TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF PHOTOGRAPHS

LIST OF APPENDICES

10.0 SOCIO-ECONOMIC AND CULTURAL ENVIRONMENT

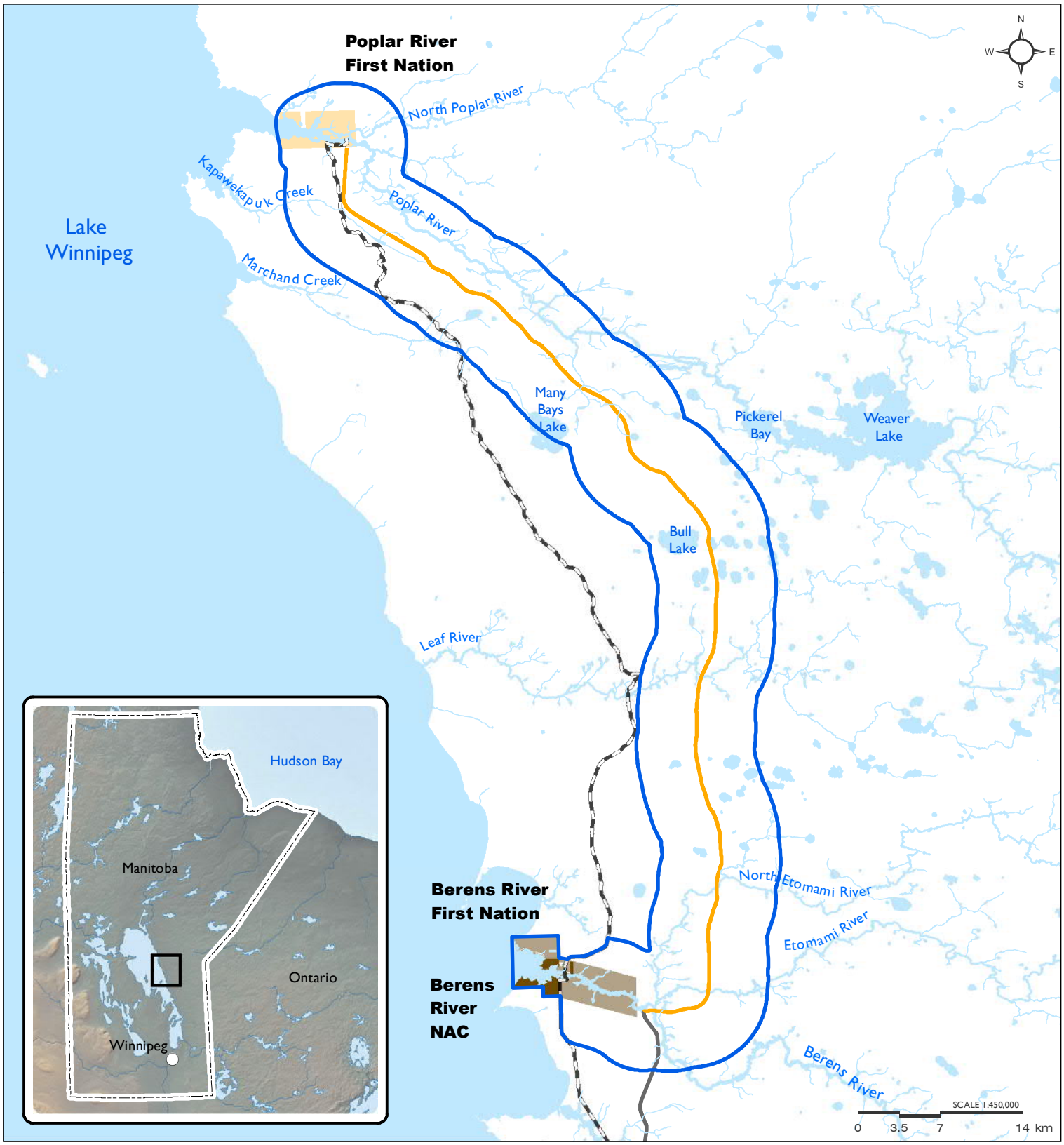
This chapter of the Environmental Impact Statement (EIS) provides information on the existing conditions for the socio-economic and cultural (referred to frequently as 'socio-economic') environment components in the Project study area including data gathered from desktop studies and field investigations as well as information provided by local communities regarding their traditional and cultural activities. Linkages between expected Project activities and the socio-economic environment were examined to determine the potential effects of the Project on the natural environment that may then affect the socio-economic environment. Mitigation measures to avoid or minimize the potential adverse effects were identified. The residual effects following the application of mitigation measures were then summarized and evaluated using the significance criteria outlined in **Chapter 6** (Environmental Impact Assessment Scope and Approach).

Dillon Consulting Limited led the community engagement process regarding this Project which is documented in **Chapter 4** (Aboriginal and Public Engagement). Northern Lights Heritage Services Inc. (NLHS), AMEC Foster Wheeler, and the Centre of Indigenous Environmental Resources (CIER) were involved in compiling and documenting Traditional Knowledge and heritage and cultural resources information for the Project study area. Summary information from these studies is provided throughout this chapter.

For the purpose of scoping the spatial extent of the socio-economic and cultural environment, the study areas for the environmental impact assessment (**Section 10.2**) are described as follows:

The **Project Footprint** is the directly affected area within which the P4 all-season road construction and associated activities are located. The Project Footprint is defined as the 100 m right-of-way corridor centered on the all-season road centerline of which, typically, 60 m is cleared. This area includes both permanent (e.g. the all-season road) and temporary (e.g., temporary access routes, borrow areas) Project components. It is expected that borrow areas will be within 500 m of the road centreline while quarries may be up to 1 km from the road alignment to minimize the need for temporary access route development and minimize haul distance by heavy construction equipment.

The Socio-Economic **Local Assessment Area** is the area beyond the Project Footprint within which Project effects are measurable. For the socio-economic and cultural environment, this area includes the communities of Berens River First Nation, the Berens River Northern Affairs Community (NAC) and Poplar River First Nation (**Figure 10-1**) that may be affected by the potential environmental effects of the Project.



Project 4 - All-Season Road Connecting Berens River to Poplar River First Nation

Figure 10-1
Socio-Economic Local Assessment Area

- P4 All-Season Road Alignment
- P1 All-Season Road (South of Berens to PTH 304) - Under Construction
- 2013/2014 Manitoba Winter Road
- Socio-Economic Local Assessment Area
- Berens River First Nation Reserve
- Poplar River First Nation Reserve
- Berens River Northern Affairs Community

Map Drawing Information:
ESRI Base Layers, Province of Manitoba, CanVec, GeoGratis, Dillon Consulting Limited

Map Created By: ECH
Map Checked By: MG/PS/LD
Map Projection: NAD 1983 UTM Zone 14N

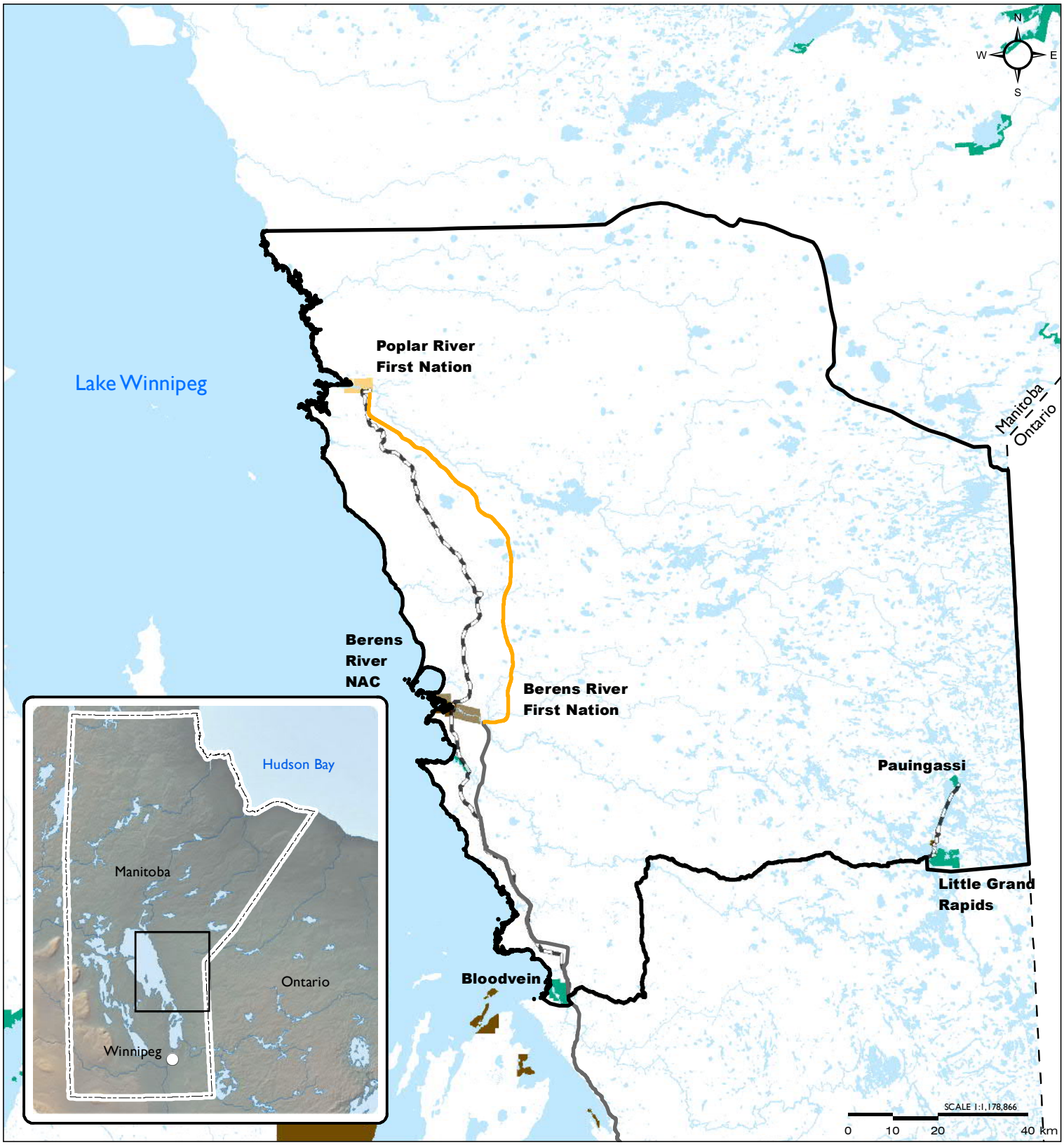
DATE: 4/8/2016

MANITOBA East Side Road AUTHORITY

The Socio-Economic **Regional Assessment Area** is the area beyond the Local Assessment Area within which most indirect and cumulative effects would be expected to occur. For the socio-economic environment, the Regional Assessment Area includes areas in which the Project may have effects on the regional environment and those who use this area. The Regional Assessment Area (**Figure 10-2**) is large and sparsely populated. In addition to the communities contained with the Local Assessment Area, the Regional Assessment area also includes the following First Nations communities:

- Bloodvein First Nation;
- Little Grand Rapids First Nation;
- Little Grand Rapids Northern Affairs Community; and
- Pauingassi First Nation.

Other Northern Affairs communities (NAC) that lie in the regional assessment area include Princess Harbour just north of Bloodvein First Nation and Little Grand Rapids, adjacent to the Little Grand Rapids Airport, both which have limited or seasonal populations.



Project 4 - All-Season Road Connecting Berens River to Poplar River First Nation

Figure 10-2

Socio-Economic Regional Assessment Area

- P4 All-Season Road Alignment
- P1 All-Season Road (South of Berens to PTH 304) - Under Construction
- 2013/2014 Manitoba Winter Road
- Socio-Economic Regional Assessment Area
- Northern Affairs Community
- Berens River First Nation Reserve
- Poplar River First Nation Reserve
- Other First Nations

Map Drawing Information:
ESRI Base Layers, Province of Manitoba, CanVec, GeoGratis, Dillon Consulting Limited

Map Created By: ECH
Map Checked By: MG/PS/LD
Map Projection: NAD 1983 UTM Zone 14N

DATE: 4/8/2016

MANITOBA East Side Road AUTHORITY

10.1 Existing Conditions

10.1.1 Local Landscape

The existing landscape of the Local Assessment Area is characterized by a generally level or gently undulating terrain dominated by boreal forest including areas of peat-covered lowland (i.e., bog/fen complexes), bedrock outcrops and resulting fragmented patches of forest cover. The landscape is mostly undisturbed with the exception of the forest fire evidence and physical socio-economic features that include: the settlement areas of Berens River First Nation reserve and Northern Affairs Community, and Poplar River First Nation reserve; the existing winter road corridor; the Manitoba Hydro transmission line corridor; snowmobile trails; portages; and traditional travel routes. Permanent features that will be added following construction of the Project include: the proposed all-season road; quarries for road maintenance; bridges at four river crossings; and culverts at other waterways.

10.1.2 Socio-Economic and Cultural History

The region in which the Project is to be built has been one in which First Nations engaged in traditional activities and celebrated their relationship with the land for thousands of years. The region's lakes and rivers played a strategic role in the establishment of settlements at Berens River and Poplar River. Their locations at the confluence of major rivers with Lake Winnipeg contributed to the region serving as an integral component of the prairie fur trade. The following sections provide an overview of the socio-economic and cultural history of the area.

10.1.2.1 Prior to the Fur Trade

East-Central Manitoba was covered by glacial ice and melt water until about 11,000 years ago (Prest 1969). By 8,000 B.C. archaeological records indicate that the Anishinaabe were living along the east side of Lake Winnipeg (Buchner 1979) and much of the drainage basin east of Lake of the Woods had become free of large, glacial water bodies and assumed its modern form (Steinbring 1980). Earliest traces of human occupation have been found south of the Project Regional Assessment Area along the Manigotagan River system where large projectile points were excavated at Caribou Lake (Buchner 1979).

In the pre-European contact period, signs of Anishinaabe occupation throughout this area are evidenced by small winter settlements of log cabins and winter tents in well-protected, wooded areas within reasonable distance from lakes. These sites are often found within 100 m of shorelines, but also occur in the remote interior where trapline cabins were erected. Cabins were usually constructed at 13 km intervals across one's trapline as this was the optimum distance of travel by dogsled or on foot. Skins and furs of mammals trapped in the area were used primarily for personal and community uses. Given the fire regime of the boreal forest, many of these early cabins were destroyed by fire and remain only as hard-to-find hummocky foundations or subtle outlines on the forest floor.

10.1.2.2 Fur Trade History

It is presumed that the history of the fur trade on the east side of Lake Winnipeg began in or around the 1720s with the establishment of trade with the French (Lytwyn 1986). William Tomison is presumed to be the first Hudson's Bay Company (HBC) representative to reach Lake Winnipeg in 1767 via the Poplar or Berens River from Severn House on Hudson Bay (Lytwyn 1986). This expedition was followed by George Sutherland in 1777 (Lytwyn 1981). The first trade post in the area was established in 1801 when David Sanderson came to Little Grand Rapids from Fort Albany, Ontario, and established a winter trading post for the HBC calling the area "Big Fall" (Schuetze 2001). The name of the post changed over the years to 'Great Falls' and 'Grand Falls' and is now known as Little Grand Rapids (Neufeld 1991). The first trading post on the Poplar River was established in 1806, by William Thomas of the Hudson's Bay Company (Poplar River First Nation 2011).

Between 1870 and 1930, Aboriginal hunting and gathering shifted from a subsistence activity to a commercial activity where harvested natural resources could be used to trade for European foods at the HBC post. Trapping throughout the region became considerably more intensive during the fur trade era than to times prior. Movement of the Anishinaabe across the landscape followed resources with hunting and trapping activities dependent on the season.

10.1.3 Overview of Regional Communities

There are seven communities within the Project's Regional Assessment Area: five First Nations; and two Northern Affairs Communities (NACs). Four of the five First Nations were signatories to Treaty 5 which covers much of central and northern Manitoba[1]. The Treaty was signed in 1875/76. A brief overview of each of the communities in the Regional Assessment Area is provided below from southernmost to northernmost. Population (i.e., census) data were compiled from Aboriginal Affairs and Northern Development Canada's (AANDC's[2]) most recent First Nation Profiles, Statistics Canada census data and Southeast Resource Development Council Corp's (SERDC) website. The SERDC is a political and administrative organization incorporated in 1978 having a mandate to facilitate the management of programs and services for its eight member communities. The five First Nations of the Regional Assessment Area are members of the SERDC. The locations of the First Nations and NACs within the Regional Assessment Area are shown in **Figure 10-2**[3].

Bloodvein First Nation

The Bloodvein First Nation (IR No. 12) is located at the southern boundary of the Regional Assessment Area and along 3 km of shoreline at the confluence of the Bloodvein River with Lake Winnipeg. The community is located approximately 200 km north of Winnipeg and covers an area of approximately

[1] Originally part of Little Grand Rapids First Nation, some members moved to Fishing Lake to form the Pauingassi First Nation; officially becoming a separate First Nation on October 7, 1991. The Pauingassi received reserve status in 1988.
[2] AANDC is now Indigenous and Northern Affairs Canada (INAC), however population demographic data in this chapter is referenced as AANDC 2015, as the source of the information was still attributed to AANDC at the time of publication of this document.
[3] Note that the Little Grand Rapids Northern Affairs Community location is not illustrated in Figure 10-2 due to the scale of the map figure and small geographic area of the community.

1,625 ha. Census data from 2011 identify the on-reserve population of the Bloodvein First Nation at 645 although SERDC data from 2012 indicate an on-reserve population of 1,030 and 604 off-reserve for a total of 1,634 (SERDC 2015). The reserve is connected to the provincial road network and the Province operates a ferry/barge service during the summer months. A 3,000 ft (915 m) gravel runway is maintained in the community. The Bloodvein River became Manitoba's first Canadian Heritage River in 1987.

Little Grand Rapids Northern Affairs Community (NAC)

Little Grand Rapids NAC is located approximately 250 km northeast of Winnipeg on the north shore of Family Lake on approximately 150 ha of provincial Crown land near the Manitoba/Ontario border. The community is very small with approximately 18 housing units and a population of 5 (Government of Manitoba 2007). The Little Grand Rapids First Nation is located across the Lake. A 2,800 ft (850 m) gravel airstrip is operated by the Province and serves as the local airport for the NAC and the Little Grand Rapids and Pauingassi First Nations.

Little Grand Rapids First Nation

Little Grand Rapids First Nation (IR 14) is located approximately 270 km northeast of Winnipeg along an 8 km length of shoreline (2,006 ha) on the southeast side of Family Lake. During the open water season, the community is only accessible by boat or float plane. Regional air service is accessed from the airstrip located at the NAC. In winter, access is via snow machine or winter roads to Bloodvein and Pine Dock. During freeze up and spring break up, the Little Grand Rapids First Nation is accessible only by helicopter. Census data from 2011 identify the total population of Little Grand Rapids First Nation as 835 however SERDC data for 2014 indicate that there are 1,047 members living on-reserve and 508 living off-reserve for a total population of 1,555 (SERDC 2015). An Order-In-Council established the Little Grand Rapids First Nation reserve in 1930.

Pauingassi First Nation

Pauingassi First Nation is approximately 261 ha in size, is located at the north end of Fishing Lake approximately 280 km northeast of Winnipeg, and is approximately 25 km north of Little Grand Rapids First Nation. Similar to Little Grand Rapids First Nation, there is no permanent access to Pauingassi First Nation. During the open water season, the community is only accessible by boat or float plane. In winter, access is via snow machine or winter roads to Bloodvein and Pine Dock. Regional air service is accessed from the airstrip located at the Little Grand Rapids NAC. The total registered population of Pauingassi First Nation is 370 (Statistics Canada 2011a) although SERDC 2014 data reports an on-reserve population of 565 and 47 off-reserve for a total population of 612 (SERDC 2015). The Pauingassi First Nation was originally part of the Little Grand Rapids First Nation which was a Treaty 5 signatory in 1876. They received their reserve status in 1988 and became a separate First Nation by Ministerial Order in 1991.

Berens River First Nation

Berens River First Nation reserve (IR No. 13) is located approximately 270 km north of Winnipeg at the confluence of the Berens River with Lake Winnipeg. The reserve is approximately 2,550 ha in size. The community is accessible by air, private vessel, community barge (seasonally-operated) and winter road. A 2,900 ft (880 m) gravel airstrip is located in the community with scheduled service to Winnipeg and other communities. ESRA's P1 all-season road project is currently under construction which will connect the Berens River First Nation community with Bloodvein First Nation and the wider provincial road network via PR 304. Census data from 2011 state the population of Berens River First Nation at just over 1,000 and 240 households (Statistics Canada 2011b) although recent (i.e., 2015) data from the SERDC identify the total population of this First Nation at 3,244 with 2,110 living on-reserve and 1,134 living off-reserve (SERDC 2015). The community is located in the Local Assessment Area and represents the southern terminus of the proposed P4 Project. Additional details about Berens River First Nation are provided in **Section 10.1.4**.

Berens River Northern Affairs Community (NAC)

The Berens River NAC is located generally west of Berens River First Nation on approximately 390 ha of provincial Crown land adjacent to the First Nation. Created under Manitoba's *Northern Affairs Act*, the community has been governed by a mayor and council since 1970. There are approximately 60 housing units and a population of just over 150 (Berens River Community Council 2015). Economic activity generally consists of fishing, trapping, forestry and rock quarrying.

Poplar River First Nation

Poplar River First Nation (IR No. 16) is the most northerly community in the Regional Assessment Area and is located at the confluence of the Poplar River and Lake Winnipeg. The area of the reserve is approximately 1,540 ha. Poplar River First Nation has a total population of 1,787 with 1,326 living on-reserve and 461 members living off-reserve (SERDC 2015). The community, located approximately 350 km north of Winnipeg, is currently accessible by air, winter road and by barge (during open water). A 2,500 ft (760 m) gravel airstrip is maintained in the community and is serviced by scheduled and charter flights. The community is also located in the Local Assessment Area and represents the northern terminus of the proposed P4 Project. Additional details about Poplar River First Nation are provided in **Section 10.1.4**.

Princess Harbour Northern Affairs Community

Princess Harbour is a small community approximately 15km north of Bloodvein First Nation (IR No. 16) on Lake Winnipeg with a total population of 10. The community, located approximately 304 km north of Winnipeg, is currently accessible by private boat (during open water) or private winter road (Government of Manitoba 2007) and is approximately 10km west of the all season road under construction between PR 304 and Berens River.

10.1.4 Berens River First Nation and Poplar River First Nation Communities

Below are additional details of the two First Nations communities located in the Local Assessment Area and which represent the two end-points of the proposed P4 all-season road.

10.1.4.1 Local Demographics and Labour Force

Both Berens River and Poplar River communities are characterized as young and growing. Based on federal census data, the populations of Berens River and Poplar River grew by 38% and 32% between 2006 and 2011, respectively (**Table 10.1**). By comparison, population growth in the Province of Manitoba over the same 5-year period was 3.6%. Current estimates from the SERDC indicate continued growth in both communities.

Table 10.1: On-Reserve Population and Population Growth[4]

	Berens River First Nation	Poplar River First Nation
Population in 2001	625	644
Population in 2006	739	643
Population in 2011	1,028	848
% Change (2006-2011)	38%	32%
Population in 2015	2,110	1,326

Source: Statistics Canada (2006a,b); Statistics Canada (2011b,c); SERDC (2015)

As shown in **Table 10.2**, the median ages of Berens River and Poplar River First Nations are 21.3 and 21.7 respectively. This is substantially younger than the provincial median age of 37.9 years. There are few residents in either community over the age of 65 while that age cohort comprises roughly 10% of the Manitoba population. The majority of residents (95%+) in both communities are Status Indians. There are slightly more males than females in both communities (**Table 10.2**), while the opposite is true for the Province as a whole. The average household size for both Berens River First Nation and Poplar River First Nation is 3.7 persons per household which is greater than the provincial average of 3.0 persons per household (Statistics Canada 2006a,b; Statistics Canada 2011b,c).

Table 10.2: Population Demographics for Berens River First Nation and Poplar River First Nation

	Berens River First Nation			Poplar River First Nation		
	Total	Male	Female	Total	Male	Female
Total All Persons	1,030	550	480	845	445	400
Registered Indian	1,000	535	465	820	430	390
Not a registered Indian	35	15	20	25	20	10
Age characteristics						
Total All Persons	1,030	550	480	845	445	400
Age 0-19	485	255	230	390	200	190

[4] The population numbers for Berens River do not include the Berens River Northern Affairs Community.

