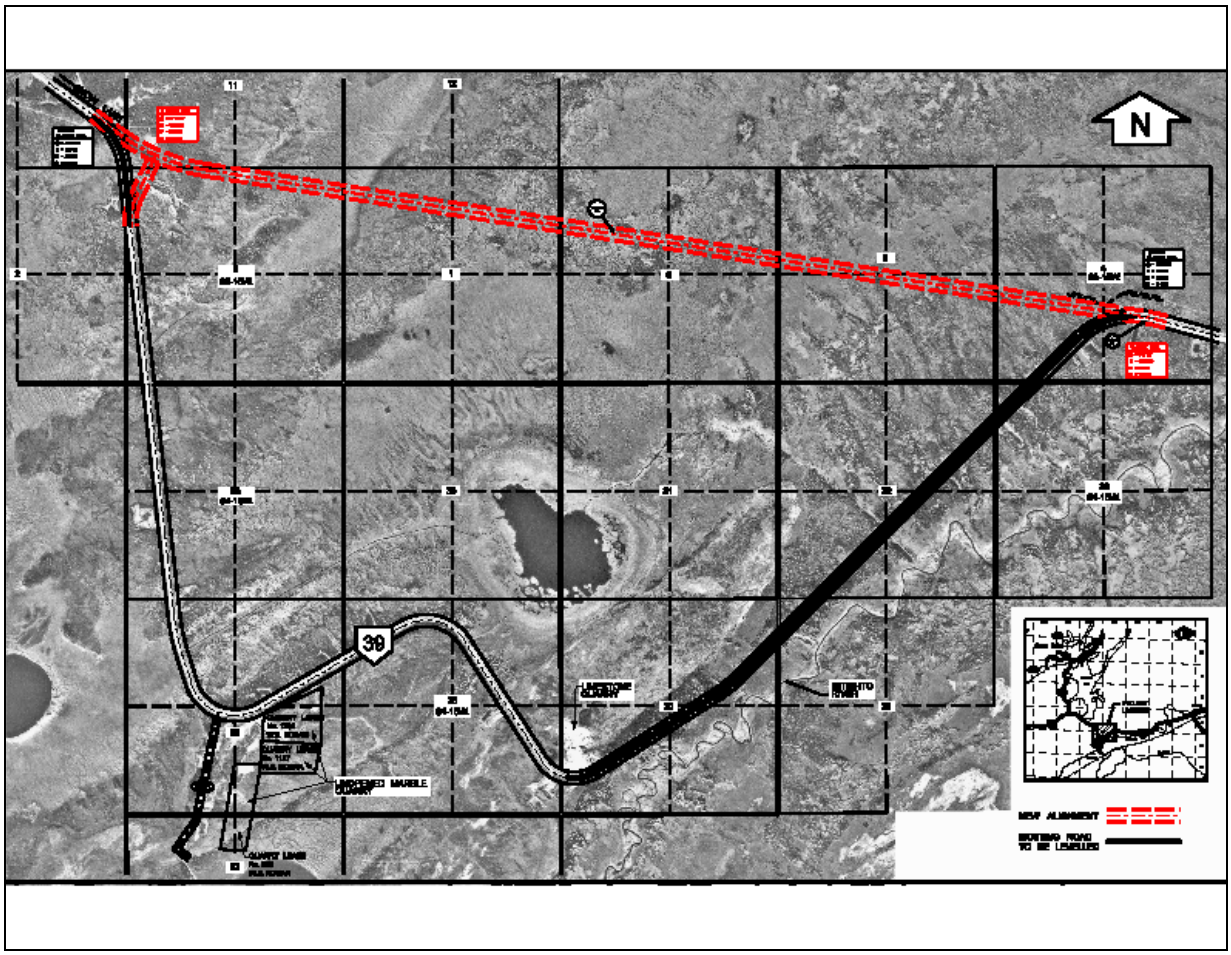
MANITOBA ENVIRONMENT ACT PROPOSAL

PROPOSED UPGRADING OF:

PROVINCIAL TRUNK HIGHWAY (PTH) 39

(FROM 6 KM WEST OF PROVINCIAL ROAD 596 TO 10.0 KM EAST OF PROVINCIAL ROAD 596)



Manitoba Infrastructure and Transportation

Highway Planning and Design Branch

October 2013

Manitoba

Proposed Upgrading of Provincial Trunk Highway 39

Manitoba Environment Act Proposal

Submitted to:

Manitoba Conservation and Water Stewardship

Environmental Approvals Branch

Submitted by:

Manitoba Infrastructure and Transportation

Highway Planning and Design Branch

1420-215 Garry Street,

Winnipeg, Manitoba,

R3C 3P3

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Executive Summary

Manitoba Infrastructure and Transportation (MIT) is planning to relocate a section of Provincial Trunk Highway (PTH) 39 from 6.0 km west of Provincial Road (PR) 596 to 10.0 km east of the same PR. The proposed work consists of constructing approximately 8.6 km of new roadway on a new location.

The roadway will be constructed within a proposed 91.44 m (300 ft.) right-of-way with material excavated from within this right-of-way, borrow areas and/or with quarried rock.

The embankment will be constructed to accommodate a 9.0 m wide bituminous surface, 1.7 m gravel shoulders and grade slopes of approximately 4:1.

Existing drainage patterns will be retained to the extent possible.

A decommissioning plan is currently being developed for the existing portion of PTH 39 and currently involves abandoning and revesting approximately 3.3 km of the existing highway. The existing west arm of PTH 39 is expected to become an extension of PR 596 while the east arm of PTH 39 will be retained by MIT as a departmental road in an unorganized territory. The abandoned section of PTH 39 will be closed, leveled and appropriately seeded to encourage natural vegetation to re-establish.

Because the project involves the construction of a section of new two-lane road on a new location, it is subject to Licensing under *The Environment Act*.

Taking into consideration the scope of the project, associated environmental issues and suggested appropriate mitigation measures, MIT is of the opinion that implementation of this project is not likely to cause significant environmental effects.

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1.0 Introduction and Background

Manitoba Infrastructure and Transportation is planning to upgrade and relocate a section of Provincial Trunk Highway 39 from 6.0 km west of Provincial Road (PR) 596 to 10.0 km east of PR 596. The project includes construction of 8.6 km of a two lane road on a new location. The project is considered a Class II development under the *Classes of Development Regulation 164/88* and will require a License pursuant to Manitoba's *The Environment Act C.C.S.M. c. E125*. The following includes a review of the proposed development and assessment of its potential effects as outlined under the Environment Act Proposal Report Guidelines published by Manitoba Conservation and Water Stewardship's Environmental Approvals Branch.

1.1 Need and Rationale for Development

Provincial Trunk Highway (PTH) 39 serves as an important east-west route linking PTH 6 and PTH 10 and is approximately 164 km in length. The Average Annual Daily Traffic (AADT) for PTH 39 is 170 vehicles with roughly 14% consisting of Truck/Transport and the remainder consisting of commuter traffic. Traffic projections indicate that AADT is expected to increase to 275 vehicles by 2023 (MIT 2003). The projections are based on an estimated growth rate of 1.5% that doesn't take into account potential developments in nearby communities such as Snow Lake which could influence increases that are unpredictable at this time. PTH 39 itself is classified as a Primary Arterial route which generally consists of two 3.7 m lanes, a paved shoulder width of 1.0 m, a posted design speed of 100 km/h, and an average Right of Way (ROW) width of 91.44 m.

The portion of PTH 39 to be re-constructed consists of a "W" shaped road configuration extending roughly 6.0 km west and 10 km east of PR 596 as shown on Figures 1 and 2. Figure 1 identifies the general location of the project area while Figure 2 shows the existing PTH 39 "W" alignment. Previous studies (MIT 2003) indicate that the portion of PTH 39 to be re-constructed does not meet current departmental design standards and has a number of potential safety hazards that may impact the travelling public. For example, the "W" shaped configuration includes substandard shoulder widths, five sharp horizontal curves which do not meet current geometric design criteria resulting in a lower posted speed limit of 70 km/h (i.e. as opposed to the 100 km/h posted speed limit for the remainder of PTH 39), and a geometrically substandard alignment of the existing intersection with PR 596 which falls on a curve. Potential safety hazards for the travelling public along this section of PTH 39 include steep side slopes that reduce the ability of a vehicle leaving the road surface to recover, non-existent rounding/transition from the existing shoulders to the roadside ditch slope, and unprotected culverts situated throughout the extent of this section of road.

The relocation and reconstruction of this section of PTH 39 meets a number of inter-related goals intended to benefit the travelling public in Manitoba. This includes correcting substandard road conditions in order to meet current departmental design standards and elimination of potential safety hazards for road users. The project will also contribute to enhancing the general

efficiency of the Provincial Highway network by ensuring a more consistent speed and improved travel times along PTH 39.

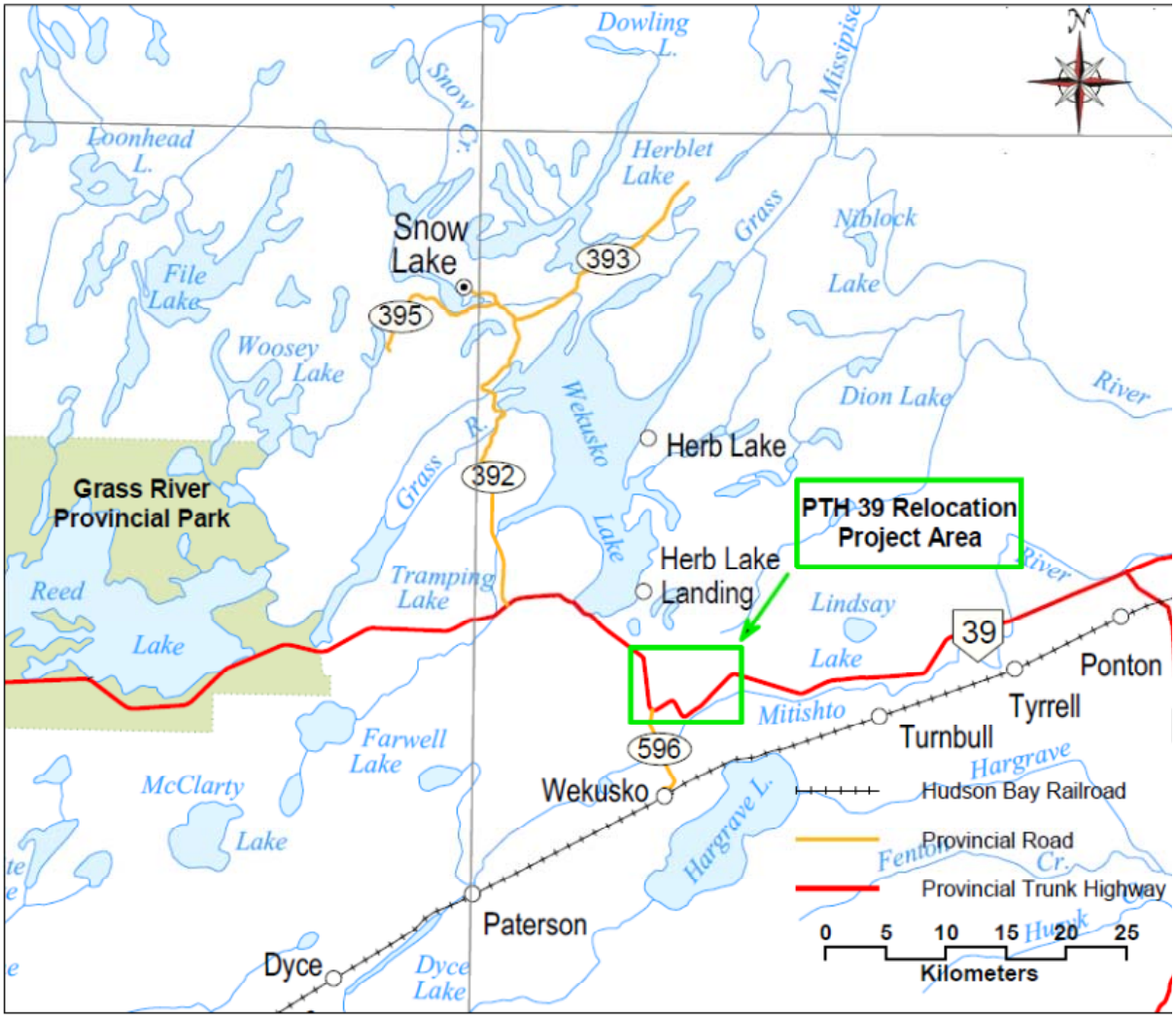

Figure 1: PTH 39 Relocation General Project Area

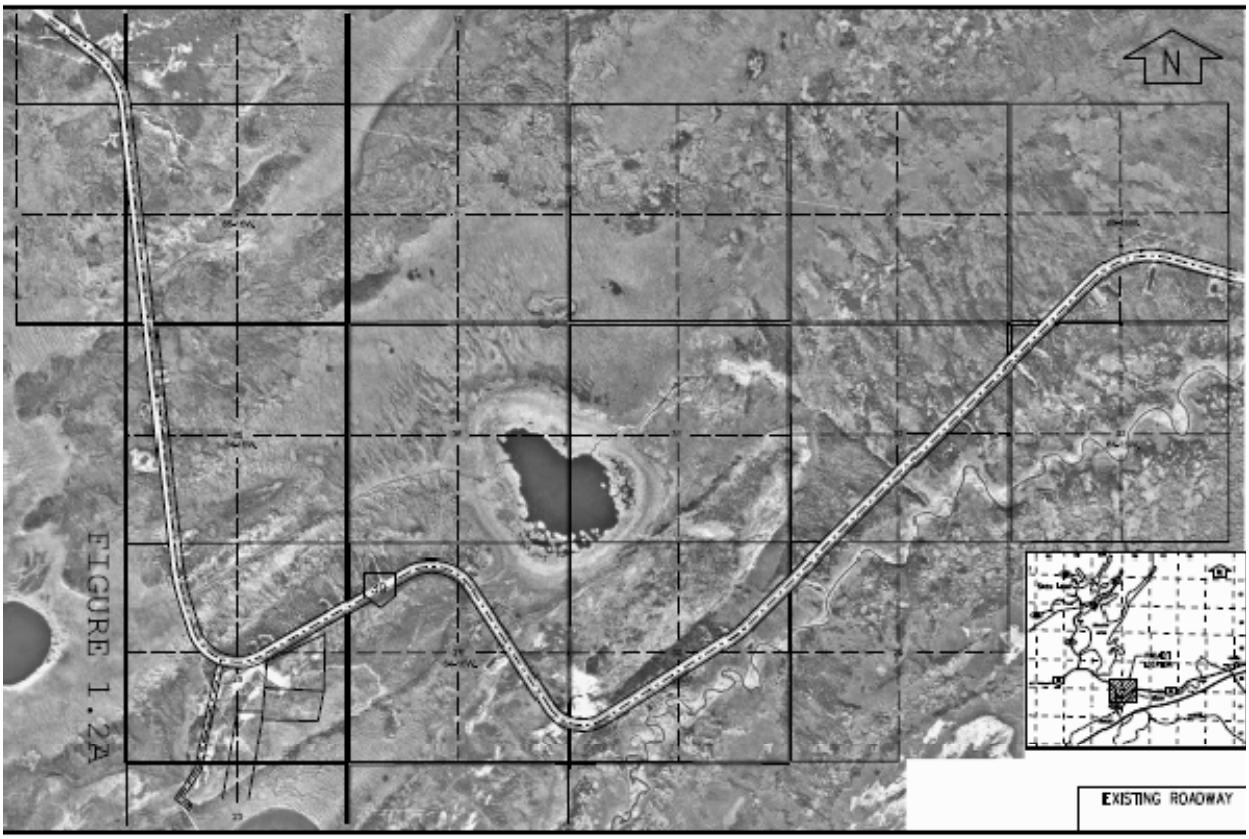

Figure 2: Existing PTH 39 "W" Alignment to be Relocated

1.2 Alternatives Considered

In 2003 MIT undertook a Functional Design Study to review the existing alignment of the section of PTH 39 currently proposed for reconstruction/relocation. The purpose of the Functional Design Study was to identify potential alternatives to rectify the current substandard conditions and recommend a preferred alignment. The evaluation of alternatives and selection of a preferred option was based on consideration of engineering, environmental and socio-economic factors. Four design alternatives were considered and are as follows:

Option One (Figure 3):

- Leave the two existing 582 m radius curves at the west and east ends of the project, widen the road shoulders, realign the substandard curves in the middle of the project area converting the “W” configuration into a “U” shape, and install a bituminous surface.

