of plant or equipment outside the hours as regulated by local government shall require an exemption in writing.

### **Wildlife**

58. Construction camps and worksites shall be kept clean and tidy. All food and garbage waste shall be stored in a secure manner to prevent access and exposure to local wildlife. All food and garbage waste shall be disposed of at an area which has been designated as an appropriate waste disposal site.
59. Nuisance wildlife shall be immediately reported to Manitoba Sustainable Developments local District Office and the Engineer.

### **Heritage Resources**

60. Work shall immediately cease and be suspended at the location where archaeological or historic artifacts are encountered during construction activities. The discovery shall be reported to the Engineer and work at this location shall not resume unless otherwise authorized by the Engineer.

Work at the location shall be suspended until a Historic Resource Consultant can assess archaeological or historic artifacts that are encountered, and mitigation measures are confirmed with the Manitoba Historic Resources Branch.

### **Other**

61. The disturbed area shall be minimized to the greatest extent possible and limited to the Department's right-of-way unless otherwise permitted by the Department.
62. Utilization of ditches as a heavy-machinery transportation corridor shall be minimized to the greatest extent possible.
63. Existing drainage patterns shall not be altered.
64. Should there be a need for a water source for compaction or dust suppression or related activity, a temporary authorization for any withdrawal greater than 25,000 litres or 550 gdp shall be required from the Manitoba Sustainable Development Water Use Licensing Section. Contact the Manager of Water Use Licensing Section, at (204) 945-3983 prior to the commencement of the work.
65. Any asphalt plant and temporary asphalt plant sites shall have the necessary licence/permit and shall be operated in accordance with the terms and conditions on their licence/permit.



# ICE BRIDGES AND SNOW FILLS

Fisheries and Oceans Canada  
Manitoba Operational Statement

Version 3.0

Ice bridges and snow fills are two methods used for temporary winter access in remote areas. Ice bridges are constructed on larger watercourses that have sufficient stream flow and water depth to prevent the ice bridge from coming into contact with the stream bed or restricting water movement beneath the ice. Snow fills, however, are temporary stream crossings constructed by filling a stream channel with clean compacted snow.

Ice bridge and snow fill crossings provide cost-effective access to remote areas when lakes, rivers and streams are frozen. Since the ground is frozen, ice bridges and snow fills can be built with minimal disturbance to the bed and banks of the watercourse. However, these crossings can still have negative effects on fish and fish habitat. Clearing shoreline and bank vegetation increases the potential for erosion and instability of the banks and can lead to deposition of sediments into fish habitat. There is also potential for blockage of fish passage during spring break-up.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to incorporate into your project in order to avoid negative impacts to fish habitat. You may proceed with your ice bridge or snow fill project without a DFO review when you meet the following conditions:

- ice bridges are constructed of clean (ambient) water, ice and snow,
- snow fills are constructed of clean snow, which will not restrict water flow at any time,
- the work does not include realigning the watercourse, dredging, placing fill, or grading or excavating the bed or bank of the watercourse,
- materials such as gravel, rock and loose woody material are NOT used,
- where logs are required for use in stabilizing shoreline approaches, they are clean and securely bound together, and they are removed either before or immediately following the spring freshet,
- the withdrawal of any water will not exceed 10% of the instantaneous flow, in order to maintain existing fish habitat,

- water flow is maintained under the ice, where this naturally occurs, and
- you incorporate the *Measures to Protect Fish and Fish Habitat when Constructing an Ice Bridge or Snow Fill* listed below in this Operational Statement.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in the violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact the DFO office in your area if you wish to obtain DFO's opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

**You are required to respect all municipal, provincial or federal legislation that applies to the work being carried out in relation to this Operational Statement.** The activities undertaken in this Operational Statement must also comply with the *Species at Risk Act* ([www.sararegistry.gc.ca](http://www.sararegistry.gc.ca)). If you have questions regarding this Operational Statement, please contact the DFO office in your area (see Manitoba DFO office list).