Age 20-64	520	280	240	430	230	200
Age 65 and over	25	15	15	25	15	10
Median Age	21.3	21.6	21.1	21.7	22.3	20.8

Source: AANDC (2015)

Education rates in Berens River and Poplar River First Nations are much lower than those for the province as a whole, particularly for post-secondary education. Residents with a high school diploma (or equivalent) make up 14.8% of the population over 15 years of age in Berens River, 14.0% in Poplar River, and 27.7% for Manitoba. Residents with a university degree (Bachelor or higher) make up 4.4% of the population over 15 years of age in Berens River, 1.9% in Poplar River and 17.8% in Manitoba (AANDC 2015).

Income levels in Berens River and Poplar River First Nations are much lower than the Manitoba average. The average total income for those over the age of 15 is $16,973 for Berens River and $16,342 for Poplar River. The provincial average is $36,696. Government transfers make up a much larger proportion of income in Berens River and Poplar River (30% in both communities) than at the provincial level (13%) (AANDC 2015).

The predominant employment sectors in Berens River First Nation include “other services” (21.5%), health and education (14.8%), and agriculture and resource-based activities (8.1%). For Poplar River First Nation, the predominant employment sectors are health and education (22.6%), “other services” (17.9%) and wholesale and retail services (4.7%). Unemployment rates in both communities are much higher than the provincial average. The unemployment rate in Berens River First Nation is 18.8% and in Poplar River First Nation is 19.3%. The provincial rate is 6.2%.

10.1.4.2 Economy

The economy of Berens River First Nation/NAC and Poplar River First Nation includes a mix of wage, cash and traditional economic activities. The wage economy is largely derived from public sector employment including health care, education, social services and band activities. The cash economy (also including the barter economy) accounts for the delivery of goods and services outside of registered businesses or companies. The traditional economy includes subsistence activities such as non-commercial hunting, gathering and fishing as well as other resource-based activities.

Poplar River First Nation manages and operates the services in its community including housing, roads, sewers, watermains and capital purchases at an annual cost of $10,000,000. In addition to incomes from fishing and trapping, most other economic activities are associated with government, community services and construction/maintenance projects (Poplar River First Nation 2011).

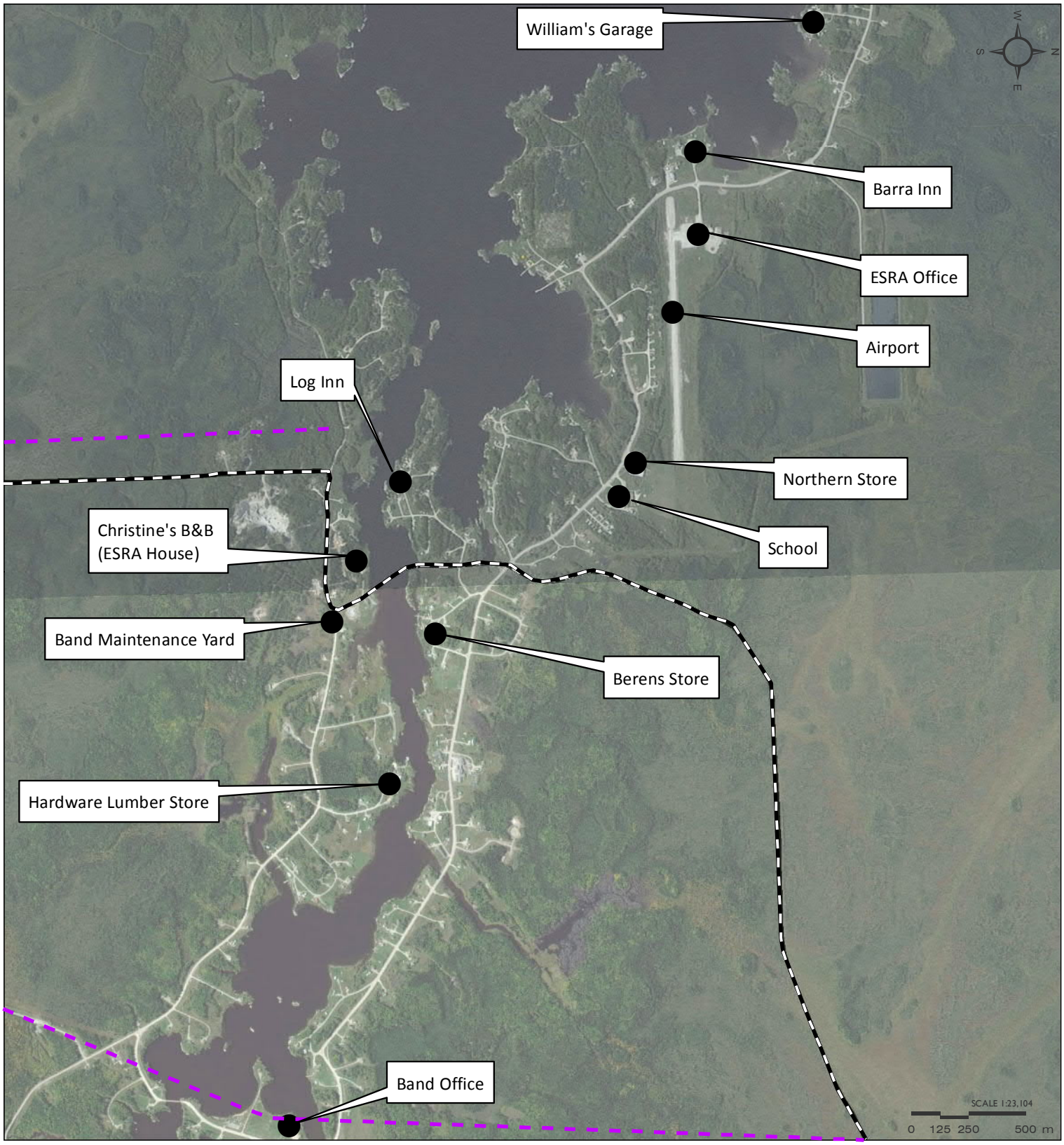
Berens River First Nation/NAC have an economic makeup similar to that of Poplar River First Nation. At present, 95 residents of Berens River are employed by contractors involved in the P1 all-season road project which will connect Berens River and Bloodvein First Nation.

Local businesses established in Berens River and Poplar River First Nation include those listed in **Table 10.3**. The locations of a number of these businesses in Berens River and Poplar River First Nation are shown in **Figures 10-3** and **10-4**, respectively.

Table 10.3: Select Local Businesses in Berens River and Poplar River First Nation

Business Type	Berens River	Poplar River First Nation
Food, Lodging, Construction, Communications and Transportation	▪ Berens River Log Inn ▪ Berens River Lodge ▪ North Country Lodge ▪ Christine's Coffee Shop ▪ Berens River Tug Boat/Barge ▪ Berens River Airport ▪ Barra Inn (NAC) ▪ Meemeesipii Inc. (Construction)	▪ Sagatay Lodge ▪ Bunny's Restaurant ▪ Sara's Diner ▪ B & B Networking (internet service provider) ▪ Poplar River Airport ▪ Poplar River Barge Service
Retail and other	▪ Oshetoon Building Supplies ▪ Neil Disbrowe's Woodworking ▪ Linda & Valerie's Video Shop ▪ William's Garage ▪ Berens River Store ▪ Northern Store ▪ Hubert Boyd (Store) ▪ John Alex Enterprises Ltd. (Store)	▪ Negginan Hardware ▪ Northern Store

Source: SERDC (2015)



Project 4 - All-Season Road Connecting Berens River to Poplar River First Nation

Figure 10-3

Berens River Businesses

2013/2014 Manitoba Winter Road

Existing Transmission Line

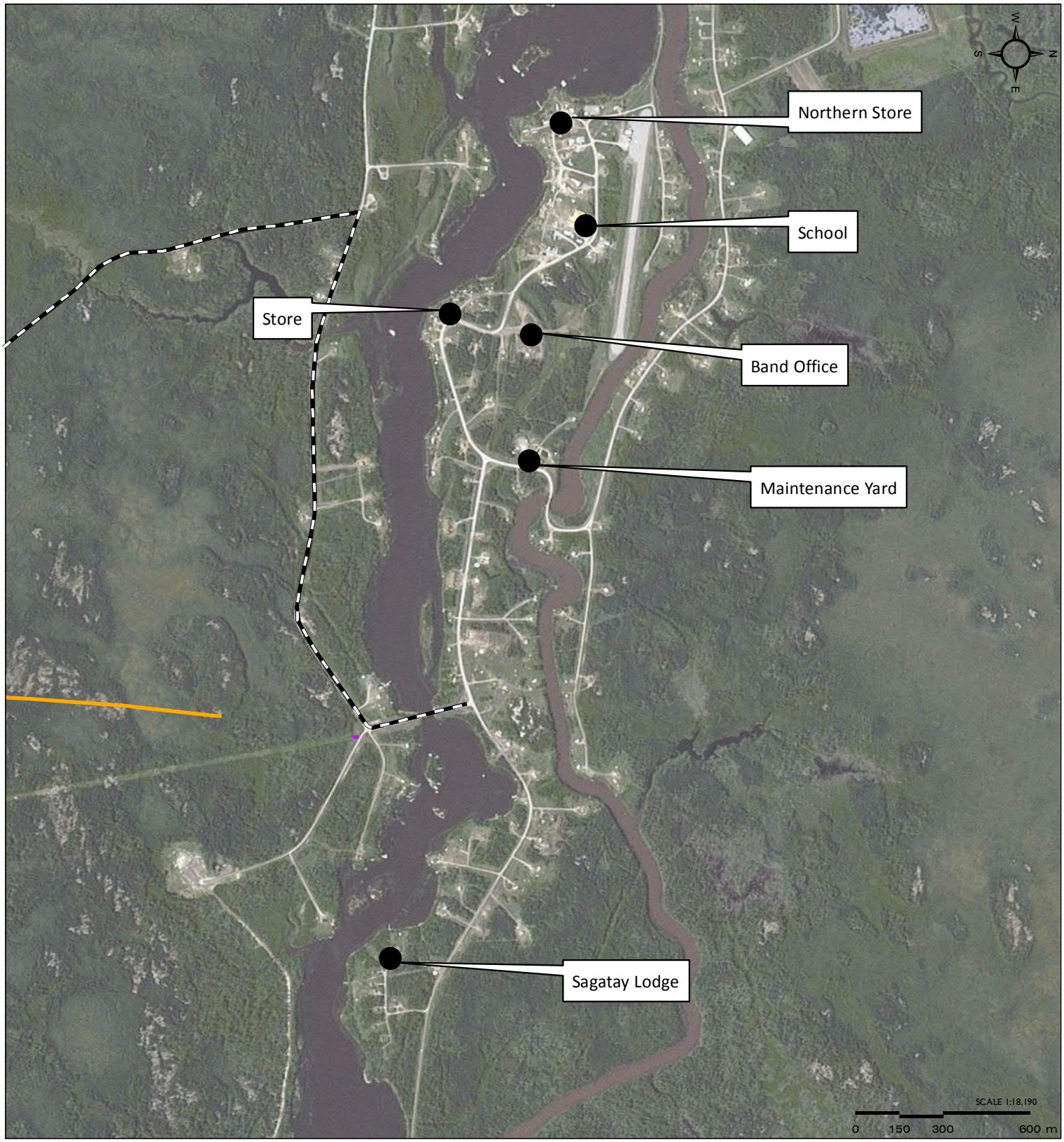
Berens River Businesses

Map Drawing Information:
ESRI Base Layers, Province of Manitoba, CanVec, GeoGratis, Dillon Consulting Limited

Map Created By: ECH
Map Checked By: MG/PS/LD
Map Projection: NAD 1983 UTM Zone 14N

DATE: 4/8/2016

MANITOBA East Side Road AUTHORITY



Project 4 - All-Season Road Connecting Berens River to Poplar River First Nation

Figure 10-4

Poplar River Businesses

- P4 All-Season Road Alignment
- 2013/2014 Manitoba Winter Road
- Existing Transmission Line
- Poplar River Businesses

Map Drawing Information:
ESRI Base Layers, Province of Manitoba, CanVec, GeoGratis, Dillon Consulting Limited

Map Created By: ECH
Map Checked By: MG/PS/LD
Map Projection: NAD 1983 UTM Zone 14N

DATE: 4/8/2016

MANITOBA East Side Road AUTHORITY

10.1.4.3 Infrastructure, Utilities and Services

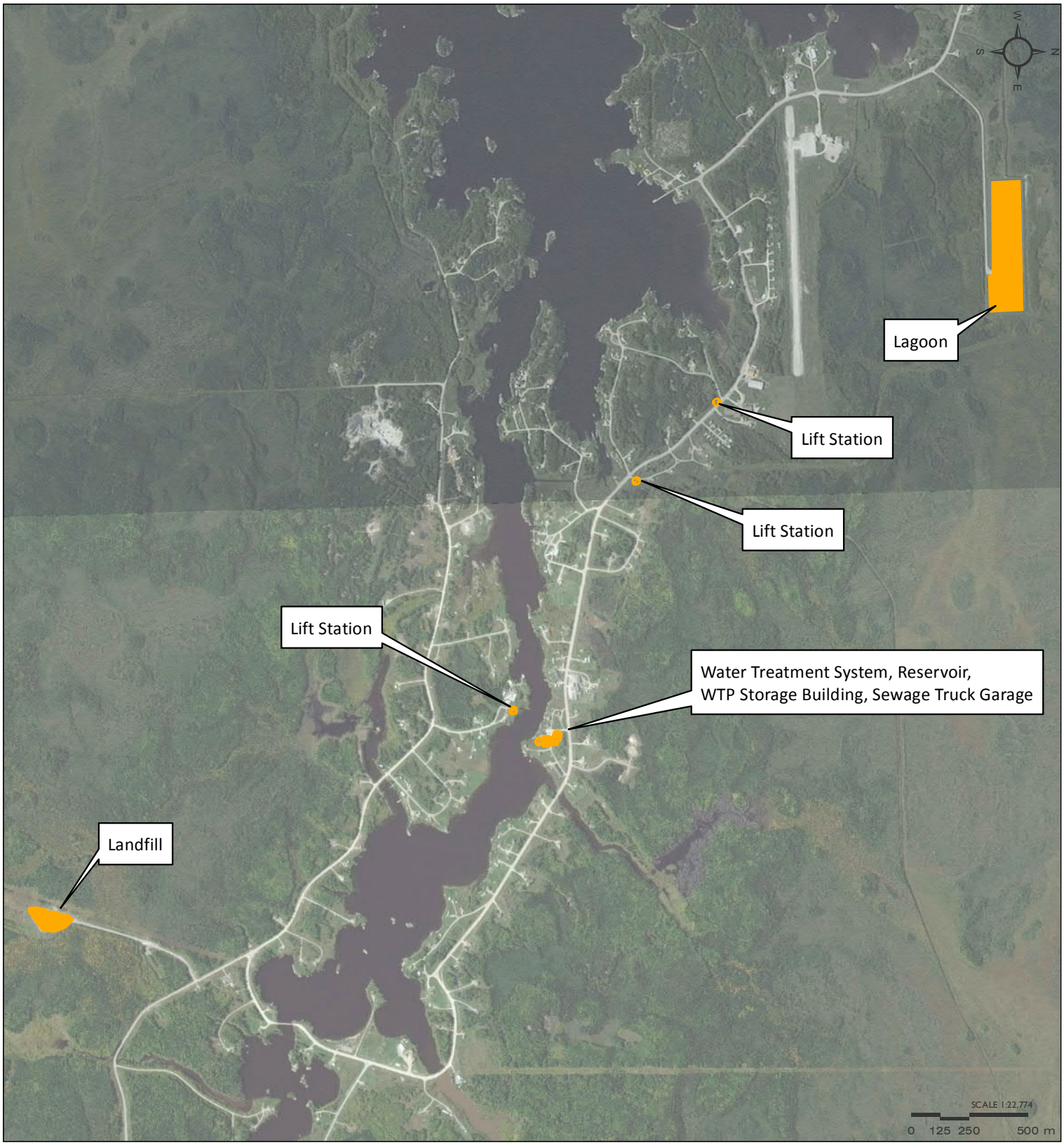
The communities of Berens River First Nation/NAC and Poplar River First Nation have modern water and wastewater services. Drinking water is sourced from the major rivers flowing through each community that is treated at community water treatment plants, although the Berens River NAC is sourced from Lake Winnipeg. There are approximately 23 residences in Berens River that have no water service. Certain institutional buildings operate their own water treatment facilities and distribution systems. Both Berens River and Poplar River First Nations are serviced by community sewage treatment plants and lagoons. There are approximately 23 residences in Berens River that use private privies.

Table 10.4 provides a summary of the infrastructure and utilities in the communities of the Local Assessment Area. **Figure 10-5** and **Figure 10-6** illustrate various infrastructure within Berens River and Poplar First Nations, respectively. A 66 kV Manitoba Hydro transmission line, located west of the winter road corridor, provides electricity to the Berens River First Nation, Berens River NAC and Poplar River First Nation communities. Internet in the communities is generally provided by satellite.

Table 10.4: Overview of Infrastructure and Utilities – Berens River First Nation/NAC and Poplar River First Nation

Infrastructure Services	Berens River First Nation/NAC	Poplar River First Nation
Water	Water is obtained from the Berens River, then treated and distributed via watermains to 239 houses; 23 houses have no service. Certain institutional buildings operate individual water treatment facilities and distribution systems. Water in the Berens River NAC is obtained from Lake Winnipeg.	The community has a water treatment plant and water is distributed to houses and community buildings; water source is the Poplar River.
Sewer	The community has a sewage treatment plant connected to 239 houses and public facilities; 23 houses utilize pit privies, lagoons are located north of the community.	The community has a sewage treatment plant and houses and community buildings are connected.
Waste Management	One landfill site located southwest of the community.	One landfill site located southwest of the community.
Roads	No permanent access route to the community; access is provided by winter road; the community has a small network of internal gravel roads.	No permanent access route to Poplar River; an annual winter road provides access to Poplar River for travel southward; there are approximately 21 km of internal roads on-reserve.
Electricity	Manitoba Hydro – Transmission line	Manitoba Hydro – Transmission line
Telephone	MTS – Landline. No cell service.	MTS – Landline. No cell service.

Source: ESRA (2011)



Project 4 - All-Season Road Connecting Berens River to Poplar River First Nation

Figure 10-5

Berens River Physical Infrastructure

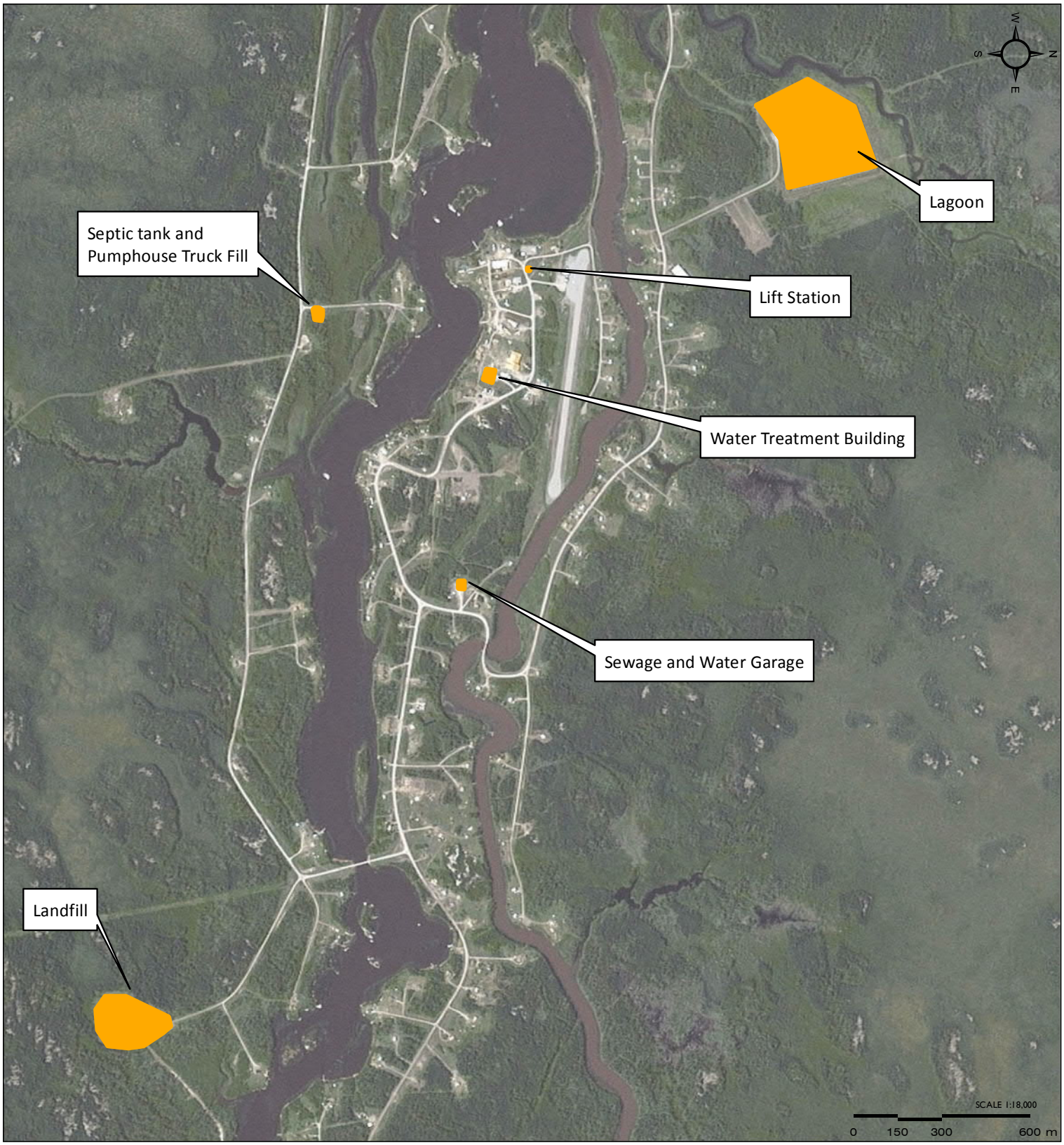
Physical Infrastructure

Map Drawing Information:
ESRI Base Layers, Province of Manitoba, CanVec, GeoGratis, Dillon Consulting Limited

Map Created By: ECH
Map Checked By: MG/PS/LD
Map Projection: NAD 1983 UTM Zone 14N

DATE: 4/8/2016

MANITOBA East Side Road AUTHORITY



Project 4 - All-Season Road Connecting Berens River to Poplar River First Nation

Figure 10-6

Poplar River Physcial Infrastructure

Physical Infrastructure

Map Drawing Information:
ESRI Base Layers, Province of Manitoba, CanVec, GeoGratis, Dillon Consulting Limited

Map Created By: ECH
Map Checked By: MG/PS/LD
Map Projection: NAD 1983 UTM Zone 14N

DATE: 4/8/2016

MANITOBA East Side Road AUTHORITY

The Berens River School provides educational and student services programming up to grade 9. A nursing station and new renal centre in Berens River provide health care services to the community. One on-reserve band constable is supported by RCMP constables stationed in Selkirk. Recreational amenities in Berens River include a skating rink, baseball diamond, playground, and park. Fire protection is provided via a fire truck and a water truck converted for the purpose.

The Poplar River Elementary School provides educational and student services programming for elementary and junior high-aged students (up to grade 8). Students can apply for support in obtaining higher education in part through the SERDC Student Services Division (SERDC 2015).

Poplar River First Nation employs a full-time fire chief, volunteer fire department and two full-time police officers who are assisted by Selkirk RCMP, as necessary. There are also a full range of health and social services available in the community, including a nursing station, group home, gym, seniors centre and a day care. **Table 10.5** outlines these local services in more detail.

Table 10.5: Services Inventory – Berens River First Nation/NAC and Poplar River First Nation

Services	Berens River First Nation/NAC	Poplar River First Nation
Postal Service	▪ Mail service is provided by air three times per week.	▪ Mail is delivered daily by air.
Recreation	▪ Facilities include an outdoor skating rink, ball diamond, Pee-Wee Sports Club, Berens River Junior and Senior/Old Timers Hockey Club, playground and park.	▪ Youth drop-in, two baseball diamonds, arena, gym, and skating rink.
Health Care	▪ Berens River Nursing Station and Renal Centre/Chief Jacob Berens Mino-Ayaawin Centre.	▪ Poplar River Health Resource Centre.
Education	▪ Berens River School (Frontier School Division: Nursery to Grade 9). ▪ Berens River Daycare. ▪ Berens River Training & Employment Program.	▪ Poplar River Elementary School (Nursery to grade 9). ▪ Headstart Program. ▪ Daycare Program.
Government	▪ Berens River Band Office.	▪ Poplar River Band Office.
Police	▪ The two constables stationed in Selkirk serve the area. There is one First Nation constable on-reserve.	▪ The community employs two constables. The community is serviced by the RCMP detachment in Selkirk.
Fire	▪ The First Nation has a fire truck and a converted water truck for fire protection.	▪ The community has a fire truck and a volunteer fire department.