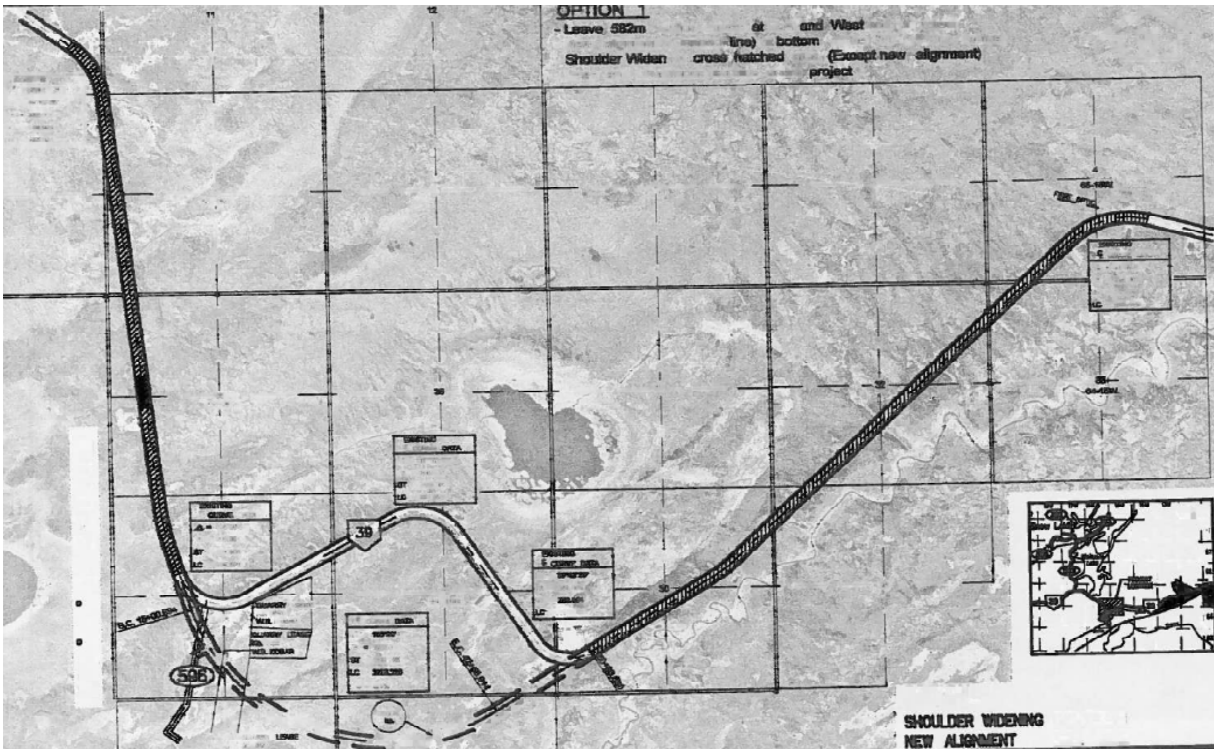

Figure 3: Option One

Option Two (Figure 4):

- Reconstruct the 582 m curves located at both the east and west ends of the project to a 750 m radius bringing them up to geometric standards; re-align the substandard curves in the middle of the project area converting the “W” configuration into a “U” shape, and widen the shoulders and install a bituminous surface.

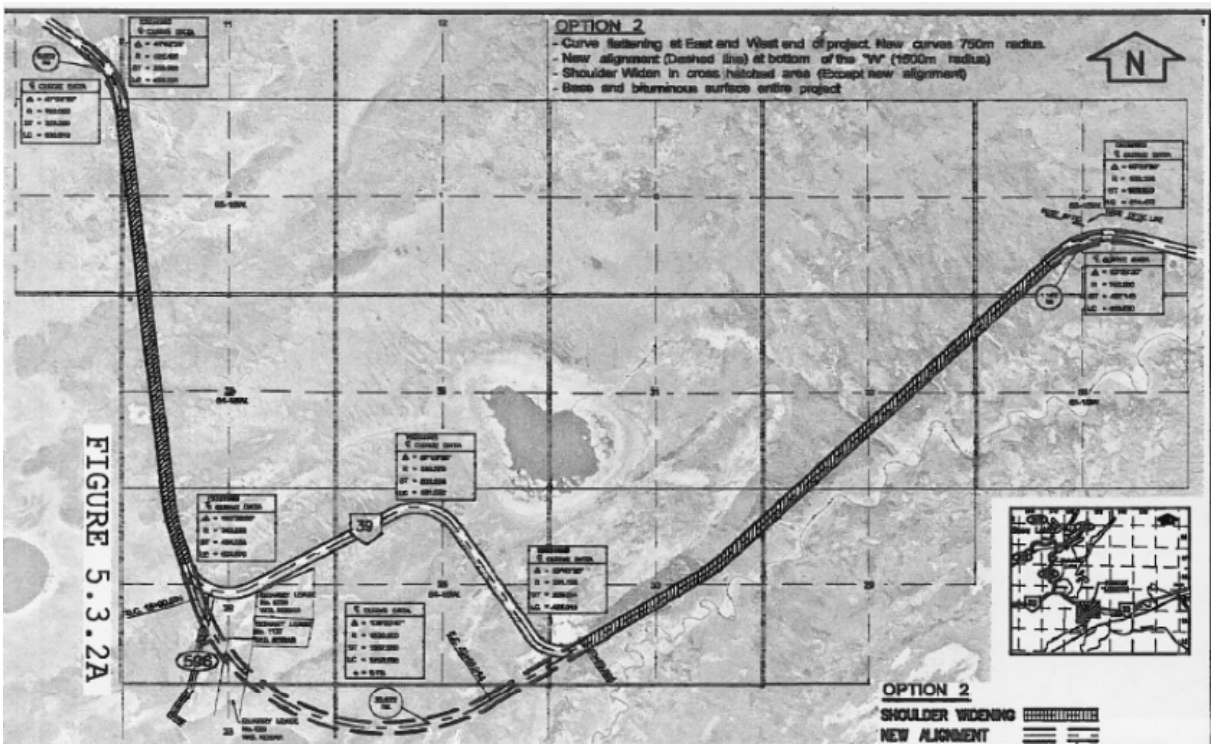

Figure 4: Option Two

Option Three (Figure 5):

- Realign and straighten PTH 39 across the top of the “W” configuration through the construction of new road which meets current design standards.

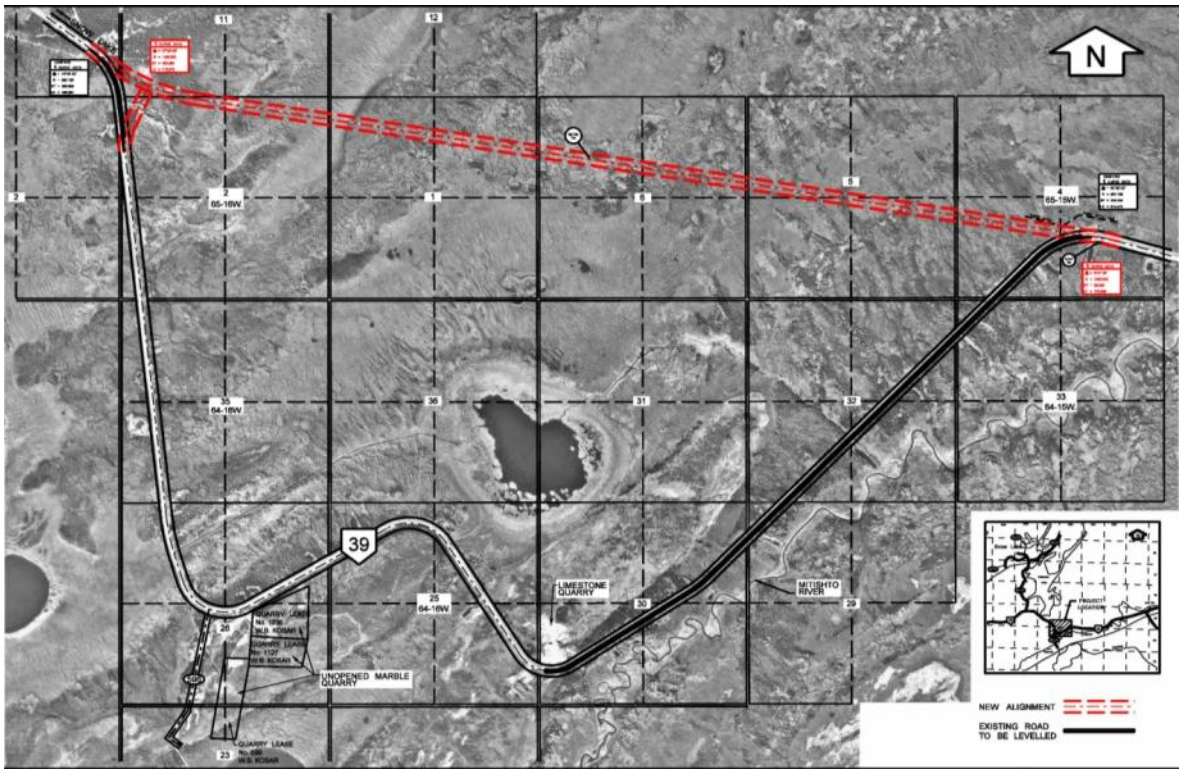

Figure 5: Option Three

Option Four (Figure 6):

- Flatten the curves at both the east and west limits of the project to an 800 m radius, change the existing “W” configuration of a flat bottomed “U” shape , widen existing shoulders, install a bituminous surface, and construct a new intersection at PR 596.

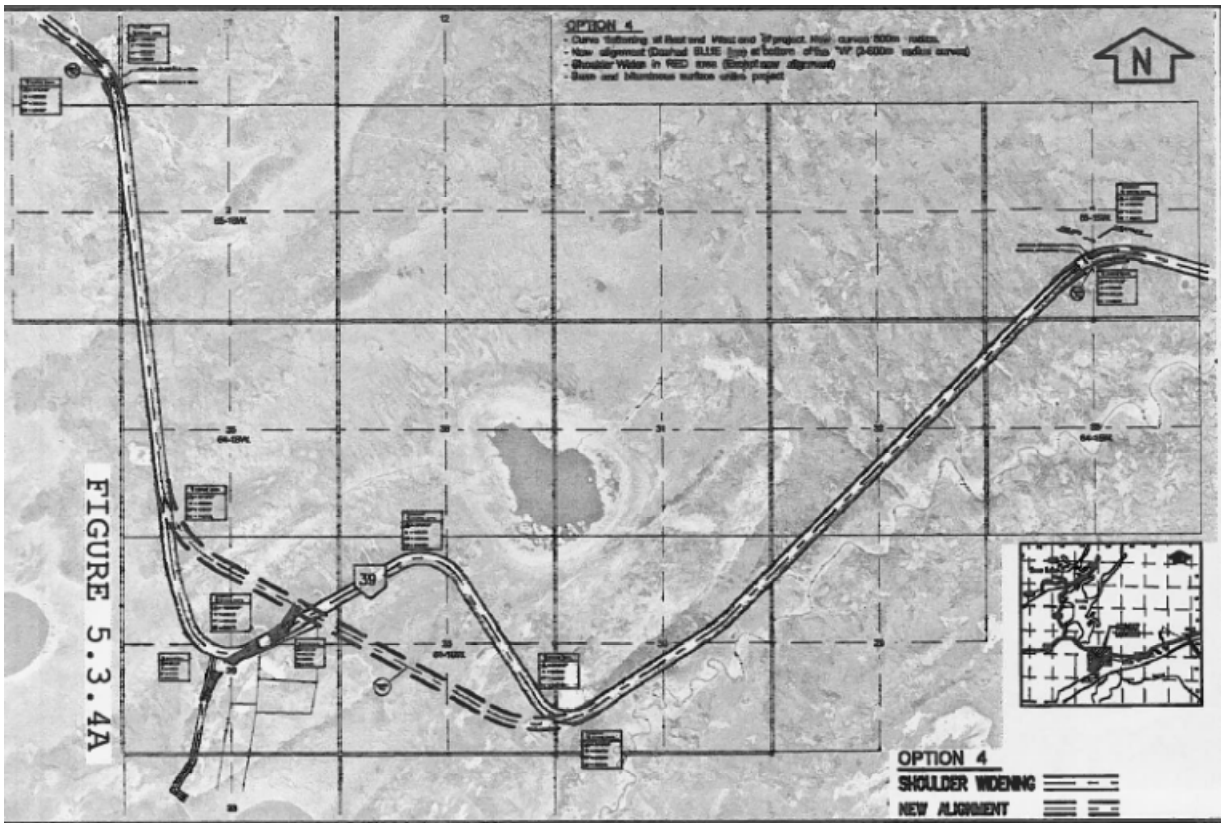

Figure 6: Option Four

The evaluation of alternatives for the relocation of PTH 39 from 6.0 km west and 10 km east of PR 596 was based on consideration of engineering, socio-economic and environmental criteria. Table 1 provides a summary of the evaluation criteria employed for the alternatives analysis.

Table 1: Summary of Alternative Evaluation Criteria

Engineering Criteria	Socio-Economic Criteria	Environmental Criteria
Lowest construction costs	Provides better access to communities	Minimizes loss of wildlife habitat
New (ROW) land to be acquired	Safest for motoring public	Minimizes impact on natural watercourses
Lowest maintenance costs	Provides access for stakeholders	Potential to disrupt drainage patterns
Maximizes safety	Shortest route (gas savings)	Minimizes borrow requirements (vol./land area)
Meets geometric design criteria		
Improves traffic efficiency		
Compatible with future highway facilities		
Best construction staging potential		
Reduces PTH length		
Better truck/hazardous goods route		

(Source: adapted from MIT 2003)

Option Three emerged as the preferred alignment based on the outcome of the alternatives evaluation. Each of the four options were assessed and a weighted mean applied to the criteria set out in Table 1. In general, Option Three was ranked higher than all others based on engineering considerations with exception of the need to acquire new land. Because option three supports a new alignment the greatest amount of land would need to be acquired for the ROW. Outcomes of the socio-economic criteria were more varied. For example, Option Three generally provides similar or better access to communities than the other options considered in the evaluation. However, Option Three did not appear to provide the same equitable level of access to those whose interests are adjacent, or in close proximity to the existing road alignment (quarry lease holders for example). Option Three outranked all others in terms of safety (i.e. highest safety rating for motorists) and travel distance making it more efficient. A shorter route also supports potential gas savings for the travelling public along this section of PTH 39. The results of the alternatives evaluation against environmental criteria had similarly varied outcomes with respect to option three. Generally speaking, Option Three ranked the same as, or slightly worse than the other options based on environmental considerations due to the need for developing new land. That said, Option Three outranked all others (i.e. more

favorable) with respect to potential disruptions on drainage patterns within the project area. A higher ranking here stems from the fact that Option Three crosses some bog terrain requiring equalization culverts as opposed to multiple culvert replacements and new installations along some variation of the existing alignment in order to retain drainage (i.e. Options One, Two, and Four).

Table 2 summarizes the outcome of the alternatives analysis. A detailed review of the alternative analysis and evaluation can be found in the PTH 39 Functional Design Study (MIT 2003) included as Appendix A. Although there is some variability with respect to the ranking of options with regard to the socio-economic and environmental criteria, Option Three was ultimately selected as the preferred alignment based on enhanced safety benefits to motorists as well as lower construction and maintenance costs.

Table 2: Summary Output of Alternatives Analysis

Summary Criteria	Rating Factor	Option 1	Option 2	Option 3	Option 4
Engineering Criteria	57%	79	84	151	91
Socio-economic Criteria	21%	35	35	49	23
Environmental Criteria	22%	44	44	38	38
Overall Rating	***100%***	***158***	***163***	***238***	***152***

(Source: MIT 2003)

2.0 Description of Proposed Development

The relocation of PTH 39 from 6.0 km west to 10 km east of PR 596 (Project) generally consists of:

- Construction of approximately 8.6 km of new roadway on a new location within a 91.44 m (300 ft.) right-of-way;
- PTH 39 will be relocated across of the existing “W” configuration as shown on Figure 5;
- Relocation and reconstruction of the PTH 39 intersection with PR 596 in order to accommodate the geometry of the new road alignment and bring it up to current departmental standards;
- The base width of the new roadway embankment will be approximately 17.3 m with 4:1 side slopes. The road top surface will be 13.4 m wide and consist of two 3.7 m travel lanes, 2.5 m shoulders and a 0.5 m shoulder edge treatment. The road embankment will be constructed out of suitable fill material sourced from local borrow areas. The structure

of the road surface itself will consist of a crushed limestone base course and bituminous paved surface. A typical cross section of the new road alignment is shown on Figure 7; and

- Installation of a 900 mm x 32 m through grade culvert at St. 52+00 to maintain existing drainage. Figure 8 shows a typical cross section of the new culvert location. Figure 9 provides a plan view locating the 900 mm x 32 m culvert along the new road alignment.