We ask that you notify DFO, preferably 10 working days before starting your work by filling out and sending the Manitoba Operational Statement notification form ([www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/prov-terr/index\\_e.htm](http://www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/prov-terr/index_e.htm)) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

## Measures to Protect Fish and Fish Habitat when Constructing an Ice Bridge or Snow Fill

1. Use existing trails, winter roads or cut lines wherever possible as access routes to limit unnecessary clearing of additional vegetation and prevent soil compaction.
2. Construct approaches and crossings perpendicular to the watercourse wherever possible.
3. Construct ice bridge and snow fill approaches using clean, compacted snow and ice to a sufficient depth to protect the banks of the lake, river or stream. Clean logs may be used where necessary to stabilize approaches.

4. Where logs are used to stabilize the approaches of an ice bridge or snow fill:
  - 4.1. The logs are clean and securely bound together so they can be easily removed.
  - 4.2. No logs or woody debris are to be left within the water body or on the banks or shoreline where they can wash back into the water body.
5. While this Operational Statement does not cover the clearing of riparian vegetation, the removal of select plants may be necessary to accommodate the road. This removal should be kept to a minimum and within the road right-of-way.
6. Install sediment and erosion control measures before starting work to prevent the entry of sediment into the watercourse. Inspect them regularly during the course of construction and decommissioning activities and make all necessary repairs if any damage occurs.
7. Operate machinery on land or on ice and in a manner that minimizes disturbance to the banks of the lake, river or stream.
  - 7.1. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.
  - 7.2. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent any deleterious substance from entering the water or spreading onto the ice surface.
  - 7.3. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.
  - 7.4. Restore banks to original condition if any disturbance occurs.
8. If water is being pumped from a lake or river to build up the bridge, the intakes are sized and adequately screened to prevent debris blockage and fish mortality (refer to DFO's *Freshwater Intake End-of-Pipe Fish Screen Guideline* (1995) available at [www.dfo-mpo.gc.ca/Library/223669.pdf](http://www.dfo-mpo.gc.ca/Library/223669.pdf)).
9. Crossings do not impede water flow at any time of the year.
10. When the crossing season is over and where it is safe to do so, create a v-notch in the centre of the ice bridge to allow it to melt from the centre and also to prevent blocking fish passage, channel erosion and flooding. Compacted snow should be removed from snow fills prior to the spring freshet.
11. Stabilize any waste materials removed from the work site to prevent them from entering the lake, river, or stream. This could include covering spoil piles with biodegradable mats or tarps or planting them with grass or shrubs.

12. Vegetate and stabilize (e.g., cover exposed areas with erosion control blankets or tarps to keep the soil in place and prevent erosion) any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses. Cover such areas with mulch to prevent erosion and to help seeds germinate.
  - 12.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

## FISHERIES AND OCEANS CANADA OFFICES IN MANITOBA

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# ISOLATED OR DRY OPEN-CUT STREAM CROSSINGS

Fisheries and Oceans Canada  
Manitoba Operational Statement

Version 1.0

For the purpose of this Operational Statement, the term “Isolated Crossing” means a temporary stream crossing technique that allows work (e.g., trenched pipeline or cable installation) to be carried out “in-the-dry” while diverting the natural flow around the site during construction. These types of open trenched crossings are isolated using flume or dam and pump techniques (see *Pipeline Associated Watercrossings*, 2005 at [http://www.capp.ca/default.asp?V\\_DOC\\_ID=763&PubID=96717](http://www.capp.ca/default.asp?V_DOC_ID=763&PubID=96717)).

The term “Dry Open-cut Stream Crossing” means a temporary stream crossing work (e.g., trenched pipeline or cable installation) that is carried out during a period when the entire stream width is seasonally dry or is frozen to the bottom.

The risks to fish and fish habitat associated with isolated open cut stream crossings include the potential for direct damage to substrates, release of excessive sediments, loss of riparian habitat, stranding of fish in dewatered areas, impingement/entrainment of fish at pump intakes, and disruption of essential fish movement patterns. Similarly, dry open-cut stream crossings pose a risk to fish and fish habitat due to potential harmful alteration of substrates, loss of riparian habitat, and release of excessive sediment once stream flows resume.