Source: MFESRA (2011)

10.1.4.4 Transportation

Roads

Varying in distance from approximately 1 to 10 km west of the proposed all-season road alignment is the 96 km long, 12 m wide winter road corridor that seasonally connects the Berens River and Poplar River communities (Smyrski, T. personal communication, September 11, 2015). The majority of goods

are delivered to the communities via the winter road network which is operational for approximately two months each year. The network of gravel roads within the communities are maintained locally.

Barge and Other Water Travel Modes

A private barge service operated by Berens River is seasonally operated and brings supplies to the community during the open water season. There is also a Freshwater Fish barge that transports fish from local fishers in Berens River and Poplar River First Nation to local fish plants for processing. A private barge service is available for the Berens River and Poplar River First Nation communities during the open water season (Riverton Transport 2015).

Airports

As described above, 2,900 ft (880 m) and 2,500 ft (760 m) gravel airstrips are maintained by the communities of Berens River (YBV) and Poplar River (ZNG), respectively. Both airports are operated by the Northern Airports & Marine Operations Division of Manitoba Infrastructure and Transportation. Aircraft movements for the 2012-2013 period were 2,706 for Berens River and 2,118 for Poplar River, and passenger traffic for the same period was 8,648 for Berens River and 7,676 for Poplar River (Manitoba Infrastructure and Transportation 2016). Scheduled service to both communities is provided by Perimeter Airlines and Northway Aviation.

10.1.5 Land and Resource Use

10.1.5.1 Overview

The proposed Project is located in an undeveloped area of the Boreal Shield. Land use in the Local Assessment Area consists mainly of traditional activities by Poplar River and Berens River First Nations such as hunting, trapping, fishing, camping, timber harvest for firewood and local log homes, recreation activities, sacred/ceremonial use and food and medicine gathering. Historically there was some minor commercial timber harvesting northeast of Berens River First Nation, but that ceased with the closure of the paper mill at Pine Falls (Matthewson, C., personal communication, January 2016). **Figure 10-7** demonstrates regional infrastructure, including airports, provincial parks, and wildlife refuges and management areas. **Figure 10-8** identifies regional land use planning areas including the Poplar River, Pauingassi, Little Grand Rapids, and Bloodvein Planning Areas.

There are no existing or past commercial development sites or industrial facilities in the Regional Assessment Area with the exception of commercial traplines (**Section 10.1.5.5**) and some historic wild rice harvesting areas (the majority of which are currently inactive) (Poplar River First Nation 2011). Poplar River First Nation is in the process of developing a quarry site south of the community and Local Project Area to provide aggregate for on-reserve needs. Berens River has two quarry leases under its name, one of which is being used for the construction of the P1 all-season road.

The northern section of the proposed all-season road corridor is located within the Asatiwisipe Aki Traditional Land Use Planning Area established by regulation in 2011 (MR 77/2011). The planning area replaced the previously designated Nanowin/Poplar River Park Reserve where mineral rights had been withdrawn by Ministerial Order. Following the establishment of the Planning Area, the park reserve designation was repealed in 2012 (MR 23/2012). Although the land is no longer designated as a park reserve, the All-Mineral Rights Withdrawal Order is still in place for that area awaiting future legislative amendment. Of note, the Asatiswisipe Aki Ma Ma Wichitowin Mutual Land Relationship Board has agreed that quarries may be established for the purpose of constructing and maintaining an all-season road in the zoned corridor which includes the northern portion of the Project corridor, as identified in the Planning Area Regulation.

The Asatiwisipe Aki Management Plan describes Poplar River First Nation's vision, goals and objectives for managing and protecting Poplar River Anishinabek Traditional Territory (Poplar River First Nation 2011). In addition to describing the land management framework and implementation mechanisms, the Asatiwisipe Aki Management Plan also provides information on:

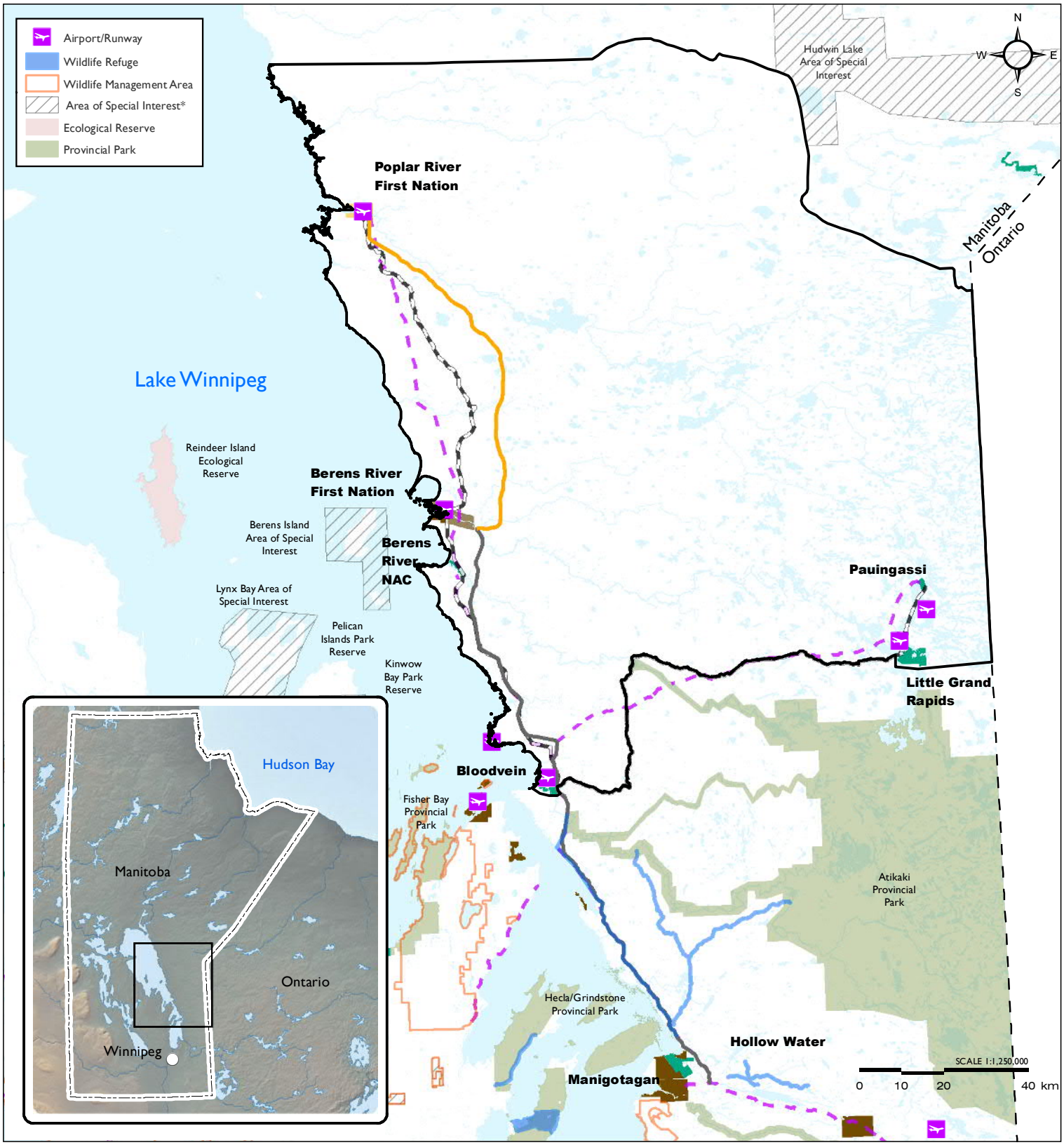
- Physical, aquatic and terrestrial environments, including wildlife, fish, and vegetation;
- History and archaeology;
- Present and future socio-economic life; and
- Traditional community resource use.

There are no Canadian Heritage Rivers in the Regional Assessment Area or Local Assessment Area. The closest Canadian Heritage River is the Bloodvein River which is located at the southern boundary of the Regional Assessment Area.

In Manitoba, the Treaty Land Entitlement Program is responsible for the Crown land clearance and transfer processes from provincial Crown land to federal reserve lands in accordance with the Treaty Land Entitlement Framework Agreement. Berens River and Poplar River First Nations have no outstanding treaty land entitlements.

The existing land use configuration in the Berens River area comprises two major land use areas – the defined townsites of both the reserve and the NAC (primarily residential and commercial) and the largely undeveloped traditional lands. The southern portion of the Local Assessment Area falls within the Berens River Trapline District (not a provincially-regulated planning designation). Berens River is in the process of developing a land use plan.

Similar to Berens River, the existing land use configuration in the Poplar River area also comprises two major land use areas – the townsite and the surrounding traditional lands which remain largely undeveloped and undisturbed (Poplar River First Nation 2011). A system of trails, dotted with hunting and trapping camps, tend to follow the rivers and streams. An important community camp has been established at Weaver Lake. Many residents travel to this camp for spiritual journeys and for healing (Zeilig 2012).



Project 4 - All-Season Road Connecting Berens River to Poplar River First Nation

Figure 10-7
Regional Infrastructure

*Areas of Special Interest are candidate protected areas selected to represent the enduring features found within an ecoregion that still need to be captured in Manitoba's protected areas network.

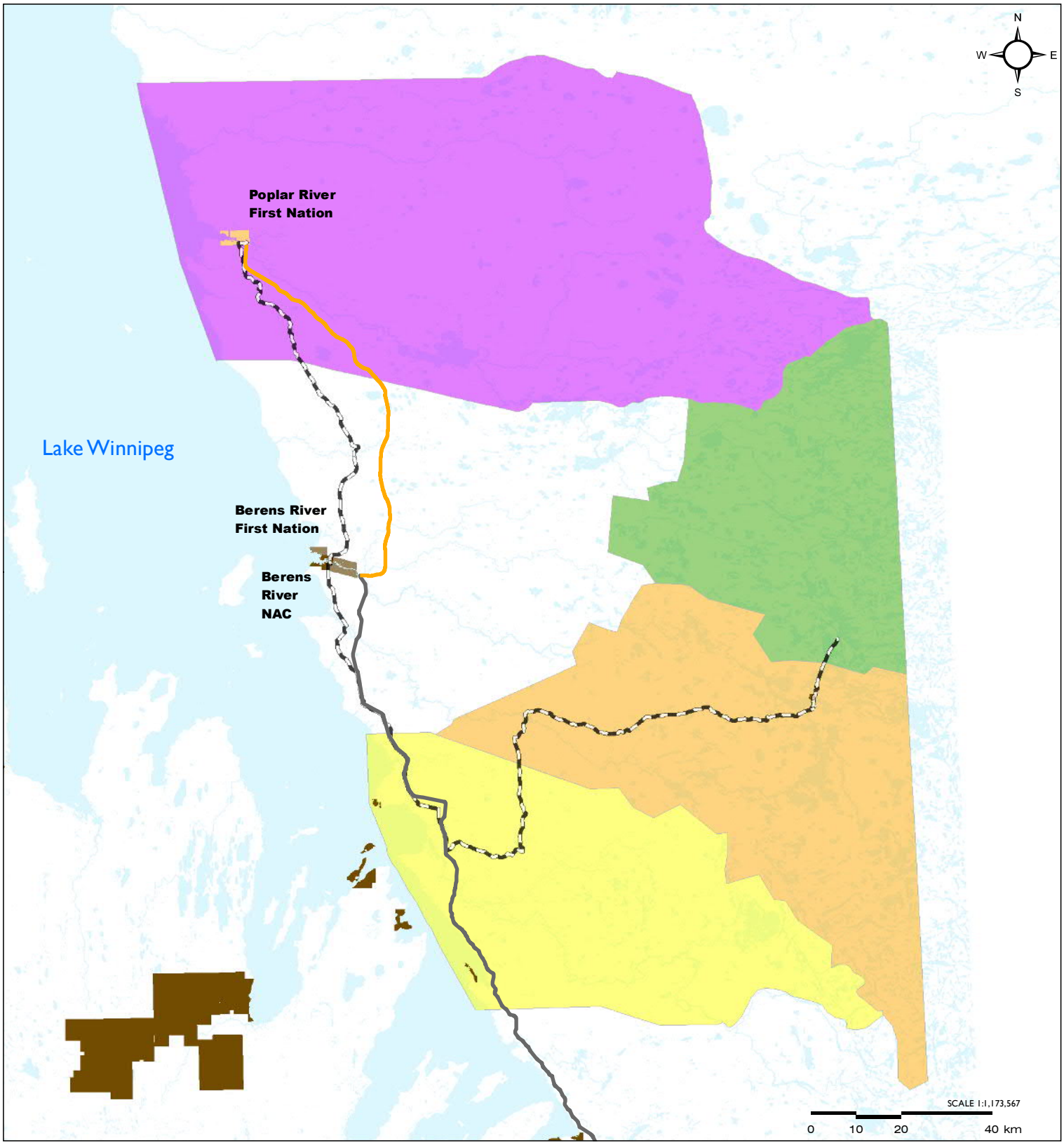
- P4 All-Season Road Alignment
- P1 All-Season Road (South of Berens to PTH 304) - Under Construction
- Transmission Line
- Manitoba Winter Road
- Regional Assessment Area
- Northern Affairs Community
- Berens River First Nation Reserve
- Poplar River First Nation Reserve
- Other First Nations

Map Drawing Information:
ESRI Base Layers, Province of Manitoba, CanVec, GeoGratis, Dillon Consulting Limited

Map Created By: ECH
Map Checked By: MG/PS/LD
Map Projection: NAD 1983 UTM Zone 14N

DATE: 4/8/2016

MANITOBA East Side Road AUTHORITY



Project 4 - All-Season Road Connecting Berens River to Poplar River First Nation

Figure 10-8

Traditional Land Use Planning Areas in the Vicinity of P4 All-Season Road Alignment

- P4 All-Season Road Alignment
- P1 All-Season Road (South of Berens to PTH 304) - Under Construction
- Transmission Line
- 2013/2014 Manitoba Winter Road
- Northern Affairs Community
- Berens River First Nation Reserve
- Poplar River First Nation
- Bloodvein Planning Area
- Little Grand Rapids Planning Area
- Pauingassi Planning Area
- Poplar River Planning Area

Map Drawing Information:
ESRI Base Layers, Province of Manitoba, CanVec, GeoGratis, Dillon Consulting Limited

Map Created By: ECH
Map Checked By: MG/PS/LD
Map Projection: NAD 1983 UTM Zone 14N

DATE: 4/8/2016

MANITOBA East Side Road AUTHORITY

Figure 10-8: Traditional Land Use Planning Areas in the Vicinity of the P4 All-Season Road Alignment

10.1.5.2 Zoning

The Asatiwisipe Aki Land Use Planning Area contains a zoning plan developed by Poplar River First Nation (**Appendix 10-1**). The zoning plan designates protected areas on nearby Lake Winnipeg islands and two areas on the mainland. The land-based zones are: a Protected Area; and a Community Resource Area. The zoning plan also designates two access corridors within those areas: Winter Road Access Corridor; and All-Season Road Access Corridor[5].

The Protected Areas designation is intended to protect natural landscapes and ecological processes while allowing traditional and recreational uses of the land where approved by a local management board (Poplar River First Nation 2011). Therefore, logging, mining, oil and gas development and hydro development are prohibited in this area.

The Community Resource Area has a similar purpose and prohibitions, while allowing for future local use of resources including gravel extraction, airstrip development, community logging and sawmill development. The Community Resource Area also accommodates the winter road access corridor and the community transmission line.

The All-Season Road Access Corridor designation traverses both the Community Resource Area and the Protected Area (Poplar River First Nation 2011). The Corridor Area anticipates and specifically allows for the establishment of an all-season road, and associated activities related to the road (subject to final negotiations with Poplar River First Nation on the alignment). The corridor outlined in the zoning plan is very similar to ESRA's proposed corridor as identified in the Large Area Transportation Network Study, and generally falls entirely within the Local Assessment Area. There are minor differences, such as turning radii and where the road would fall in relation to lakes (e.g., the corridor in the zoning plan is closer to Bull Lake than the proposed alignment).

There are no zoning designations south of the Asatiwisipe Aki Land Use Planning Area in the Project area.

10.1.5.3 Parks and Protected Areas

There are no National Historic Sites, National Parks, Heritage Rivers (although the Bloodvein River is adjacent and to the south) or other federally-protected areas in the Local Assessment Area. The Project is not located within provincially-designated parks or protected areas (**Figure 10-9**).

[5] As the Asatiwisipe Aki Land Use Planning Area was devised prior to this project, the all-season road access corridor differs slightly from the current proposed alignment; however, they are substantially similar, with minor deviations.

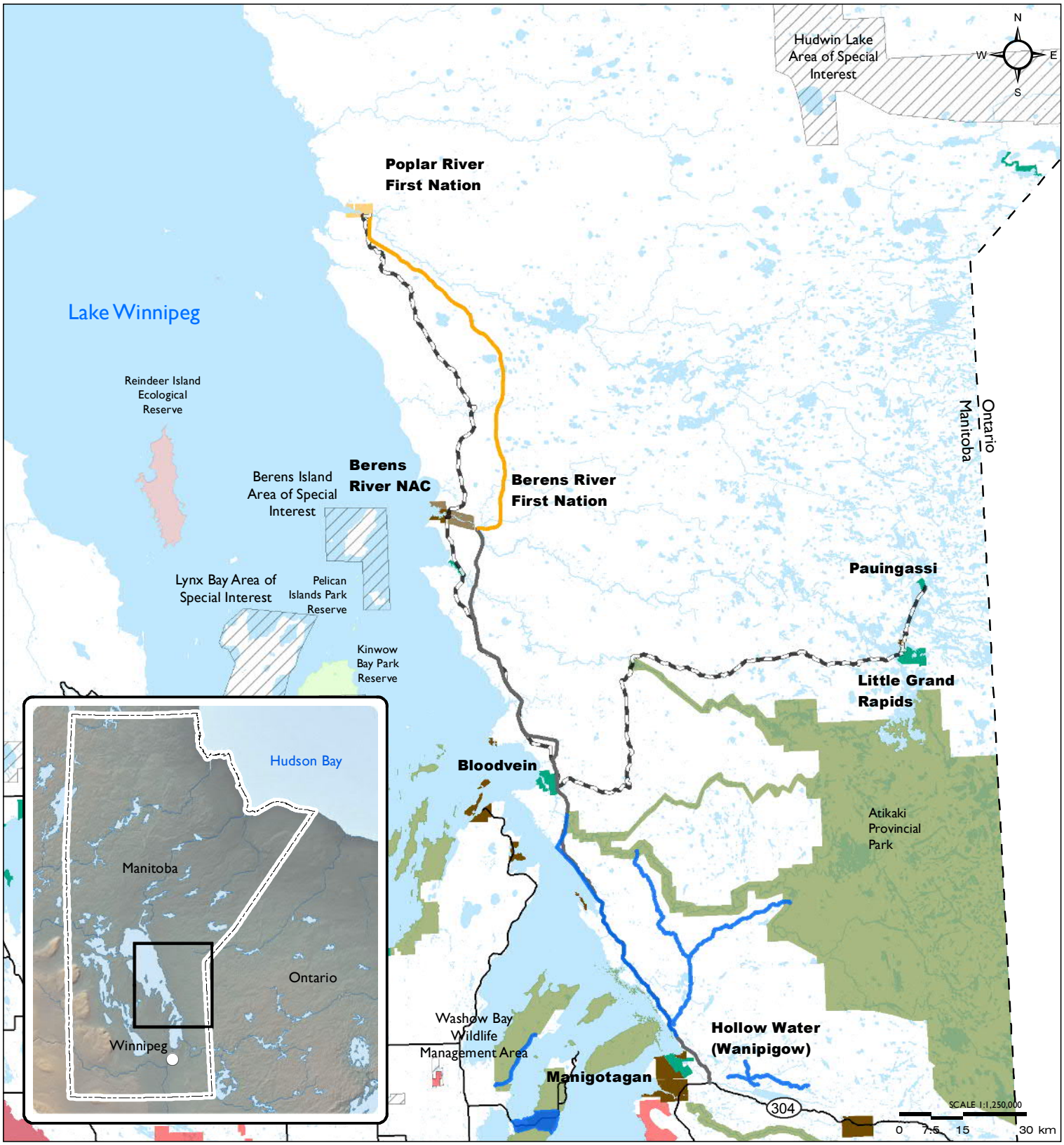
The nearest provincially-designated protected areas to the proposed Project are Pelican Island Park Reserve and Atikaki Provincial Park (**Figure 10-9**). Pelican Park Island Reserve is approximately 30 km south-west of the southern terminus of the Project and is surrounded by Lake Winnipeg. The northern extent of the Atikaki Provincial Park boundary is approximately 45 km from the southern end of the Project.

Areas of Special Interest (ASI)

Areas of Special Interest (ASI) are candidate sites selected to represent enduring features found within a natural region that capture landforms and unique sites to achieve adequate representation as a part of the Manitoba Protected Areas Initiative. The goal of the Initiative is to permanently protect a representative sample of each of the province's 18 natural regions and sub-regions thereby conserving the biodiversity of the Province of Manitoba. Areas supporting rare or endangered plant and animal species, unusually high biodiversity, extremely sensitive sites and unique landscapes are taken into account. There are no ASI within or proximate to the Local Assessment Area (**Figure 10-9**). The closest ASI to the Local Assessment Area is the Berens Island ASI located west of Berens River on Lake Winnipeg, and the Hudwin Lake ASI adjacent to the northeast boundary of the Regional Assessment Area.

Pimachiowin Aki

First Nations in both Manitoba and Ontario, as well as the two respective provincial governments, have applied to have a large portion of boreal forest designated as a United Nations Educational, Scientific, and Cultural Organization (UNESCO) World Heritage Site. The area, known as Pimachiowin Aki "The land that gives life" (**Figure 10-10**), is over 40,000 km^2 and includes traditional First Nation lands on both sides of the Manitoba/Ontario border. Approximately 44 km of the north section of the proposed all-season road corridor is situated within this proposed UNESCO site and corresponds with a portion of the Asatiwisipe Aki Land Use Planning Area.



Project 4 - All-Season Road Connecting Berens River to Poplar River First Nation

Figure 10-9

Protected Areas

*Areas of Special Interest are candidate protected areas selected to represent the enduring features found within an ecoregion that still need to be captured in Manitoba's protected areas network.