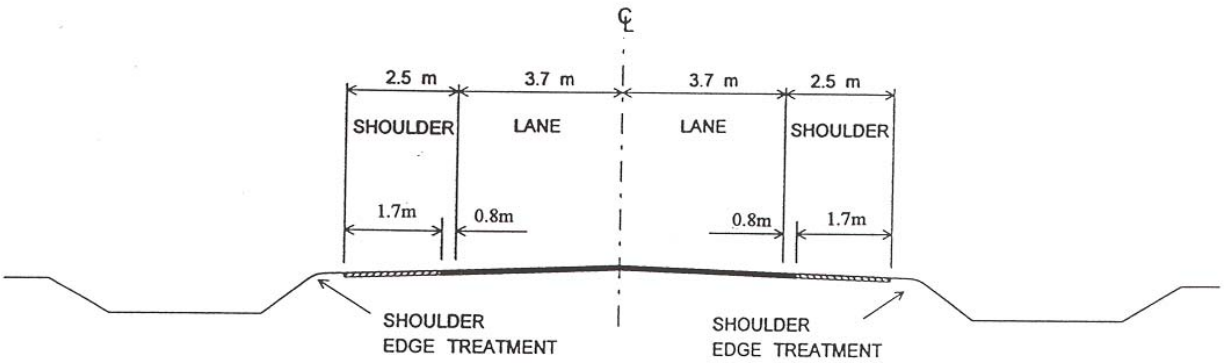

Figure 7: PTH 39 Relocation Typical Design Cross Section

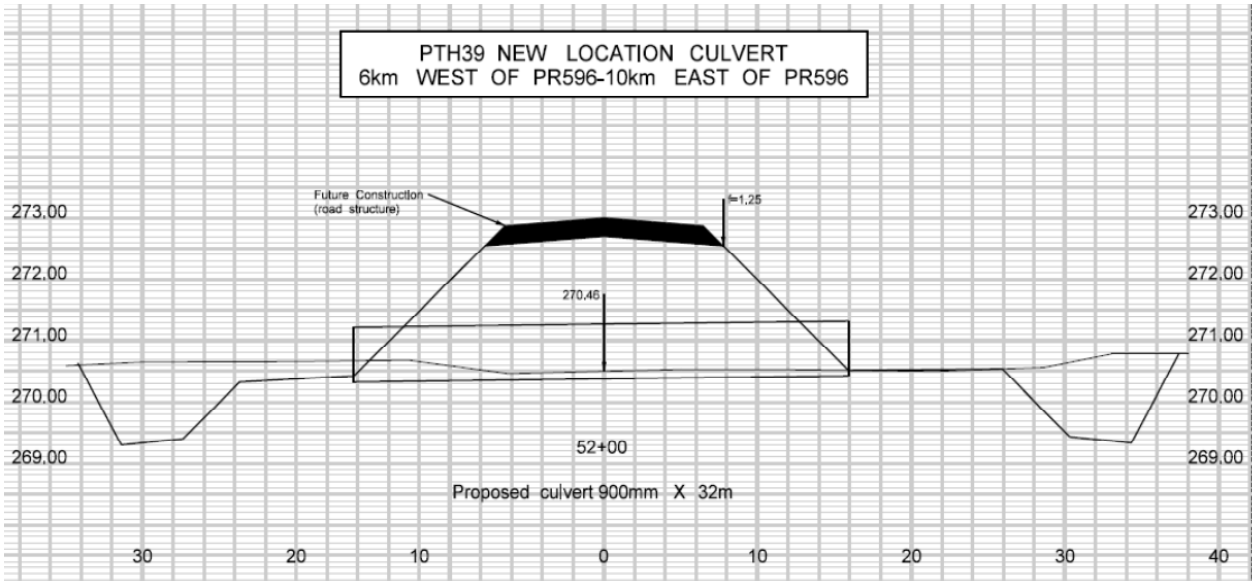

Figure 8: PTH 39 Relocation Typical Design Cross Section

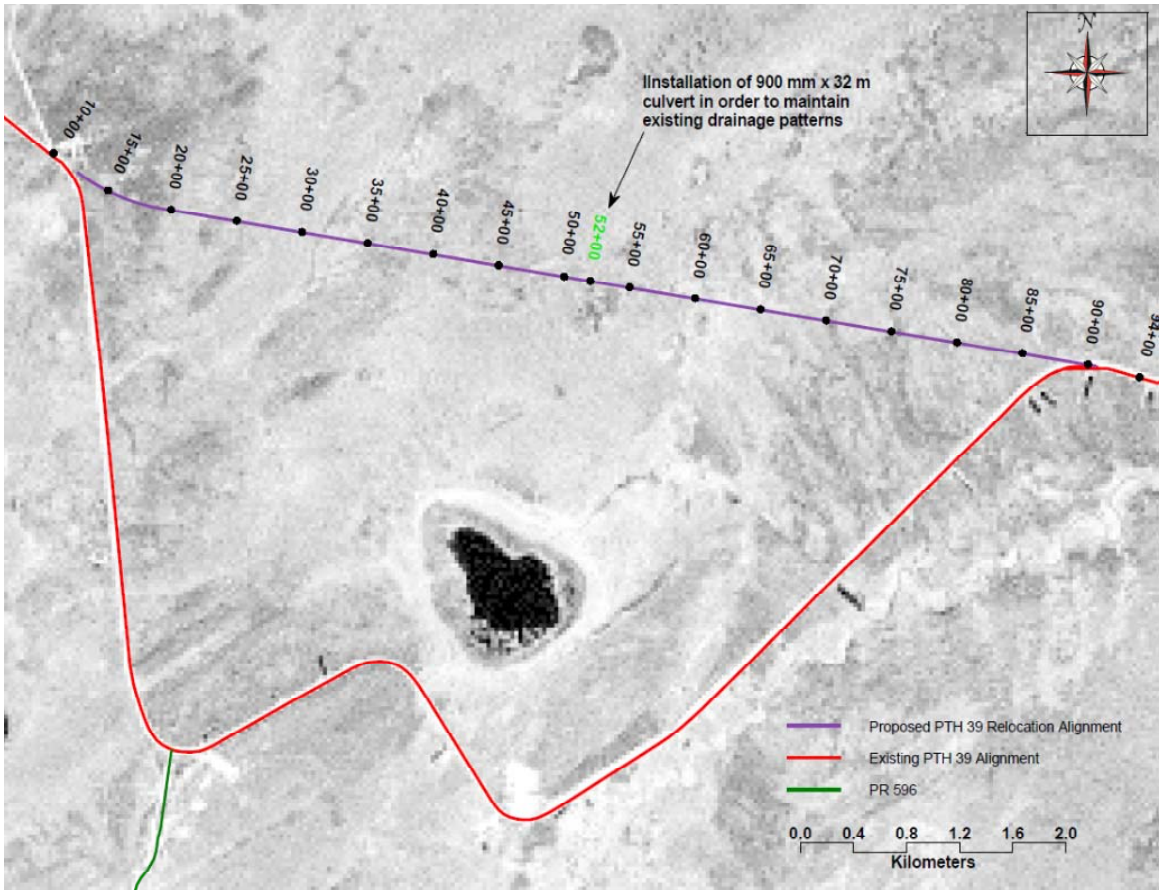

Figure 9: PTH 39 Relocation Culvert Installation

2.1 Project Activities

The Project includes a number of different activities which will occur at different stages during its development. The following sections highlight key activities that will take place during the Projects Construction, Operation, and Decommissioning stages.

2.1.1 Construction

The Construction phase of the Project includes the broadest array of different activities. Key activities associated with the construction of the relocated section of PTH 39 will generally include the following:

- Setting up laydown areas;
- Establishing temporary fuel storage areas;
- Setting up and operating temporary construction camps;
- ROW Clearing;
- Brushing and timber disposal;
- Grubbing;

- Quarrying/crushing rock;
- Constructing temporary access roads;
- Establishing borrow pits and associated access for sand, granular and fill material;
- Excavating, hauling and placing material for road bed/embankment construction;
- Slope work (Cuts and fills);
- Ditching;
- Installing culverts;
- Installing bituminous paved road surface;
- Revegetating;
- Installing erosion and sediment control measures; and
- Rehabilitating/restoring construction site.

2.1.2 Operation and Maintenance

Upon completion of construction the relocated section of PTH 39 will become part of Manitoba's Provincial Highway Network. Traffic flow on the highway will largely be attributable to the highway function as the main route between the two largest urban centers (The Pas and Thompson) in the area. The AADT for this road was estimated at 170 vehicles as of 2001 with a projected increase to 275 by 2023. Approximately 14% of traffic along this route is comprised of Trucks/Transports.

Regular and ongoing maintenance activities will be carried out by MIT in order to ensure the relocated section of PTH 39 meets departmental standards as a means to facilitate safe and reliable transportation for the travelling public. Key maintenance activities are as follows:

- Ice control via the application of road salt and/or sand and gravel as required;
- Snow clearing;
- Vegetation management which includes periodic mowing of grasses and brushing of woody vegetation within the ROW where required in order to maintain sightlines;
- Surface maintenance including periodic grading, asphalt patching, and crack repair;
- Periodic stabilization of road shoulders and embankments due to settlement/slumping;
- Periodic ditch cleanouts to ensure proper drainage; and
- Culvert maintenance activities including clearing plugged culverts and culvert replacement as required in the event of failure (i.e. collapse or washout etc.)

2.1.3 Decommissioning

Decommissioning of the relocated section of PTH 39 is not expected to occur in the foreseeable future. The Project intends to upgrade an existing section of PTH 39 (Figure 2) which does not meet current departmental standards. A decommissioning plan for the existing PTH 39 "W" alignment is under development. With access to PR 596 still necessary in order to service various stakeholders, MIT is currently considering maintaining the west portion of PTH 39

continuing onto PR 596 as either an access road or departmental road. This would mean leaving the west arm (4.7 km) of the existing PTH 39 in place in order to ensure PR 596 (8.3km) remains linked to the road network. The remaining 3.3 km at the bottom of the 'W' between the existing limestone quarry and PR 596 would be decommissioned and revested which includes removing access at both ends. The 3.3 km to be decommissioned roughly equates to 30 ha of land that would be reverted back to crown land. The 5.7 km of the east arm of the 'W' would also like to be kept and maintained at a minimal standard in order to maintain access to material from existing quarries for casual and other quarry permit holders.

For the portion of road being decommissioned and revested along the bottom of the existing "W" alignment key activities will include the following:

- Removal and appropriate disposal of the existing road asphalt surface;
- Removal and appropriate disposal of any corrugated steel culverts;
- Leveling the existing road embankment;
- Slope/landscape contouring in order to ensure maintenance of appropriate land drainage; and
- Revegetating disturbed areas within the existing ROW. Currently vegetation within the ROW has grown up to the existing road shoulders. A 50 m width has been assumed which encompasses the existing road embankment and ditches. Roughly 16.5 ha of land will be revegetated as part of the road decommissioning activities.

A generalized version of MIT's decommissioning plan is shown on Figure 10.

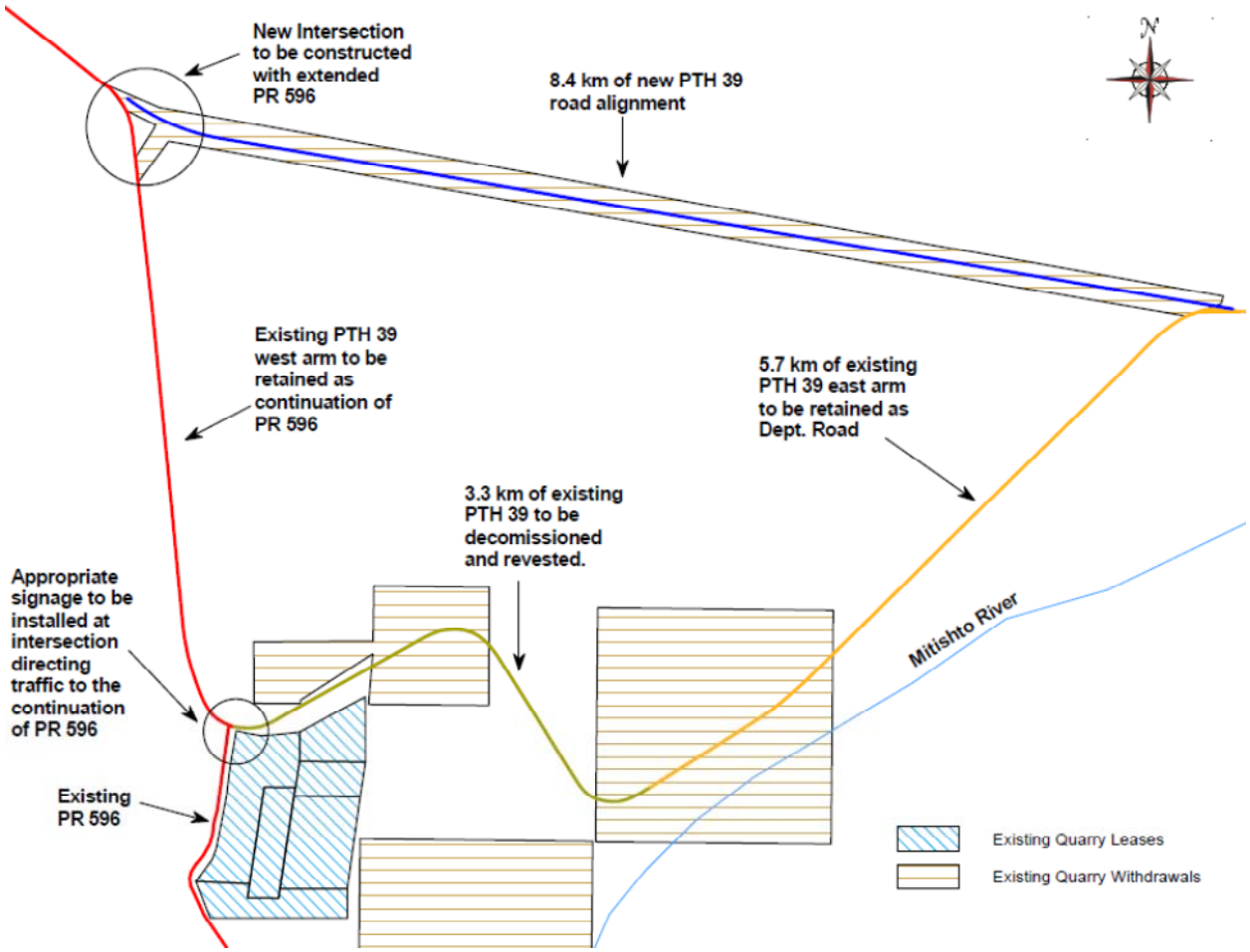

Figure 10: PTH 39 Relocation Generalized Decommissioning Plan

2.2 Property Ownership and Mineral Rights

The majority of the land that will accommodate the proposed road is Crown land. MIT is in the process of placing a Crown Lands Reservation on the lands necessary for the construction of the relocated of a section of PTH 39. The existing PTH 39 “W” alignment is managed and maintained by Manitoba Infrastructure and Transportation.

Review of existing information indicates that there are mineral rights related properties and dispositions present within close proximity to the project area. Figure 11 shows the mineral properties and dispositions present in close proximity to the section of PTH 39 to be realigned. MIT has placed a quarry withdrawal which encompasses the ROW along the proposed new road alignment. MIT also maintains three additional quarry withdrawal properties located along the existing section of road. Two of these properties are located each along the east and west

portions of the PTH 39 “W” alignment with a third situated a short distance south of the existing road.

Six privately held quarry leases are also present at the southern end of the western curve of the existing PTH “W” alignment. The six quarry leases are held by John B. Kobar (QL-699, QL-1127, QL-1236) and Mediterranean Marble Ltd. (QL-1727, QL-1728, QL-1729).

In addition to the items noted above seven mining claims located to the north, east, and south of the general project area were also noted as being present Six of the mining claims are held by Hudson Bay Exploration and Development Company Ltd. (claim nos. MB 2518, MB 263, MB 2551, MB 2554, MB 10034, MB 4088). The remaining mining claim (claim no. MB 9185) is held by William C. Hood.

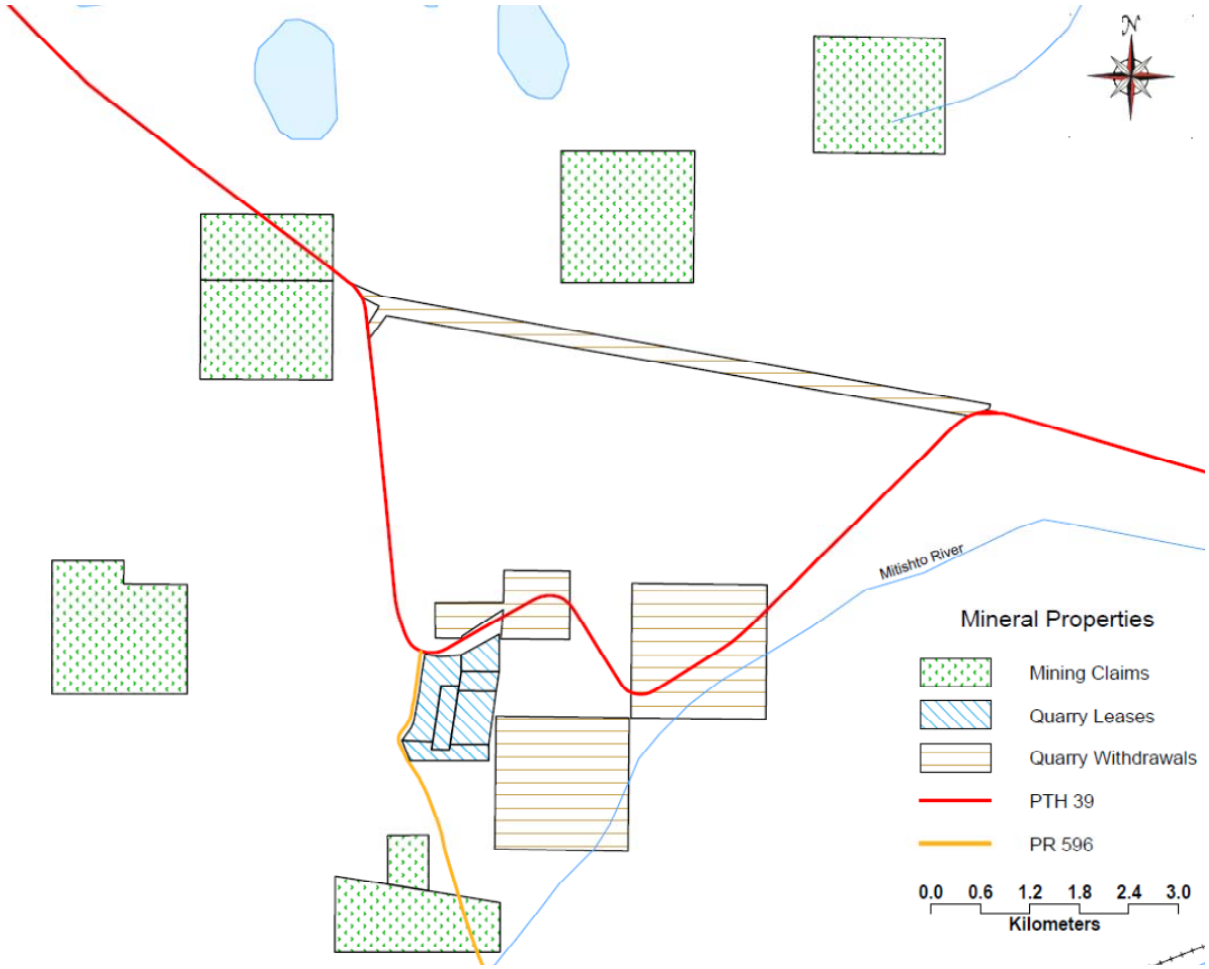

Figure 11: Mineral Properties within the General Vicinity of the PTH 39 Project Area

2.3 Existing Land Uses

The existing land use on the site and immediately adjacent to the proposed development is undeveloped and is under natural vegetation cover. Other land uses within the general project area have been identified. MTS Allstream maintains an easement to the north and parallel with the proposed alignment for the relocated section of PTH 39. The Hudson Bay Rail Road line is located just to the south and generally runs parallel to the existing PTH 39 alignment within the study area. As noted in Section 2.2 and shown on Figure 11 a number of mineral properties (leases, quarries, claims and withdrawals) were identified within the general project area and along the existing PTH 39 “W” alignment. MIT’s quarry withdrawal is the only mineral property that exists along the proposed PTH 39 “W” alignment as shown on Figure 11.

