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AUTHORITY

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October 7 2016

Ms. Janet Scott
Project Manager, Prairie and Northern Region
Canadian Environmental Assessment Agency
Suite 1145, 700 Jasper Avenue
Edmonton, AB T5J 4C3

Dear Ms. Scott:

Re: Registry File 80094 Response to Information Requests - Environmental Impact Statement for Project 4 All-season Road connecting Berens River and Poplar River First Nation

The Environmental Impact Statement for Project 4 All-season Road Connecting Berens River and Poplar River First Nation (Project EIS) was submitted to the Canadian Environmental Assessment Agency, on February 26, 2016 and resubmitted in response to requests for clarification from the Agency on May 9, 2016. Subsequent to this we received an Information Request from the Agency on July 14, 2016 regarding the Project EIS.

Please find attached our response to the July 14, 2016 Information Request from the Agency. We note that the majority of the information requested was provided in the Project EIS, in correspondence with the Agency, or in information provided to federal authorities having interest in the Project.

If you have any questions please contact myself or Jaime Clarke.

Sincerely,

<Original signed by>

Leanne Shewchuk, LEED AP
Manager, Special Projects and Environmental Services

LS/sk

Attachment

cc: Mike Knight, Acting Director
Lance Vigfusson, Interim CEO and Deputy Minister, Manitoba Infrastructure
Tracey Braun, Manitoba Sustainable Development

Federal Environmental Assessment of Project 4 – All-Season Road Connecting Berens River to Poplar River First Nation

Information Requests – Round #1

IR Number (e.g. HC-IR-01)	*Project Effects Link to CEAA 2012*	*Reference to EIS Guidelines*	*Reference to EIS*	*Context and Rationale*	*Specific Question / Request for Information*	*Response*
No Project Description						
CEAA-01		EIS Guidelines, Part 1, Section 3.1	Chapter 4	The EIS should include a consolidated summary of all changes that have been made to the Project since originally proposed, including the benefits of these changes to the environment, Aboriginal peoples, and the public. The EIS should document any additional issues and concerns raised by Indigenous groups in relation to the environmental effects assessment and the potential adverse impacts of the project on potential or established rights. The EIS (Chapter 4, p. 4-38) states "The APEP will continue throughout the development of the Project, and will provide updated information and opportunities for all interested parties to continue commenting on the Project. Comments and input received will be reviewed to assess whether the information alters the effects assessment and/or warrants modifications to proposed mitigation measures". Project changes are described throughout the EIS document but a consolidated summary is absent.	A. Provide a consolidated summary of proponent changes to the project, including proponent's responses to the issues identified in the proponent's on-going engagement activities with Indigenous groups (e.g. Poplar River First Nation, Berens River First Nation, Manitoba Métis Federation) such as concerns related to project component siting, heritage and cultural sites, habitat compensation plans such as a fisheries offsetting plan, and any other issues raised in comments provided to the proponent by Indigenous groups. B. Update descriptions of project potential effects and proposed mitigations as a result of any changes. Re-assess residual effects to project valued components and update conclusions presented in the EIS.	A. With regard to summarizing the changes to the project and issues identified in on-going engagement, there are no changes subsequent to the submitted EIS. The responses to the issues identified in its on-going engagement activities with Indigenous groups can be found in Table 4.6 Summary of Key Comments Received, Response and Reference Location found in Chapter 4 of the EIS and Chapter 4 Appendices. B. With regard to updated descriptions of the project's potential effects and proposed mitigation, there are no changes subsequent to the submitted EIS. No updates to the effects or residual effects are required.
CEAA-02		EIS Guidelines, Part 2, Section 1.1	EIS Summary, Chapter 1. Introduction and	The proponent information in the EIS should identify the legal entity that would develop, manage, and operate the project as well as specify the mechanism used to ensure that corporate policies will be	A. The Agency requests formal notification of the proponent name change for Project 4, updates to the EIS to reflect any changes to corporate policies resulting from this change and any updated contact	A. With regard to a formal name change of the proponent, there is no change at this time. Manitoba Infrastructure is taking responsibility for the East Side Transportation Initiative and associated projects as of November 25, 2016.