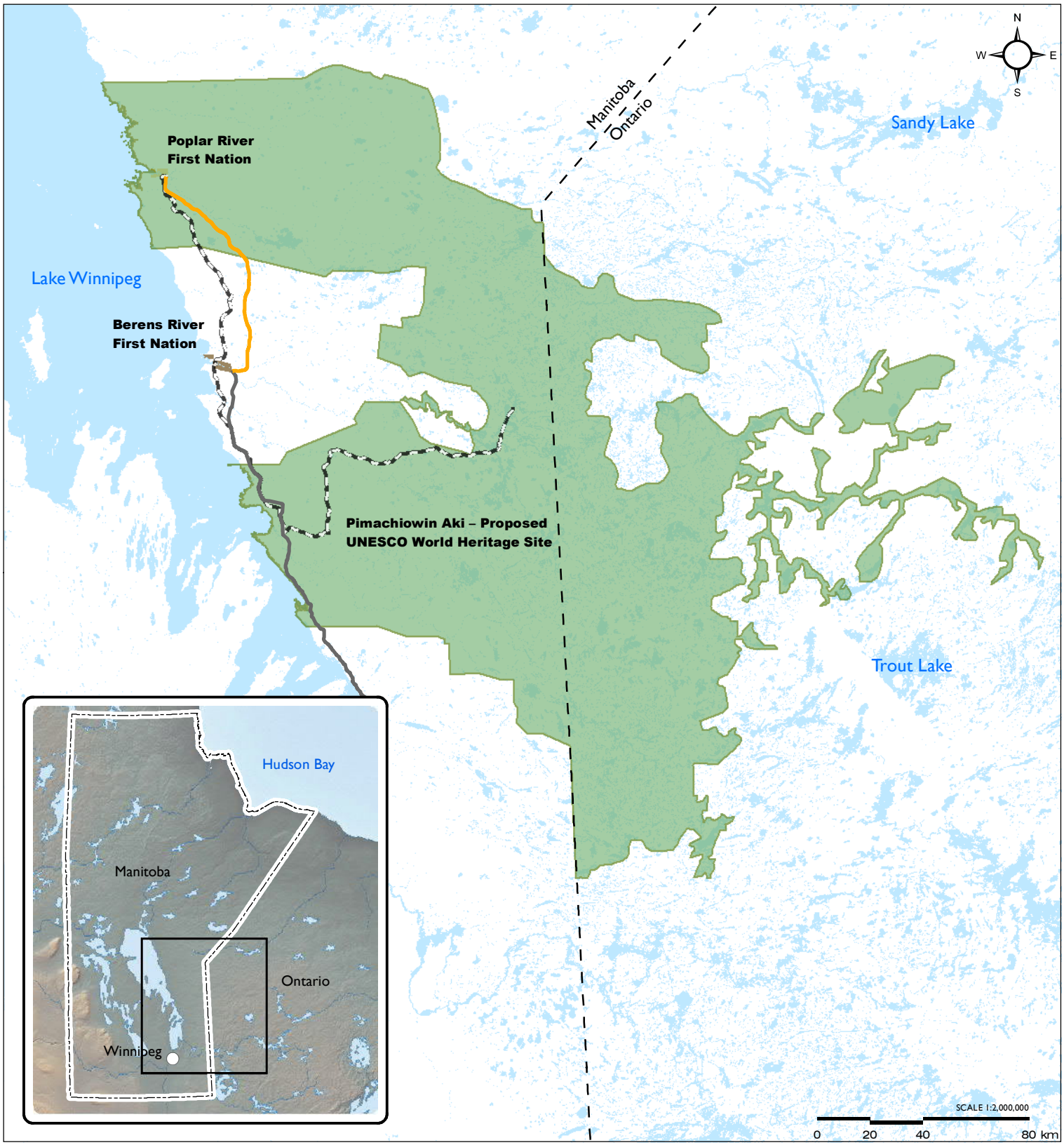
- P4 All-Season Road Alignment
- P1 All-Season Road (South of Berens to PTH 304) - Under Construction
- Manitoba Winter Road
- Northern Affairs Community
- Berens River First Nation Reserve
- Poplar River First Nation Reserve
- Wildlife Refuge
- Other First Nations
- Provincial Park
- Ecological Reserve
- Wildlife Management Area
- Area of Special Interest

Map Drawing Information:
ESRI Base Layers, Province of Manitoba, CanVec, GeoGratis, Dillon Consulting Limited

Map Created By: ECH
Map Checked By: MG/PS/DM
Map Projection: NAD 1983 UTM Zone 14N

DATE: 4/8/2016

MANITOBA East Side Road AUTHORITY



Project 4 - All-Season Road Connecting Berens River to Poplar River First Nation

Figure 10-10
Pimachiowin Aki – Proposed UNESCO World Heritage Site (Pimachiowin Aki Corporation 2015)

- P4 All-Season Road Alignment
- P1 All-Season Road (South of Berens to PTH 304) - Under Construction
- 2013/2014 Manitoba Winter Road
- Pimachiowin Aki – Proposed UNESCO World Heritage Site
- Berens River First Nation Reserve
- Poplar River First Nation Reserve

Map Drawing Information:
ESRI Base Layers, Province of Manitoba, CanVec, GeoGratis, Dillon Consulting Limited

Map Created By: ECH
Map Checked By: MG/PS/LD
Map Projection: NAD 1983 UTM Zone 14N

DATE: 4/9/2016

MANITOBA East Side Road AUTHORITY

10.1.5.4 Tourism

The Regional Assessment Area is described as having wilderness backcountry tourism and associated outdoor recreation opportunities which include snowmobiling, ATV use, boating/canoeing, lodging/camps, back-country camping, fishing and hunting. The increased accessibility provided by the Project could provide additional interest and opportunity for tourism and recreation. Regional tourism and associated recreation opportunities are currently found at sites including Nopiming Provincial Park, Atikaki Provincial Park and the Bloodvein (Canadian Heritage) River. The east side of Lake Winnipeg also has sport fishing, hunting lodges and outfitters, and is supported by the Eastern Manitoba Tourism Association that assists in the promotion of tourism in the area. There is considerable history for support of tourism on the east side of Lake Winnipeg.

The "*Promises to Keep…*" document (East Side Planning Initiative 2004) reported a high potential for tourism and recreation in the east side planning area. Recreational opportunities identified were wilderness and ecotourism, cultural tourism, backcountry camping and canoeing. The document expressed that further development of this potential is both wanted and needed, and that the focus should be on creating improved local capacity and benefits. It was indicated that more tourism development in the area and more local benefits in this sector would flow from the development of all-season roads.

The Large Area Transportation Network Study Report completed in 2010 noted that improved access through all-season road construction would benefit tourism, especially for tourism activities during the summer months where there is no existing road transportation to the area. Tourism was stated to have an overall positive effect on the local economy by improving accessibility and thereby injecting money into local businesses (SNC-Lavalin, J.D. Mollard and AECOM 2010b). During community engagement activities, potential effects on traditional lands and the traditional way of life, and potential effects on existing tourist lodges that attract visitors due to their remote location were noted.

There is some limited eco-tourism in the area. The Berens River is a charted wilderness canoe route and Poplar River draws canoeists to a lesser degree. The Leaf River, Etomami and North Etomami are not considered recreational canoeing routes. Berens River currently has several businesses that support the tourism industry: Berens River Lodge; North Country Lodge; Berens River Log Inn; and the Barra Inn. Traditional lands east of Berens River have natural attributes that support the potential growth for eco-tourism and recreation including excellent routes for canoe travel, as well as fishing opportunities. Berens River First Nation community members acknowledged the potential for increased tourism associated with the construction of the all-season road and the potential for positive economic benefits (**Chapter 4**, Aboriginal and Public Engagement, **Section 4.3.2.1)**. The economic benefits of tourism generated by the proposed all-season road have been recognized by community members since early (2009) engagement activities (SNC-Lavalin, J.D. Mollard and AECOM 2010b).

Tourist accommodation in Poplar River First Nation is limited to the Sagatay Lodge although the community envisions future development in tourism and recreation. Comments received from early

community engagement activities in 2009 were generally supportive of eco-tourism development associated with the proposed all-season road network conditional with community approval (SNC-Lavalin, J.D. Mollard and AECOM 2010b). The Asatiwisipe Aki Management Plan notes that recreational and tourism activities that are compatible with ecosystem integrity, Anishinaabe culture and traditions, and Poplar River First Nation management requirements will be welcomed and accommodated (Poplar River First Nation 2011). Further, Poplar River First Nation recognizes opportunities for community members to develop and manage eco-tourism services and enterprises compatible with their land use plan (Poplar River First Nation 2011).

10.1.5.5 Recreational Hunting and Commercial Trapping and Fishing

The communities of Berens River First Nation/NAC and Poplar River First Nation, as well as other communities in the Regional Assessment Area, use Registered Traplines (RTLs) for both commercial trappers and personal use. There are 10 RTLs that are intersected by the Local Assessment Area (**Figure 10-11**) which are within the Province of Manitoba's Eastern RTL District. Refer to **Chapter 9** (Terrestrial Environment) for detailed information on animals trapped in the Regional Assessment Area. Community traplines are also used by women and children for trapping smaller mammals (Poplar River First Nation 2011).

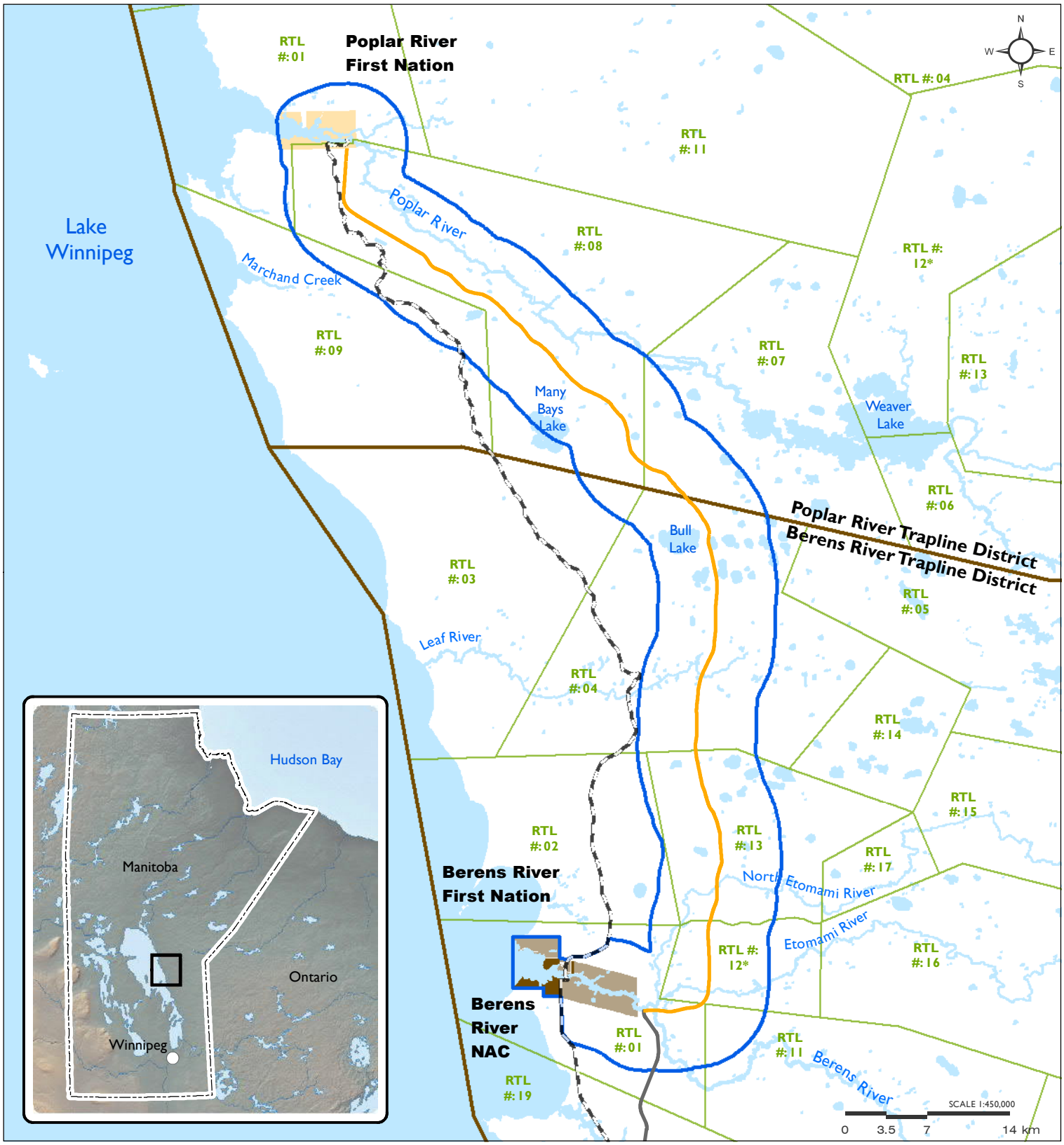
Commercial fishing is another important activity related to the economic sustainability of the communities in the Local Assessment Area. The Negginan Fishing Station is located on the Poplar River First Nation reserve and serves the community by packaging and shipping fish harvested by approximately 56 commercially licensed fishers (Poplar River First Nation 2011). There is also a relatively new fishing station located on Matheson Island where harvested commercial fish are transferred to trucks for transport to the Freshwater Fish Marketing Corporation facility in Winnipeg for processing and marketing. Commercial fishing in the regional area occurs in large lakes, particularly Lake Winnipeg, rather than in waterways intersected by the proposed all-season road. Non-commercial (i.e., traditional) fishing by community members is described in **Section 10.1.6.3**.

The local assessment area is located entirely within Game Hunting Area (GHA) 17B and is adjacent to GHA 17 to the east, GHA 17A and GHA 26 to the south, and GHA 3A to the north. GHA 17B is part of black bear hunting zone A, grey wolf and coyote zone A, white-tailed deer zone A, and is situated in the northern zone for vehicle use (deer and moose). White-tailed deer may be present in the local assessment area, however their range is generally limited to south of the Bloodvein River due to harsh winter conditions and limited food supply (Joro, 2015). The Local Assessment Area is also located within Game Bird Hunting Zones 2 and 3.

Manitoba Conservation and Water Stewardship (MCWS) are responsible for the allocation and regulation of wildlife resources for recreational purposes. Regulations are reviewed annually, and include the establishment of season dates, bag limits and vehicle restrictions. There is annual review of non-resident big game hunting quotas and area allocations for lodges and outfitters as non-residents of Canada must utilize the services of a lodge or outfitter. MCWS also restricts lodge and outfitter big game

allocations to specific areas where no conflicts with First Nations or resident hunters exist. All non-aboriginal/licensed hunters must obtain a Province of Manitoba hunting license for the Game Hunting Area and species under Manitoba Wildlife Act in order to harvest animals. The current seasons, bag limits and vehicle regulations for resident and non-resident hunters have remained relatively constant from year to year. Licensed moose hunters typically use the same areas from year to year and their camps are found mainly on float plane accessible lakes and rivers outside and east of the Local Assessment Area.

Waterfowl hunting opportunities for resident and non-resident hunters is marginal, as the area is far removed from the major waterfowl staging areas associated with agricultural lands to the south. The hunting of upland game birds (grouse) by licenced hunters is also limited due to the remoteness of the area. Non-resident bird hunters do not require the services of a guide or outfitter as is the case for big game.



Project 4 - All-Season Road Connecting Berens River to Poplar River First Nation

Figure 10-11

Registered Traplines in the Local Assessment Area

- P4 All-Season Road Alignment
- P1 All-Season Road (South of Berens to PTH 304) - Under Construction
- 2013/2014 Manitoba Winter Road
- Socio-Economic Local Assessment Area
- Berens River First Nation Reserve
- Poplar River First Nation Reserve
- Berens River Northern Affairs Community
- Registered Trapline District
- Registered Traplines (RTL)

Map Drawing Information:
ESRI Base Layers, Province of Manitoba, CanVec, GeoGratis, Dillon Consulting Limited

Map Created By: ECH
Map Checked By: MG/PS/LD
Map Projection: NAD 1983 UTM Zone 14N

DATE: 4/9/2016

MANITOBA East Side Road AUTHORITY

10.1.5.6 Forestry

The project straddles Forest Management Units (FMU) 38 and 39 (Government of Manitoba 2013). The Regional Assessment Area also overlaps with FMU 35, 36 and 37. There are currently no quota holders within the Local Assessment Area (Matthewson, C., personal communication, January 2016). The northern portion of FMU 39 is covered by the Asatiwisipe Aki Traditional Territory Zoning Plan which states that commercial forestry operations are prohibited as per the *Asatiwisipe Aki Traditional Use Planning Area Regulation* in the *East Side Traditional Lands Planning and Special Protected Areas Act (2011)* (Poplar River First Nation 2011). Previously, Tembec Industries Inc. had commercial forest operations in FMU 31, 35 and 38. However, the forest operations ceased with the closing of the pulp mill in Pine Falls in 2009 (Matthewson, C., personal communication, January 2016).

10.1.5.7 Mineral and Aggregate Resources

Past and current mining activities are located significantly south, northeast and northwest of the Regional Assessment Area. The nearest mine to the Project is the gold mine operated in Bissett, Manitoba (approximately 100 km south of the Regional Assessment Area). In the northern portion of the Regional Assessment Area, mining is prohibited under the Asatiwisipe Aki Traditional Territory Zoning Plan as per the *Asatiwisipe Aki Traditional Use Planning Area Regulation* and applications for future mineral extraction must be reviewed with the Pimitotah Advisory Board on a case-by case basis (Poplar River First Nation 2011).

Quarry activities are permitted under the Asatiwisipe Aki Traditional Territory Zoning Plan for developments related to the community or the road Project (Poplar River First Nation 2011). Asatiwisipe Construction Inc., Poplar River First Nation's construction company, is currently operating a quarry site just south of the community and Local Assessment Area to provide aggregate material for on-reserve needs. Other than the aggregate quarries that will be required for the proposed all-season road Project, there are no additional aggregate extraction sites anticipated within the Local Assessment Area in the foreseeable future. Through a Band Council Resolution, Berens River First Nation supports aggregate extraction activities as they relate to all-season road construction in their traditional territory.

10.1.5.8 Cultural, Heritage and Archaeological Record

The archaeological record for the Lac Seul Upland Ecoregion is incomplete due to limited field work investigations in this area. Archaeological sites along rivers and lakeshores in the area suggest that First Nations have lived in the area for at least 2,500 years, and in some areas, over 3,000 years (Poplar River First Nation 2011). An archaeological investigation was undertaken in 1999 to document historic land uses along the Poplar River and at Weaver Lake due to the importance of these waterbodies. Fifteen archaeological sites were discovered, while two previously discovered pictograph sites were revisited. A site of major importance, as it included burial sites, was discovered at Weaver Lake.

In support of the proposed P4 Project, Heritage Resources Impact Assessments (HRIAs) were completed to discover archaeological sites potentially affected or in conflict with the proposed road alignment. A summary of the HRIA activities and findings is provided in **Appendix 10-2**. The results of the first HRIA (NLHS 2013a) resulted in changes to the original alignment. Applicable information was also provided in the HRIA performed for the P7a project (NLHS 2013b). Subsequent HRIA activities were conducted for the alignment currently proposed as well as potential quarry sources (AMEC Foster Wheeler Environment and Infrastructure 2015a,b,c). Key archaeological site types found through these assessments have included:

- Petroforms (arrangements of rocks or boulders having symbolic and religious meaning or serving a functional purpose of trail marking);
- Artifact scatters (formed tools or portions thereof); and
- Isolated finds (single artifacts in an area, usually a single piece of chipped stone, tool, or tool fragment).

HRIA work in the Poplar River First Nation Traditional Land Use Area was conducted in 2012 (NLHS 2013a) for the area of the Project from Poplar River First Nation to a point approximately 55 km south of the community. The assessment involved a Traditional Knowledge workshop to inform the investigations and a field assessment through aerial and ground research. Eight previously unknown heritage sites were identified during the assessment. Investigations identified five sites of medium and high concern, each requiring mitigation measures. Three sites were deemed to be of low priority and did not require mitigation. The proposed all-season road alignment was relocated further southwest based on community feedback in general and in consideration of the archaeological findings, and will now avoid these five sensitive locations. A subsequent HRIA was conducted in 2013 by AMEC Foster Wheeler Environment and Infrastructure (2015a) from Poplar River First Nation to the area east of Bull Lake based on the revised all-season road alignment. It was concluded that no known heritage resources would be disturbed by proposed road construction and operations and maintenance, and no further archaeological investigations were recommended (see **Appendix 10-2**).

HRIA work in the Berens River First Nation Traditional Territory was completed from the area east of Bull Lake to Berens River First Nation (AMEC Foster Wheeler Environment and Infrastructure 2015b). No archaeological features were discovered. Four traditional use sites were identified including two modern campsites and two trapping areas with equipment for trapping marten. It was determined that no further archaeological investigations were required with respect to this portion of the all-season road corridor however, community engagement was recommended to determine the appropriate management of the potential effects to the traditional use sites.

10.1.6 Traditional Knowledge and Land Use

Members of Berens River and Poplar River First Nations maintain cultural connections to the land within their traditional territories (which encompass the Local Assessment Area and Regional Assessment Area) and continue to engage subsistence and traditional/cultural activities such as hunting, trapping, fishing

and gathering. Community members of both First Nations also engage in recreational and/or commercial fishing activities (Lake Winnipeg). Metis also continue to pursue traditional activities, such as the harvest of country foods, although these activities have been reported by the Manitoba Metis Federation (MMF) to occur outside of the Local Assessment Area. Those activities reported as taking place in the Regional Assessment Area by the MMF were primarily south of Berens River.

Within the Local Assessment Area and Regional Assessment Area, rivers and lakes as well as the associated riparian areas are valued as travel routes, as well as for the habitat they provide to species of traditional and cultural importance. Travel routes intersect the proposed all-season road at several locations and are discussed in **Section 10.1.6.5**.

The following sections summarize the findings of the Traditional Knowledge studies carried out for the Project, as well as knowledge contained in local area management plans and other studies that are relevant to the Project and the First Nations communities including:

- Pimachiowin Aki Cultural Landscape Atlas (Davidson-Hunt *et al.* 2012);
- Poplar River All-Season Road Heritage Resources Impact Assessment (NLHS 2013a);
- Summary of Poplar River Traditional Knowledge Study (CIER and Poplar River First Nation 2015);
- Project 4 All-Season Road Traditional Knowledge Study – Summary of Poplar River Traditional Knowledge Study (CIER and Poplar River First Nation 2015);
- Project 4 All-Season Road Traditional Knowledge Study – Summary of Berens River Traditional Knowledge Study (CIER 2015);
- TK Study of the Berens River Road (P1) Project Area and Associated Impacts (MMF 2011)[6];
- PR 304 to Berens River All-Season Road - Environmental Impact Assessment (SNC Lavalin et al. 2009); and
- PR 304 to Berens River All-Season Road – Alignment Focused Trappers-Wildlife Activity Survey (SNC Lavalin 2011c).

Findings have been organized based on the following traditional land use categories:

- Traditional land use activities (hunting, trapping, fishing and gathering);
- Travel routes; and
- Cultural, heritage and archaeological resources.

Groups that are anticipated to have an interest in and would potentially be affected by the Project include local First Nations (Berens River and Poplar River First Nations) as well as those living in Berens River Northern Affairs Community. The use of the Local and Regional Assessment Area for traditional purposes by the communities is described in relation to the particularly valued traditional land use activities related to hunting, fishing, gathering and travel throughout the area (**Sections 10.1.6.1** to **10.1.6.5**).Community members participating in Traditional Knowledge studies and through the Aboriginal and Public Engagement Program (**Chapter 4,** Aboriginal and Public Engagement) identified

[6] The study area delineated in the report encompasses the Local Assessment Area and the majority of the Regional Assessment Area, except for the northernmost portion.

the importance of these activities for their contribution to country food sources and local income economies that were identified in the environmental impact assessment for PR 304 to Berens River All Season Road and confirmed in TK studies for the Project (SNC Lavalin et al., 2009). The potential effects of the Project on these particularly valued activities are assessed in **Sections 10.2.4.2** and **10.2.4.3**.

10.1.6.1 Hunting

Hunting is a cultural activity widely practiced by community members of the Regional Assessment Area. Game hunting areas (**Figure 10-12** illustrates those within the Regional Assessment Area) are provincially-designated zones under which certain hunting conditions apply (e.g., hunting seasons, bag limits, and other restrictions and regulations) however they do not apply to Aboriginal Peoples under their Treaty and Constitutional rights. The game hunting areas within the Regional Assessment Area are 17, 17A, 17B and 3A. Hunting provides a direct cultural connection to the land and an important source of traditional food for family and community members. **Chapter 9** (Terrestrial Environment) provides detailed information on animals hunted in the Regional Assessment Area.

For Berens River First Nation, hunting activities within the Local Assessment Area largely take place in areas adjacent to the community, along the winter road and in the vicinity of large waterways. An area that encompasses portions of the Berens, Etomami and North Etomami Rivers directly east of Berens River First Nation was specifically identified as important for hunting waterfowl for country foods in the spring and fall (SNC Lavalin et al. 2009; SNC Lavalin 2011c; CIER 2015). Within the Regional Assessment Area, geese and ducks are hunted along the Lake Winnipeg shoreline, northwest of and in close proximity to Berens River Reserve and NAC. Moose are a source of country foods and are hunted by community members year-round throughout the Local Assessment Area. Salt licks have been noted along a portion of the North Etomami River and at the Leaf River and were identified as Environmentally Sensitive Sites for that reason. Moose are also found along the shores of Lake Winnipeg. While historically hunted, boreal woodland caribou were reported by the communities as are not hunted anymore and are not considered an important source of country food (SNC Lavalin et al. 2009; SNC Lavalin 2011c; CIER 2015). A caribou crossing in the vicinity of several unnamed lakes west of the proposed Project was identified in the Local Assessment Area. Berens River First Nation community members specifically commented on potential effects on resident and migratory bird populations along the road corridor (CIER 2015).

Poplar River First Nation shared that Aboriginal Peoples historically relied on moose as a source of food, clothing, equipment and handicrafts and that today, they continue to rely on moose as an important source of country food (SNC Lavalin et al. 2009; CIER and Poplar River First Nation 2015). Boreal woodland caribou were historically a country food source and tools were made from their bones and their hides used for bedding. Poplar River First Nation community members noted the presence of boreal woodland caribou in mature coniferous forest areas that support lichen in the Local and Regional Assessment Areas although they are not frequently seen (SNC Lavalin et al. 2009; CIER and Poplar River First Nation 2015). Poplar River First Nation community members reported that they no longer hunt

caribou and do not use it as a source of country food as many in the community believe they are an important species and should be protected. Small game, including waterfowl, is considered a country food and is often hunted near the community in the Local Assessment Area, as well as around Weaver Lake and at the mouth of the Poplar River at Lake Winnipeg (SNC Lavalin et al. 2009; CIER and Poplar River First Nation 2015). Project-related comments offered through TK studies with Poplar River First Nation (CIER and Poplar River First Nation 2015) regarding hunting include:

- Interest in potential effects on moose behaviour due to blasting;
- Interest in potential effects on moose calving;
- Interest in potential effects of increased access to the area by non-community members on hunting;
- Interest in potential short-term effects of noise on ability to hunt as animals move away (community believes the animals will return soon after construction is completed);
- Interest in safety of construction workers during hunting season;
- Care should be taken to protect bear dens and bird nests during construction.