The project itself is located within the Herb Lake 15 Registered Trap Line Section. The general study area for the project includes four registered Trap Lines including RTL’s 29, 4, 1, and 32. Although four Trap Lines were identified the section of PTH 39 to be relocated is primarily situated within Trap Line 4 and 32. Figure 12 shows Trap Lines within the Herb Lake Registered Trap Line Section Located in close proximity to the Project.

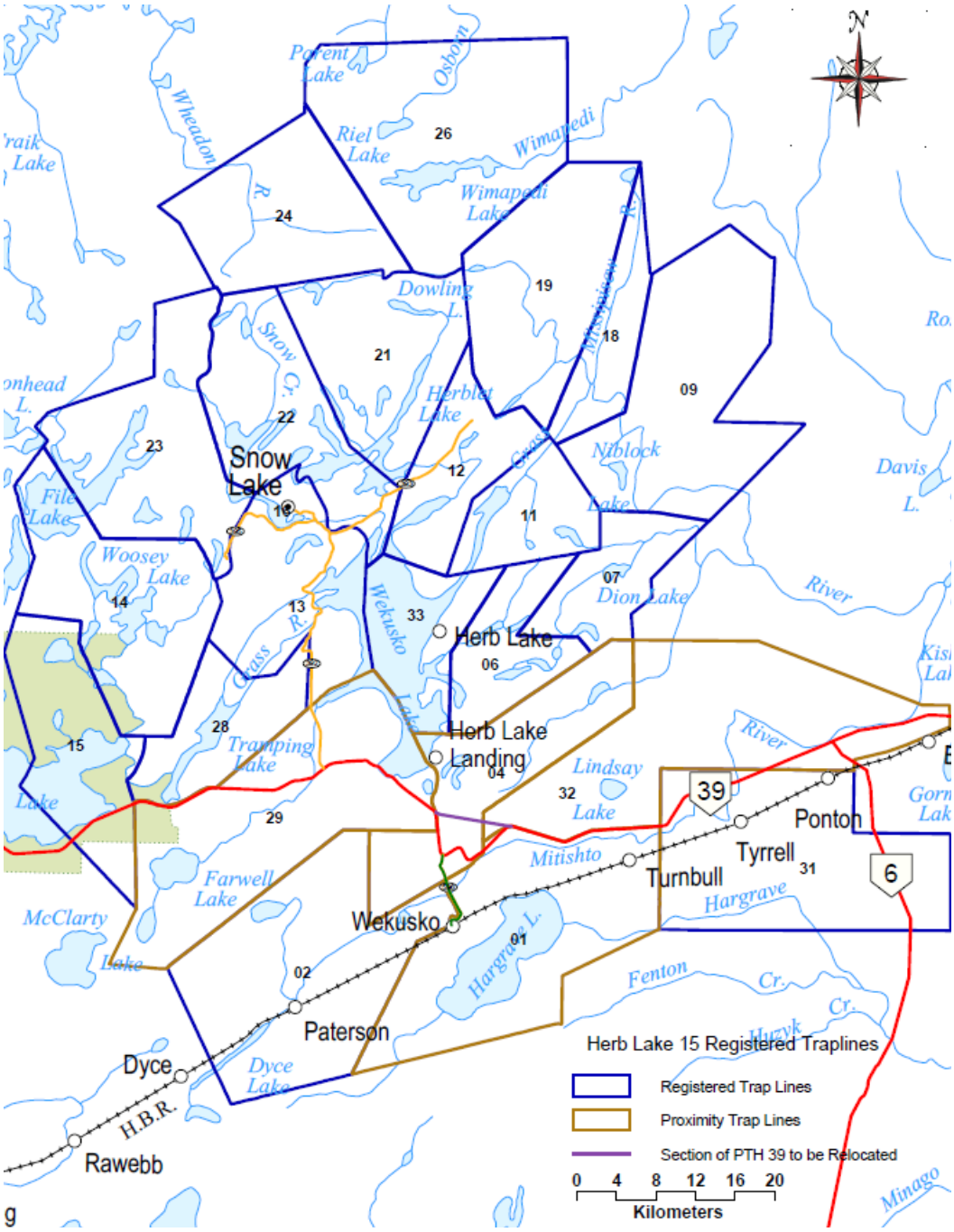

Figure 12: Registered Trap Lines Located within close Proximity to the Project Area

Forestry has also been identified as an existing land use within the project area. Manitoba forested lands are divided up into ten Forest Sections that relate to common forest conditions throughout a particular section (Manitoba Conservation, Forestry Branch 2013a). The project falls within and is generally situated along the boundary between Forest Sections five and six (found within Forest Management Units 59 and 67) respectively termed the Saskatchewan River

and High Rock Truck Haul Zone (Figure 13). Figure 13 also shows that the Project is located within the general area assigned to Forest Management License Agreement # 2, or FML-2. *The Forestry Act C.C.S.M. c. F150* includes provisions for the Province of Manitoba to issue Forest Management Licenses for the purposes of timber supply (Manitoba Conservation, Forestry Branch 2013c). The Province of Manitoba initially entered into Forest Management License Agreement #2 with Repap Manitoba Inc. in 1989. Since that time FML-2 has been transferred and is now managed by Tolko Industries which supplies timber to the Kraft Paper Mill and Sawmill in The Pas (Manitoba Conservation Forestry Branch 2013b). Figure 13 shows the Project in relation to Forest Sections five and six as well as FML-2.

Anecdotal evidence indicates that Tolko uses PTH 39 to access the Hudson Bay Rail line in order to move harvested timber to their facilities in The Pas. The Hudson Bay Railway also owns a property at the nearby settlement of Wekusko known as Wekusko Siding. Although the property does not have any structures it is still used as an area to off load mining equipment that is to be transported to Snow Lake. The Wekusko rail siding is accessed via the existing PTH 39 alignment.

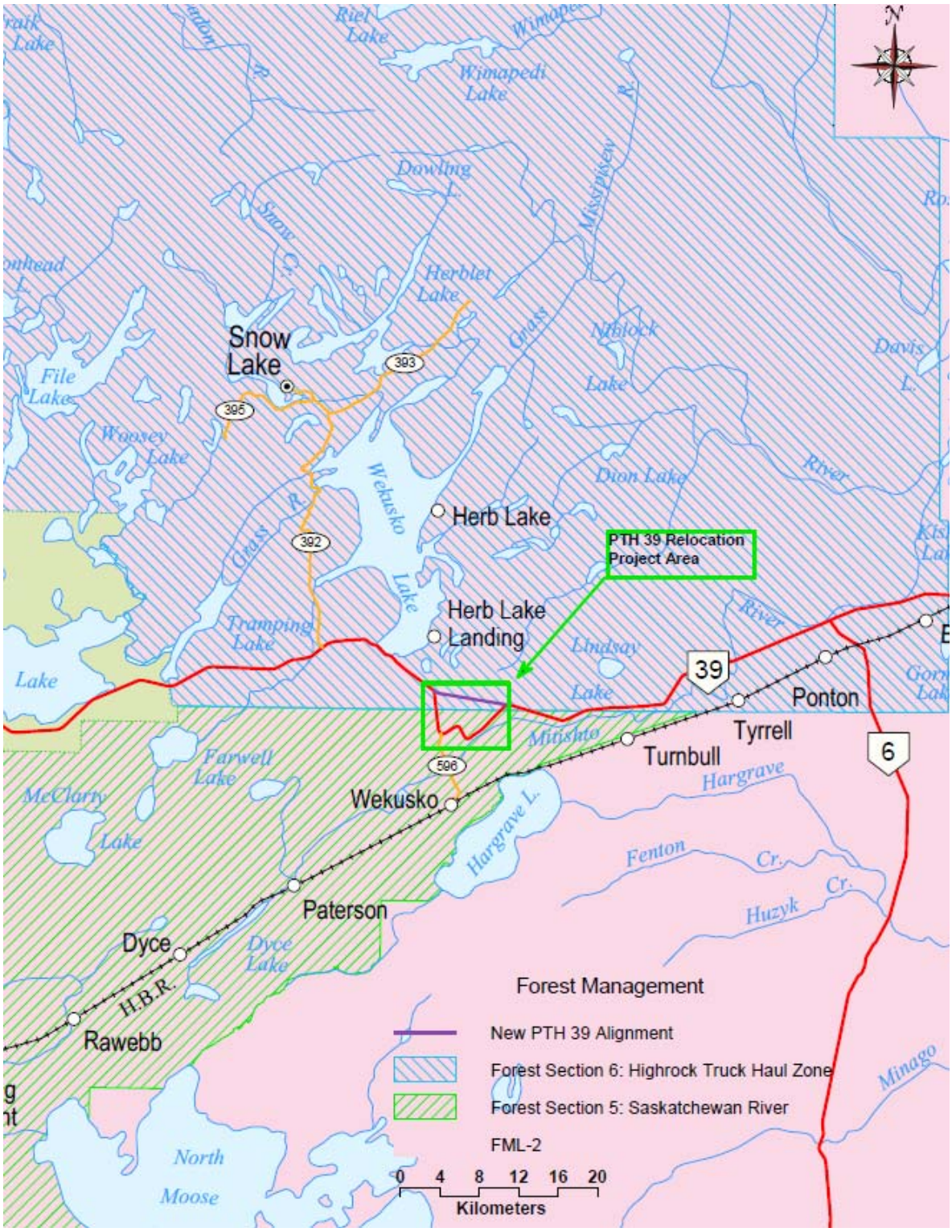

Figure 13: PTH 39 Relocation and Forest Management Considerations

2.4 Land Use Designations

There are neither land uses nor zoning designations for the site affected by the proposed development or the lands adjacent to it.

2.5 Proposed Schedule and Dates

A tentative schedule for the various components of the project is as follows:

- Clearing of right-of-way Winter 2014
- Installation of drainage structures Winter 2014
- Grading Winter 2014/Summer 2015
- Paving Summer/Fall 2016
- Start of operation Summer/Fall 2016
- Maintenance Fall 2016 - Future
- Decommissioning of existing road Summer/Fall 2016

2.5.1 Project Funding

The project will be funded by the Province of Manitoba.

2.5.2 Other Federal/Provincial/Municipal Approvals and Requirements

Additional approvals that may be required for the undertaking of this project include:

- Drainage approval from Manitoba Conservation and Water Stewardship for the proposed drainage requirements.
- A Crown Land Reservation for the required right-of-way.
- Authorization under the Water Rights Act if construction dewatering or taking of water for road grade compaction or dust management purposes are required.

2.5.3 Public Consultations

A public open house was held on August 15th, 2013 at the Royal Canadian Legion in the Town of Snow Lake for the PTH 39 relocation project. Notice of the open house was placed in the Thompson Nickel Belt News and the Flin Flon Reminder on August 9th, 2013. Local flyers advertising the PTH 39 Open House were also posted around Snow Lake and Herb Lake Landing.

An informal drop-in format was employed and included the use of display boards describing the project. MIT Region 5 staff were present during the open house in order to discuss the project and answer any questions from those in attendance. Attendance at the open house included nine individuals, four of which were from Herb Lake Landing and five from Snow Lake. Feedback obtained at the PTH 39 Relocation Open House was positive, with participants acknowledging the advantages of a straighter, shorter road. Questions raised during the open house focused on when the work would be taking place and why the section of road was being relocated. Participants also raised questions about other highways and future planned upgrades to the provincial road network.

Also in attendance at the Snow Lake Open House was a local trapper identified as the line holder for RTL's 4 & 32 in the Herb Lake Registered Trap Line Section. As noted previously in Section 2.3, the bulk of the project and existing PTH 39 alignment is situated within RTL's 4 & 32. The line holder for RTL's 4 & 32 indicated that he currently uses much of the existing PTH 39 "W" alignment to gain access to his trap line. No opposition was noted from the local trapper regarding the relocation of the section of PTH 39.

In addition to discussing the project with the line holder for RTL's 4 & 32, MIT regional staff have also had informal discussions with the line holder for RTL 1 in the Herb lake 15 Registered Trap Line Section. RTL 1 is in close proximity but located outside of the project area. Based on informal discussions between MIT regional staff and the RTL 1 line holder there do not appear to be any concerns with the project. RTL 29 was also identified as being within close proximity to the project area, but is currently vacant (i.e. not held by anyone).

Appendix B includes copies of the Open House notice, display boards, and summary meeting notes.

Should it be required, MIT will undertake appropriate consultations considered necessary to ensure compliance with Section 35 of the Constitution Act.

3.0 Description of Existing Environment

3.1 Biophysical Environment

This section provides a description of the biophysical characteristics of the study region. Topics are discussed on a regional scale with some topics being focused on the proposed road corridor.

3.1.1 Regional Setting

The proposed project is located in the Cormorant Ecodistrict of the Mid-boreal Lowland Ecoregion and in the Boreal Plains Ecozone of Canada. This Ecozone extends as a wide band from the Peace River area of British Columbia in the northwest to the southeastern corner of Manitoba. This ecozone is not strongly bedrock controlled; it has few bedrock outcrops and has considerably fewer lakes than the Boreal Shield (Smith et al. 1998)

The Cormorant Ecodistrict is a hummocky morainal plain covered by thin, discontinuous glacial till veneers. Most of the glacial deposits vary in thickness from less than 10 cm on limestone bedrock outcrops to more than 30 m. Elevations range from about 300 metres above sea level (masl) in the western sector to about 263 masl along the shore of Hargrave Lake in the east. The ecodistrict slopes gently eastward at the rate of approximately 0.5 m per km. Moderately long (50 to 150 m), hummocky slopes range from 5 to about 10 percent in subdued upland areas, while long slopes (over 400 m) ranging from level to 0.5 percent occur on organic terrain (Smith et. al. 1998).

3.1.2 Prevailing Climate and Meteorological Conditions

The Cormorant Ecodistrict is in a warmer subdivision of the Subhumid Mid-Boreal Ecoclimatic Region in Manitoba. Its climate is marked by short, moderately warm summers and long, very cold winters. The Cormorant Ecodistrict is characterized as having a humid, cold to moderately cold, Cryoboreal climate (Smith et al. 1998). Environment Canada has collected climate data at various locations across Canada in order to establish a snapshot of climate normals over a defined period of time. Environment Canada's reporting station located in The Pas (53°58'00.000" N, 101°06'00.000" W) was noted as being closest to the Project area. Table 3 provides a summary of select Climate parameters including temperature and precipitation over the 1971-2000 period for The Pas. The daily average temperature at the Pas is 0.1 °C. The daily average temperature in January is -20.6 °C while July's daily average temperature is 17.7 °C. Precipitation in the vicinity of the Pas is considered to be relatively moderate and consists of both rain and snowfall. The annual average amount of precipitation experienced in the vicinity of the Pas between 1971 – 2000 is 442.8 mm. The bulk of precipitation in the area is received as rainfall with the greatest amount occurring over the months of May to October. The average annual amount of rainfall experienced in the vicinity of The Pas is 323.8 mm. The Pas receives approximately 154.9 mm of snow annually. Review of the summary climate data shown in Table 3 indicates that with the exception of June, July and August, snowfall can be expected to occur to varying degrees in most months of the year.

Table 3: Selected Summary Climate Statistics 197-2000 for The Pas, Manitoba

Parameters	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average
Daily Average (°C)	-20.6	-16.1	-8.9	1	9	14.8	17.7	16.5	10	3.1	-7.8	-17.4	0.1
Daily Maximum (°C)	-15.8	-10.6	-2.9	7	15.4	20.7	23.4	22.2	14.9	7.2	-4.1	-13	5.4
Daily Minimum (°C)	-25.5	-21.6	-14.9	-5	2.6	8.9	12	10.8	5	-1	-11.4	-21.9	-5.2
Extreme Maximum (°C)	9.4	10.2	15.6	30	33.3	35.6	**36.7**	35	31.7	25.6	18.4	8.3	**-**
Date (yyyy/dd)	1993/ 30	1990/ 28	1993/ 24	1949/ 29	1944/ 28	1956/ 10	**1955/ 20**	1970/ 08	1967/ 06	1943/ 07	1978/ 02	1969/ 01	-
Extreme Minimum (°C)	-45	**-49.4**	-39.4	-30	-12.8	-3.3	1.4	-0.7	-7.2	-16.7	-35.5	-44.4	-
Date (yyyy/dd)	1943/ 20	**1966/ 18**	1964/ 04	1967/ 03	1954/ 01	1957/ 01	1979/ 23	1992/ 31	1964/ 29	1991/ 30	1985/ 29	1967/ 31	-
Rainfall (mm)	0.1	0.4	2.1	10	32.2	67.6	64.8	62.5	54.2	27.3	2.4	0.3	323.8
Snowfall (cm)	23	18.6	22.5	18.1	4.3	0	0	0	1.4	14.6	26.9	25.6	154.9
Precipitation (mm)	16.1	13.4	19.2	25.9	36.3	67.6	64.8	62.5	55.4	40.3	23	18.3	442.8

(Adapted from: Environment Canada 2013)

3.1.3 Air Quality and Greenhouse Gas Emissions

Air quality and greenhouse gas emissions are an important consideration for human and environmental health. According to Manitoba Conservation (2013d), air quality concerns in Manitoba are typically localized meaning that should any occur their effects tend to be limited to local people and their immediate environments. Typical human and environmental effects associated with poor air quality are generally associated with nuisance odour, noise, and air pollutants. For example, ground level ozone or smog can serve to damage vegetation and degrade various types of materials (Manitoba Conservation 2013d). Interestingly, acid rain does not appear to be much of a concern in Manitoba compared with other Provinces due to the natural buffering capacity inherent in its soils and waters (Manitoba Conservation 2013d). The U.S. Environmental Protection Agency (2009) states 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. 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 (Manitoba Conservation 2013d).