The order of preference for carrying out a cable or pipeline stream crossing, in order to protect fish and fish habitat, is: a) punch or bore crossing (see *Punch & Bore Crossings* Operational Statement); b) high-pressure directional drill crossing (see *High-Pressure Directional Drilling* Operational Statement); c) dry open-cut crossing; and d) isolated open-cut crossing. This order must be balanced with practical considerations at the site.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to incorporate into your project in order to avoid negative impacts to fish habitat. You may proceed with your isolated or dry open-cut stream crossing project without a DFO review when you meet the following conditions:

- for dry, open-cut crossings the watercourse is dry or frozen completely to the bottom at the site,
- for isolated crossings, the channel width of the watercourse at the crossing site is less than 5 meters from ordinary high

water mark to ordinary high water mark (HWM) (see definition below),

- the isolated crossing does not involve the construction or use of an off-stream diversion channel, or the use of earthen dams,
- the isolated crossing ensures that all natural upstream flows are conveyed downstream during construction, with no change in quality or quantity,
- the site does not occur at a stream location involving known fish spawning habitat, particularly if it is dependent on groundwater upwelling,
- the use of explosives is not required to complete the crossing, and
- you incorporate the *Measures to Protect Fish and Fish Habitat when Carrying Out an Isolated or Dry Open-cut Stream Crossing* listed below.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact the DFO office in your area if you wish to obtain DFO’s opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

**You are required to respect all municipal, provincial and federal legislation that applies to the work being carried out in relation to this Operational Statement.** The activities undertaken in this Operational Statement must also comply with the *Species at Risk Act* (SARA) ([www.sararegistry.gc.ca](http://www.sararegistry.gc.ca)). If you have questions regarding this Operational Statement, please contact the DFO office in your area (see Manitoba DFO office list).

We ask that you notify DFO, preferably 10 working days before starting your work, by filling out and sending the Manitoba Operational Statement notification form ([www.dfo-mpo.gc.ca/regions/central/habitat/os-oo/prov-terr/index\\_e.htm](http://www.dfo-mpo.gc.ca/regions/central/habitat/os-oo/prov-terr/index_e.htm)) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

## Measures to Protect Fish and Fish Habitat when Carrying Out an Isolated or Dry Open-Cut Stream Crossing

1. Use existing trails, roads or cut lines wherever possible as access routes to avoid disturbance to the riparian vegetation.

2. Locate crossings at straight sections of the stream, perpendicular to the banks, whenever possible. Avoid crossing on meander bends, braided streams, alluvial fans, active floodplains or any other area that is inherently unstable and may result in the erosion and scouring of the stream bed.
3. Complete the crossing in a manner that minimizes the duration of instream work.
4. Construction should be avoided during unusually wet, rainy or winter thaw conditions.
5. While this Operational Statement does not cover the clearing of riparian vegetation, the removal of select plants may be necessary to access the construction site. This removal should be kept to a minimum and within the utility right-of-way.
6. Machinery fording a flowing watercourse to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and is to occur only if an existing crossing at another location is not available or practical to use. Operational Statements are also available for *Ice Bridges and Snow Fills*, *Clear-Span Bridges*, and *Temporary Stream Crossing*.
  - 6.1. If minor rutting is likely to occur, stream bank and bed protection methods (e.g., swamp mats, pads) should be used provided they do not constrict flows or block fish passage.
  - 6.2. Grading of the stream banks for the approaches should not occur.
  - 6.3. If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation is likely to occur as a result of equipment fording, then a temporary crossing structure or other practice should be used to protect these areas.
  - 6.4. Time the one-time fording to prevent disruption to sensitive fish life stages by adhering to appropriate fisheries timing windows (see the *Manitoba In-Water Construction Timing Windows*).
  - 6.5. Fording should occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.
7. Operate machinery in a manner that minimizes disturbance to the watercourse bed and banks.
  - 7.1. Protect entrances at machinery access points (e.g., using swamp mats) and establish single site entry and exit.
  - 7.2. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.
  - 7.3. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent deleterious substances from entering the water.
  - 7.4. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.
8. Install effective sediment and erosion control measures before starting work to prevent entry of sediment into the watercourse. Inspect them regularly during the course of construction and make all necessary repairs if any damage occurs.