Although the Metis are not known to have hunted in the Local Assessment Area, they have hunted in the Regional Assessment Area south of the Pigeon River for many decades and reportedly continue to do so for cultural and subsistence purposes. Metis people reportedly hunted big and small game in the recent past along the Poplar River between Poplar River First Nation and Weaver Lake, and in areas along the Berens River near Lake Winnipeg, but not currently (MMF 2011). Poplar River First Nation advised that this hunting occurred by invitation of Poplar River. In more recent years, hunting activities have been carried out primarily along the shoreline of Lake Winnipeg between the Bloodvein First Nation and Berens River First Nation communities. Species commonly hunted include moose, deer, bear, upland birds, geese, and ducks, and to a lesser extent beaver and other species for bounty or nuisance control reasons (coyote and wolf). Hunting activities are most commonly carried out in the fall, followed by winter and summer (MMF 2011).

Specific comments on Metis use (MMF 2011) related to hunting activity and the P1 Project currently under construction that are relevant for consideration with the proposed P4 Project include:

- Increased access to the area by non-Aboriginal people;
- Increased regional development and potential effects on animal populations and habitats;
- Potential for increased exploitation of animals commonly hunted; and
- Non-resident hunters taking advantage of drive-in hunting opportunities in lieu of fly-in packages with established outfitters.

Project 4 - All-Season Road Connecting Berens River to Poplar River First Nation

Figure 10-12
Big Game Hunting Areas in the Regional Assessment Area

- P4 All-Season Road Alignment
- P1 All-Season Road (South of Berens to PTH 304) - Under Construction
- 2013/2014 Manitoba Winter Road
- Regional Assessment Area
- Northern Affairs Community
- Berens River First Nation Reserve
- Poplar River First Nation Reserve
- Other First Nations
- Big Game Hunting Area
- Wildlife Refuge

Map Drawing Information:
ESRI Base Layers, Province of Manitoba, CanVec, GeoGratis, Dillon Consulting Limited

Map Created By: ECH
Map Checked By: MG/PS/LD
Map Projection: NAD 1983 UTM Zone 14N

DATE: 4/9/2016

MANITOBA East Side Road AUTHORITY

10.1.6.2 Trapping

Trapping is a traditional activity that is actively practiced by many community members in the Regional Assessment Area. In addition to the cultural connection that trapping provides to the land within the traditional territories of Aboriginal Peoples, commercial trapping also occurs as a source of employment and income, and in some cases, country foods. There are 10 Registered Traplines within the Local Assessment Area (see **Section 10.1.5.5**) that are held by licensed individuals and their appointed helpers as well as community traplines (**Photograph 10-1**) where trapping may be undertaken by community members (Poplar River First Nation 2011). **Chapter 9** (Terrestrial Environment) provides detailed information on animals hunted and trapped in the Regional Assessment Area.

The majority of trapping activity by Berens River First Nation members occurs in the Regional Assessment Area near the community, but outside of the Local Assessment Area, and is a winter activity (SNC Lavalin et al. 2009; SNC Lavalin 2011c; CIER 2015). Most trapping activity occurs in an area that encompasses several unnamed lakes directly east of the proposed all-season road and approximately 20 km northeast of Berens River First Nation, as well as along the Lake Winnipeg shoreline (north and south of the community) and in the Seventeen Mile Lake area (SNC Lavalin et al. 2009; SNC Lavalin 2011c; CIER 2015). Marten, fisher, beaver, muskrat, mink, lynx, red fox, silver fox, cross fox, ermine and rabbit are targeted by trappers in these areas. Although it appeared to some Berens River First Nation trappers that wolverine populations were impacted when the hydro dam was constructed at the north end of Lake Winnipeg, they appear to be making a comeback and their numbers have increased over the last three to four years (SNC Lavalin 2011c; CIER 2015). Areas along and adjacent to the North Etomami River and the Berens River, as well as areas adjacent to and east of the 2014/2015 winter road alignment, were also identified by Berens River First Nation community members as trapping areas (SNC Lavalin et al. 2009; SNC Lavalin 2011c; CIER 2015). Species commonly trapped along the large rivers include beaver, river otter, rabbit, muskrat and mink and periodically lynx. Trapping continues to be a winter activity (SNC Lavalin et al. 2009; SNC Lavalin 2011c; CIER 2015). Berens River First Nation noted the potential for displacement of traditional traplines of community members within the proposed all-season road alignment specifically during construction.

Source: Provided by ESRA 2015

Photograph 10-1: Trapping Cabin South of Berens River

Trapping was historically, and is currently, an important traditional activity for Poplar River First Nation (SNC Lavalin 2011c; Poplar River First Nation 2011). It is valued for its importance as an economic activity as well as for its cultural and heritage importance. A local Trappers Association manages traplines worked by approximately 30 licensed community members. The beaver is particularly important to Poplar River First Nation, contributing to the arrangement of the physical environment and ecological communities and serving as a source of country food. Snowshoe hare is another animal important to the cultural landscape by holding boreal forest food webs together as well as supporting life in the bush for Poplar River First Nation hunters, their families and formerly their dog teams. Historically, rabbit fur was used to make loom-woven blankets and to line gloves and slippers (Davidson-Hunt *et al.* 2012). Within the Regional Assessment Area, rivers and creeks serve as important areas for trapping including those directly east of and connected to Weaver Lake, Kapawekapuk Creek (Poplar Point Creek) and Marchand Creek located south of the community (CIER and Poplar River First Nation 2015). Within the Local Assessment Area, the Poplar River, Kapawekapuk Creek and Marchand Lake areas are important for trapping. Two trapping cabins are situated at the south end of Marchand Lake near Moothwechik Creek (CIER and Poplar River First Nation 2015). There is also a community trapline adjacent to Poplar River First Nation that is used to teach community members about trapping and enables members to trap close to home. Children from the community are also taken out to learn to trap along the transmission line (NLHS 2013a). Most trapping activity occurs close to the community and decreases moving east along the Poplar and North Poplar Rivers. Species most commonly trapped in the Local Assessment Area include marten, fox, wolf, mink, fisher, beaver, rabbit, otter and muskrat with wolverine and lynx periodically harvested. Bear and bear dens may also be present throughout the

Local Assessment Area, especially near Poplar River, but they are rarely trapped because of their cultural significance. Weasels used to be found and trapped in the Local Assessment Area but they are no longer present in large numbers (CIER and Poplar River First Nation 2015).

The proposed all-season road runs through three active Poplar River First Nation Registered Traplines (CIER and Poplar River First Nation 2015). Specific community comments (CIER and Poplar River First Nation 2015) related to trapping and the proposed all-season road Project include:

- Potential flooding caused by beavers blocking culverts;
- Increased access to trapping areas will be provided; and
- Head trappers are not concerned about the road affecting their trapping.

Participants of the MMF Traditional Land Use and Knowledge study (2011) indicated that trapping activities have been or continue to be carried out on the east side of Lake Winnipeg. The report did not differentiate between commercial and non-commercial trapping activities Small animal harvest which has been interpreted as including trapping harvest occurs for the most part south of Berens River outside of the Local Assessment Area with some historic activities along Poplar River and between Berens First Nation and Poplar River First Nation along the shores of Lake Winnipeg (MMF 2011).. Poplar River First Nation advised that any activity in its traditional territory by the Metis was by permission of the community (Poplar River 2015).

10.1.6.3 Fishing

Fishing is an important year-round traditional activity for the members of the two local communities as well as Metis of the area. Fishing takes place on Lake Winnipeg as well as on the many rivers and lakes within the Regional Assessment Area. Commercial fishing activities occur in Lake Winnipeg with subsistence activities occurring in the rivers as well as Lake Winnipeg. There are licensed commercial fishers in both Berens River and Poplar River First Nations. Fishing Stations at Poplar River First Nation and Matheson Island provide the infrastructure for commercially harvested fish to be packaged and shipped to markets in southern Manitoba and beyond. Additional information on fish and fish habitat, including harvested fish species, is provided in **Chapter 8** (Aquatic Environment).

The key fishing area in the Regional Assessment Area for commercial fishers from Berens River First Nation is Lake Winnipeg, west of the proposed all-season road. Species harvested in these areas are whitefish, suckers, walleye, northern pike, sturgeon, perch, and sauger (SNC Lavalin et al. 2009; CIER 2015). In the Local Assessment Area, reaches of the Berens, Etomami and North Etomami Rivers serve as important year-round community fishing areas for Berens River First Nation. Species commonly harvested in these areas include walleye, northern pike, catfish, sturgeon and suckers (CIER 2015). Species most sought after for local consumption include walleye, northern pike, catfish and whitefish (CIER 2015). Berens River First Nation community members noted the potential for increased access of non-local fishers provided by the proposed all-season road to increase fishing pressure in the Regional Assessment Area.

Fishing has been an important part of the subsistence economy of Poplar River First Nation for centuries (Davidson-Hunt *et al.* 2012). Community members are encouraged to only take what is needed for them and their family, and not waste their catch (Poplar River First Nation 2011). Fishing takes place on Lake Winnipeg, as well as in the rivers and larger streams within the Regional Assessment Area. There are approximately 60 licensed commercial fishers in the community harvesting from Lake Winnipeg (CIER and Poplar River First Nation 2015). Important fishing areas for subsistence harvests are Lake Winnipeg, Big Black River (located north of Poplar River First Nation), and Weaver Lake (located east of the proposed all-season road)(CIER and Poplar River First Nation 2015). Species commonly harvested from the lakes and rivers in the Local Assessment Area include goldeye, northern pike, walleyeand suckers, which spawn in the small creeks that drain into the Poplar River. The Poplar River is a local source of fish and provides important habitat for harvested species such as northern pike, burbot, cisco, sunfish (freshwater drum), carp, walleye, suckers, whitefish, catfish, minnows and smelt (CIER and Poplar River First Nation 2015). Sturgeon used to be present in the Local Assessment Area (i.e., Poplar River) but can no longer be found. Smoking fish is a traditional practice that is still being undertaken today (CIER and Poplar River First Nation 2015). Specific community comments (CIER and Poplar River First Nation 2015) related to fishing activities and the proposed all-season road include:

- Potential for an increase in unwanted access to Poplar River;
- Suggestion that there be no access routes built to Poplar River;
- Potential for pollution from the runoff from the road into Poplar River and the effect on fish populations; and
- Preference for small bridges rather than small culverts as it is believed that fish will not travel through culverts to spawn upstream.

Fishing activities by Metis have been reported by the MMF as occurring in the Regional Assessment Area along the shoreline of Lake Winnipeg between the Hollow Water First Nation and Pigeon River, as well as along a 25 km section of the Pigeon River beginning at Lake Winnipeg and continuing outside of the Project area. No harvesting was identified in the Local Assessment Area and limited gravest was reported at the mouth of the Poplar River for a short period between 1960 and 1970. Metis members fish for both commercial and subsistence purposes. Food fishing predominantly occurs in the fall and most food fishing activity is undertaken from a boat with rod and reel. During winter, fishing areas are accessed by truck and skidoo (MMF 2011). Fishing occurs in all seasons, although spring fishing activity appears to have become less prominent (MMF 2011). Walleye is the most sought after fish species for consumption, followed by northern pike, perch and bass. Other species harvested include catfish and sauger, and occasionally sunfish (freshwater drum) and mariah (burbot) (MMF 2011). Fishing-related comments of the Metis community of relevance to the proposed Project include (MMF 2011):

- Potential for increased access to the area by non-community members (i.e., non-Aboriginal people);
- Increased harvest pressure and effects on fish populations; and
- Effects on harvest success and ability to pursue fishing activities.

10.1.6.4 Gathering

Gathering of food (e.g., berries) and medicinal plants is a traditional activity practiced by many community members in the Regional Assessment Area and provides a cultural connection to the land. **Chapter 9** (Terrestrial Environment) provides detailed information on the plants of the Regional Assessment Area including those used for food and medicinal purposes.

For Berens River First Nation, berry and medicinal plant gathering occurs in the Regional Assessment Area, however most gathering activity occurs close to the community. Important berry and plant harvesting areas of the Regional Assessment Area are found along and adjacent to the Berens River (southeast of the community), the Pigeon River (south of the community) and along the shoreline of Lake Winnipeg (north of the community) (CIER 2015). According to Berens River First Nation community members, cranberries are generally found in and around the edges of muskeg (bog), Saskatoon berries along rivers and blueberries where there is jack pine. The shoreline of Lake Winnipeg and adjacent areas up to and directly east of the 2014/2015 winter road corridor, both north and south of the community, were also identified as important berry harvesting areas in the Regional Assessment Area (CIER 2015). Within the Local Assessment Area, berry and plant harvesting areas occur along and adjacent to the Berens River and several of the waterbodies adjacent to the proposed all-season road (e.g., Berens and Omoche Lakes). Saskatoon berries, strawberries and raspberries are harvested in the summer along the Berens River from areas close to the community. Wild rice is harvested from an area within the Local Assessment Area along the Berens River. Saskatoon berries are also harvested from isolated clusters of shrubs located along the North Etomami River, northeast of the community. Blueberries, mooseberries, strawberries and pincherries are harvested at mossy sites directly north of the community and the Berens River. Cranberries, or muskeg berries, are also harvested directly north of the Berens River in the early spring and late fall in the muskeg areas. Rhubarb is harvested from an area of the Local Assessment Area along the Etomami River close to the community. Wild rose and rosehips, birch sap and wild carrots are harvested throughout the Local Assessment Area and Regional Assessment Area when found (CIER 2015).

Berens River First Nation community members also actively harvest various medicinal plants from both the Regional and Local Assessment Areas. The mouth of the Berens River at Lake Winnipeg (Regional Assessment Area) was identified as a medicinal plant gathering area (CIER 2015). Other medicinal plants are harvested from river banks and dry creek beds of both the Local and Regional Assessment Areas. A small creek, referred to as Medicine Creek, is a tributary to the North Etomami River located directly east of Berens River First Nation and is an important area for harvesting medicinal plants in the Local Assessment Area.

A variety of vegetation including trees, shrubs, flowers, mosses, lichens, and fungi have historically been gathered from the Regional and Local Assessment Areas both as an important food source and a medicinal source for Poplar River First Nation (Poplar River First Nation 2011). Kapawekapuk Creek ("see through the willows") and muskeg areas were identified as important places for gathering

medicinal plants and trees within the Local Assessment Area. Wild rice can be found along the Poplar River and is harvested by some community members for personal use only; it is no longer profitable to harvest for commercial purposes (NLHS 2013a). Berries harvested in the Local Assessment Area include raspberries, mooseberries, muskeg berries, blueberries, strawberries, cranberries and Saskatoon berries. The lands south and southeast of Poplar River First Nation were identified as important berry harvesting areas within the Local Assessment Area (CIER and Poplar River First Nation 2015; Poplar River First Nation 2015). Specific community comments (CIER and Poplar River First Nation 2015) related to the gathering of food and medicinal plants and the proposed all-season road include:

- Berries and medicinal plants may be temporarily disturbed during construction, but will grow back;
- Water plants may not return if water flows in creeks and muskeg areas are changed; and
- Increased access to berry picking areas may be provided.

According to MMF (2011), the area identified as being used for gathering plant materials by local Metis is along the Lake Winnipeg shoreline and adjacent to the Rice River Road in the Regional Assessment Area, south of Berens River First Nation. In addition to firewood, Metis are reported to harvest plants and plant materials for food (blue berries, raspberries, strawberries, chokecherries, pin cherries, Saskatoon berries, moss berries, wildlife plum, cranberries, mushrooms, wild rice) and medicinal/cultural purposes (Seneca root, Labrador tea, birch balsam, Wekis, Ochre, black poplar bud, sweet grass and/or sage, various roots and nuts) in the area since 1950 and continue to actively harvest plants. Plant harvesting occurs predominantly in the summer and fall seasons and may be undertaken as a discrete activity or conducted in conjunction with fish harvesting activities (MMF 2011).

10.1.6.5 Travel Routes

Travel routes are important to the communities of the Regional Assessment Area in providing seasonal access to allow traditional activities of cultural importance including hunting, trapping, fishing and gathering. Travel routes of the Local and Regional Assessment Areas include walking, ATV and snowmobile trails (**Photograph 10-2**) as well as open-water and frozen waterways. The majority of travel routes documented during TK and community engagement sessions were associated with the major waterways of the Local and Regional Assessment Areas such as the Pigeon River, Berens River, North Etomami River, Etomami River, Leaf River and Poplar River. For centuries, waterways have provided connectivity between different regions of the landscape (Davidson-Hunt *et al.* 2012). Outside of the communities, abandoned, informal and disconnected road segments are found that historically were associated with logging or other activities. The formal network of winter roads operated by the province provides important travel routes although these roads are not usually associated with traditional activities with the exception of the Metis who have reported using the winter roads to access up to the Pigeon River to hunting areas.

Source: Provided by ESRA 2015

Photograph 10-2: Travelling via Snowmobile to a Trapline

For Berens River First Nation, the many rivers and creeks of the Regional and Local Assessment Areas serve as important travel routes used by community members to access the natural resources that sustain them. For example, boats and canoes are used to access hunting and fishing areas and cabins on the North Etomami and Leaf Rivers within both Assessment Areas. Portages (i.e., trails connecting waterways) are located at rapids on the Etomami and Leaf Rivers within both Assessment Areas (CIER 2015). In winter, snowmobile trails are used extensively by community members. An important snowmobile route in the Regional Assessment Area originates at Berens River First Nation and runs parallel to the shoreline of Lake Winnipeg, west of the winter road (CIER 2015). An important snowmobile route of the Local Assessment Area parallels the proposed all-season road alignment from the North Etomami River to Weaver Lake (CIER 2015).

For Poplar River First Nation, waterways in the Local Assessment Area and Regional Assessment Area continue to provide important connectivity between the landscapes, people and resources. For Poplar River First Nation community members, these routes include the many rivers and creeks of the area as well as the shoreline of Lake Winnipeg (CIER and Poplar River First Nation 2015). An established trail between Poplar River First Nation and Many Bays Lakes (Local Assessment Area) are used to access hunting and trapping areas. The community also takes advantage of built infrastructure such as transmission lines and the winter road corridor. The Poplar River itself historically served, and continues to be used, as an important winter travel corridor in the Local Assessment Area (CIER and Poplar River First Nation 2015). Poplar First Nation (CIER and Poplar River First Nation 2015) commented on the intersection of the proposed all-season road with established travel routes and has requested that ramps be placed at key intersections to allow snowmobiles to easily cross the road to access traplines.

10.1.6.6 Cultural, Heritage and Archaeological Resources

To supplement the known body of cultural, heritage and archaeological resource information, Traditional Knowledge was shared by local community members to further document traditional activities and the cultural heritage of Aboriginal Peoples in the Regional Assessment Area. **Section 10.1.5.8** (Cultural, Heritage and Archaeological Record) summarizes some of this information and describes the extent of heritage investigations completed for the P4 Project including a Traditional Knowledge workshop. **Appendix 10-2** provides a summary of that work.

Members of Berens River First Nation have shared that within the Regional Assessment Area there are multiple cabins along the Leaf River between the winter road and Lake Winnipeg and in a general area located east of the proposed all-season road. These cabins are used for cultural purposes (a "safe haven" for trappers). Although the specific locations of these cabins were not disclosed, they are not in conflict with the proposed road alignment (CIER 2015). Several culturally important gathering areas are also present in the Regional Assessment Area including the Thunder Mountain area northeast of Berens River First Nation. The peninsula at Patterson Bay along the shoreline of Lake Winnipeg was also identified as a meeting site for family outings (CIER 2015). Several sacred areas were identified by members of Berens River First Nation within the Regional Assessment Area, but well away from the Local Assessment Area. Burial grounds are also known to be present along the Leaf River between the winter road and Lake Winnipeg (CIER 2015). Within the Local Assessment Area, a historic and communal gathering area was identified by Berens River First Nation community members directly east of the reserve. An axehead and arrow heads had been found there in the past. A wilderness camp was also identified adjacent to the Berens River, approximately 9 km southeast of Berens River First Nation. The locations of several cabins in the Local Assessment Area used for hunting and trapping were identified: two of these cabins are located in the historic gathering area directly east of Berens River First Nation reserve, as well as along the North Etomami, Etomami, Berens, and Leaf Rivers. According to community members, burial sites are scattered along the Berens River as historically it was tradition to be buried by the river. Several specific burial sites have been identified in the Local Assessment Area however none are in conflict with the proposed all-season road alignment.

Within the Regional Assessment Area, Poplar River First Nation shared the location of cabins used by community members along the shoreline of Lake Winnipeg, west of the proposed all-season road (CIER and Poplar River First Nation 2015). Areas in the vicinity of Weaver Lake were noted by Poplar River First Nation community members to be culturally sensitive due to their importance as gathering, healing and ceremonial sites (NLHS 2013a). Burial grounds were noted to be present within the Local Assessment Area along the shores of the Poplar River as well as on islands in the river (CIER and Poplar River First Nation 2015; NLHS 2013a). The Poplar River itself is extremely important to the community – "the river is our life". Community members referred to the river as "the most important place on earth" and "our survival, our livelihood area" (CIER and Poplar River First Nation 2015). Geological features that represent Thunder Bird nests (Pinesewapikoons) are also present in the Local Assessment Area several kilometres west of Poplar River First Nation, although not within the Project Footprint. Thunder

Bird nests are important in the oral tradition of Poplar River First Nation and their legends continue to be told in the community (NLHS 2013a).

Project-specific comments (CIER and Poplar River First Nation 2015) from the Poplar River First Nation community members related to cultural, heritage and archaeological resources include:

- Request to have a pipe ceremony prior to construction start each season;
- Road could be too close to sacred sites and increased risk of access and vandalism;
- Interest in buffers around culturally sensitive sites;
- Provide transportation for Elders to the Thunder Bird nest sites and known petroform sites to hold ceremonies; and
- Preference for the road to be 3 km from the Poplar River, although most community members that participated in the 2015 TK Study were satisfied with the present location of the proposed all-season road.

10.1.7 Valued Components

In consideration of the existing socio-economic and cultural environment of the Local and Regional Assessment Areas (**Sections 10.1.1** to **10.1.6**, the assessment of potential environmental effects of the proposed Project that follows in **Section 10.2** focuses on those components that are particularly valued by local communities and are linked to valued ecological and cultural resources of the area as outlined in **Section 6.4.2** of **Chapter 6** (Environmental Impact Assessment Scope and Approach). The Valued Components (VCs) identified for the socio-economic and cultural environment and rationale for selection are shown in **Table 10.6**.

Table 10.6: Socio-Economic and Cultural Environment Valued Components and Selection Rationale

Valued Component	Selection Rationale
Tourism	▪ Importance for Aboriginal and local community economy. ▪ Identified as a sustainable land use objective in the Poplar River First Nation Land Management Plan (Poplar River First Nation 2011).
Hunting, Trapping, Fishing and Gathering	▪ Importance for Aboriginal and local community cultural, traditional and/or economic activities and values. ▪ First Nations' rights to hunting and fishing are protected under Treaty No. 5 (Government of Canada 2013). ▪ Regulated under Manitoba's *The Wildlife Act* (commercial and recreational) and the Manitoba *Fisheries Act*.
Travel Routes	▪ May interact with, and potentially be affected by, the proposed Project. Types of travel routes that may be impacted include travel routes to traditional use and cultural areas and traplines. Includes waterways, portages, and other trails. ▪ Importance for Aboriginal and local community culture as well as traditional activities and values. ▪ First Nations' rights to navigation of waterways are protected under Treaty No. 5 (Government of Canada 2013).

Valued Component	Selection Rationale
Cultural, Heritage and Archaeological Resources	▪ Importance for Aboriginal and local community cultural and traditional activities and values. ▪ Protected under Manitoba's *The Heritage Resources Act.*
Human Health and Safety	▪ Linked to Section 5 of the Canadian Environmental Assessment Act 2012. ▪ CEA Agency Guidelines indicated that the EIA should describe how changes to the environment potentially caused by the Project will affect human health (CEA Agency 2015a)

10.2 Socio-Economic and Cultural Effects and Mitigation

The assessment of potential effects of Project activities on the Socio-Economic and Cultural Environment VCs was conducted as described in **Section 6.4** of **Chapter 6** (Environmental Impact Assessment Scope and Approach), and included the following approach:

- Identification of the interactions among the selected VCs and the Project construction and operations and maintenance activities;
- Identification of the potential environmental effects of the Project prior to the implementation of mitigation measures;
- Initial screening of the potential environmental effects via examination of the magnitude/geographic extent, duration, frequency, reversibility and ecological context of the potential effects prior to the implementation of mitigation measures;
- Identification of appropriate mitigation measures and their application to reduce or avoid potential adverse effects; and
- Prediction of residual adverse environmental effects remaining after mitigation and determination of the significance of those residual adverse effects.