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			Overview	implemented and respected for the project. Manitoba issued a press release in May 2016 noting that ESRA is dissolved and its mandate is repatriated into Manitoba Infrastructure. The EIS references ESRA as the proponent throughout the document and in Environmental Protection Procedures describing mitigation commitments.	information for the proponent.	
CEAA-03	19(1)(g) – alternative means and environmental effects of alternative means	EIS Guidelines, Part 2, Section 2.2	Chapter 2, Project Justification and Alternatives Considered Chapter 5, Appendices, Environmental Protection Procedures	The EIS describes alternative means for the project as a whole (EIS, Chapter 2, Project Justification and Alternatives Considered) but does not evaluate environmental effects associated with the alternative means for project components, including alternative siting and locations for potential quarry and borrow areas, and temporary construction camps and staging areas. Instead, the EIS states "potential quarry and borrow areas will be selected using a variety of factors…" (p. 2-9), and that temporary camps and staging areas "…will be selected for the construction of the proposed road and crossings based on consideration of factors…" (p. 2-9).	A. Potential quarry locations are noted in Appendix 3-3, Figure 3-3, where "distance to waterbody" is indicated. Describe whether any of the alternatives have been eliminated and provide the rationale for this. Characterize for each remaining potential quarry location: i. proximity to fish-habitat; ii. proximity to wetlands; iii. terrestrial habitat loss (area) by vegetation cover type; iv. proximity to human health receptors, e.g. traplines, residences, camps, First Nations reserve lands; v. proximity to sites of cultural and heritage value; and vi. potential impact to rights, proposed accommodate measures, and views of groups listed Section 5 of Part 1 of the EIS guidelines on proposed accommodations. B. For proposed quarries (290 ha), temporary staging areas (57 ha), and construction camps (64 ha), describe the environmental effects to be considered as factors in site selection and the ranking process to be used in selecting preferred sites. List and describe the environmental protection measures that will be applied to quarries, temporary staging area and construction camps. Describe how potential sites will be confirmed to meet these protection criteria.	A. With regard to potential quarry sites noted in Appendix 3-3 and the rational employed if alternatives have been eliminated, this information is contained in the EIS. No additional information is required to be provided at this time. With respect to the request to characterize for each remaining potential quarry location: i. Proximity to fish habitat is found on the maps outlined in Appendix 3-3 *Potential Quarry Site Locations*, Figure 3-3 *P4 All-Season Road Proposed Watercourse Crossings*. See map in Annex 1 for further clarification. Information on quarry selection, with regard to proximity to fish habitat, can be found in the EIS: Chapter 4 *Aboriginal and Public Engagement:* • Section 4.4 *Additional Engagement Information*; • Section 4.7 *Future Engagement Activities*; Chapter 5 *Environmental Protection and Sustainable Development*: • Section 5.4.1 *Contract Specifications*; • Appendix 5-3 *Environmental Protection Procedures*: ▪ EPP14.0.12 *Wildlife*; ▪ EPP6.4.1 *Working Within or Near Fish Bearing Waters*; ▪ EPP20 5.2 *Quarry Site Selection and Requirements*; • Appendix 5-4 *GR130s Environmental Protection Specifications*: ▪ GR130.8.5 *Designated Areas and Access;* ▪ GR130.9.2.5.9 *Petroleum Handling and Storage;* ▪ GR130.15.1.1 *Working Within or Near Water – General;* ▪ GR130.15.1.2 *Working Within or Near Water – General*; ▪ GR130.15.1.3 *Working Within or Near Water – General*;