In Manitoba, air quality is monitored at four locations including Winnipeg, Brandon, Thompson, and Flin Flon. The range of parameters measured include Sulfate (SO_4), Sulfer Dioxide (SO_2), PM_{10} (Particulate Matter ≤ 10 microns), $PM_{2.5}$ (Particulate Matter ≤ 2.5 microns), amonia (NH_3), nitrous oxide (NO_X), nitrogen dioxide (NO_2), nitric oxide (NO), ozone (O_3), carbon monoxide (CO), wind speed, and wind direction. The suite of air quality parameters measured at each of the four monitoring locations varies. That said, review of Manitoba Conservations Air Quality Mapping website (http://web20.gov.mb.ca/EnvistaWeb/Default.ltr.aspx) suggests that each location does collect consistent data on PM_{10} and $PM_{2.5}$ as a general indicator of air quality.

The closest air quality monitoring station to the PTH 39 project area is located approximately 135 km away in Flin Flon, Manitoba. The second closest air quality monitoring station is located in Thompson, approximately 150 km away followed, by Brandon and Winnipeg both distanced over 500 km from the PTH 39 project area. Review of air quality reporting data for Flin Flon indicates that the local area has had ongoing issues related to air quality management stemming from the operation of the Hudson Bay Mining and Smelting Co. According to 2010 quarterly air quality monitoring report for the Flin Flon area, the Hudson Bay Mining and Smelting Co. permanently shut down its copper smelter in mid-June of 2010 which has resulted in reduced emissions and the near elimination of sulfur dioxide releases (Manitoba Conservation 2010). Air quality data for Flin Flon can be obtained online from Manitoba Conservations air quality website (http://web20.gov.mb.ca/EnvistaWeb/Default.ltr.aspx). Table 4 provides a snapshot of air quality variables measured at Flin Flon for August 21st, 2013. Parameters were compared to Manitoba's Ambient Air Quality Criteria (2005). A cursory review

indicates that all parameters measured were within the maximum acceptable levels of concentration as set out by Manitoba Conservation.

Table 4: Average Air Quality Parameter Concentrations at Flin Flon for August 20th, 2013

Station	SO_2 (ppb)	$PM10_t$ (µg/m3)	Wind Speed S (kph)	Wind Direction S (Deg)	$PM_{2.5}$ (µg/m3)	SO_4 Cycle (µg/m3)	O_3 (ppb)
Flin Flon	0	32	12	250	6.7	-0.34	26.8

The PTH 39 project area itself is located some 135 km east of Flin Flon and appears to be in relatively pristine condition with limited development occurring in its immediate vicinity. As noted in Section 2.3, land uses within close proximity to the project area are relatively limited. Key emission sources are likely attributable to traffic along PTH 39 with minor contributions stemming from the periodic use of equipment to support logging and quarrying activities in the general area. It is important to note that the general area in which the project occurs has been subject to forest fires on at least three occasions including 1928, 1937, and 1989. Forest fires generally occur naturally and sporadically depending on conditions within a given area. As a natural emission source forest fire contributions to air quality (should they occur) would outweigh those stemming from anthropogenic origins (i.e. vehicle emissions). Figure 15 shows forest fire occurrence over time in the vicinity of project area. Of these emission sources in the project area, traffic along the existing PTH 39 alignment is likely the largest anthropogenic contributor. As noted in Section 1.1 traffic volumes along PTH 39 are relatively low and not expected to increase substantially over time. Vehicle emissions may be the greatest anthropogenic emitter of pollutants in the project area however, their actual contributions to poor air quality are believed to be relatively minor when considering the existing environment (i.e. relatively remote and pristine), the nature of the project (road improvement), in conjunction with current and projected traffic volumes. Based on the above review and for the purposes of this Environment Act Proposal, air quality within the project area is assumed to be good.

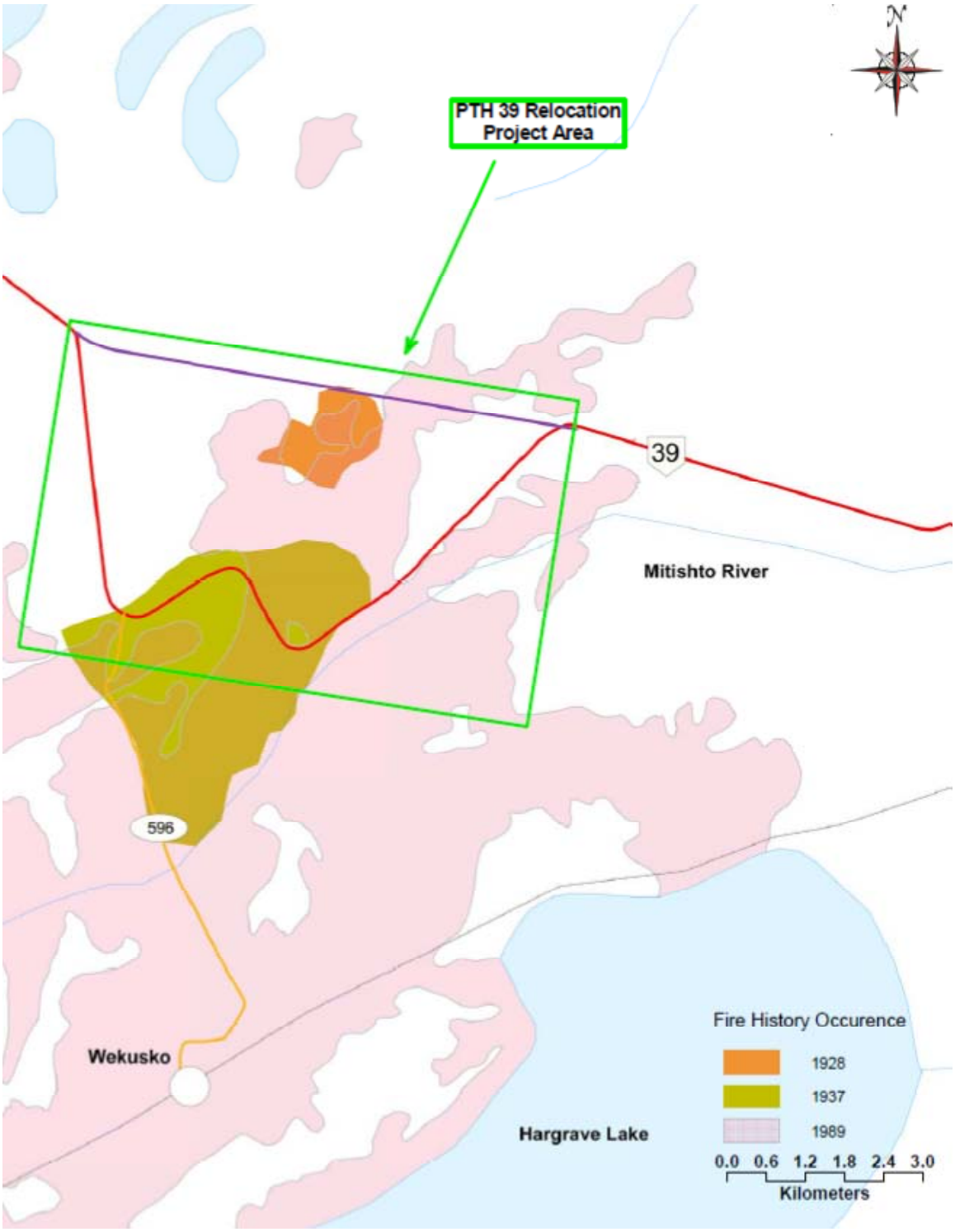

Figure 14: Fire History Occurrence in the PTH 39 Project Area

Manitoba, along with the remainder of Canada's provinces and territories participates in submitting a national inventory of human generated greenhouse gases (GHGs) to the United Nation as part of its obligations under the United Nations Framework Convention on Climate Change and as a tool to assist in meeting Kyoto Protocol Targets (Climate Change Connection 2013a). Environment Canada is responsible for collecting data on GHG's and includes carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), perofluorocarbons, (PFC's), and hydrofluorocarbons (HFC's) (Environment Canada 2013b). The bulk of Manitoba's GHG emissions stem from fossil fuel combustion (62%) primarily associated with transportation (38%) followed by stationary combustion sources such as residential/commercial heating, manufacturing (20%), and fugitive emissions (4%) (Climate Change Connection 2013b). The remainder of GHG sources in Manitoba can be broken down as follows:

- 30% agriculture primarily linked to methane from livestock and nitrous oxide from soils;
- 5% from waste disposal which consists of mostly methane from landfills and waste water; and
- 3% stemming from products of industrial processes.

In considering the breakdown of GHG sources by sector, it appears that transportation as a subset of fossil fuel combustion is the primary emitter of GHGs in the Province of Manitoba.

As noted above, the PTH 39 project area is relatively remote with limited development in the area with the exception of some logging and quarrying activities. As such it can be assumed that the primary source of human generated GHGs within the project area can be attributed to transportation and use of PTH 39 by the travelling public. Again, current traffic levels are low as are projected future increase in traffic volumes. This suggests that while transportation may be the largest source of GHGs in the project area its contributions are likely limited. Non-anthropogenic sources of GHGs should also be noted for the project area. As discussed above, forest fires have occurred on at least three occasions within the PTH 39 project area. Although not anticipated and depending on its size and scale, forest fires could likely be the greatest non-anthropogenic source of GHGs in the PTH 39 project area at any one time should one occur.

3.1.4 Water Resources

3.1.4.1 Surface Water

The Mid-Boreal Lowland Ecoregion is dominated by very large lakes, including the northern basin of Lake Winnipeg, the northern half of Lake Winnipegosis, as well as Cedar, Moose, Cormorant, Clearwater and Athapapuskow lakes. Closer to the project study area, one finds Wakusko Lake to the north, Hargrave Lake to the south and Lindsay Lake to the east. Minor lakes and ponds and water streams are located in the

general area of the project. The Mitishto River is also located near the PTH 39 project area and runs parallel to the road near the eastern arm of the existing "W" alignment. A cursory review of the project area indicates that at its closest point the Mitishto River is greater than 250 m away from the road.

3.1.4.2 Groundwater

The principal source of water is the variable quality groundwater available from sand and shallow aquifers associated with till, beach and inter-till outwash and glaciolacustrine deposits. Development of wells in this general area is poor from Silutian bedrock formations. Limestone aquifers consist of fractured rock and both water quantity and quality in the ecodistrict are variable (Smith et al. 1998).

3.1.5 Aquatic Environment

Based on a review of aerial photos, the area does not appear to have defined watercourses and does not appear to be fish habitat.

3.1.6 Terrestrial Environment

3.1.6.1 Vegetation

Vegetation on the uplands of the Ecodistrict varies with fire history. Jack pine is the dominant species after fire, with areas of trembling aspen regenerating on favourable sites. Black spruce becomes dominant with time and is associated with shrubs such as alder and ericaceous shrubs. Ground cover varies from moss to herbs and forbs.

Bog peat lands support stunted black spruce with dwarf birch and ericaceous shrubs and mosses, while fens have sedges, brown mosses and varying amounts of swamp birch, alder, willow and stunted tamarack.

The vegetation along the proposed right-of-way 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 project area is interspersed with mixed deciduous/coniferous forest cover in drier areas.

3.1.6.2 Wildlife

Characteristic wildlife normally associated with the Mid-Boreal Lowland Ecoregion includes moose, black bear, wolf, lynx, red fox and snow hare. The ecoregion also provides habitat for waterfowl including various ducks, geese, white pelican and cormorant. Other birds include various raptors, sandhill crane and ruffed grouse.

Based on information obtained from Manitoba Conservation and Water Stewardhsip, caribou are also present in the general study area. Although the biggest concentrations of caribou have been recorded to the north and south-east of the proposed relocation, some sightings of caribou have also been recorded in the vicinity of Sunday Lake between the existing highway and the proposed relocation.

3.1.6.2.1 Sensitive Species and/or Habitats

According the Manitoba Conservation Data Centre, the following is a list of species of conservation concern that can be found in the Mid-Boreal Lowland Ecoregion:

Vascular Plants:

- Arethusa *(Arethusa bulbosa)*
- Leathery Grape-fern *(Botrichium multifidum)*
- Swamp-pink *(Calopogon tuberosus)*
- Fibrous-rooted Sedge *(Carex communis)*
- Douglas Sedge (*Carex douglasii*)
- Yellow Sedge *(Carex flava)*
- Elk Sedge *(Carex garberi)*
- Porcupine Sedge *(Carex hystericina)*
- Stalked Sedge *(Carex pedunculata*)
- Necklace Sedge *(Carex projecta)*
- Blister sedge (*Carex vilpinoida*)
- Fox Sedge *(Carex vulpinoida)*
- Alternate-leaved Dogwood (*Cornus alternifolia*)
- Houghtons Umbrella-sedge (*Cyperus houghtonii*)
- Ram's Head Lady's-slipper *(Cypripedium arietinum)*
- Oblong-leaved Sundew *(Drosera anglica)*
- Slender-leaved Sundew *(Drosera linearis)*
- Three-way Sedge *(Dulichium arundinaceum)*
- Engelmann's Spike-rush *(Eleocharis engelmannii)*
- Beautiful Cotton-grass *(Eriophorum calitrix)*
- Cleavers *(Galium aparine)*
- Tesselated Rattlesnake Plantain *(Goodyera tesselata)*
- Northern Oak Fern *(Gymnocarpium jessoense)*
- Limestone Oak Fern *(Gymnocarpium robertianum)*
- Water Star-grass *(Heteranthera dubia)*

- False Heather (*Hudsonia tomentosa*)
- Large White-flowered Ground-cherry *(Leucophysalis grandiflora)*
- Yellow Twayblade *(Liparis loeselii)*
- Auricled Twayblade *(Listera auriculata)*
- White Adder's-mouth *(Malaxis monophyllos)*
- Green Adder's-mouth *(Malaxis unifolia)*
- Fragrant Water-lily *(Nymphaea odorata)*
- Sensitive Fern *(Onoclea sensibilis)*
- Interrupted Fern (*Osmunda claytoniana*)
- American Pellytory *(Parietaria pensylvanbica)*
- Cliff-brake *(Pelleae glabella)*
- Red Pine *(*Pinus resinosa)
- Seaside Plantation *(Plantago maritime)*
- Hooker"s Orchid (*Platanthera hookeri*)
- Fringed Orchid *(Platanthera lacera)*
- Round-leaved Bog Orchid *(Platanthera orbiculata)*
- Straightleaf Pondweed *(Patamogeton ctristifolius)*
- Round-leaved Pyrola *(Pyrola Americana)*
- White Beakrush *(Rhynchospora alaba)*
- Horned Beakrush *(Rhynchospora capillacea)*
- Sharp-toothed Goldenrod (*Solidago juncea*)
- Canada Yew *(Taxus canadensis)*
- Few-flowered Meadow-*rue (Thalictrum sparsiflorum)*
- Dwarf Bilberry (*Vaccinium caespitosum)*
- *Dog Violet (Viola conspersa*)
- Long-spurred Violet *(Viola selkirkii)*
- Smooth Woodsia *(Woodsia glabella)*

Most of these species have not been listed as *endangered, threatened or extirpated* under the Manitoba Endangered species act or the Canadian Species at Risk Act (SARA).

Vertebrate Animals:

- Western Grebe *(Aechmorphous occidentalis)*
- Blue Spotted Salamander (*Ambystoma lateral*)

- Great Blue Herron *(Ardea Herodias)*
- Greater Scaup *(Aythia marila)*
- Eastern Whip-poor-will/Whip-poor-will (*Antrostomus vociferous/ Caprimulgus vociferus*)
- Piping Plover (*Charadrius melodus*)
- Common Nighthawk (*Chordeiles minor*)
- Shortjaw Cisco *(Coregonus zenithicus)*
- Bald Eagle (*Haliaeetus leucocephalus)*
- Chestnut Lamprey *(Ichthyomyzon castaneus*)
- Silver Chub *(Macrhybopsis storeriana*)
- Little Brown Myotis *(Myotis lucifugus)*
- Black-crowned Night-heron *(Nyctorax nyctorax)*
- Northern Parula (*Parula americana*)
- American White Pelican *(Pelecanus erythrorhynchos)*
- Double-crested Cormorant *(Phalacrocorax auritus)*
- Horned Grebe (*Podiceps auritus*)
- Eared Grebe (*podiceps nigricollis*)
- Caribou *(Rangifer tarandus caribou)*
- Caspian Tern *(Sterna caspia)*
- Foster's Tern *(Sterna forsteri)*
- Barred Owl *(Strix varia)*
- Golden Winged Warbler (*Vermivora chysoptera*)
- Canada Warbler (*Cardellina canadensis/Wilsonia Canadensis*)

The following provides a brief overview of species found in the project area listed under the Manitoba *Endangered Species Act* and in the Canada *Species at Risk Act* (SARA).