10.2.1 Valued Components and Project Interactions

Table 10.7 provides a summary of the interaction between the Socio-Economic and Cultural Environment VCs and key activities associated with the construction and operations and maintenance phases of the Project.

Table 10.7: Key Project Activity Interactions with Socio-Economic and Cultural Environment Valued Components

Project Activities	Socio-Economic and Cultural Environment VCs				
	Hunting, Trapping, Fishing, and Gathering	Travel Routes	Cultural Heritage and Archaeological Resources	Tourism	Human Health and Safety
Construction Phase					
Operation and staging of equipment, machinery, and vehicles and transportation of equipment as necessary during construction phase*.	✔	✔	✔	✔	✔

Project Activities	Socio-Economic and Cultural Environment VCs				
	Hunting, Trapping, Fishing, and Gathering	Travel Routes	Cultural Heritage and Archaeological Resources	Tourism	Human Health and Safety
Clearing road right-of-way including clearing vegetation, salvaging, burning, stockpiling, grubbing, and mechanical brushing.	✔	✔	✔	✔	✔
Blasting and development of quarries.	✔	✔	✔	✔	✔
Road construction including topsoil stripping, soil removal, rock placement/compaction, rock crushing, traffic control/signage, and contouring.	✔	✔	✔	✔	✔
Grading and gravelling of road surface.		✔			✔
Bridge construction including construction of components, batching/pouring concrete, steel girder placement.	✔	✔	✔	✔	✔
Culvert installation including coffer damming, stream excavation, geotextile material placement, filling, crossing streams, culvert placement, backfilling, and compaction.	✔	✔		✔	✔
Erosion and sediment control including placing silt fencing and re-vegetation.	✔				
Establishment of staging areas and temporary components (i.e., quarry and borrow areas, temporary access and crossings, staging areas, camps).	✔	✔	✔	✔	✔
Solid and liquid waste management.					✔
Storage and handling of hazardous materials.	✔				✔
Site cleanup including waste removal, contaminated soil removal, stockpiling, and recycling materials.	✔	✔	✔	✔	✔
Closure and reclamation of temporary components (quarry and borrow areas, access, crossings, staging areas) including excavation, slope stabilization, re-vegetation, and barrier installation.	✔	✔	✔	✔	✔
Operations and Maintenance Phase					
Road maintenance including vegetation maintenance, grading, washout repair, and traffic controls.		✔			✔

Project Activities	Socio-Economic and Cultural Environment VCs				
	Hunting, Trapping, Fishing, and Gathering	Travel Routes	Cultural Heritage and Archaeological Resources	Tourism	Human Health and Safety
Ditch maintenance including excavation and debris removal.	✔	✔	✔	✔	✔
Bridge and culvert maintenance including seasonal inspections and debris removal.	✔	✔	✔	✔	✔
Erosion and sediment control including re-vegetation.					
Clearing snow.	✔	✔			✔
Operation and staging of equipment, machinery, and vehicles and transportation of equipment as necessary during maintenance.					✔

Note: *Other activities require the operation of equipment/vehicles/machinery. Therefore, influences on VCs for subsequent activities relate to how the completion of the activity potentially influences the VC.

The potential effects of Project activities on the Socio-Economic and Cultural Environment VCs are assessed in **Section 10.2.4** as described in **Section 10.2.2**.

10.2.2 Assessment of Potential Effects

As noted in **Chapter 6** (Environmental Impact Assessment Scope and Approach), the potential environmental effects of the Project activities on the VCs were assessed using the five steps outlined in **Section 6.4** and the assessment criteria described in **Table 6.3**. Various information sources such as Traditional Knowledge sharing and heritage resource studies as described in **Chapter 6**, **Section 6.3** were used to collect, record and analyse information on the socio-economic and cultural environment of the Local Assessment Area and Regional Assessment Area. This information was used to quantify the potential effects of Project activities on the selected VCs where quantification was possible, and to qualify the potential effects where quantitative data were unavailable.

10.2.3 Mitigation

As part of ESRA's commitment to environmental protection and sustainability, the design and routing of the Project has been developed with an acute awareness of the importance of the ecological and cultural resources of the area including the value of the environment to the people and animals of the region. The final route alignment for the proposed all-season road was selected following review of a number of proposed route alternatives and design options and their potential effects on the people, air, water, land, fish, vegetation, wildlife, Heritage Resources, Traditional land use and Traditional activities. Input received from Elders, elected officials and community members of Berens River First Nation, Berens River NAC, Poplar River First Nation and from the MMF community was used to validate and refine the proposed all-season road alignment (**Chapter 2**, Project Justification and Alternatives

Considered) and contributed to the use of appropriate designs and the application of environmental protection measures for the pre-construction, construction and post-construction stages of the Project. The environmental components that contribute to the ecological and cultural resources of the area were examined individually and collectively to find the best feasible route for the all-season road; a route that will connect the communities to the provincial highway network, while respecting and preserving the ecological, socio-economic and cultural resources of the region.

Many potential effects of road construction and operations and maintenance on the socio-economic and cultural environment can be minimized or avoided through appropriate siting of the road alignment and road design. A variety of measures have been incorporated into the proposed Project to avoid or mitigate potential effects. They include:

- Selecting a road alignment in close proximity to required building materials (rock, clay) to minimize the disturbance footprint;
- Working directly with the local communities (Berens River First Nation/NAC and Poplar River First Nation) on the review of the various options and refinement of the alignments through leadership and elder meetings, community meetings and traditional knowledge studies;
- Providing opportunities for input by other east side First Nations, the Manitoba Metis Federation and regulatory bodies into alignment selection and refinement;
- Selecting a road alignment that provides appropriate setbacks from important physical features such as sensitive cultural, heritage and biophysical sites, and waterbodies, where possible;
- Selecting crossing locations to avoid sensitive aquatic environments such as spawning areas and minimize in-water works;
- Designing Culvert to preserve existing surface and shallow subsurface flow patterns; e.g.) Designs of watercourse crossing structures (i.e., bridges, culverts) that span the wetted perimeter, where possible, and meet 1:100 year flood design standards (i.e., Q1% flood/flow);
- Selecting quarry, borrow, and temporary work/staging locations that avoid sensitive or important features associated with traditional activities and treaty and Aboriginal rights (i.e. trapper cabins, gathering areas);
- Incorporating measures into project design and construction planning to accommodate traditional activities and treaty and Aboriginal rights (i.e. maintain trails, provide access to trapping areas for trappers, provide crossing ramps to allow for safe snowmobile road crossing) and,
- Committing to construction activities and practices (e.g., erosion and sediment control, schedule, blasting, equipment idling), including health and safety, in construction contract documents that avoid or minimize potential environmental effects on the socio-economic and cultural environment.

Information on the route selection process is provided in **Chapter 2** (Project Justification and Alternatives Considered). Information on the design mitigation features and measures that were used

to reduce or avoid a number of potential environmental effects are described in **Chapter 3** (Project Description) and **Chapter 5** (Environmental Protection and Sustainable Development).

Chapter 5 also outlines the environmental protection and management plans that will be implemented for the Project. ESRA has developed a series of Environmental Protection Specifications (e.g., General Requirements 130 [GR130]) that are distributed to contractors as part of the contract agreements for clearing and construction works. These plans and specifications will provide information on the appropriate socio-economic and cultural environment mitigation methods and environmental and health and safety protection measures to be used before, during and following Project activities.

10.2.4 Effects on the Socio-Economic and Cultural Environment

There are potential temporary, short-term effects as well as longer term or permanent effects of Project clearing, construction and operations and maintenance activities that may affect the socio-economic and cultural environment in the Local Assessment Area. These potential environmental effects may influence the following socio-economic aspects:

- Tourism,
- Recreational hunting,
- Commercial fishing and trapping,
- Traditional hunting, trapping, fishing and gathering,
- Travel routes,
- Cultural, heritage and archeological resources, and
- Human health and safety.

Potential environmental effects related to the selected Socio-Economic and Cultural Environment VCs are provided in **Section 10.2.4.1** (Tourism), **Section 10.2.4.2** (Hunting, Trapping, Fishing and Gathering), **Section 10.2.4.3** (Travel Routes), **Section 10.2.4.4** (Cultural, Heritage and Archaeological Resources) and **Section 10.2.4.5** (Human Health and Safety). For each predicted adverse effect, mitigation measures are stated and assessments of the significance of residual environmental effects remaining after mitigation are provided. **Appendix 10-5** provides a list of fish, plant, bird and mammal species that were identified as being important to the Aboriginal communities that may potentially be affected by the Project. **Appendix 10-5** also provides a summary of the predicted significance of Project effects on those species, residual effect on traditional use of those species and proposed monitoring as required.

VCs related to the current use of land and resources for traditional purposes are indicated in **Table 10.7**. A determination of no significant adverse Project effects on VCs related to current traditional land and resource use indicates no significant adverse effects on Aboriginal/treaty rights is predicted.

10.2.4.1 Tourism

Tourism in the Regional Assessment Area is described in **Section 10.1.5.4**. Tourism in the Local Assessment Area is limited to ecotourism and recreational hunting and fishing. Wilderness canoeing on

the Berens River and to a lesser extent the Poplar River draws small numbers of recreationalists. There are no lodges within the local study area that cater exclusively to tourism. Lodging that could provide accommodation for tourist activities is located in both Poplar and Berens communities, but generally provides accommodation to those traveling to the communities on business (i.e. legal services, construction and maintenance workers). Within the Regional Assessment Area, six registered lodges/outfitters support tourism activities (Joro 2015) such as hunting, fishing, canoeing and back-country camping which provide socio-economic benefits including nominal local employment opportunities. The closest lodge/outfitter is approximately 40 km to the west of the Local Study Area. Recreational hunting and fishing is discussed under **Section 10.2.4.2**.

10.2.4.1.1 Construction Effects and Mitigation

The potential environmental effects on tourism associated with Project construction activities are linked to the potential effects on the environmental components (e.g., fisheries resources, hunted animals such as moose) and access to those resources that tourism depends on. A summary of the potential effects of construction on tourism and the mitigation measures that will be used to prevent or minimize potential adverse effects to tourism are provided in **Table 10.8**.

Table 10.8: Summary of Potential Construction-Related Socio-Economic Effects on Tourism and Proposed Mitigation Measures

Construction Activities and Potential Socio-Economic Effects	Proposed Mitigation Measures	Residual Effects	Significance Evaluation
Reduced interest in tourism activities due to temporary disturbance from construction activities.	▪ Setback of all-season road from Poplar River. ▪ Limiting construction to work areas within the Project Footprint and Local Assessment Area (quarries). No quarry development between the proposed road and Poplar River ▪ Measures to protect wildlife will minimize adverse effects to hunting success and therefore related tourism activities will not be adversely influenced. ▪ Measures to protect fish and fish habitat will minimize adverse effects to recreational fishing success and therefore related tourism activities will not be adversely influenced.	No impairment in the Regional Assessment Area based on current setback of the road from registered outfitter/lodges No reduction in interest in ecotourism activities in the regional or local areas as a result of construction activities	Not significant
Reduced access to major waterways associated with boating and canoeing associated with tourism during construction	▪ Navigation access to be retained during construction as per construction specifications and permits obtained from Transport Canada under the Navigation Protection Act.	No impediment to navigation activities	Not significant

The potential adverse effects of Project construction on tourism activities are not anticipated to be significant. Tourism activities such as hunting and fishing in the Regional Assessment Area are primarily based at lodges and mostly take place within the vicinity of existing lodges. Outside of the communities of Berens River and Poplar River First Nation, there are no lodges located in close proximity to the Project Footprint that would be potentially disturbed by construction-related activities. The closest lodge to the communities is located approximately 40 km east of the alignment at Wrong Lake. Access along major waterways where boating and canoeing tourism activities occur will be temporarily disrupted during the construction of the all-season road major waterway crossings.

10.2.4.1.2 Operations and Maintenance Effects and Mitigation

The potential environmental effects on tourism associated with Project operations and maintenance activities are linked to the potential effects on the environmental components (e.g., waterways, fisheries resources, and hunting resources) that tourism is dependent on and access to those resources that tourism depends on. A summary of the potential effects of Project operation and maintenance on tourism and the mitigation measures that will be used to prevent or minimize potential adverse effects to tourism are provided in **Table 10.9**.

Table 10.9: Summary of Potential Operation and Maintenance-Related Socio-Economic Effects on Tourism and Proposed Mitigation Measures

Construction Activities and Potential Socio-Economic Effects	Proposed Mitigation Measures	Residual Effects	Significance Evaluation
Potential for increased tourism opportunities due to road access.	▪ None required. Hunting and fishing limits associated with tourism activities (i.e., not related to traditional resource use) are regulated by the Province.	Potential for increased tourism in the Local Assessment Area due to road access.	Not significant
Reduced navigation access on major waterways reducing tourism opportunities associated with boating and canoeing	▪ Watercourse crossings along key waterways used for tourism-related activities to be designed for boat passage or to include portages.	No effect	Not significant

There is anticipated to be some positive effects to tourism related to improved access within the Local Assessment Area but are not anticipated to directly extend to the Regional Assessment Area considering the regional area will remain largely remote with the exception of additional planned all-season roads that are discussed within **Chapter 13** (Cumulative Effects). The overall positive effects on tourism linked to improved access are expected to be minor and related to the potential for increased business and employment opportunities for communities and local residents rather than potential effects to environmental components (e.g., waterfowl) related to tourism (e.g., guided hunting).

10.2.4.2 Hunting, Trapping, Fishing and Gathering

The proposed Project has the potential to affect traditional hunting, trapping, fishing and gathering activities by members of the local communities as well as the commercial aspects of trapping. Potential effects of the Project construction and operations and maintenance phases on hunting, trapping, fishing and gathering are assessed in **Sections 10.2.4.2.1** and **10.2.4.2.2**.

10.2.4.2.1 Construction Effects and Mitigation

The potential environmental effects on hunting, trapping, fishing and gathering associated with Project construction activities, which include effects to the quality and availability of country foods, are linked to the potential effects on the environmental components (e.g., fisheries resources) that those activities are dependent on and the effects on access to those areas where hunting, trapping, fishing and gathering occur. A summary of the potential effects of Project construction on hunting, trapping, fishing and gathering, and the mitigation measures that will be used to prevent or minimize the potential environmental effects from occurring, are provided in **Table 10.10**.

Table 10.10: Summary of Potential Construction-Related Socio-Economic Effects on Hunting, Trapping, Fishing and Gathering, and Proposed Mitigation Measures

Construction Activities and Potential Socio-Economic Effects	Proposed Mitigation Measures	Residual Effects	Significance Evaluation
Reduced hunting success for traditional resources due to temporary disturbance to wildlife from construction activities.	▪ Engage communities in the planning and design of the all-season road and incorporate feedback. ▪ Communicate information on planned and active construction activities to facilitate local planning of harvesting activities and provide opportunities for ongoing input into the project. ▪ Routing all-season road to avoid areas of high quality habitat where feasible. ▪ Limiting construction to work areas within the Project Footprint and Local Assessment Area (quarries). ▪ Using existing access routes, trails or cut lines to the extent feasible; access routes and trails will be kept as short and narrow as feasible. ▪ Temporary construction-related access roads will be blocked following construction; natural re-vegetation will be encouraged and augmented by native plants and seeds. ▪ Measures to protect and avoid disturbance to wildlife minimizes disruption to traditional hunting activities	Temporary minor impairment of traditional resource use (hunting).	Not significant
Reduced licenced hunting success due to temporary disturbance to wildlife from construction activities.	▪ Routing all-season road to avoid areas of high quality habitat where feasible. ▪ Measures to protect wildlife and associated habitat will support hunting success rates. ▪ Limiting construction to work areas within the Project Footprint and Local Assessment Area (quarries). ▪ Temporary construction-related access roads will be blocked after construction; natural revegetation will be encouraged and augmented by native plants and seeds.	Temporary impairment of licenced hunting.	Not significant
Reduced commercial and traditional use trapping success due to temporary disturbance to wildlife	▪ Engage communities in the planning and design of the all-season road and incorporate feedback. ▪ Communicate information on planned and active construction	Temporary impairment of traditional resource use (trapping).	Not significant

Construction Activities and Potential Socio-Economic Effects	Proposed Mitigation Measures	Residual Effects	Significance Evaluation
from construction activities (aquatic and terrestrial furbearers); Potential for disturbance to traplines.	activities to facilitate local planning of harvesting activities and provide opportunities for ongoing input into the project. ▪ Routing all-season road to avoid areas of high quality habitat where feasible. ▪ Discuss with Chief and Council installation of trapline signage. ▪ Construction activities will be localized to work areas within the Project Footprint. ▪ Dens found during pre-construction surveys will be marked and isolated as Environmentally Sensitive Sites. ▪ Trapper access to be accommodated in construction areas. ▪ Hunting, trapping or harassment of wildlife by contractors, employees and agents will be prohibited. ▪ Existing water flow patterns, levels and wetland hydrologic regimes will be maintained through road design. ▪ Protection of wildlife and habitat to protect trapping success ▪ Riparian vegetation clearing within the right-of-way will be limited to the removal of trees and tall shrubs (to maintain line of sight safety requirements) with no removal of low growing vegetation. ▪ A vegetated buffer zone will be retained between the all-season road and lakes or ponds along the right-of-way, e.g., Bull Lake and Pamatakakowin Lake. ▪ Where feasible, roads will be located a minimum of 100 m from waterbodies except when crossing a watercourse. ▪ Appropriate erosion and sediment control (ESC) measures will be in place prior to the commencement of clearing and construction and will remain in place until disturbed areas are stabilized and revegetation is occurring. ▪ Road clearing activities will occur during daytime hours when marten (an important furbearing species) are less active. ▪ Temporary construction-related access roads will be blocked after construction; natural revegetation will be encouraged and augmented by native plants and seeds as appropriate.		

Construction Activities and Potential Socio-Economic Effects	Proposed Mitigation Measures	Residual Effects	Significance Evaluation
Reduced land access to hunting, trapping, fishing and gathering resource use areas during construction.	▪ Create temporary detours for snowmobiles and ATVs during construction. ▪ Identify and sign detour routes and portages. ▪ Grubbing to not block access to the existing trails, trap lines, portages and other travel corridors. ▪ ESRA's special provision in construction contracts requires that access to key travel routes be maintained during construction. ▪ ESRA's *Special Provision 18 Trapline Access* in construction contracts requires that access to key travel routes be maintained during construction. ▪ Provide community updates regarding location and timing of construction activities that could result in limited access so that alternative routes can be planned.	Temporary limited access or detoured access to land trails used to access hunting, trapping, fishing and gathering resources use areas.	Not significant
Reduced access to major waterways associated with fishing activities during construction.	▪ Engage communities in the planning and design of the all-season road and incorporating feedback. ▪ Communicate information on planned and active construction activities to facilitate local planning of harvesting activities and provide opportunities for ongoing input into the project ▪ Watercourse crossings along key waterways used for traditional resource use activities to be designed for boat passage or to include portages. ▪ Grubbing to not block access to the existing trails, trap lines, portages and other travel corridors ▪ Navigation access to be retained during construction as per construction specifications and permits obtained from Transport Canada under the *Navigation Protection Act.*	Temporary impairment of traditional resource use (fishing) during construction of key waterway crossings.	Not significant
Reduced traditional fish harvest success in major waterways during construction.	▪ Protection of water quality, fish habitat and fish, will protect fish populations and protect fish harvest success ▪ Engage communities in the planning and design of the all-season road and incorporating feedback. ▪ Communicate information on planned and active construction activities to facilitate local planning of harvesting activities and provide opportunities for ongoing input into the project ▪ Riparian vegetation clearing within the right-of-way will be	Temporary impairment of traditional resource use (fish harvest) during construction of major waterway crossings.	Not significant

Construction Activities and Potential Socio-Economic Effects	Proposed Mitigation Measures	Residual Effects	Significance Evaluation
	limited to the removal of trees and tall shrubs (to maintain line of sight safety requirements) with no removal of low growing vegetation. ▪ A vegetated buffer zone will be retained between the all-season road and lakes or ponds along the right-of-way, e.g., Bull Lake and Pamatakakowin Lake. ▪ Where feasible, roads will be located a minimum of 100 m from waterbodies except when crossing a watercourse. ▪ Appropriate erosion and sediment control (ESC) measures will be in place prior to the commencement of clearing and construction and will remain in place until disturbed areas are stabilized and revegetation is occurring. ▪ Navigation access to be retained during construction as per construction specifications and permits obtained from Transport Canada under the Navigation Protection Act.		
Loss or impairment of areas for berry picking and cultural/medicinal plant gatherings due to construction activities.	▪ Engage local communities in the planning and design of the Project to identify traditional use areas and avoid important traditional use areas to the extent feasible. ▪ Communicate information on planned and active construction activities to facilitate local planning of harvesting activities and provide opportunities for ongoing input into the project. ▪ Block and re-vegetate temporary access routes and other disturbed areas immediately after construction.	Minor loss/impairment of traditional use areas for gathering.	Not significant

Considering the potential adverse effects of Project construction on hunting, trapping, fishing and gathering activities are not anticipated to be significant, the adverse effects to current traditional land and resource use associated with those activities during the Project construction phase are also not anticipated to be significant.

Traditional Knowledge studies, trapper engagement and community engagement sessions were used to gather information and identify and assess measures to minimize potential Project effects including route selection. Hunting success, both licenced and traditional/subsistence, to be maintained as a result of measures to protect wildlife and their habitats and measures to limit hunting opportunities from the road right-of-way.

A trapline within RTL #12 is bisected by the Project all-season road right-of-way alignment (**Section 10.1.5.5**). ESRA staff are working with local trappers on data gathering and monitoring during this period which will enable adaptive management measures if necessary. ESRA construction contracts have a special provision (*Special Provision 18 Trapline Access*) to see that trappers have continued access to traplines and trails during construction.

Commercial fishing in the regional area occurs in large lakes, particularly Lake Winnipeg, rather than in waterways crossed by the proposed all-season road (**Section 10.1.5.5**). Therefore, commercial fishing activities are not expected to be affected by Project construction activities.

Sustenance fishing is not expected to be adversely affected as a result of measures to protect water quality, fish habitat and fish during construction and efforts to maintain access to fishing areas by providing for ongoing navigation during construction. Similarly, preferred gathering areas were avoided during route selection and measures to protect vegetation during construction will protect harvesting success.

10.2.4.2.2 Operations and Maintenance Effects and Mitigation

The potential environmental effects on hunting, trapping, fishing and gathering associated with Project operation and maintenance activities, which include effects to the quality, availability and accessibility of country foods, are linked to the potential effects on the environmental components (e.g., fisheries resources) that those activities are dependent on, as well as access to those resources. A summary of the potential effects of Project operation and maintenance activities on hunting, trapping, fishing and gathering, and the mitigation measures that will be used to prevent or minimize the potential environmental effects from occurring, are provided in **Table 10.11**.

Table 10.11: Summary of Potential Operations and Maintenance-Related Socio-Economic Effects on Hunting, Trapping, Fishing and Gathering, and Proposed Mitigation Measures

Operations and Maintenance Activities* and Potential Socio-Economic Effects	Proposed Mitigation Measures	Residual Effects	Significance Evaluation
Facilitated access to traditional hunting areas due to increased access to traditional land and resource use areas.	▪ Engage communities in the planning and design of the all-season road and incorporate feedback. ▪ None required. All-season access road will provide increased access to traditional hunting areas.	Access improvement to traditional land and resource use areas (hunting)	Not significant
Reduced traditional use hunting success due to increased non-resident hunting pressure as a result of road access	▪ Engage communities in the planning and design of the all-season road and incorporate feedback. ▪ Avoid preferred harvest areas identified by communities ▪ Do not provide boat launches at water crossings ▪ Do not provide pull off areas and install signage ▪ Decommission temporary access roads, block access to temporary activity areas and encourage re-growth to deter non-local hunters from using the road as an access point	No residual effects to traditional harvest success	Not significant
Facilitated access to traplines due to increased access to traditional land and resource use areas. Potential for disturbance to traplines	▪ Engage communities in the planning and design of the all-season road and incorporate feedback. ▪ Solicit and discuss feedback with community members and Chief and Council. ▪ Installation of trapline signage.	Access improvement to traditional land and resource use areas (trapping)	Not significant
Impeded access to major waterways at major waterway crossings for fishing opportunities. Protect fish and fish habitat to ensure ongoing fish harvest success.	▪ Engage communities in the planning and design of the all-season road and incorporate feedback. ▪ Watercourse crossings along key waterways used for fishing will be designed for boat passage or will include portages. ▪ Maintain fish passage and protect water quality with design such as permanent erosion control measures and culvert design.	No residual effects to traditional fishing activities are anticipated.	Not significant
Facilitated access to areas for berry picking and cultural/medicinal plant	▪ Engage communities in the planning and design of the all-season road and incorporate feedback.	Access improvement to traditional land and	Not significant

Operations and Maintenance Activities* and Potential Socio-Economic Effects	Proposed Mitigation Measures	Residual Effects	Significance Evaluation
gatherings.	▪ None required. All-season access road will provide increased access to areas for berry picking and cultural/medicinal plant gatherings.	resource use areas (berry picking and cultural/medicinal plant gatherings)	

*Mitigation measures proposed during the construction phase will also be applied to maintenance activities during the operations phase as required (see **Table 10.10**)

** Manitoba Conservation and Water Stewardship is in discussions with Poplar River First Nation and Berens River First Nation/NAC discussing the implementation of a wildlife refuge along the alignment to prevent hunting directly adjacent to the road.