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					C. Appendix 5-3 describes the mitigation measures contained within the Environmental Protection Procedures for Quarry Site Selection (EP un-numbered) and for Site Selection - Temporary Works (EP21), which includes a table entitled Selection Criteria for Temporary Construction Sites. i. Describe how the contractor will be asked to confirm endangered species habitat as outlined in the Selection Criteria for Temporary Construction Sites directive "Avoid habitat occupied by endangered species". This commitment is also noted in the Appendix 5-4 Environmental Protection Specifications, GR130.19 Wildlife. ii. As is provided in the Selection Criteria for Temporary Construction Sites for caribou, include avoidance mitigation measures (e.g., timing of activities) for bird species at risk, aquatic species at risk, and wildlife species at risk that are listed in Appendix 9-7. iii. Describe minimum distances for the buffer zones of undisturbed vegetation from watercourses or waterbodies that will be accepted for Selection Criteria for Temporary Construction Sites given that "Construction activities shall not occur within 100 m of a watercourse (GR130.15.1.2). Where a 100 m distance is not possible, a buffer zone of undisturbed vegetation between the construction activities and the watercourse shall be established." Provide examples of expected scenarios where approval by the Contract Administrator and ESRA would be given for construction within the 100m set-back distances.	▪ GR130.15.1.5 *Working Within or Near Water – General*; ▪ GR130.15.1.7 *Working Within or Near Water – General*; ▪ GR130.15.1.9 *Working Within or Near Water – General*; ▪ GR130.16.7 *Erosion and Sediment Control*; ▪ GR130.16.11 *Erosion and Sediment Control; and* Chapter 7 *Physical Environment*: • Section 7.2.4 *Effects on Surface Water, Air Quality and Noise* ii. The location of wetlands (bog/fen) in relation to quarry sites is identified in various locations in the document. There are no open water marsh wetlands within the Project Assessment Area and Local Assessment Area. Wetlands within the P4 study area are discussed in the EIS in: • Chapter 9, Table 9.1 *Area and Proportion of Vegetation Cover Classes among Vegetation Assessment Areas* in the EIS notes that the wetlands in the study area are composed of bog and fen complexes. • Section 4.3.3 *Wetlands* (page 15) of the *Vegetation Characterization and Effects Assessment Report* found in Chapter 9, Appendix 9-2 of the EIS states that: "Marshes, and other wetland complexes (peat and non-peat forming) are also present in the greater area, although not generally found within the P4 regional assessment area." iii. Areas identified as potential quarry locations were selected due to the presence of rock outcrops; rock outcrops are sparsely vegetated. These sites consist of small clusters or instances of jack pine, with occasional moss and/or shrubs. Clearing and grubbing activities will be minimal, as the area is rocky and naturally clear, and limited to the site and associated access routes (Chapter 5, Appendix 5-3, EPP14.3 *Wildlife* and Chapter 5, Appendix 5-4 of EIS GR130.17.1.1 *Clearing and Grubbing*). iv. The all-season road alignment and the selection of quarry sites, considered appropriate buffers from cabins, camps, residences, and First Nations reserve lands. "Traplines" as defined by Manitoba are blocks of land registered to a trapper for the exclusive harvest of furbearing animals in that block. Generally, Crown land in Manitoba comprised of boreal forest habitat that is not otherwise used for agricultural or other purposes has been allocated into a "trapline" block. The location of potential quarries was reviewed with the communities/trappers to minimize interference with

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						important areas within individual traplines. Figure 10-11 in Chapter 10 of the EIS shows the registered traplines in the local assessment area. Additional information on the protection of traplines can be found in Chapter 5 of the EIS, Appendix 5-3 *Environmental Protection Procedures and* Appendix 5-4 *GR130s Environmental Protection Specifications*: • EPP1 4.0 *Wildlife*; • EPP20 5.2 *Quarry Site Selection and Requirements*; • EPP21 4.0 *Site Selection – Temporary Works*; and • GR130.17.3.3 *Clearing and Grubbing*. EPP20 5.2.1 *Quarry Site Selection and Requirements* found in Chapter 5, Appendix 5-4 of the EIS indicates that no quarry is to be established closer than 150 m from a residence (home or cabin). This requirement is also found in Manitoba *Mines and Minerals Act, section 40(1).* First Nation Reserve lands are shown in relation to quarries in Chapter 3, Figure 3-6 *Potential Construction Quarry Sites* of the EIS. The closest residence within Poplar First Nation reserve land to a potential quarry site is 2.3 km away. The closest residence within Berens First Nation reserve land to a potential quarry site is 6.6 km away. The nearest potential quarry location (Quarry 31) is 6.0 km from the closest cabin. v. Heritage Resources Impact Assessments and Traditional Knowledge Studies were conducted for the project to identify areas of importance to the communities. Quarry sites were selected so as to not interfere with area of importance (heritage resources, cultural sites) and appropriate setbacks have been applied in consultation with communities and Manitoba Heritage Resources Branch. Additional information for quarry selection, with regard to proximity to heritage resources, can be found in Chapter 5 of the EIS: – Appendix 5-3 *Environmental Protection Procedures*: • EPP13 4.1-4.3 *Heritage Resources*; • EPP20 5.2, 5.4.3 *Quarry Site Selection and Requirements*; and – Appendix 5-4 *GR130s Environmental Protection Specifications*: • GR130.18.1-GR130.18-3 – *Heritage Resources*. vi. With regard to the potential impact to rights: No impacts to rights are anticipated with extensive mitigation measures identified in the EIS. B. With regard to the environmental effects considered in site selection: The