9. Stabilize any waste materials removed from the work site, above the HWM, to prevent them from entering the watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with grass or shrubs.
10. Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent soil erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
  - 10.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

### Measures to Protect Fish and Fish Habitat when Carrying Out an Isolated Crossing

Temporary isolation is used to allow work “in-the-dry” while maintaining the natural downstream flow by installing dams up and downstream of the site and conveying all of the natural upstream flow into a flume, or pumping it around the isolated area. In addition to measures 1 to 10, the following measures should be carried out when conducting an isolated stream crossing:

11. Time isolated crossings to protect sensitive fish life stages by adhering to fisheries timing windows (see Measure 6.4).
12. Use dams made of non-earthen material, such as water-inflated portable dams, pea gravel bags, concrete blocks, steel or wood wall, clean rock, sheet pile or other appropriate designs, to separate the dewatered work site from flowing water.
  - 12.1. If granular material is used to build dams, use clean or washed material that is adequately sized (i.e., moderately sized rock and not sand or gravel) to withstand anticipated flows during the construction. If necessary, line the outside face of dams with heavy poly-plastic to make them impermeable to water. Material to build these dams should not be taken from below the HWM of any water body.
  - 12.2. Design dams to accommodate any expected high flows of the watercourse during the construction period.
13. Before dewatering, rescue any fish from within the isolated area and return them safely immediately downstream of the worksite.
  - 13.1. You will require a permit from DFO to relocate any aquatic species that are listed as either endangered or threatened under SARA. Please contact the DFO office in your area to determine if an aquatic species at risk is in the vicinity of your project and, if appropriate, use the DFO website at [www.dfo-mpo.gc.ca/species-especes/permits/sarapermits\\_e.asp](http://www.dfo-mpo.gc.ca/species-especes/permits/sarapermits_e.asp) to apply for a permit.



# OVERHEAD LINE CONSTRUCTION

Fisheries and Oceans Canada  
Manitoba Operational Statement

Version 3.0

Overhead lines are constructed for electrical or tele-communication transmission across many watercourses that range in size from small streams and ponds to large rivers, lakes and reservoirs. This Operational Statement applies to selective removal of vegetation along the right-of-way to provide for installation and safe operation of overhead lines, and passage of equipment and materials across the water body.

Although fish habitat occurs throughout a water system, it is the riparian habitat that is most sensitive to overhead line construction. Riparian vegetation occurs adjacent to the watercourse and directly contributes to fish habitat by providing shade, cover, and spawning and food production areas. It is important to design and build your overhead line project to meet your needs while also protecting riparian areas. Potential impacts to fish and fish habitat include excessive loss of riparian vegetation, erosion and sedimentation resulting from bank disturbance and loss of plant root systems, rutting and compaction of stream substrate at crossing sites, and disruption of sensitive fish life stages.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to incorporate into your project in order to avoid negative impacts to fish habitat. You may proceed with your overhead line project without a DFO review when you meet the following conditions:

- it does not require the construction or placement of any temporary or permanent structures (e.g. islands, poles, crib works, etc.) below the ordinary high water mark (HWM) (see definition below), and
- you incorporate the *Measures to Protect Fish and Fish Habitat when Constructing Overhead Lines* listed below in this Operational Statement.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact the DFO office in your area if you wish to obtain DFO's opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

**You are required to respect all municipal, provincial or federal legislation that applies to the work being carried out**

**in relation to this Operational Statement.** The activities undertaken in this Operational Statement must also comply with the *Species at Risk Act* ([www.sararegistry.gc.ca](http://www.sararegistry.gc.ca)). If you have questions regarding this Operational Statement, please contact the DFO office in your area (see Manitoba DFO office list).

We ask that you notify DFO, preferably 10 working days before starting your work by filling out and sending the Manitoba Operational Statement notification form ([www.dfo-mpo.gc.ca/regions/central/habitat/os-ao/prov-terr/index\\_e.htm](http://www.dfo-mpo.gc.ca/regions/central/habitat/os-ao/prov-terr/index_e.htm)) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

## Measures to Protect Fish and Fish Habitat when Constructing Overhead Lines

1. Installing overhead lines under frozen conditions is preferable in all situations. On wet terrains (e.g., bogs), lines should be installed under frozen conditions, where possible, or using aerial methods (i.e., helicopter).
2. Design and construct approaches so that they are perpendicular to the watercourse wherever possible to minimize loss or disturbance to riparian vegetation.
3. Avoid building structures on meander bends, braided streams, alluvial fans, active floodplains or any other area that is inherently unstable and may result in erosion and scouring of the stream bed or overhead line structures.
  - 3.1. Wherever possible, locate all temporary or permanent structures, such as poles, sufficiently above the HWM to prevent erosion.
4. While this Operational Statement does not cover the clearing of riparian vegetation, the removal of select plants may be necessary to accommodate the overhead line. This removal should be kept to a minimum and within the road or utility right-of-way.
5. Machinery fording the watercourse to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and should occur only if an existing crossing at another location is not available or practical to use. A *Temporary Stream Crossing Operational Statement* is also available.
  - 5.1. If minor rutting is likely to occur, stream bank and bed protection methods (e.g., swamp mats, pads)