Piping Plover *(Charadrius melodus circumcinctus):* is a provincially and nationally endangered bird, found in many provinces and states, including Manitoba. It is a stocky shorebird with a white breast, abdomen and rump and pale brown to grey back, head and wings. The piping plover can be found on lakeshores and river sandbars. It nests on gravel shores of shallow, saline lakes and on sandy shores of larger prairie lakes. It tends to use only non vegetated or sparsely vegetated areas for nesting.

Note: Although the Piping Plover may be found in the Mid-boreal Lowland Ecoregion, it is not expected to be found in the project study area because of the characteristics of the habitats that the Piping Plover inhabits. The section of PTH 39 to be relocated does not

cross any water courses or water bodies. There are no lakeshores or river sandbars in the study area.

Canada Warbler (*Cardellina canadensis/Wilsonia Canadensis*): is a provincially protected migratory bird species. The Canada Warbler is listed as endangered under the Manitoba Endangered Species Act. The Canada Warbler is also a Schedule 1 species under Canada's Species at Risk Act (SARA) and is listed as threatened. Additional legal protection is afforded the Canada Warbler in Manitoba under the Migratory Birds Convention Act, 1994 and the Canada National Parks Act. Eighty percent of the Canada Warbler's breeding occurs in Canada. The species itself is noted as having experienced a significant long-term decline. Although the cause of decline is unknown it may be related to the loss of primary forest areas in South American over-wintering grounds.

Habitat preferences for the Canada Warbler generally include wet, mixed deciduous/coniferous forest types with a well developed shrub layer. The species is also noted as being found in riparian shrub forests, old growth forests with an open canopy and a well developed shrub layer, as well as in forest stands regenerating after disturbances such as fire and logging. Terrestrial vegetation within the PTH 39 project area is generally wet and consists of Spruce bog with some mixed deciduous/coniferous forest stands present (section 3.1.6.1). The general project area also supports a history of natural disturbance including fire (section 3.1.3) and logging (section 2.3).

The Canada Warbler tends to build its nests close to the ground often in dense ferns or fallen logs. Figure 15 shows breeding evidence noted for the Canada Warbler throughout Manitoba in relation to the PTH 39 project area. As shown on Figure 15, no breeding evidence of the Canada Warbler has been noted within the PTH 39 project area. The nearest known breeding evidence for the Canada Warbler (assessed as possible/probable) occurs to the west and southwest of the PTH 39 project area. According to the Manitoba Breeding Bird Atlas (2013) early and late breeding dates for the Canada Warbler for central Manitoba (blocks 9-12) can be around late may and late July (May 21st and July 25th respectively).

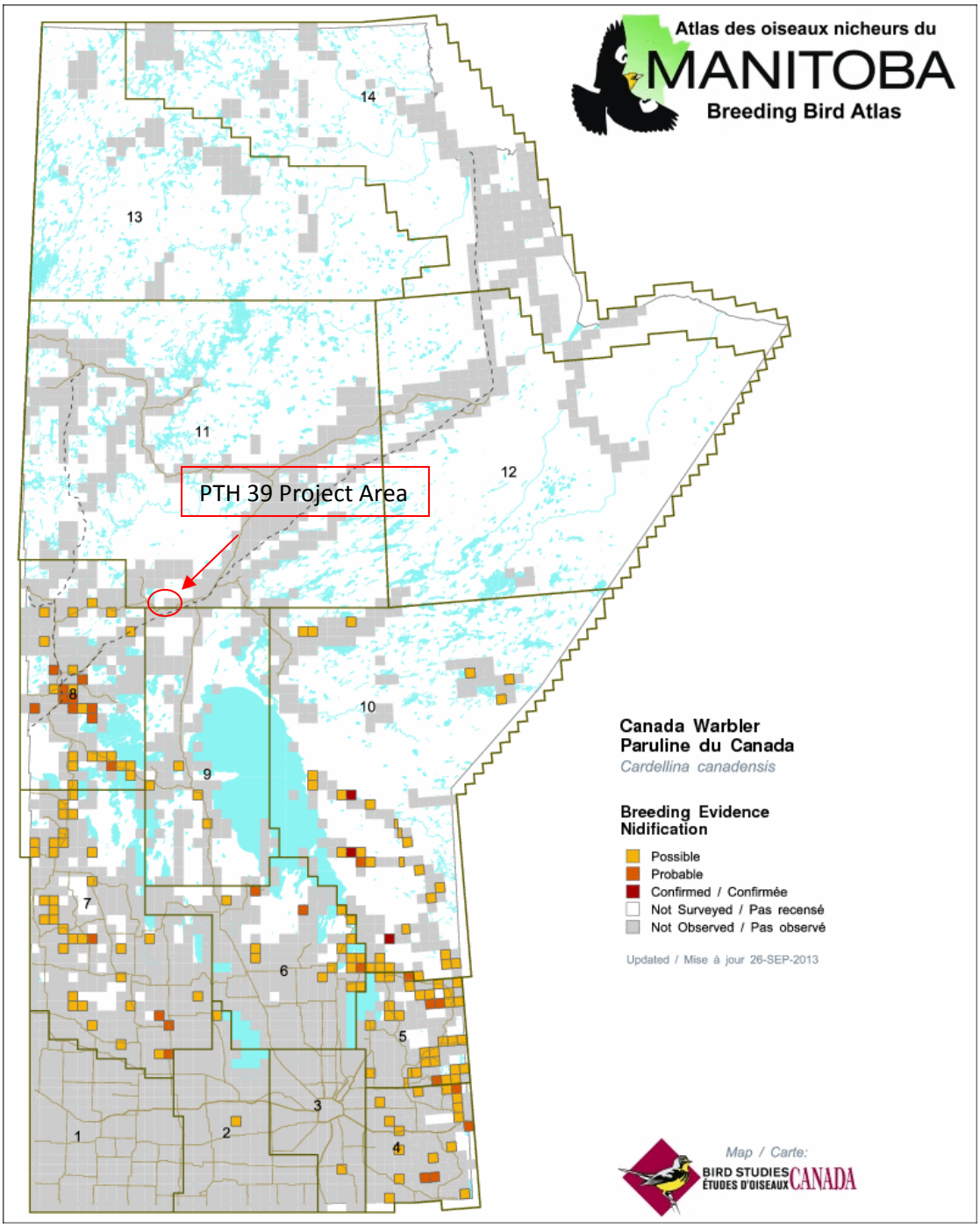

Figure 15: Canada Warbler Breeding Evidence (Source: Manitoba Breeding Bird Atlas, 2013 http://www.birdatlas.mb.ca/mbdata/maps.jsp?lang=en)

Eastern Whip-poor-will/Whip-poor-will (*Antrostomus vociferous/Caprimulgus vociferus*): is a federally and provincially protected migratory bird.[1] The Whip-poor-will is a Schedule 1 species under Canada's Species at Risk Act and designated as threatened. Under Manitoba's Endangered Species Act, the Whip-poor-will is also designated as threatened. Additional legal protection is afforded the Whip-poor-will in the Migratory Birds Convention Act, 1994. The total adult breeding population is estimated at 66,000 across Canada with approximately 8,000 individuals present in Manitoba. Between 1968 and 2007 estimates suggest that the Whip-poor-will has experienced a 75% decline in species abundance. Causes of the Whip-poor-will species decline are unknown but thought to be related to habitat loss (Species at Risk Public Registry 2012).

The Whip-poor-will's breeding range extends east from central Saskatchewan to southern Manitoba, south/south central Ontario, southern Quebec, New Brunswick, and in localized areas in central Nova Scotia. Habitat preferences for the species generally include semi-open patchy forests with clearings including those regenerating after a major disturbance. Review of the Manitoba Breeding Bird Atlas Safe Dates (2013) indicates that central Manitoba early breeding occurs at the beginning of June with late breeding in mid July (June 1st and July 16th respectively).

Figure 16 indicates breeding evidence for the Whip-poor-will throughout Manitoba in relation to the PTH 39 project area. As shown on Figure 16, no Whip-poor-will breeding evidence has been noted within the PTH 39 project area, however, possible/probable breeding evidence to the west of the PTH 39 project area is noted. Review of the data furnished by the Conservation Data Centre confirms two Whip-poor-will sightings in 2011 to the west of the PTH 39 project area. Although breeding evidence is not noted, the species has been confirmed as being present within the general area.

[1] Six subspecies of Whip-poor-will are recognized, but in Canada all are represented by the subspecies vociferous. As such reference to the Whip-poor-will is used to include the Eastern Whip-poor-will subspecies.

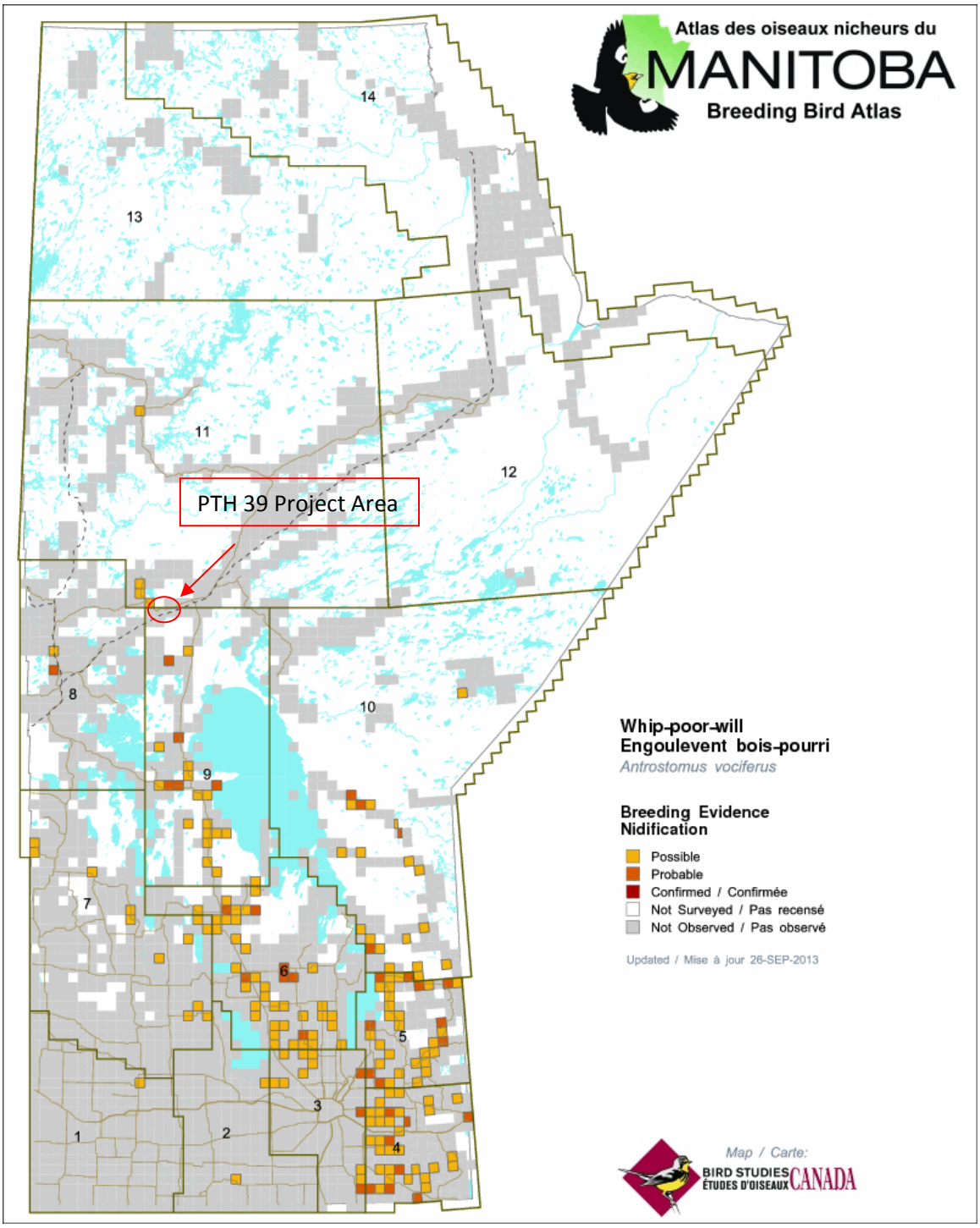

Figure 16: Whip-Poor-Will Breeding Evidence (Source: Manitoba Breeding Bird Atlas 2013, from http://www.birdatlas.mb.ca/mbdata/maps.jsp?lang=en)

Common Nighthawk (*Chordeiles minor*): is a federally and provincially protected migratory bird that occurs throughout Manitoba and in other parts of Canada. The Common Nighthawk is listed as a Schedule 1 species under Canada's Species at Risk Act and has been designated as threatened. The Common Night hawk is also listed as a threatened species under Manitoba Endangered Species Act and is afforded additional legal protection under the Migratory Birds Convention Act, 1994. In 2007 Canada's Common Nighthawk breeding population was estimated at 400, 000. Overall the species has experienced a significant population decline of approximately 80% between 1968 and 2005. Threats to the species are unknown but thought to be related to declines in insect populations upon which it feeds, and habitat loss/modification.

The Common Nighthawk typically nests in a broad range of open, vegetation free habitats which can include recently burned or logged areas, rocky outcrops/barrens, grasslands, pastures, peat bogs, and marshes. The PTH 39 project area generally consists of spruce bog with some mixed deciduous/coniferous tree stands present in various locations. The general area falls within FML-2 and has experienced some timber harvesting activities managed by Tembec (see section 2.3). Further, the general project area also supports a history of forest fire (see section 3.1.3).

According to the Manitoba Breeding Bird Atlas Safe Dates (2013) early breeding for the Common Nighthawk throughout central Manitoba can occur in the beginning of June with late breeding taking place in early August (June 6th and August 1st respectively). Figure 16 shows the PTH 39 project area in relation to known breeding evidence for the Common Nighthawk in Manitoba. As Figure 16 notes, breeding evidence (possible/probably) for the common Nighthawk occurs within the general vicinity of the PTH 39 project area. Review of data supplied by Manitoba's Conservation Data Centre also identifies recent 2011 sightings of the Common Nighthawk within the general area. One observation noted the presence of the species along the existing PTH 39 alignment which is to be relocated as part of the project.

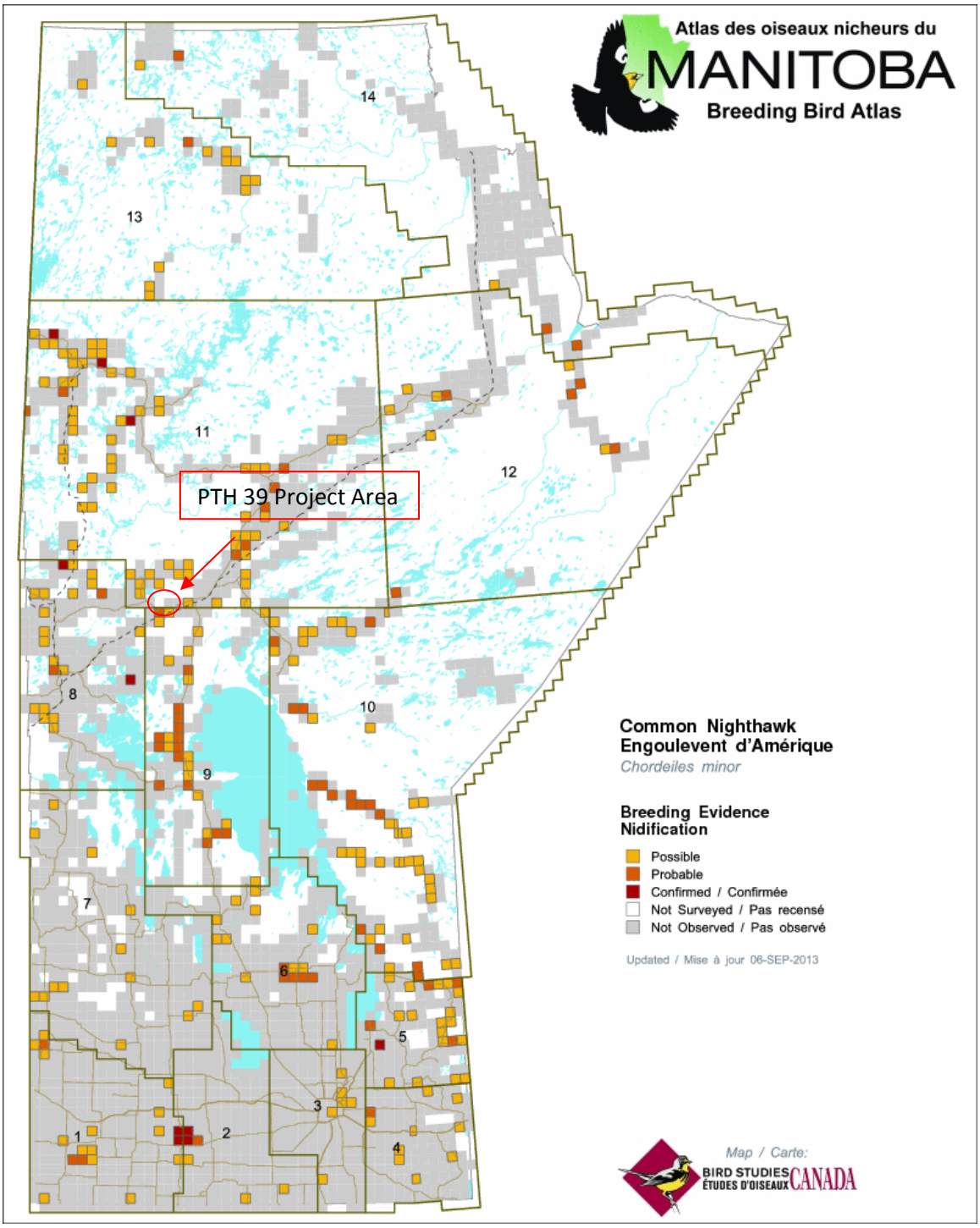

Figure 17: Common Nighthawk Breeding Evidence (Source: Manitoba Breeding Bird Atlas 2013, from http://www.birdatlas.mb.ca/mbdata/maps.jsp?lang=en)

Shortjaw Cisco (*Coregonus zenithicus*): is a small deepwater member of the whitefish family. The shortjaw cisco is typically associated with the Great Lakes but has been found in other lakes in Ontario, Manitoba, Saskatchewan, Alberta, and the Northwest Territories. The Shortjaw cisco has an elliptical body covered in large, smooth scales. It is silver, with an olive or tan back and white underbelly. The species is fairly small with common sizes ranging from 150 mm – 300 mm in length. The species is generally found at depths of 20 m – 180 m and known to spawn in either the spring or the fall. Threats to the Shortjaw cisco are overexploitation in food fisheries, competition/predation by introduced species (e.g. Rainbow Smelt and Alewives), as well as habitat loss/degradation associated with development activities. The Shortjaw cisco is currently listed as a Schedule 2 species under SARA and considered threatened. Schedule 2 species receive no formal protection under SARA, however, the Shortjaw cisco receives protection under the provisions of the Fisheries Act. The Shortjaw ciso is not listed under Manitoba's The Endangered Species Act. The section of PTH 39 to be relocated does not cross any water courses or water bodies.