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						EIS has considered the potential effects of quarries, staging areas, construction camps as identified in the EIS. The potential quarry sites identified in the EIS have been selected with consideration to sensitive sites and other environmental elements. The quarries that are selected for development will be selected based on need, quality of material, and accessibility with consideration of criteria identified in EPP20 *Quarry Site Selection and Requirements*, Chapter 5, Appendix 5-3 *Environmental Protection Procedures* in the EIS. Once detailed design is complete and the amount of material available from within the road bed and ditches, (cut and full balance estimate) the remaining material that will be required from quarries will be known. Materials for construction of the road that are required over and above this will be sourced from quarries. Location of construction camps and staging areas will be defined based on operational requirements during construction, with consideration of the criteria identified in EPP21 *Site Selection –Temporary Works*, found in Chapter 5, Appendix 5-3 *Environmental Protection Procedures* of the EIS. C. With regard to the mitigation measures contained within EPP20 *Quarry Site Selection and Site Selection - Temporary Works* found Chapter 5, Appendix 5-3 *Environmental Protection Procedures* of the EIS: i. Environmental Protection Procedures (EPPs) are guidance to the proponent and Contract Administrators in the application of the construction contracts such as the interpretation of the GR130s. The contractor is not being asked to confirm endangered species habitat, nor is this stated in the EIS. Natural resources are a provincial jurisdiction which is managed under the Manitoba Mines and Minerals Act. The Act requires that prior to the development of a quarry, a permit be acquired under the Act. Prior to applying for a permit the current database for species at risk information is reviewed by the Proponent. Prior to issuance of a permit, Manitoba reviews each quarry site for potential constraints including species at risk. ii. Avoidance mitigation measures (e.g., timing of activities) for bird species at risk, aquatic species at risk, and wildlife species at risk that are listed in the EIS in Chapter 9, Appendix 9-7 *Terrestrial Species at Risk in the Local Assessment Area* and Chapter 8, Table 8.7 *ESRA's Protection Procedures*

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						and Specifications for Fish Habitat, Fish and Harvested Fish and Aquatic Species at Risk. Mitigation measures are explained explicitly in Chapter 9, Section 9.2.3 of the EIS. iii. Currently the project maintains a 100 m set back from all water courses along the proposed P4 All-Season Road alignment with the exception of crossing sites. However, field conditions (soil conditions, newly identified sensitive site, etc.) encountered during construction may dictate that the setback cannot be maintained. While this is an unlikely occurrence, the mitigation is as follows: where a 100 m setback is not obtainable, a buffer of undisturbed vegetation equal to 10 m plus 1.5 m times the slope gradient, or 30 m whichever is greater will be left between the road and adjacent waterbodies as recommended in the Manitoba Stream Crossing Guidelines (http://www.gov.mb.ca/waterstewardship/fisheries/habitat/sguide.pdf) For additional information related to buffer zones see response given to CEAA-09(C), Chapter 7 Table 7.7 *ESRA's Protection Procedures and Specifications for Surface Water* in the EIS, and Chapter 5, Appendix 5-3 *Environmental Protection Procedures* and 5-4 *ESRA's GR130s Environmental Protection Specifications*, in the EIS: • EPP1 *Clearing and Grubbing*; • EPP2 *Petroleum Handling and Storage*; • EPP3 *Spill Response*; • EPP5 *Materials Handling and Storage*; • EPP6 *Working Within or Near Fish Bearing Waters*; • EPP7 *Stream Crossings*; • EPP8 *Temporary Stream Diversions*; • EPP11 *Culvert Maintenance and Replacement*; • EPP12 *Blasting Near a Watercourse*; • EPP16 *Erosion and Sediment Control*; • EPP17 *Concrete Area Management Practices*; • EPP18 *Dust Suppression Practices*; • EPP21 *Site Selection – Temporary Works*; • GR130.6 *General*; • GR130.8 *Designated Areas and Access*; • GR130.9 *Materials Handling, Storage and Disposal*; • GR130.10 *Spills and Remediation and Emergency Response*; • GR130.15 *Working Within or Near Waters*;