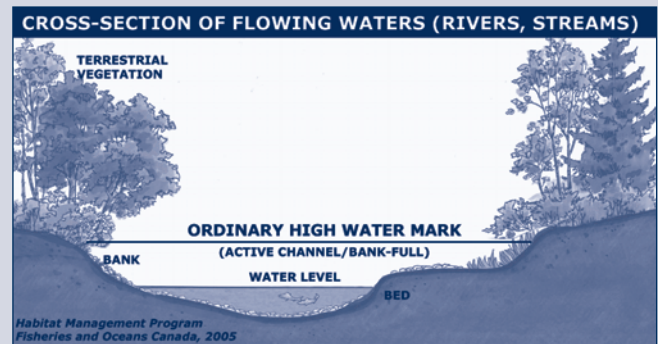
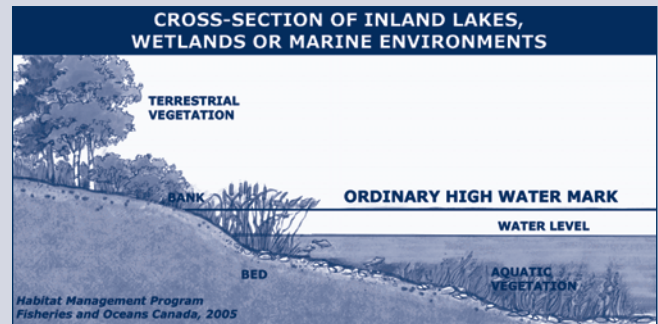
should be used provided they do not constrict flows or block fish passage.

- 5.2. Grading of the stream banks for the approaches should not occur.
  - 5.3. If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation is likely to occur as a result of equipment fording, then a temporary crossing structure or other practice should be used to protect these areas.
  - 5.4. Time the one-time fording to prevent disruption to sensitive fish life stages by adhering to appropriate fisheries timing windows (see the *Manitoba In-Water Construction Timing Windows*).
  - 5.5. Fording should occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.
6. Operate machinery on land and in a manner that minimizes disturbance to the banks of the watercourse.
- 6.1. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.
  - 6.2. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent any deleterious substance from entering the water.
  - 6.3. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.
  - 6.4. Restore banks to original condition if any disturbance occurs.
7. Install effective sediment and erosion control measures before starting work to prevent entry of sediment into the watercourse. Inspect them regularly during the course of construction and make all necessary repairs if any damage occurs.
- 7.1. Avoid work during wet, rainy conditions or use alternative techniques such as aerial methods (i.e., helicopter) to install overhead lines.
8. Stabilize any waste materials removed from the work site to prevent them from entering the watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with grass or shrubs.
9. Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
- 9.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

**Definition:**

**Ordinary high water mark (HWM)** – The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the “active

channel/bank-full level” which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments it refers to those parts of the water body bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (Full Supply Level).



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# TEMPORARY STREAM CROSSING

Fisheries and Oceans Canada  
Manitoba Operational Statement

Version 1.0

A temporary stream crossing consists of i) a one-time ford in flowing waters, ii) a seasonally dry streambed ford, or iii) a temporary bridge (e.g., Bailey bridge or log stringer bridge). Temporary stream crossings are employed for short term access across a watercourse by construction vehicles when an existing crossing is not available or practical to use. They are not intended for prolonged use (e.g., forest or mining haul roads). The use of temporary bridges or dry fording is preferred over fording in flowing waters due to the reduced risk of damaging the bed and banks of the watercourse and downstream sedimentation caused by vehicles. Separate Operational Statements are available for *Ice Bridges and Snow Fills* used for temporary access during the winter and for non-temporary *Clear Span Bridges*.