The potential adverse effects of Project operations and maintenance on traditional hunting, trapping, fishing and gathering activities are not anticipated to be significant. The all-season road is expected to facilitate land access to traditional resource use areas associated with hunting, trapping, fishing and gathering activities (**Section 10.2.4.3.2**). Traplines are registered and regulated by the provincial government. Therefore, potential economic benefits related to facilitated access to traplines or trapline areas are managed by the provincial government. Regarding access to waterways used to access hunting, trapping, fishing and gathering areas, access for local users will not be impeded because key waterway crossings along the all-season road route will be designed for boat passage or will include portages. Boat launches or skidoo launch sites at crossing locations, or pull offs will not be constructed as a component of this Project; therefore access to waterways associated with hunting, trapping, fishing and gathering activities are not expected to be substantially improved. Monitoring information collected from the Project and ongoing communication with the local communities will provide for the implementation of additional protection measures through the Manitoba *Wildlife Act* if warranted.

Commercial fishing in the regional area occurs in large lakes, particularly Lake Winnipeg, rather than in waterways crossed by the proposed all-season road (**Section 10.1.5.5**). Therefore, commercial fishing activities are not expected to be adversely affected by the Project.

10.2.4.3 Travel Routes

Travel routes on the east side of Lake Winnipeg are described in **Section 10.1.6.5**. Information regarding the waterway travel routes bisected by the Project was obtained from local communities during the Aboriginal and Public Engagement Program (**Chapter 4**, Aboriginal and Public Engagement) and sharing of Traditional Knowledge. Traditional travel routes in the Local Assessment Area and Regional Assessment Area include creeks, rivers, lakes and land trails such as portage routes, walking trails, snowmobile trails and ATV trails. These routes are important to local communities as they serve to connect them to lands and resources used for traditional purposes in recognition and exercise of Aboriginal and treaty rights. During construction and when completed, the Project all-season road may bisect some traditional travel routes.

10.2.4.3.1 Construction Effects and Mitigation

The potential environmental effects on travel routes associated with Project construction activities prior to the implementation of mitigation measures include:

- Temporary blockage of access to land and waterway travel routes bisected by the proposed all-season road route in the Local Assessment Area; and
- Temporary disruption of traditional land and resource use activities due to blockage of access to travel routes bisected by the Project.

Using the approach described in **Section 10.2.2**, the overall level of effect of the potential construction effects on travel routes prior to the implementation of mitigation measures was examined. **Appendix 10-3** provides a summary of the potential construction effects on travel routes prior to the

implementation of mitigation measures, and the determined overall level of potential effect. Potential effects of Project construction on travel routes prior to the implementation of mitigation measures was identified as having a low level of potential effect, and is as follows:

- Reduced access to travel routes including land trails and waterway routes.

Considering the construction of the Project all-season road will be completed in segments starting from each of the Berens River and Poplar River First Nations communities (**Chapter 3,** Project Description**, Section 3.2.3**), disruption to travel routes that intersect the all-season road right-of-way will be temporary as each segment of the all-season road is completed. ESRA will be providing regular Project construction progress updates to the local communities (**Chapter 4,** Aboriginal and Public Engagement) to communicate which areas along the Project all-season road route will be under construction, providing information on how and when traditional travel routes will be potentially affected and which will require alternative temporary re-routing. On-going engagement with communities during the Project construction phase will allow for the identification of key travel routes that require continued access during particular seasons such that accommodation solutions can be discussed with the communities to preserve access along travel routes where and when necessary.

To facilitate navigation of the traditional waterway travel routes indicated as being important to the local communities, the watercourse crossings at the Berens, Etomami, North Etomami and Leaf Rivers will be designed to accommodate navigation, as will the design of the large diameter culvert crossing at Okeyakkoteinewin Creek (**Chapter 3, Section 3.3.2**). To accommodate safe snowmobile/ATV crossings of the proposed all-season road, the road platform will be modified at key access points as identified and discussed with communities to include graded ramps and sufficiently cleared areas to facilitate on-coming traffic visibility (**Chapter 3, Section 3.3.1**). Contracts state that contractors may not block trails (i.e., with debris).

A summary of the potential effects of construction on travel routes and the mitigation measures that will be used to prevent or minimize potential adverse effects to travel routes are provided in **Table 10.12**. Note that the list of mitigation measures in **Table 10.12** is not exhaustive, as mitigation and environmental protection measures for the Project that are applicable to travel routes are also included in the provisions outlined in ESRA's Environmental Protection Procedure and Environmental Protection Specifications (**Chapter 5,** Environmental Protection and Sustainable Development).

Table 10.12: Summary of Potential Construction-Related Socio-Economic Effects on Travel Routes and Proposed Mitigation Measures

Construction Activities and Potential Socio-Economic Effects	Proposed Mitigation Measures	Residual Effects	Significance Evaluation*
Reduced access to travel routes including land trails and waterway routes due to: ▪ Clearing of vegetation; setup of equipment and crew staging and use areas; installation and use of cofferdams; bridge and other watercourse crossing installations; equipment, machinery and vehicle use; and road construction activities.	▪ Engage communities in the planning and design of the all-season road and incorporating feedback. ▪ Watercourse crossings along key waterways to be designed for boat passage or to include portages. ▪ Grubbing to not block access to the existing trails, trap lines, portages and other travel corridors ▪ Provide access ramps to key travel routes bisected by the all-season road. ▪ Create temporary detours for snowmobiles and ATVs during construction. ▪ Identify and sign detour routes and portages. ▪ ESRA's special provision in construction contracts requires that access to key travel routes be maintained during construction. ▪ ESRA's *Special Provision 18 Trapline Access* in construction contracts requires that access to key travel routes be maintained during construction. ▪ Provide community updates regarding location and timing of construction activities that could result in limited access so that alternative routes can be planned.	Temporary limited access or detoured access to travel routes including land trails and waterway routes.	Not Significant

Note: *Refer to **Section 10.3** for additional details regarding the significance of residual effects conclusion and evaluation.

10.2.4.3.2 Operations and Maintenance Effects and Mitigation

Based on the screening of potential effects during the operations and maintenance phase prior to mitigation in **Appendix 10-4**, the following potential adverse effects to travel routes were identified as having an overall low level of effect:

- Temporary blockage of access to land and waterway travel routes bisected by the proposed all-season road route in the Local Assessment Area during maintenance activities; and
- Temporary disruption of traditional land and resource use activities due to blockage of access to travel routes bisected by the Project during maintenance activities.

During the operations and maintenance phase of the Project there is not likely to be a substantial change to travel routes in the Local Assessment Area due to the mitigation identified in **Table 10.13** intended to accommodate continued access to traditional local travel routes. Key mitigation measures that will preserve access to traditional travel routes include designing watercourse crossings at major rivers to accommodate navigability for canoes and motorboats, as required, and providing access ramps to key travel routes bisected by the all-season road. Maintenance activities during the Project operations phase may result in some infrequent and temporary disruption to travel routes where they intersect with the Project. ESRA will inform the communities regarding the location and timing of maintenance activities (e.g., bridge maintenance) that may require alternative travel route planning. Although the existing seasonal winter road will be decommissioned when the all-season road becomes operational, the all-season road will provide an improved all-season travel route between Berens River and Poplar River communities and the existing Manitoba southern road network. There will also be the potential for an increase in access to new travel routes in the area due to the presence of the all-season road. An assessment of the significance of residual effects of the Project on travel routes is provided in **Section 10.3.**

A summary of the potential effects of operations and maintenance on travel routes and the mitigation measures that will be used to prevent or minimize potential adverse effects to travel routes are provided in **Table 10.13**. Note that the list of mitigation measures in **Table 10.13** is not exhaustive, as mitigation and environmental protection measures for the Project that are applicable to travel routes are also included in the provisions outlined in ESRA's Environmental Protection Procedure and Environmental Protection Specifications (**Chapter 5,** Environmental Protection and Sustainable Development).

Table 10.13: Summary of Potential Operations and Maintenance-Related Socio-Economic Effects on Travel Routes and Proposed Mitigation Measures

Operations and Maintenance Activities and Potential Socio-Economic Effects	Proposed Mitigation Measures	Residual Effects	Significance Evaluation*
Reduced access to travel routes including land trails and waterway routes due to: ▪ Operations and maintenance activities for the P4 all-season road.	▪ Engage communities in the planning and design of the all-season road and incorporating feedback. ▪ Watercourse crossings along key waterways used for traditional resource use activities to be designed for boat passage or to include portages. ▪ Provide access ramps to key travel routes bisected by the all-season road. ▪ Inform the communities regarding the location and timing of maintenance activities (e.g., bridge maintenance) that may require alternative travel route planning.	Temporary reduction in access to travel routes including land trails and waterway routes during maintenance activities.	Not Significant
Substantial additional travel route (P4 all-season road) that is connected to the southern Manitoba network, and access to potential new travel routes due to: ▪ Operations and maintenance activities for the P4 all-season road.	▪ Not required.	Substantial additional travel route, and access to potential new travel routes.	Not Significant

Note: *Refer to **Section 10.3** for additional details regarding the significance of residual effects conclusion and evaluation.

10.2.4.4 Cultural, Heritage and Archaeological Resources

Cultural, heritage and archaeological resources can be found within the Local Assessment Area and Regional Assessment Area of the Project and are described in **Sections 10.1.5.8** and **10.1.6.6**. Heritage Resources Impact Assessments (HRIAs) for the Project provided information that was used to refine the proposed road alignment where appropriate to avoid sensitive sites of high and medium priority, and inform mitigation measures.

10.2.4.4.1 Construction Effects and Mitigation

The potential environmental effects on cultural, heritage and archaeological resources associated with Project clearing and construction activities prior to the implementation of mitigation measures include:

- Loss and damage of known and unknown cultural, heritage and archaeological sites and objects in the Local Assessment Area during construction.

Using the approach described in **Section 10.2.2**, the overall level of effect of the potential construction effects on cultural, heritage, and archaeological resources prior to the implementation of mitigation measures was examined. **Appendix 10-3** provides a summary of the potential construction effects on cultural, heritage, and archaeological resources prior to the implementation of mitigation measures, and the determined overall level of potential effect.

Based on the screening of potential effects in **Appendix 10-3**, the following potential adverse effect was identified as having an overall low level of effect:

- Loss and damage of known and unknown cultural, heritage and archaeological sites and objects in the Local Assessment Area during construction.

During the construction phase of the all-season road there is not likely to be a significant effect on cultural, heritage and archaeological resources activity in the Local Assessment Area with road construction as the known significant resources have been avoided through route modifications.

In addition to the HRIAs that were conducted to investigate the locations of high and medium priority sites to inform the all-season road alignment to avoid priority sites, ESRA has developed specific Environmental Protection Procedures and Environmental Protection Specifications to mitigate potential adverse effects to cultural, heritage, and archaeological resources during Project construction (**Chapter 5**, Environmental Protection and Sustainable Development). A summary of the potential environmental effects of construction and the mitigation measures that will be used to prevent or minimize the potential environmental effects from occurring are provided in **Table 10.14**.

Table 10.14: Summary of Potential Construction-Related Socio-Economic Effects on Cultural, Heritage and Archaeological Resources and Proposed Mitigation Measures

Construction Activities and Potential Socio-Economic Effects	Proposed Mitigation Measures	Residual Effects	Significance Evaluation
Loss and damage of known and unknown cultural, heritage and archaeological sites and objects in the Local Assessment Area during construction.	▪ Engage communities in the planning and design of the all-season road and incorporating feedback. ▪ Communicate information on planned and active construction activities to facilitate traditional ceremonies in advance of construction ▪ Conducted traditional knowledge studies and heritage resource assessments to identify archaeological, heritage and cultural sites. ▪ Alignment of the all-season road to avoid known cultural, heritage and archaeological sites and objects. ▪ Flag construction exclusion areas around discovered/previously unknown cultural, heritage and archaeological sites when encountered during construction activities and identify construction exclusion zones on right-of-way mapping for contract administrators. ▪ Relocate heritage resources that would be destroyed by construction activities only with consent from Manitoba Heritage Resources Branch and input of the local community. ▪ Consult with the local community and/or the MMF on culturally appropriate measures procedures to follow if archaeological sites or objects are exposed during construction. ▪ Provide instructions to contractors on procedures to follow if archaeological sites or objects are exposed during construction. ▪ Block and re-vegetate temporary access routes and other disturbed areas immediately after construction.	None anticipated after application of mitigation measures.	N/A

10.2.4.4.2 Operations and Maintenance Effects and Mitigation

Operations and maintenance of the proposed all-season road is not anticipated to affect cultural, heritage and archaeological resources in the Local Assessment Area considering vehicle use of the all-season road and maintenance activities will be confined to previously affected areas. Mitigation measures that will be followed during maintenance of the all-season road were described in **Table 10.14** for construction-related activities. Therefore, no residual adverse effects on cultural, heritage and archaeological resources are anticipated as a result of Project operations and maintenance.

10.2.4.5 Human Health and Safety

The Project has the potential to directly affect the health and safety of both community members and workers during the construction and operations and maintenance phases. As no construction activity will take place within the boundaries of either Berens River First Nation/NAC or Poplar River First Nation, community members will be primarily subject to potential direct effects of Project construction and operations and maintenance activities when travelling outside of their communities. Effects on the health and safety of construction and maintenance workers are associated with effects of activities such as right-of-way clearing, blasting, road and bridge construction and maintenance and the operation of heavy equipment and machinery in remote areas removed from medical facilities and services. Potential indirect effects of the Project on health and safety of community members are also considered and include potential effects of Project construction and operations and maintenance activities that alter existing drinking water quality, air quality, or noise exposure levels (**Chapter 7,** Physical Environment) and the quality and availability of country foods collected through hunting, trapping, fishing and gathering (**Section 10.2.4.2**). Information about the communities of Berens River First Nation/NAC and Poplar River First Nation is presented in **Section 10.1.4**. Information about construction activities, facilities and workforce is presented in **Chapter 3** (Project Description).

The potential environmental effects on human health and safety associated with Project construction and operations and maintenance activities are linked to the potential direct and indirect effects on the environmental components that those activities interact with. Therefore, potential adverse effects of Project construction on human health and safety are, in part, determined through the assessment of Project construction effects on the VCs linked to those activities. For human health, associated environmental effects assessment determinations for other VCs are found in the effects assessment sections for Surface Water, Air Quality, Noise and Vibration and Hunting, Trapping, Fishing and Gathering (**Sections 7.2.4.1, 7.2.4.2, 7.2.4.3** and **10.2.4.2,** respectively). Mitigation measures that would be applied to avoid/minimize potential adverse effects of Project construction on VCs linked to human health and safety are also provided in the EIS sections referenced.

An environmental effects assessment determination for human health and safety as an independent VC within the Socio-Economic and Cultural Resources component of the environment was also completed. During the construction and operations and maintenance phases, community members and construction and maintenance workers can be exposed to health and safety risks such as

vehicle/equipment/machinery accidents, hearing impairment, injuries from explosions, and health effects from the use or spills of hazardous substances. The health of community members and workers can also be affected by potential changes to drinking water quality, air quality, and the quality and availability of country food resulting from Project construction and operations activities. The potential effects of the Project on human health and safety in the Project areas prior to the implementation of mitigation measures are described below.

Road and Bridge Construction and Maintenance Activities

Risks of construction and operations-related injury or death may occur during road construction and maintenance, heavy equipment and machinery use, bridge construction and maintenance, quarry and borrow pit development, blasting, rock crushing, aggregate sorting and other related activities. Construction and maintenance worker health may be at risk from vehicle accidents, burns, explosions, and the handling of hazard substances such as fuels and other materials. Community members and the general public may also be at risk of injury and death during the construction and operations phases from accidents with equipment, machinery and vehicles, fires, explosions, blasting and other risks associated with related activities. There are inherent health and safety concerns with construction in remote areas that are removed from medical facilities and services. The health and safety of community members and workers in the vicinity of active construction areas are also subject to hearing impairment from machinery/equipment noise and blasting. Generally, risks to human health are highest within the Project Footprint and decrease with increasing distance (i.e., through the Local and Regional Assessment Areas).

Changes in Drinking Water Quality

During construction and operations, risks to the health of community members and the construction work force may occur indirectly through Project-induced changes to the quality of watercourses that are used as a potable water source. The communities of Berens River First Nation/NAC and Poplar River First Nation source their drinking water from surface water that may be affected by road and bridge construction activities (i.e., the Berens River and Poplar River). Construction work camps for the P4 Project will truck in water from existing sources at Poplar River and Berens River First Nations. The potential impairment of drinking water quality from proposed Project activities could potentially result from the release of deleterious substances to watercourses within the Project Footprint and Local Assessment Area and move downstream within the Regional Assessment Area. Examples include:

- Runoff of stormwater and meltwater from road and bridge surfaces under construction and completed can contain substances such as sediment, nutrients, and hydrocarbons. During and following significant rainfall events or periods of melt, runoff into surface water receiving streams can result in short-term changes in water quality.
- Geochemical leachate generated by the blasting, excavation and storage of specific bedrock types potentially found along the road alignment and at quarry sites can generate acidic runoff

that leaches metals and can impair drinking water quality. The risk and degree of adverse environmental effects of acid rock drainage and/or metal leaching is dependent on many factors such as the amount of sulphide mineralization compositions present in the exposed rock.

- Concrete and concrete wash water from cast-in-place concrete structures such as bridge abutments, footings and bridge decks. The high pH of wash water from uncured or partly-cured concrete can affect drinking water quality. Concrete wash water can also contain particulates that can increase turbidity when spilled.

- Hydrocarbons such as oil, gasoline and hydraulic fluids used by construction and maintenance vehicles, machinery and equipment operating or serviced near watercourses. Hydrocarbons can impair drinking water quality and are hazardous to human health.

Drinking Water Quality Standards and Guidelines for Canadian Drinking Water Quality have been published by the Province of Manitoba and Health Canada, respectively, and serve as the standards against which construction and operations effects on drinking water quality can be assessed.

Changes in Air Quality

Road construction and maintenance activities have the potential to reduce air quality through the generation of fugitive dust and other particulates from blasting, clearing, burning of woody debris and other construction-related activities and through dust and emissions from vehicle and equipment operations. Primary emissions from the operation of vehicles, machinery and equipment that can compromise air quality are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and volatile organic compounds (VOCs). Dust and emissions may have potential adverse effects to human health for receptors within the Project Footprint and Local and Regional Assessment Areas. The Manitoba Ambient Air Quality Criteria (Government of Manitoba 2005) serve as the technical standard against which Project construction and operations effects on air quality can be assessed.

Changes in Noise Exposure

With the exception of the settled communities of Berens River First Nation/NAC and Poplar River First Nation, the Regional Assessment Area is noise and vibration-free. Road construction and maintenance activities will introduce temporary and on-going noise and vibration to the Project Study Areas that may affect human health depending on the magnitude and duration. Potentially adverse sound and vibration exposure levels may be generated by construction activities, blasting and road traffic. Effects of noise decrease with increasing distance from the source therefore the magnitude of noise effects in greatest within the Project Footprint and lowest in the Regional Assessment Area. There are no federal or provincial noise guidelines or thresholds that apply to noise exposure levels generated by the Project.

Changes in the Quality or Related Availability of Country Foods

Changes in the quality of “country foods” (i.e., traditional foods in the diet of Aboriginal people) resulting from Project construction and operations and maintenance activities may indirectly affect

human health through consumption or reduced availability of country foods. The release of sediment in a fish-bearing watercourse (i.e., water quality impairment) from which fish are harvested by local community members, for example, can temporarily reduce the availability of that fish species and reduce fishing success. Similarly, changes in air quality and noise levels associated with Project construction and/or operations and maintenance activities may alter the current distribution, and thus availability, or quality of plants and animals. Traditional country foods are those that originate from local plant or animal resources through harvesting, gathering, fishing or hunting and which possess cultural meaning as a traditional food. Country food used in the local assessment area includes plants for berries and roots, mammals (e.g., moose), birds (e.g., ducks), fish (e.g., northern pike) and others.

10.2.4.5.1 Construction Effects and Mitigation

Using the approach described in **Section 10.2.2**, the overall level of effect of potential construction effects on human health and safety prior to the implementation of mitigation measures was examined. **Appendix 10-3** provides a summary of the potential construction effects on community member/construction worker health and safety prior to mitigation measure implementation, and the determined overall level of potential effect.

Based on the screening of potential effects in **Appendix 10-3**, the following potential adverse effects were identified as having an overall low level of effect:

- Road and bridge construction activities;
- Changes in drinking water quality;
- Changes in air quality;
- Changes in noise exposure; and
- Changes in the availability or quality of country foods.

As described in **Chapter 3 (Project Description), Section 3.2.3**, construction of the Project all-season road will be completed in short segments starting from each of the Berens River and Poplar River communities thereby limiting the extent of active construction. ESRA will be providing regular Project construction progress updates to the local communities (**Chapter 4, Aboriginal and Public Engagement**) to communicate which areas along the Project all-season road route will be under construction. Public access to construction areas will be restricted to only the approved workforce and will be monitored and enforced by ESRA contractors. Signage, barricades and notices provided to the communities will be employed to keep community members away from active construction areas. Construction workers will be trained in safe practices, will abide by Health and Safety Plans, and will attend regular construction site safety briefings. Construction contractors will develop and implement appropriate Health and Safety Plans, conduct regular safety training and inspections, use trained and certified blasting crews, and equip and maintain construction equipment, machinery and vehicles with appropriate safety features. Contractors will also operate under ESRA's EPPs (GR130s and GR140s) including: Spills and Remediation and Emergency Response (GR130.10); Dust and Particulate Control (GR130.11); Noise and Noise Limitations (GR130.12); Staff Training and Awareness (GR130.14); and Health and Safety (GR140s).

A summary of the potential effects of construction on human health and safety and the mitigation measures that will be used to prevent or minimize potential adverse effects to human health and safety are provided in **Table 10.15**. Note that the list of mitigation measures in **Table 10.15** is not exhaustive, as mitigation and environmental protection measures for the Project that are applicable to human health and safety are also included in the provisions outlined in **Chapter 5**. Accidents and malfunctions are also addressed in **Chapter 12**. Following the application of mitigation measures, adverse effects to the health of community members and workers during construction are predicted however they are not anticipated to be significant.