The Silver Chub *(Macrhybopsis storeriana):* is a member of the Minnow family. It mainly lives in central North America, especially in the lakes of the Mississippi drainage area from the Gulf Coast north of the Laurentian Great Lakes, east of the foothills of the Appalachians and as far west as the Great Plains. In Manitoba, it occurs in the Red and Assiniboine River Systems and in the south basin of Lake Winnipeg.

The species has been identified as Species of Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The species was re-examined by COSEWIC in May 2012 and split into two distinct populations. The Great Lakes – Upper St. Lawrence population is considered endangered and listed as a Schedule 1 species under SARA. The Saskatchewan – Nelson Rivers population found in Manitoba is considered not at risk following the species May 2012 reassessment. The Saskatchewan – Nelson Rivers population in Manitoba currently has no status under SARA and is not listed under Manitoba's Endangered Species Act. The section of PTH 39 to be relocated does not cross any water courses or water bodies.

Woodland Caribou *(Rangifer tarandus caribou):*

Woodland Caribou are a medium-sized subspecies of caribou belonging to the deer family, inhabiting the boreal forest.

Woodland Caribou are an endangered species listed as threatened under the Manitoba Species at Risk Act. Woodland Caribou have also been listed as a Schedule 1 species under SARA and designated as threatened. In 2005 Manitoba Conservation and Water Stewardship developed its recovery strategy for Boreal Woodland Caribou. A national Recovery Strategy for Canada's Woodland Caribou, Boreal Population was adopted in 2012. Among others the National recovery strategy provides a broad overview of the species throughout Canada, discusses threats, identifies critical habitat, provides

general guidance relating to mitigation measures, as well as establishing recovery strategies and action plans (Environment Canada 2012).

Woodland Caribou are irregularly distributed throughout the boreal forest generally requiring mature and old-growth coniferous forests that contain large quantities of terrestrial and arboreal (tree-inhabiting) lichens. These forests are generally associated with marshes, bogs, lakes, and rivers. As noted in section 3.1.6.1, vegetation within the ROW for the section of PTH 39 to be relocated consists of mature forest and spruce bog interspersed with some stands of mixed deciduous/coniferous trees.

Woodland caribou remain within local areas and form relatively distinct herds moving within specific greater ranges according to seasons and other biological requirements. MIT acquired telemetry data in 2012 from Manitoba Conservation and Water Stewardship's Wildlife Branch which indicates that Woodland Caribou are present within the general project area. The data set spans the period of June 22nd, 2011 to May 28th, 2012 and consists of point data from tracking collars showing individual species movements over time. The data also indicates that those individuals present within the general project area can be associated with the Reed Lake and Wabowden herds. The PTH 39 project area is situated between the Reed Lake and Wabowden Ranges as shown on Figure 18. Figure 19 shows the distribution of Woodland Caribou between June 22nd, 2011 and May 28th, 2012 within the general vicinity of the PTH 39 project area.

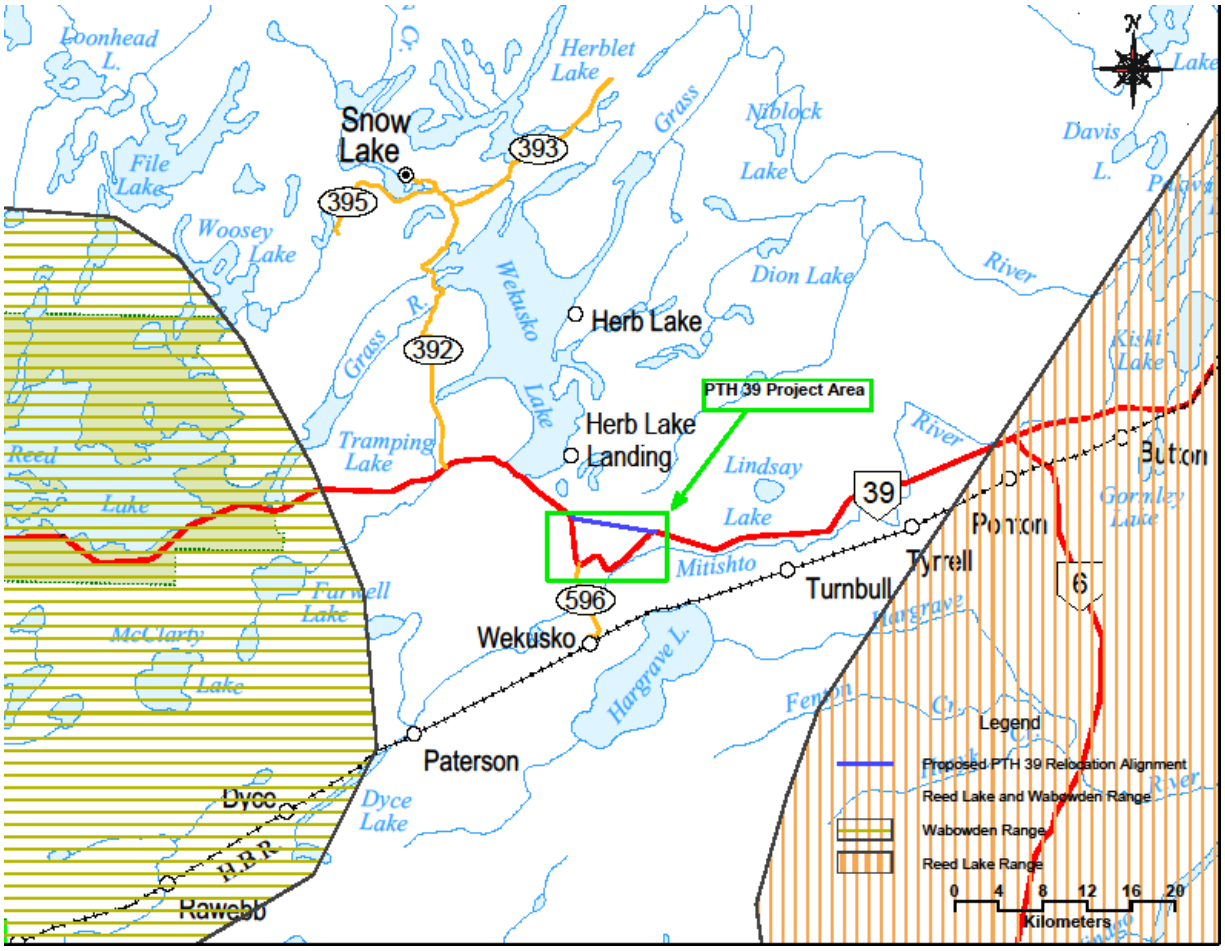

Figure 18: PTH 39 Project Area in Relation to Reed Lake and Wabowden Woodland Caribou Ranges

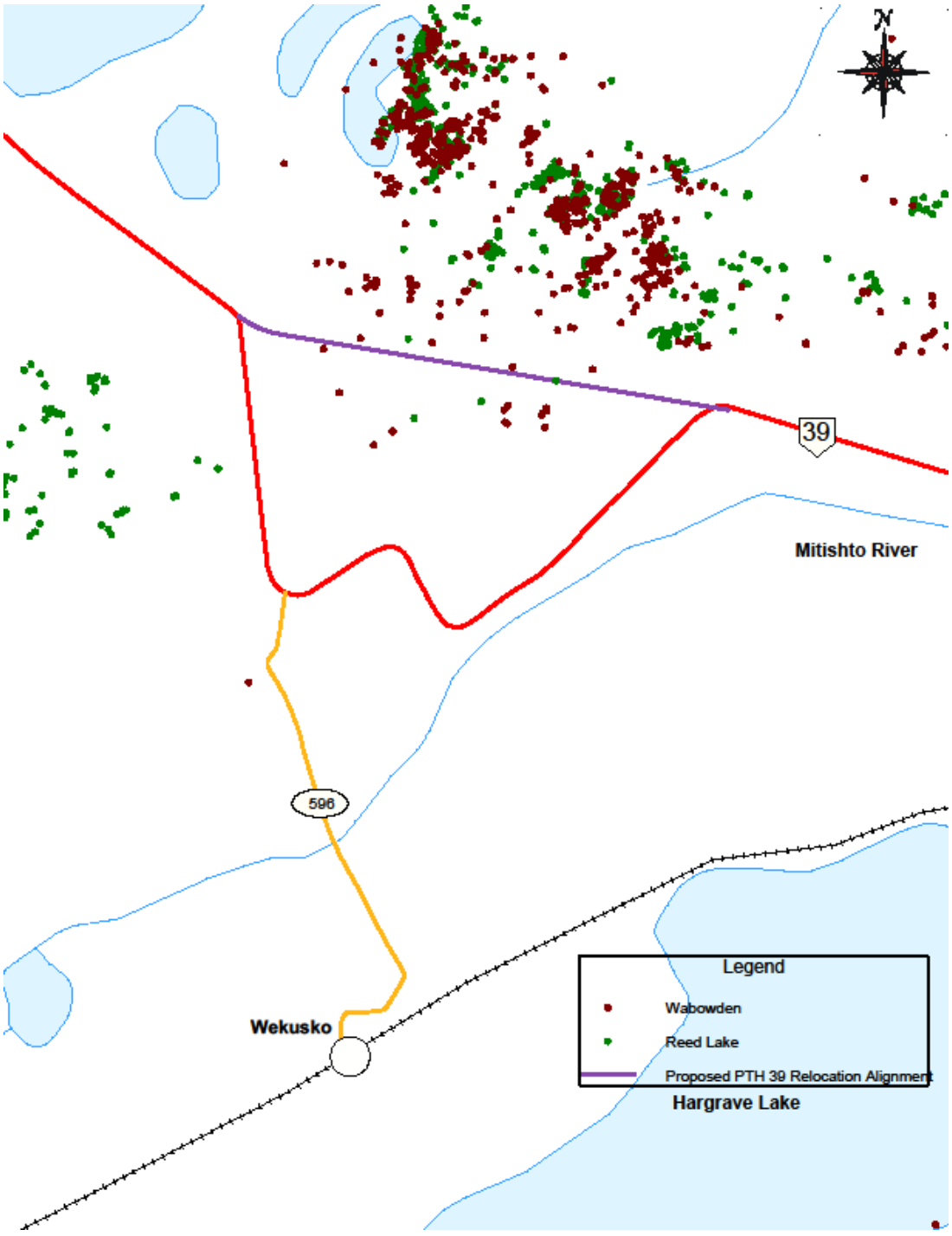

Figure 19: Spatial Distribution of Woodland Caribou Activity in Vicinity of PTH 39 Project Area: June 2011 - May 2012

According to Manitoba's Boreal Woodland Caribou Recovery Strategy Reed Lake herd has a population of approximately 100 – 150 individuals. The Wabowden herd is somewhat larger consisting of 200 – 225 members. The conservation risk assessment in Manitoba's Woodland Caribou Recovery Strategy for both the Reed Lake and Wabowden Woodland Ranges is medium (Manitoba Conservation and Water Stewardship 2005). Canada's national recovery strategy for Boreal Woodland Caribou is generally consistent and supports Manitoba's conservation risk assessment. The national recovery strategy identifies critical habitat areas associated with the Reed Lake and Wabowden Woodland Caribou Ranges. In either case the Reed Lake and Wabowden populations are considered to be self sustaining, with their ranges having experienced limited natural (i.e. fire) and anthropogenic disturbance. The total estimated amount of disturbed habitat within the Reed Lake and Wabowden Ranges is 26% and 28% respectively (Environment Canada 2012).

Further review of Canada's recovery strategy for Boreal Woodland Caribou suggests that areas of critical habitat for both the Reed Lake and Wabowden herd appear to be consistent with their respective ranges as shown in Figure 18[2]. Figure 18 also locates the general PTH 39 project area in relation to Reed Lake and Wabowden Ranges. Although Woodland Caribou from both the Reed Lake and Wabowden herds are at times present or pass through the PTH 39 project area (see Figure 19), the project itself appears to occur outside any areas of critical habitat as described in Canada's Woodland Caribou recovery strategy.

3.1.7 Existing Land and Resource Uses

There are no settlements in the immediate vicinity of the study area. That said, the closest communities to the project area are Herb Lake Landing and Wekusko located to the north and south of the study/project area respectively. As discussed in Section 2.5.3, an open house was held in Snow Lake on August 15th, 2013 to discuss the project with local residents.

Most of the soils in the study area are not suitable to, and are not used for, arable agriculture. All the land in the study area is Crown land. There is no hydroelectric, oil gas, recreation or tourism resource uses. As noted previously in Section 2.3 the project area falls within FML-2 currently managed by Tolko Industries. Some of the lands within the general project area may be subjected to minor pulpwood and/or saw log forestry. Additional land uses identified within or in close proximity to the project area include trapping and quarrying. The project area is located within Registered Trap line 4 of the Herb Lake 15 Registered Trap Line Section (see Figure 11). Six privately held quarry

[2] See Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal Population in Canada (2012), Appendix J: Critical habitat Fact Sheets available at http://www.sararegistry.gc.ca/default.asp?lang=En&n=A59A02AB-1#_Toc025

leases are also present at the southern end of the western curve of the existing PTH "W" alignment as shown in Figure 10.

A fibre optic telephone line is also located along the northern boundary of the study area.

3.2 Socio-Economic Environment

3.2.1 Public Safety and Health Risks

Some of the deficiencies that exist along the existing route include: very steep side slopes that reduce the ability of vehicles leaving the roadway to safely recover; and, non-existent rounding for transition from existing shoulders to roadside ditch slopes. In addition, unprotected culverts, surface breaks, rutting, poor visibility and substandard horizontal and vertical alignment may reduce the level of safety and driving comfort of the travelling public.

3.2.2 Protected Areas

There are no protected areas within or in close proximity to the study area.

3.2.3 Heritage Resources

The potential for this project to impact significant heritage resources is very low.

3.2.4 First Nation Communities in Study Area

There are no First Nation Communities in the Study Area.

4.0 Environmental Effects and Mitigation Measures

4.1 Impacts on Biophysical Environment

4.1.1 Soils and Terrain

Construction activities will disturb the terrain along the entire length of the proposed road, including staging areas, and establishment of various borrow pits in order to obtain material to construct the new section of road. Adverse effects to terrain and soils from project related activities could potentially occur as a result of increased loss of soil due to erosion, change in landscape features, soil compaction due to road and equipment movement, and disturbances of permafrost if such features are encountered.

4.1.1.1 Soil Loss Due to Erosion

Potential Effects

Removal of vegetation and disruption of the surface layer by grading, and other construction activities, may lead to increased soil loss due to erosion.

Mitigation Measures

Manitoba Infrastructure and Transportation has adopted a number of standard practices to reduce soil losses due to erosion along its projects. These standard practices will be used in this project as dictated by local conditions. Standard practices include: minimizing the foot print of the project area as much as possible; avoiding steep slopes wherever possible; protecting exposed soils and slopes a soon as possible; applying erosion control blankets and utilization of appropriate re-vegetation techniques to minimize erosion not only during construction but also during the operation phase of the project. In addition, construction equipment and vegetation clearing will be confined to the road right-of-way and ancillary development areas. Where considered necessary, vegetation clearing will be restricted to hand methods in areas immediately adjacent to water courses and within sensitive terrain and in terrain too rugged for mechanical clearing. Regular follow-up inspections of the construction sites will be carried out to evaluate the success of the erosion control mitigation measures and recommend further action where considered necessary.

Significance of Effects

With the proper application of the mitigation measures mentioned above, it is expected that soils within the project area will experience a negligible increase in erosion thus making the adverse residual effects not significant.

4.1.1.2 Changes in Landscape Features

Potential Effects

In order to establish the required grade for the proposed roadway, “cut-and-fill” construction processes will be used. Also, where necessary, extra material will be hauled from borrow pits. These will result in landforms and landscape features being altered or removed. These changes will occur mainly within the highway corridor and where the borrow areas are established outside of the new road ROW. These changes will be irreversible.

Mitigation Measures

In the design of the proposed relocation, special attention will be given to the establishment of borrow areas in order to minimize the number of borrow pits. Also measures will be taken, where practical, to deplete resources of borrow pits before new ones are established; and to rehabilitate or landscape borrow pits once they have been depleted.

Significance of Effects

The effects of removing or altering landscape features will be local. The implementation of the proposed mitigation measures will manage the environmental risk.