The risks to fish and fish habitat associated with temporary stream crossings include the potential for direct harm to stream banks and beds, release of excessive sediments and other deleterious substances (e.g., fuel, oil leaks), loss of riparian habitat and disruption to sensitive fish life stages.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to incorporate into your project in order to avoid negative impacts to fish habitat. You may proceed with your temporary stream crossing project without a DFO review when you meet the following conditions:

- the bridge is no greater than one lane in width, and no part of its structure is placed within the wetted portion of the stream,
- the work does not include realigning the watercourse,
- for fording in flowing waters and temporary bridges, the channel width at the crossing site is no greater than 5 metres from ordinary high water mark to ordinary high water mark (HWM) (see definition below),
- disturbance to riparian vegetation is minimized,
- the work does not involve dredging, infilling, grading or excavating the bed or bank of the watercourse,
- all crossing materials will be removed prior to the spring freshet, or immediately following project completion if this occurs earlier,

- fording involves a one time event (over and back) and will not occur in areas that are known fish spawning sites,
- the crossing will not result in erosion and sedimentation of the stream, or alteration (e.g., compaction or rutting) of the bed and bank substrates,
- the crossing does not involve installation of a temporary culvert, and
- you incorporate the *Measures to Protect Fish and Fish Habitat when Carrying Out a Temporary Stream Crossing* listed below.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact the DFO office in your area if you wish to obtain DFO's opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

**You are required to respect all municipal, provincial and federal legislation that applies to the work being carried out in relation to this Operational Statement.** The activities undertaken in this Operational Statement must also comply with the *Species at Risk Act* (SARA) ([www.sararegistry.gc.ca](http://www.sararegistry.gc.ca)). If you have questions regarding this Operational Statement, please contact the DFO office in your area (see Manitoba DFO office list).

We ask that you notify DFO, preferably 10 working days before starting your work, by filling out and sending the Manitoba Operational Statement notification form ([www.dfo-mpo.gc.ca/regions/central/habitat/os-ao/prov-terr/index\\_e.htm](http://www.dfo-mpo.gc.ca/regions/central/habitat/os-ao/prov-terr/index_e.htm)) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

## Measures to Protect Fish and Fish Habitat when Carrying Out a Temporary Stream Crossing

1. Use existing trails, roads or cut lines wherever possible, as access routes to avoid disturbance to the riparian vegetation.
2. Locate crossings at straight sections of the stream, perpendicular to the bank, whenever possible. Avoid crossing on meander bends, braided streams, alluvial

fans, or any other area that is inherently unstable and may result in the erosion and scouring of the stream bed.

3. While this Operational Statement does not cover the clearing of riparian vegetation, the removal of select plants may be necessary to access the construction site. This removal should be kept to a minimum and within the road or utility right-of-way. When practicable, prune or top the vegetation instead of uprooting.
4. Generally, there are no restrictions on timing for the construction of bridge structures or fording seasonally dry streambeds, as they do not involve in-water work. However, if there are any activities with the potential to disrupt sensitive fish life stages (e.g., fording of the watercourse by machinery) these should adhere to appropriate fisheries timing windows (see the *Manitoba In-Water Construction Timing Windows*).
5. Machinery fording a flowing watercourse to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and is to occur only if an existing crossing at another location is not available or practical to use.
  - 5.1. If minor rutting is likely to occur, stream bank and bed protection methods (e.g., swamp mats, pads) should be used, provided they do not constrict flows or block fish passage.
  - 5.2. Grading of the stream banks for the approaches should not occur.
  - 5.3. If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation are likely to occur as a result of equipment fording, then a temporary bridge should be used in order to protect these areas.
  - 5.4. The one-time fording should adhere to fisheries timing windows (see Measure 4).
  - 5.5. Fording should occur under low flow conditions, and not when flows are elevated due to local rain events or seasonal flooding.
6. Install effective sediment and erosion control measures before starting work to prevent the entry of sediment into the watercourse. Inspect them regularly during the course of construction and make all necessary repairs if any damage occurs.
7. For temporary bridges also employ the following measures:
  - 7.1. Use only clean materials (e.g., rock or coarse gravel fill, wood, or steel) for approaches to the bridge (i.e., not sand, clay or organic soil) and install in a manner that avoids erosion and sedimentation.
  - 7.2. Design temporary bridges to accommodate any expected high flows of the watercourse during the construction period.
  - 7.3. Restore the bank and substrate to pre-construction condition.
  - 7.4. Completely remove all materials used in the construction of the temporary bridge from the watercourse following the equipment crossing, and stabilize and re-vegetate the banks.