Table 10.15: Summary of Potential Construction-Related Socio-Economic Effects on Human Health and Safety and Proposed Mitigation Measures

Construction Activities and Potential Socio-Economic Effects	Proposed Mitigation Measures	Residual Effects	Significance Evaluation*
Reduced health and safety of community members and construction workers due to: ▪ Interaction with, or participation in, Project construction activities including: clearing of vegetation from road right-of-way and other use areas; staging of equipment, crew and use areas; blasting; road construction activities; bridge and other watercourse crossing installations; and equipment, machinery and vehicle use.	▪ Post "no entry", warning signs and barricades (e.g., gates, fences), where necessary, around active construction sites. Provide for safe access for trappers and other traditional users. Monitor and enforce restricted access conditions. ▪ Provide community updates regarding location and timing of construction activities. ▪ Workers to be educated regarding safe construction practices including use of Personal Protective Equipment. ▪ Develop and implement Site Health and Safety Plans prior to construction. ▪ Conduct regular construction site safety meetings. ▪ Conduct regular safety inspections of construction sites. ▪ Used trained and certified blasting crews. ▪ Blasting locations to be secured prior to blasting. ▪ Equip and maintain construction equipment, machinery and vehicles with appropriate safety features (e.g,, back-up warning devices).	Minor risk to the health and safety of community members and workers during construction.	Not Significant
Reduced health of community members and construction workers due to: ▪ Changes in drinking water quality; changes in air quality; changes in noise exposure; and changes in the availability or quality of country foods.	<u>Drinking Water Quality</u> ▪ Construction activities will not occur within 100 m of a watercourse with the exception of construction of watercourse crossings. Where a 100 m distance is not possible, a buffer zone between construction activities and the watercourse will be established according to the following formula: Buffer Width = 10 m + (1.5 X slope gradient) or 30 m whichever is greater. ▪ In-stream work will be conducted during winter months or low flow conditions and in isolation of flowing water to avoid/minimize downstream sediment transfer. ▪ Appropriate erosion and sediment control measures will be in place prior to the commencement of clearing and construction and will be regularly inspected and maintained to confirm effectiveness throughout construction. ▪ Equipment, machinery and vehicles will be checked for cleanliness	Minor risk to the health of community members and workers during construction.	Not Significant

Construction Activities and Potential Socio-Economic Effects	Proposed Mitigation Measures	Residual Effects	Significance Evaluation*
	and leaks upon arrival to site and checked and maintained daily thereafter. ▪ Areas for equipment fueling and cleaning will be a minimum of 100 m from a watercourse and will not drain to watercourses. ▪ Construction crews will be adequately trained on the handling, storage and disposal of hazardous substances. ▪ Spill clean-up kits will be available on site at all times. ▪ Provide bottled water or on site secondary treatment to provide safe drinking water. Obtain appropriate provincial approvals for water treatment systems. ▪ Safety plan to include advisory system to notify community and Manitoba Conservation and Water Stewardship in the event of a spill upstream of the drinking water supply. ▪ See **Table 7.8** for additional water quality mitigation measures. <u>Air Quality</u> ▪ Vegetation will be retained as long as possible to minimize exposure time of disturbed/bare soils subject to potential erosion and associated dust/particulate generation.Water and other approved suppressants will be used to control dust as required.Idling of equipment and vehicles will be restricted to minimize emissions. ▪ Routine maintenance of construction equipment and vehicles will be undertaken. ▪ Work having the potential to create dust or smoke (e.g., blasting, debris burning) will not take place during high wind conditions. ▪ Disturbed areas will be revegetated with native plant species following completion of the works. ▪ Explosives will be detonated at sufficient setback distances to control for dust/debris expulsion. ▪ See **Table 7.10** for additional air quality mitigation measures. <u>Noise</u> ▪ Vehicles, machinery and equipment will be fitted with factory-installed noise-reducing components (e.g., mufflers, acoustic linings, shields), where possible and will be maintained to minimize excessive noise.		

Construction Activities and Potential Socio-Economic Effects	Proposed Mitigation Measures	Residual Effects	Significance Evaluation*
	▪ Explosives will be detonated at sufficient distances from communities (i.e., First Nation reserves) to minimize noise/vibration effects. ▪ Industry best practices (e.g., blasting plans, blasting mats, appropriate charging procedures) will be when near sensitive receptors (e.g., powerlines, waterways, heritage resources) for blasting activities. ▪ Where possible, undisturbed forested buffers will be retained around quarries to reduce noise from quarry operations. ▪ See **Table 7.11** for additional noise mitigation measures. <u>Availability/Quality of Country Foods</u> ▪ Community input into alignment routing, component siting and road design avoid important areas of botanical and wildlife resources that serve as country foods to the extent feasible. ▪ Use existing access routes, trails and cut lines to the extent feasible to minimize removal of vegetation and habitats. ▪ Stage construction as required (i.e., stop and delay construction activities in sensitive areas until animal use of the area and/or sensitive time periods have passed). ▪ Maintain existing flow patterns, water levels and hydrologic regimes of drainage paths, wetlands and watercourses/ waterbodies. ▪ Retain vegetated buffer zones along watercourses, lakes and ponds. ▪ Application of ESRA GR130s, Environmental Protection Procedures and mitigation measures identified above to minimize changes to water quality, air quality and noise levels that may temporarily alter the distribution of plants and animals serving as country foods. ▪ Reclaim and rehabilitate areas disturbed by construction to encourage natural regeneration/regrowth of vegetation and habitat restoration. ▪ See **Tables 9.15, 9.21, 9.25, 9.31, 9.37, 9.41, 9.46** and **9.50** for additional mitigation measures related to the availability and quality of country foods.		

Note: *Refer to **Section 10.3** for additional details regarding the significance of residual effects conclusion and evaluation.

10.2.4.5.2 Operations and Maintenance Effects and Mitigation

The potential environmental effects on human health and safety associated with Project operations and maintenance activities are linked to the potential effects on the environmental components that those activities interact with. Therefore, potential adverse effects of Project operations and maintenance activities on human health and safety are, in part, determined through the assessment of Project effects from the operations and maintenance phase on the VCs that are linked to those activities. For human health and safety, associated environmental effects assessment determinations for other VCs are found in the effects assessment sections for Surface Water (**Section 7.2.4.1**), Air Quality (**Section 7.2.4.2**), Noise and Vibration (**Section 7.2.4.3**) and Hunting, Trapping, Fishing and Gathering (**Section 10.2.4.2**). Mitigation measures that would be applied to avoid or minimize potential adverse effects of Project operations and maintenance on the VCs that are linked to human health and safety are also provided in the EIS sections referenced above. Potential adverse effects of the Project operations and maintenance phase on the VCs listed above that are linked to human health and safety are not anticipated to be significant.

A further environmental effects assessment determination for human health and safety as an independent VC within the Socio-Economic and Cultural Resources component of the environment was considered for the operations and maintenance phase of the Project. During the operational phase of the all-season road there is a number of road or traffic-related safety risks to road users and users of trails that intersect the new all-season road. These include vehicle accidents and collisions with vehicles, maintenance equipment and wildlife. As well, there is the potential for the health of community members and road users to be indirectly affected by changes in drinking water quality, air quality, noise levels and the availability and quality of country foods during operation and maintenance of the proposed road. The following potential effects of Project operations and maintenance on human health and safety prior to the implementation of mitigation measures was identified:

- On-going risk to health and safety of road users from collisions with other road users, maintenance equipment/vehicles and wildlife;
- On-going risk to health and safety of road users and trail users at travel route crossing locations; and
- On-going risk to health of community members and road users from operations-related changes to air and drinking water quality, noise levels and the availability and quality of country foods.

Based on the screening of potential effects in **Appendix 10-4**, the following potential adverse effects were identified as having an overall low level of effect:

- Increased risk to health and safety of road and trail users during the operations and maintenance phase of the all-season road; and
- Increased risk to the health of community members from operations-related changes to drinking water quality, air quality, noise and the availability and quality of country foods.

As described in **Chapter 3** (Project Description)**, Section 3.3.1** the road will be designed and built to the Manitoba Highway Standard of a secondary arterial road with a road top width of 10 m. The road will be constructed with a design speed of 100 km/h, or potentially less where natural landscape features inhibit the design standard. The posted speed limit will be 80 km/h or less where required for safety. Traffic volume on the proposed all-season road is expected to be less than 500 vehicles annually. To accommodate safe snowmobile/ATV crossings of the proposed all-season road, the road platform will be modified at trapline access points and other community access points to include gradual slopes and sufficiently cleared areas to facilitate on-coming traffic visibility. Signage indicating these crossing locations will be installed.

Potential changes to physical components of the environment (i.e., water quality, air quality, noise) generated by Project operations may pose a risk to human health of receptors (i.e., community members). Predicted changes from the operation of the road, however, are expected to be very low given the large distance between the all-season road and communities of Berens River First Nation/NAC and Poplar River First Nation, the high quality of the baseline surface water and atmospheric conditions, and the very low magnitude and probability of Project effects. Similarly, health effects arising from a reduction in the availability or quality of country foods as a result of the operational phase of the Project are expected to be small in both magnitude and probability. Increased access provided by the new all-season road may, in fact, increase access to new sources of country foods. An extensive array of environmental protection commitments, mitigation measures and follow-up/monitoring activities are proposed by ESRA to minimize potential adverse effects of the operations and maintenance phase of the Project on the health of community members and road users.

A summary of the potential effects of road operations and maintenance on human health and safety and the mitigation measures that will be used to prevent or minimize potential adverse effects to human health and safety are provided in **Table 10.16**. As they relate to the human health effects of changes in air and water quality, noise and the quality and availability of country foods, mitigation measures are similar to those listed for corresponding Physical (**Chapter 7**) and Terrestrial Environment (**Chapter 9**) VCs. Note that the list of mitigation measures in **Table 10.16** is not exhaustive, as mitigation and environmental protection measures for the Project that are applicable to human health and safety are also included in the provisions outlined in ESRA's Environmental Protection Procedures and Environmental Protection Specifications (**Chapter 5**, Environmental Protection and Sustainable Development). Accidents and malfunctions are also addressed in **Chapter 12** (Accidents and Malfunctions).

Following the application of proposed mitigation measures, no significant adverse residual effects on the health of road users or community members are anticipated to occur as a result of the operations and maintenance phase of the Project.

Currently, the majority of travel between Berens River First Nation and Poplar River First Nation and other communities is by winter road during winter and by air during other seasons. Some travel also

occurs by boat during the open water season. Once complete, the proposed P4 all-season road is expected to substantially improve the safety of travel to and from these communities. The proposed P4 all-season road, along with the decommissioning of the winter road and ice crossings on Berens and Leaf rivers and streams, will result in an important Project benefit of improved health and safety for community members of Berens River First Nation and NAC and Poplar River First Nation.

Table 10.16: Summary of Potential Operations and Maintenance-Related Socio-Economic Effects on Human Health and Safety and Proposed Mitigation Measures

Operations and Maintenance Activities and Potential Socio-Economic Effects	Proposed Mitigation Measures	Residual Effects	Significance Evaluation*
Increased risk to health and safety of all-season road users and trail users from accidents and collisions due to: ▪ Road, ditch, culvert and bridge maintenance activities and snow clearing activities.	▪ Road geometric design standard based on recognized safety standards ▪ Speed limits on road to be established based on road design. ▪ Ramps for snowmobiles/ATVs to be placed at road/trail crossing intersections. ▪ Warning signage and markings to be provided at defined trail (e.g., ATV/snowmobile) crossing locations. ▪ Management of right-of-way vegetation to maintain driver sightlines and safety clearance. ▪ Use or granitic aggregate and crushing standards to reduce dust generation ▪ Approved dust suppressants (e.g., water) to be used as necessary ▪ Warning signs and reduced speed limits to be established at known wildlife crossing locations. ▪ Warning signs and lights to be displayed for road maintenance equipment. ▪ As required, flag persons will direct traffic around maintenance activities. ▪ Community updates to be provided regarding the locations of scheduled maintenance activities.	Reduced risk of injury or death from the all season as compared to current winter road usage and boat travel.	Not Significant
Increased risk to health of community members due to: ▪ Changes in drinking water quality; changes in air quality; changes in noise exposure; and changes in the availability or quality of country foods.	<u>Drinking Water Quality</u> ▪ Road geometric design standard based on recognized safety standards ▪ On-going maintenance and management of road surface and drainage infrastructure to minimize potential sediment releases to watercourses. ▪ Maintenance equipment, machinery and vehicles maintained to avoid leaks of fuels and/or lubricants. ▪ Maintenance crews will be adequately trained on the handling, storage and disposal of hazardous substances. <u>Air Quality</u> ▪ Water and other approved suppressants will be used to control dust as required.	Minor increase in the risk to health of community members.	Not Significant

Operations and Maintenance Activities and Potential Socio-Economic Effects	Proposed Mitigation Measures	Residual Effects	Significance Evaluation*
	▪ Use of granitic aggregate and crushing techniques reduces dust generation during operation. ▪ Idling of maintenance equipment and vehicles will be restricted to minimize emissions. ▪ Routine maintenance of equipment and vehicles will be undertaken. <u>Noise</u> ▪ Maintenance vehicles, machinery and equipment will be fitted with factory-installed noise-reducing components (e.g., mufflers, acoustic linings, shields), where possible and will be maintained to minimize excessive noise. ▪ Where possible, undisturbed forested buffers will be retained around quarries to reduce noise from quarry operations. <u>Availability/Quality of Country Foods</u> ▪ Schedule road, bridge and culvert maintenance activities during fall and winter to the extent feasible to avoid sensitive lifecycle periods for animals serving as country food. ▪ Maintain signage and speed reduction zones where necessary to minimize potential wildlife-vehicle collisions. ▪ Optimize line of sight through vegetation management to minimize potential wildlife-vehicle collisions. ▪ Maintain existing flow patterns, water levels and hydrologic regimes of drainage paths, wetlands and watercourses/waterbodies. ▪ Road designed with no pull-outs or parking areas.		
Improvement to the health and safety of road and trail users due to: ▪ Decommissioning of the existing winter road, removal of ice crossings and provision of alternative to summer water travel via fishing boats.	▪ Not required.	Improvement to the health and safety of road and trail users due to winter road decommissioning.	Not Significant

Note: *Refer to **Section 10.3** for additional details regarding the significance of residual effects conclusion and evaluation.

10.3 Summary of Project Residual Effects and Conclusion

Information and feedback obtained through the Aboriginal and Public Engagement Program (**Chapter 4,** Aboriginal and Public Engagement) has indicated that the local communities are generally supportive of the proposed Project. Berens River First Nation views the benefits of Project to be increased access, reduced travel distance, trade opportunities and an overall higher standard of living for the community (CIER 2015). Similarly, at an in-community meeting at Poplar River First Nation on August 24, 2015, the community was generally supportive of the Project and requested that the project move forward without delays (see **Chapter 4** for more detailed accounts from community members). The MMF has indicated that it does not object to the development of an all-season road noting specific concerns with lack of access to supplies and medical services for its members.

The residual effect of the Project on the traditional use value of the Local and Regional Assessment Areas has been evaluated as not significant based on the assessment of those VCs related to current traditional use of land and resources (e.g., hunting, trapping, fishing, gathering, travel routes) as summarized in the following sections, and the above-described results of engagement feedback received from potentially affected Aboriginal communities.

10.3.1 Tourism

Regarding tourism, the evaluations of residual adverse effects of the Project described in **Section 10.2.4.1** and summarized in **Table 10.17**, are adverse effects related to the potential for temporary disruption to tourism-related activities during the construction phase of the Project. This temporary adverse effect on tourism-related activities is limited to the Local Assessment Area (where tourism activities may occur in the Local Assessment Area, e.g. canoeing along major waterways), will occur once over the duration of the specific construction/maintenance activity, will be short-term in duration, and will be a low magnitude, short-term, reversible effect. Therefore, the adverse effects to tourism are not anticipated to be significant.

Table 10.17: Summary of Residual Project Effects and Significance Conclusions for Tourism

Residual Effects	Residual Effects Characteristics/Level Rating						Ecological Context	Significance Conclusion
	Direction	Duration	Magnitude	Extent	Frequency	Reversibility		
Construction Phase								
▪ Temporary reduced interest in tourist activities due o temporary disturbance of tourism-related activities in the Local or Regional Assessment Areas.	N-	I	I	I	I	I	I	N
Operations and Maintenance Phase								
▪ Potential for increased tourism in the Local Assessment Area due to road access.	P+	III	II	II	III	II	I	N

KEY: (see also **Chapter 6, Section 6.4** for full definitions and Level of Effect criteria for determination of Significance)

Direction:
N- Negative
P+ Positive

Duration:
Short-term = Level I
Medium-term = Level II
Long-term = Level III

Magnitude:
Negligible or Low = Level I
Moderate = Level II
High = Level III

Extent:
Project Footprint = Level I
Local Assessment Area = Level II
Regional Assessment Area = Level III

Frequency:
Once = Level I
Intermittent = Level II
Continuous = Level III

Reversibility:
Reversible (short-term) = Level I
Reversible (long-term) = Level II
Irreversible = Level III

Ecological Context:
Low = Level I (Effect results in minimal disruption of ecological functions and relationships in the area).
Moderate = Level II (Effect results in some disruption of non-critical ecological functions and relationships in the area).
High = Level III (Effect results in disruption of critical ecological functions and relationships in the impacted area).

Significance Conclusion:
S = Significant residual effect
N = No significant residual effect

10.3.2 Hunting, Trapping, Fishing and Gathering

Regarding hunting, trapping, fishing and gathering activities, the evaluations of residual adverse effects of the Project described in **Section 10.2.4.2** and summarized in **Table 10.18**, are adverse effects related to the potential for temporary disruption to these activities during the construction phase of the Project. This temporary adverse effect to hunting, trapping, fishing and gathering activities is limited to the Local Assessment Area, will occur once over the duration of the specific construction/maintenance activity, will be short-term in duration, and will be a low to moderate magnitude, short-term, reversible effect. Therefore, the adverse effects to hunting, trapping, fishing and gathering activities are not anticipated to be significant.

Table 10.18: Summary of Residual Project Effects and Significance Conclusions for Hunting, Trapping, Fishing and Gathering

Residual Effects	Residual Effects Characteristics/Level Rating						Ecological Context	Significance Conclusion
	Direction	Duration	Magnitude	Extent	Frequency	Reversibility		
Construction Phase								
▪ Temporary impairment of traditional resource use (hunting) or licenced hunting.	N-	I	II	I	I	I	I	N
▪ Temporary impairment of traditional resource use (trapping).	N-	I	II	I	I	I	I	N
▪ Temporary limited access or detoured access to land trails used to access hunting, trapping fishing and gathering resources use areas.	N-	I	I	I	I	I	I	N
▪ Temporary impairment of traditional resource use (fishing) during construction of key waterway crossings.	N-	I	I	I	I	I	I	N
▪ Minor loss / impairment of traditional use areas for gathering. Road will open new areas for access.	N-	I	I	I	I	I	I	N
Operations and Maintenance Phase								
▪ Access improvement to traditional land and resource use areas for hunting, trapping, fishing and gathering.	P+	III	II	II	III	II	I	N

KEY: (see also **Chapter 6, Section 6.4** for full definitions and Level of Effect criteria for determination of Significance)

Direction:
N- Negative
P+ Positive

Duration:
Short-term = Level I
Medium-term = Level II
Long-term = Level III

Magnitude:
Negligible or Low = Level I
Moderate = Level II
High = Level III

Extent:
Project Footprint = Level I
Local Assessment Area = Level II
Regional Assessment Area = Level III

Frequency:
Once = Level I
Intermittent = Level II
Continuous = Level III

Reversibility:
Reversible (short-term) = Level I
Reversible (long-term) = Level II
Irreversible = Level III

Ecological Context:
Low = Level I (Effect results in minimal disruption of ecological functions and relationships in the area).
Moderate = Level II (Effect results in some disruption of non-critical ecological functions and relationships in the area).
High = Level III (Effect results in disruption of critical ecological functions and relationships in the impacted area).

Significance Conclusion:
S = Significant residual effect
N = No significant residual effect

10.3.3 Travel Routes

Regarding travel routes, the residual adverse effect of the Project described in **Section 10.2.4.3** and summarized in **Table 10.19** is the temporary reduction of access to travel routes, including land trails and waterway routes, during Project construction and operations and maintenance activities. This temporary adverse effect on travel routes is limited to the Local Assessment Area, will occur once over the duration of the specific construction/maintenance activity, will be short-term in duration, and will be a low magnitude, short-term, reversible effect. Therefore, the adverse residual effect of the Project on travel routes is determined to be not significant.

Table 10.19: Summary of Residual Project Effects and Significance Conclusions for Travel Routes

Residual Effects	Residual Effects Characteristics/Level Rating						Ecological Context	Significance Conclusion
	Direction	Duration	Magnitude	Extent	Frequency	Reversibility		
Construction Phase								
▪ Temporary limited access or detoured access to travel routes including land trails and waterway routes.	N-	I	II	I	I	I	I	N
Operations and Maintenance Phase								
▪ Temporary reduction in access to travel routes including land trails and waterway routes during maintenance activities.	N-	I	II	I	I	I	I	N
▪ Substantial additional travel route, and access to potential new travel routes.	P+	III	II	III	III	II	I	N

KEY: (see also **Chapter 6, Section 6.4** for full definitions and Level of Effect criteria for determination of Significance)

Direction:
N- Negative
P+ Positive

Duration:
Short-term = Level I
Medium-term = Level II
Long-term = Level III

Magnitude:
Negligible or Low = Level I
Moderate = Level II
High = Level III

Extent:
Project Footprint = Level I
Local Assessment Area = Level II
Regional Assessment Area = Level III

Frequency:
Once = Level I
Intermittent = Level II
Continuous = Level III

Reversibility:
Reversible (short-term) = Level I
Reversible (long-term) = Level II
Irreversible = Level III

Ecological Context:
Low = Level I (Effect results in minimal disruption of ecological functions and relationships in the area).
Moderate = Level II (Effect results in some disruption of non-critical ecological functions and relationships in the area).
High = Level III (Effect results in disruption of critical ecological functions and relationships in the impacted area).

Significance Conclusion:
S = Significant residual effect
N = No significant residual effect

10.3.4 Cultural, Heritage and Archaeological Resources

No adverse residual effects to cultural, heritage and archaeological resources are anticipated following the application of mitigation measures outlined in **Section 10.2.4.4**.

10.3.5 Human Health and Safety

Potential environmental effects of Project construction and operations and maintenance phases were assessed including direct effects of road and bridge construction and maintenance as well as indirect human health effects from changes to drinking water quality, air quality, noise and the quality and availability of country foods. The evaluations of adverse residual effects of the Project are described in **Section 10.2.4.5** and summarized in **Table 10.20**. Adverse effects on the health and safety of community members and construction workers are associated with potential direct effects of construction activities and use of the proposed all-season road, as well as potential indirect effects related to changes in air and drinking water quality, noise levels, and the availability and quality of country foods. During the construction phase of the Project, the temporary adverse effect of construction activities to human health is limited to the Project Footprint, will be short-term in duration, of low magnitude, occur continuously, and be reversible at the conclusion of construction. Indirect human health effects of construction on air and water quality, noise levels and availability and quality of country food are similar to the direct effects of construction but potentially extend to the Regional Assessment Area. During the operational phase, minor adverse residual effects associated with intermittent use of the new all-season road are predicted. Indirect effects of operations on community member health from potential changes in air and drinking water quality, and noise levels are considered to be of low magnitude, potentially extend to the Regional Assessment Area intermittently, and reversible. Indirect effects of operations on the availability and quality of country foods are similar but may be reversible over a longer term. Adverse effects to human health and safety are determined to be not significant.

A long-term positive effect was identified for the operations and maintenance phase of the Project regarding increased health and safety for road users and community members due to the decommissioning of the existing winter road and ice crossings, and the provision of an alternative to air and summer boat travel between communities.

Table 10.20: Summary of Residual Project Effects and Significance Conclusions for Human Health and Safety

Residual Effects	Residual Effects Characteristics/Level Rating						Ecological Context	Significance Conclusion
	Direction	Duration	Magnitude	Extent	Frequency	Reversibility		
Construction Phase								
▪ Risk to the health and safety of construction workers and community members from road and bridge construction.	N-	I	I	I	III	I	I	N
▪ Risk to the health of community members and construction workers from changes to drinking water quality, air quality and noise exposure levels from construction activities.	N-	I	I	III	III	I	I	N
▪ Risk to the health of community members from changes to the availability or quality of country foods.	N-	I	I	III	III	I	I	N
Operations and Maintenance Phase								
▪ Risk to health and safety of road and trail users.	N-	III	I	I	II	II	I	N
▪ Risk to health of community members and road users from changes to drinking water quality, air quality and noise exposure levels.	N-	III	I	III	II	I	I	N
▪ Risk to the health of community members from changes to the availability or quality of country foods.	N-	III	I	III	III	II	I	N
▪ Improvement to the health and safety of road and trail users due to winter road decommissioning.	P+	III	I	I	II	III	I	N

KEY: (see also **Chapter 6, Section 6.4** for full definitions and Level of Effect criteria for determination of Significance)

Direction:
N- Negative
P+ Positive

Duration:
Short-term = Level I
Medium-term = Level II
Long-term = Level III

Extent:
Project Footprint = Level I
Local Assessment Area = Level II
Regional Assessment Area = Level III

Frequency:
Once = Level I
Intermittent = Level II
Continuous = Level III

Ecological Context:
Low = Level I (Effect results in minimal disruption of ecological functions and relationships in the area).
Moderate = Level II (Effect results in some disruption of non-critical ecological functions and relationships in the area).
High = Level III (Effect results in disruption of critical ecological functions and relationships in the impacted area).

Significance Conclusion:
S = Significant residual effect
N = No significant residual effect

Residual Effects	Residual Effects Characteristics/Level Rating						Ecological Context	Significance Conclusion
	Direction	Duration	Magnitude	Extent	Frequency	Reversibility		
Magnitude: Negligible or Low = Level I Moderate = Level II High = Level III	**Reversibility:** Reversible (short-term) = Level I Reversible (long-term) = Level II Irreversible = Level III							