4.1.2 Wildlife

Potential Effects

A number of potential effects to wildlife can occur as a result of building a new road in a new location. These effects can include loss of habitats, increased hunting pressure, general disturbances and increased vulnerability to mortality due to vehicle collisions.

The total footprint of the new road ROW will cover an area of approximately 75 ha.

Also, the proposed relocation will move the existing highway closer to an area where greater concentrations of Woodland Caribou activity have been recorded in relation to the existing and proposed sections of road (see Figure 19). That said, the PTH 39 project area is situated between the Reed Lake and Wabowden Woodland Caribou Ranges. Although telemetry data obtained from Manitoba Conservation and Water Stewardship note that they are present and pass through the area, the project itself does not appear to occur within any areas of critical habitat as described in Canada's Recovery Strategy for Woodland Caribou (Environment Canada 2012).

Potential effects due to moving this section of road closer to areas where greater concentrations of Woodland Caribou activity occur can include illegal hunting; potentially greater exposure of the woodland caribou herds to predators, and on occasion to parasites and diseases carried by alternate prey species such as moose. Potential effects on Woodland Caribou associated with the project are generally linked to accessibility and disruption to breeding and feeding activities due to noise both during construction and during operation of the highway.

Construction activities associated with ROW clearing also have the potential to adversely affect the habitat of resident and migratory bird species should they be present in the project area. In particular, the review of existing information (see section 3.1.6.2.1) revealed two protected migratory bird species (Eastern Whip-poor-will, and Common Nighthawk) which have been noted within and in close proximity to the PTH 39 project area. Potential effects on the Eastern Whip-poor-will are likely to include loss of habitat as a result of clearing and grubbing operations for the new road alignment. The Common Nighthawk is not likely to experience habitat losses as a result of clearing and grubbing activities as it generally has a preference for nesting in open, vegetation free habitats. Rather, given the Common Nighthawk is present within the general project area, clearing and grubbing activities may inadvertently create nesting habitat for the species if there is a lag in time between construction and clearing activities. Further, should nesting occur within or in close proximity to the project area, breeding activities by both Eastern Whip-poor-will and/or the Common Nighthawk species have the potential to experience some degree of disruption stemming from noise and vibration associated with construction activities.

Mitigation Measures

Minimum clearing, reclamation and re-vegetation of disturbed sites are some of the environmentally sound construction techniques that will be utilized to reduce the footprint of habitat disturbance within the project area. In addition, approximately 30 ha of the abandoned road will be decommissioned, reclaimed, and revegetated in order to encourage growth/re-establishment of natural vegetation. The 3.3 km section of the existing PTH 39 alignment to be decommissioned is shown on Figure 9.

Hunting and harassment of animals during construction will not be permitted. It will be the responsibility of the contractor to ensure compliance with this condition. Mitigation measures relating to accessibility will be dealt as part of construction management. The relocated section of PTH 39 will be constructed off line and access limited to MIT staff and construction personnel working on the project. Public use of the relocated section of PTH 39 will occur once the new section of road is commissioned (i.e. completed and tied into PTH 39 as a part of the provincial transportation network). During operation, potential effects on wildlife will be mitigated by through existing regulations. Provincial Roads and Provincial Trunk Highways are closed to hunting and it is illegal to discharge a firearm or bow from, across or along any provincial road or provincial trunk highway including the road allowance (i.e. ROW) (Manitoab Conservation and Water Stewardship 2013e). Hunting regulations are enforced by provincial Natural Resources Officers.

Consultations with Manitoba Conservation, Wildlife and Ecosystem Protection Branch will be undertaken in order to identify appropriate timing windows for undertaking construction activities. Initial construction activities such as clearing the ROW will take place during the winter months, while grade construction, placement of base course, trimming, and erosion control will occur primarily during the summer so as to minimize construction noise impacts on rearing and calving of ungulate young.

Potential construction related effects on permanent resident and migratory birds include habitat loss and disruption of breading activities associated with clearing, grubbing, and noise stemming from construction activities. As noted above, clearing of the new ROW is scheduled for the winter of 2014. Scheduling clearing activities during the winter should offset potential effects on migratory birds through the removal of potentially attractive nesting habitat from the construction area before breeding typically begins. Although not expected, there may be a lag in time between completion of clearing for the new ROW and initiation of road construction due to wet conditions at the project site after the spring thaw occurs. As noted previously, the Common Nighthawk has been identified as being present within the general PTH 39 project area (see section 3.1.6.2.1).

The Common Nighthawk is a ground nesting species that has a habitat preference for open, vegetation free areas. Ongoing construction activities should be sufficient to dissuade the species from nesting within the active work area. However, should there be a sufficient lag in time between the completion of ROW clearing and start of road

construction in relation to the early breeding period (June 6th), MIT will ensure that the site is reviewed (i.e. surveyed) prior to the start of construction. Should the Common Nighthawk or any other protected migratory birds be identified and likely to be affected by construction activities, MIT will contact Manitoba Conservation, Wildlife and Ecosystem Protection Branch in order to identify further appropriate mitigation measures. If necessary the nesting site will be recorded and a buffer established in order to further mitigate any effects on migratory bird species.

Noise and vibration stemming from construction activities have also been identified as having the potential to disrupt breeding among migratory bird species present should they be present within the PRT 39 project area. MIT will ensure that construction equipment supplied for use on the PTH 39 relocation project will be effectively "sound-reduced" through the use and application of proper silencers, mufflers, acoustic linings, acoustic shields or acoustic sheds as needed during the breeding period.

Significance of Effects

The proposed project consists of a minor relocation of an existing roadway. Although caribou sightings have been recorded in the general area, the biggest concentration of caribou is found to the north proposed highway relocation as shown on Figure 18.

The 2012 telemetry data obtained from Manitoba Conservation and Water Stewardship The minor concentrations of caribou sightings in close proximity to the proposed relocation would indicate that quality of caribou habitat within the proposed ROW would be marginal. Further it is possible that disturbance associated with the existing road and/or active quarries in the area (see section 2.2 for identification of mineral properties) that is keeping the larger concentration of caribou to the north of the existing PTH 39 alignment may cause the Caribou to move further north in order to avoid noise generated during construction and by traffic during operation.

Although the proposed project may result in a net loss of wildlife habitat, clearing of the right-of-way may increase the quality of habitats for some wildlife by creating more browsing habitat which some wildlife use to feed.

Construction and general traffic noises could affect the habitat utilization by local populations of wildlife. However, construction activities will be short-term in duration. Although traffic noise will be long-term during the operation phase of the facility and could extend up to one km away from the new road corridor, traffic volumes are expected to be light and will occur sporadically during the day and minimal during the night.

The risk associated with the potential impacts of increased hunting efficiency of predators and the increased probability of introducing parasites and diseases by moving the highway closer to an area high caribou concentration is difficult to quantify. It is however expected that these impacts will be minor.

Potential effects on migratory bird species will be mitigated to the extent possible through appropriate scheduling of clearing activities, ensuring that equipment used during construction is appropriately sound reduced, and conducting follow-up site investigations should they be deemed necessary.

Environmental effects to wildlife including migratory birds as a result of this project are expected to be not significant following implementation of the proposed mitigation measures described above.

4.1.3 Fisheries

Based on a review of aerial photos, the area does not appear to have defined watercourses and does not appear to be fish habitat.

4.1.4 Surface Waters

Potential Effects

Adverse effects to surface waters from project related activities could potentially occur as a result of disturbances to existing drainage patterns and reduction of water quality of local water bodies resulting from increased erosion and sedimentation loads.

Mitigation Measures

To accommodate the natural drainage of the project area, culverts and ditches will be designed to not impede the natural flow of water. Culverts of sufficient size and/or numbers will be installed to ensure proper flood management in accordance with normal departmental standard design.

Proper erosion and sedimentation control plans will be implemented as dictated by local soil conditions.

Significance of Effects

There will be minimal change to existing drainage patterns and water quality of water bodies.

No significant adverse effects to surface waters are expected as a result of this project following implementation of the identified mitigation measures.

No impacts on fish or fish habitats are expected.

No water bodies considered “navigable” are impacted by this proposal.

4.1.5 Ground Water

Potential Effects

Virtually any activity whereby chemicals or wastes may be released has the potential to pollute ground waters. Transferring of fuels and other hazardous materials can create spills that may reach the ground water table and contaminate ground water supplies.

Also, changes to ground water regimes can occur in areas experiencing deep cuts as deep cuts can intercept the natural flows. They can also expose large areas of confined aquifers; depressurize the confined aquifer thus altering the local ground water flow patterns.

High fills can also impact ground water by blocking ground water flow patterns and by reducing the hydraulic properties of the underlying surficial soils due to compaction.

Mitigation Measures

Hazardous materials shall be transported, stored, used and disposed of in accordance with applicable regulatory requirements.

There are no areas where deep cuts and high fills will be required in this project.

Significance of Effects

It has been concluded that with the application of appropriate mitigation measures, significant adverse environmental effects to underground water regimes in the study area as a result of this construction are not likely to occur.

4.1.6 Forestry Resources

Potential Effects

The vegetation along the proposed right-of-way has been previously described as a spruce bog, old growth forest of undetermined age, that is widely spaced with small diameter trees. Growth is highly suppressed due to saturation from the bog conditions of the area.

The total clearing of the right-of-way will potentially result in the removal of approximately 75 ha of mixed vegetation. Within this context, some forest vegetation will be cleared.

Mitigation Measures

Prior to any clearing taking place, the Forestry Branch of Manitoba Conservation will be consulted to identify areas of merchantable timber and discuss the most appropriate means of salvaging it within the proposed right-of-way.

In addition, closure and decommissioning of a section of the existing road will allow the vegetative community to return into these areas thus offsetting vegetation losses encountered from clearing the proposed right-of-way. It has been estimated that

approximately 30 ha of abandoned right-of-way will be decommissioned and be revegetated in order to return it to a more natural state.

Significance of Effects

With the implementation of the above noted mitigation measures, it is expected that significant adverse environmental effects to forestry resources are not likely.

4.1.7 Emissions

Project related activities may have an adverse impact on air quality of an area as a result of emissions into the air.

In addition to vehicle emissions covered in Section 4.6 of this report, other emissions that may be generated by this project include: fugitive emissions of dust from construction and operation activities and smoke and particulate matter released during the burning of slash.

4.1.7.1 Dust Emissions

Potential Effects

Dust emissions may be created in this project during the construction and operation stages of the development. Blasting during construction may also produce dust; however, this activity is to occur sporadically and the effects are expected to be short in duration and therefore, no mitigation measures are considered necessary.

Mitigation Measures

Dust suppressant will be applied as required to reduce dust generation.

Significance of Effects

No significant adverse environmental effects are expected to occur following implementation of the proposed mitigation measures.

4.1.7.2 Burning of Slash

Potential Effects

During the construction stage of the development, unsalvageable woody debris will be burned. This process may release smoke and particulate matter into the air, thus reducing the local air quality (short term) and may lead to reduced visibility in the project area.

Mitigation Measures

Burning of slash will be undertaken in accordance with appropriate provincial and municipal regulations.

Significance of Effects

Burning of slash, if undertaken, will be short duration and localized. No significant adverse environmental effects are expected to occur.

4.1.8 Hazardous Wastes (storage, transportation, and disposal)

Potential Effects

A variety of potentially hazardous materials such as fuels, oils and lubricants are usually used, stored, disposed and transported during the construction of a highway project. The major concern regarding these substances is the incidental release into the environment through spills and improper disposal.

Accidental spills and releases of fuels, oils and lubricants are possible during all phases of the project. Releases can occur as a result of equipment malfunction, and vehicular collisions. Depending on the location of these occurrences, spills can affect the health and safety of people, air quality, surface and ground water, terrestrial and aquatic habitats.

Mitigation Measures

Proper implementation of good management practices such as fuel handling safety procedures, emergency response plans and spill containment measures will be used throughout the construction of this project to ensure these potential impacts are reduced. More specifically the following are some of the measures that shall be implemented:

- Releases, spills, leaks and discharges of pollutants or contaminants shall be reported in accordance with existing regulatory requirements (Manitoba Conservation and Water Stewardship– Phone: 204-944-4888)
- Fuels, lubricants, and other petroleum products shall be stored, handled, transported and disposed of in accordance with existing regulatory requirements.

Significant of Effects

In considering the potential effects in conjunction with mitigation measures, the potential for adverse environmental effects associated with the transportation, storage and disposal of hazardous wastes is considered to be not significant.

4.1.9 Impacts on Heritage Resources

Potential Effects

Construction activities could potentially destroy identified and previously undiscovered heritage resources.

In preparation for this assessment, the proposed project has been reviewed by the Historic Resources Branch of the Manitoba Government and it has been concluded that the potential to impact significant heritage resources in this area is low and therefore they have no concerns with the proposed project.

Mitigation Measures

Based on the comments received from the Manitoba Historic Resources Branch, potential impacts on heritage resources are very low. In the event that cultural heritage resources are encountered during construction, an acceptable heritage resource management strategy (acceptable to the Manitoba Historic Resources Branch) will be implemented to mitigate the effects of the development on heritage resources.

Significance of Effects

Project related effects on heritage resources are not expected to occur and are considered to be not significant.

4.1.10 Socio-Economic Implications

Potential Effects

Socio-economic implications resulting from environmental impacts associated with the project are expected to be negligible. That said, potential socio-economic effects associated with the project are largely viewed as being linked to accessibility and disruption of activities that make use of the current PTH 39 “W” alignment. Potential activities that may be affected include disruptions to existing travel patterns along PTH 39 due to construction of the new alignment, access to active quarry sites – specifically those located at the southern end of the west arm of the existing PTH 39 “W” alignment (i.e. at the intersection of PR 596 and PTH 39), access to and use of Wekusko siding by Hudson Bay Mining and Smelting Co. and Tolko to offload equipment and transport timber to their facilities at The Pas, and access to RTL no. 4 by the local trap line holder. As noted in section 2.5.3 the local trap line holder for RTL no. 4 indicated that he makes use of various points along the existing PTH 39 “W” alignment in order to gain access to his trap line.

Mitigation Measures

Mitigation measures to offset potential access related concerns and those related to the disruption of existing activities have been considered and incorporated into the planning stages of the project. Mitigation measures are twofold centering on the decommissioning plan for the existing road and construction staging of the new sections of PTH 39. The relocated section of PTH 39 will be constructed off line and connected to the existing

road network upon completion. Although some increased truck traffic may be experienced along PTH 39 during construction for hauling of materials/equipment, and at access points to the construction site, potential safety issues for the road users and the travelling public will be addressed through implementation of a traffic safety/traffic management plan. Further, staging construction activities (i.e. building the new section of PTH 39 offline) will serve to minimize disruption to existing uses of PTH 39 for both the travelling public, commercial, and resource related interests (i.e. use of Wekusko Siding, hauling of timber and equipment, access to Trap Line no. 4).

The decommissioning plan for the existing section of PTH 39 has also considered local needs and uses. As discussed previously in section 2.3.1 and as shown in Figure 9 MIT's intent is to allow the east and west arms of the existing PTH 39 "W" alignment to remain in place. The west arm will serve as an extension of PR 596 and connect to PTH 39 at an improved intersection where it meets the newly constructed section of road. The existing east arm will be converted to and maintained as a departmental road in an unorganized territory. The 3.3 km of the centre southern portion of the existing PTH 39 alignment will be closed, leveled, revested, and revegetated. Allowing the east and west arms of the existing alignment to remain in place will permit continued access to much of the areas used by local interests. For example, ensuring that the east and west arms of the existing PTH 39 alignment remain in place will allow for access to and use of mineral/quarry properties as well as support continued access to Trap Line no. 4. Although access to a portion of the existing PTH 39 alignment will be decommissioned, it should be noted that the new alignment also falls within Trap Line no. 4. Once construction is complete and the new section of PTH 39 is tied into the provincial highway network, it will allow for new areas within Trap Line no. 4 to be opened.

Significance of Effects

In considering the project, current land uses, and application of mitigation measures associated with the project area, potential adverse socio-economic effects under review are considered to be not significant.

4.1.11 Climate Change Implications

Potential Effects and Significance of Effects

Air quality can be affected by emissions released from vehicles and equipment during the construction phase, as well as vehicles using the road during the operation phase. These vehicles and equipment are powered directly by the combustion of fossil fuels and therefore may have climate change implications.

The construction and future maintenance phases of the proposed project may also produce fugitive emissions of dust along the entire route during a number of activities.

Some vegetation will also be cleared in preparation of the construction of the proposed facility. Trees and other plants absorb and store carbon dioxide from the atmosphere. Destruction of trees, green spaces and other ecosystems within a community causes the release of that carbon dioxide into the atmosphere and prevents the ecosystem from absorbing further carbon dioxide.

Because of the relatively small magnitude of the project and its relatively short duration, climate change impacts from construction activities are expected to be local, transient and negligible.

During the operation phase, climate change implications are also expected to be negligible. The proposal basically consists of the relocation of an existing highway. The low volumes of traffic using the facility will be shifted from the old location into the new one. It may also be argued that the section of highway will be more efficient with a shorter travel distance coupled with an improved vertical and horizontal alignment. This would generally lower vehicle fossil fuel consumption during the operation phase of the project. These improvements to PTH 39 would contribute to the overall reduction of greenhouse gas emissions in Manitoba and assist in combating climate change. The overall climate change implications associated with this project are considered to be not significant.

5.0 Conclusions

MIT is planning to relocate a minor section of PTH 39 from 6.0 km west of PR 596 to 10.0 km east of PR 596. The proposed work consists of constructing approximately 8.6 km of new roadway on new location. Potential effects of the Project have been considered in conjunction with the application of mitigation measures. MIT concludes the PTH 39 relocation project is not likely to result in any significant adverse environmental effects.

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