8. Operate machinery in a manner that minimizes disturbance to the watercourse bed and banks.
  - 8.1. Protect entrances at machinery access points (e.g., using swamp mats) and establish single site entry and exit.
  - 8.2. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.
  - 8.3. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent deleterious substances from entering the water.
  - 8.4. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.
9. Stabilize any waste materials removed from the work site, above the HWM, to prevent them from entering any watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with preferably native grass or shrubs.
10. Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent soil erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
  - 10.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

**Definition:**

**Ordinary high water mark (HWM)** - The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the "active channel/bank-full level" which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments it refers to those parts of the water body bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (Full Supply Level).

## FISHERIES AND OCEANS CANADA OFFICES IN MANITOBA

### Winnipeg Office

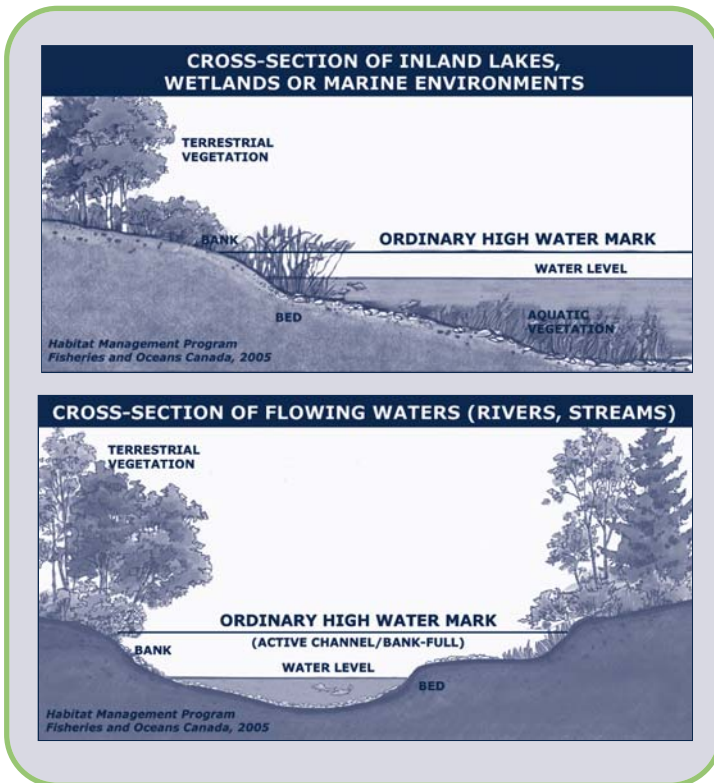
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# MANITOBA STREAM CROSSING GUIDELINES FOR THE PROTECTION OF FISH AND FISH HABITAT

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Fisheries  
and Oceans

Pêches  
et Océans

May, 1996

Manitoba  
Natural Resources  
Albert Driedger  
Minister



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### 2.8 Temporary Crossings

Temporary crossings can be very practical during short-term forestry and mineral explorations, transmission line and pipeline construction, or for use while a permanent crossing is under construction. Although they are only used on a short-term basis,

temporary crossings should be constructed using the same general guidelines for fish habitat protection as permanent crossings. Examples of temporary crossings include fords, summer crossings, and ice bridges.

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#### **Fords**

Fords are temporary or permanent stream crossings that allow vehicles to drive directly through a watercourse. They are formed by lowering the road grade to the stream bed level from bank to bank. Fording is only recommended with the appropriate fish habitat protection measures as described below.

- Construct and use fords during the driest time of year and when there will be infrequent traffic.
  - Ensure that fords will not be used during fish spawning, incubation, or migration periods. Choose fording areas that are well away from spawning and nursery areas.
  - Seek fording sites with low, stable approaches and a firm stream bed of rock or coarse gravel.
  - Select an area with a natural water depth of less than 100 cm but maintain a minimum water depth of 20 cm to allow fish passage.
- Minimize the area disturbed by building crossings that are perpendicular to the stream and not more than 10 m wide.
  - Prevent erosion by minimizing the amount of vegetation removed from the stream bed and banks.
  - Stabilize approaches if necessary with non-erodible material 15 m up the bank on both sides.
  - Log corduroy, coarse gravel, and rock fill can be used to improve the roadway through the stream.
  - Construction equipment and vehicles crossing the ford should be free of contaminants and leaks.
  - When the ford is no longer in use, any materials added to the stream bed should be removed and banks should be contoured to their original condition.

### ***Temporary Bridges and Culverts***

Temporary bridges and culverts are a viable alternative where fording is inappropriate. However, it is important to maintain the natural stream flow and prevent stream blockage. Temporary crossings can be made out of preconstructed standard components (i.e. Bailey bridge) or out of available metal, and logs.

Bailey bridges are patented bridges that are made into a variety of lengths out of standard components and then lowered into position. They should be used on low volume roads only.

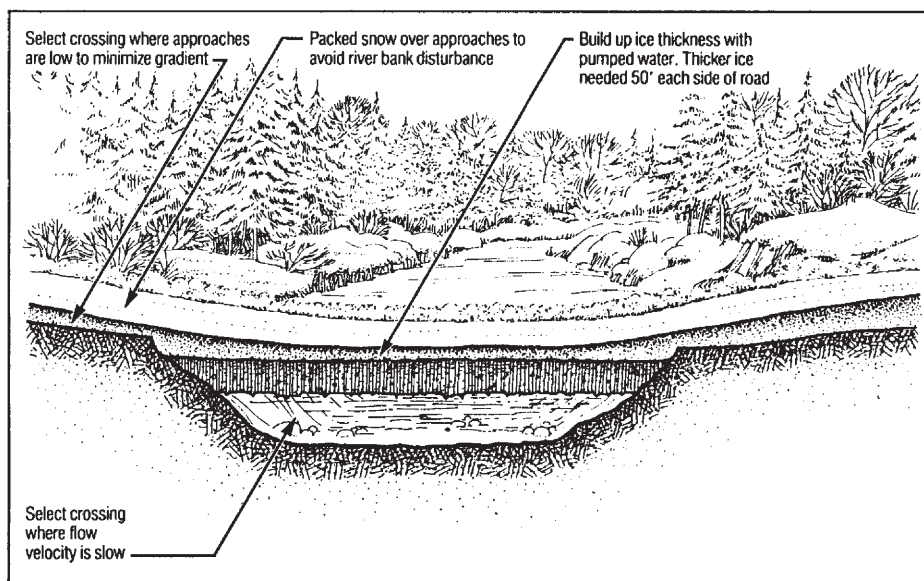
All temporary bridges and culverts should give due consideration to the protection of fish and fish habitat.

- Time the placement and removal of the bridge to avoid periods of high fish movement.
- Temporary bridges and culverts are not intended to survive extreme floods so it is acceptable that they span just above normal water level.
- Culverts and bridges should be sized to accommodate flows expected during the period of use and to provide for fish passage.
- Ensure that there are sufficient openings for fish and water to pass and to prevent excessive water backup.
- When the temporary bridge or culvert is no longer required it should be removed and the site should be restored to its original condition.
- When logs are used to create temporary bridges, the logs should be delimbed. Untreated log poles are acceptable for temporary bridges. Chain logs together on the ends for stability and to facilitate removal of the logs when the temporary bridge is no longer required.
- If material such as gravel is used to fill in gaps between planking on the bridge deck, it should be held in place and separated from the decking by geotextile fabric or a natural mat. This will allow fill material to be removed when the bridge is eventually dismantled without adding excessive sediment to the stream.

**Ice Bridges**

Ice bridges are temporary crossings constructed of ice, snow, and logs for reinforcement.

- Locate ice bridges where the winter stream flow is slow.
- Minimize disturbance by locating ice bridges at an area that requires the minimum approach grading and the shortest crossing route.
- Avoid using debris as reinforcement material, to prevent downstream siltation problems during spring break up.
- Ensure that any logs used for reinforcement are clean, delimbed, and placed on the surface of the ice. Chain logs together to facilitate removal.
- Prevent spring ice jams and flooding by removing any reinforcement logs and cutting a V-shaped notch into the middle of the ice bridge before thaw begins.



*Ice bridge - temporary water crossing for winter access. Source: OMNR (1990).*

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