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						• GR130.16 *Erosion and Sediment Control*; • GR130.17 *Clearing and Grubbing*; and • GR130.21 *Cement Batch Plant and Concrete Wash Out Area*.
CEAA-04/ INAC-01	5(1)(b) – a change that may be caused to the environment that would occur on federal lands 5(2)	EIS Guidelines, Part 2, Section 6.3.5, Trans-boundary Environment EIS Guidelines, Part 2, Section 6.3.6, Other valued components that may be affected as a result of a federal decision	Chapter 3, p.3-28, EIS Summary p.10.	The EIS should describe changes that may be caused to the environment that would occur on federal lands, not limited to changes to ambient air quality and changes to interprovincial wildlife. The EIS (Chapter 3, p.3-28) indicates that project components with undefined locations (quarries, camps, access roads) may be sited on Federal Reserve Lands. The EIS (Section 3.9, page 3-30) also describes that waste will be transported to and disposed of at the nearest approved landfill and provides as examples reserve lands (e.g. Berens River or Poplar River First Nations facilities). Poplar River First Nation and Berens River First Nation communities are the closest communities to the proposed road and contractors (including sub-contractors) would be expected to select locations for liquid and solid waste disposal, fuel and materials storage, and construction of any provincial highway operations or maintenance yards near the Project and in or near these communities. If project components are to be located on Federal Reserve Lands, permits would be required under s.58(4) of the *Indian Act*	A. Describe all project components and activities that will be located on Federal Reserve Lands during project construction and operation phases. Consider potential contractor selection of Federal Reserve Lands. Indicate where any highway operation and maintenance yards will be established as part of this Project. B. For all project components that will be located on Federal Reserve lands, describe potential environmental effects, proposed mitigation measures, and anticipated residual effects. C. Explain whether disposal on reserve land of domestic solid waste generated by construction and operation activities will require approval and/or permitting by the First Nations and Indigenous and Northern Affairs Canada. If wastes will be disposed of on federal reserve lands, provide an estimate of waste generated by the project including wastes that will be generated by construction activities (8 year period) and by on-going operation and maintenance of the project over its anticipated operating lifespan (>50 years). D. If on-reserve components or project activities are identified: i. Confirm with the First Nation(s) and INAC the compatibility with community land use plans, whether s.58 (4) *Indian Act* permits are required, and requirements of all other applicable permits such as the *Canadian Environmental Protection Act, 1999* (CEPA 1999) (Storage Tank Systems for Petroleum Products and Allied Petroleum Products	A. With regard to project components and activities located on Federal Reserve Lands, no project components are anticipated to be located on Federal Reserve lands. See Chapter 3 of the EIS. B. With regard to the potential environmental effects of project components and activities located on Federal Reserve Lands, see the response given to question CEAA-04(A). C. With regard to approval requirements for disposal of domestic waste on reserve land, domestic waste in small quantities will be disposed on First Nation lands during the construction phase due to the lack of other viable alternatives. Other wastes will be removed to provincial licensed facilities. D. With regard to on-reserve components or project activities, no on-reserve components are identified. See Chapter 3 of the EIS.

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				and if federal reserve lands are to be included in the Project Footprint, other valued components need to be considered with respect to environmental receptors on those federal lands (EIS Guidelines, Part 2, Section 6.3.6).	Regulations), and *Indian Act* (Indian Mining Regulations, Indian Timber Harvesting Regulations and Indian Reserve Waste Disposal Regulations). Update the list of regulatory requirements and Chapter 15 tables of mitigation commitments in the EIS accordingly. ii. Describe potential environmental effects, propose mitigation measures, and assess residual adverse environmental effects associated with the on-reserve components and activities. Environmental Protection Procedures and Specifications (General Requirements 130) described in Chapter 5 for the off-reserve components, should be applied to any on-reserve components including requirements for contractors and subcontractors and commitments to monitoring. iii. Assess potential impacts to rights anticipated from on-reserve project components. Propose accommodation measures and describe views of the Indigenous group on proposed accommodations.	
CEAA-05	5(1)	EIS Guidelines, Part 1, Section 3.1; Part 2, Section 1.2	Chapter 3, Section 3.3 and 3.11	The EIS includes numerous references to timing of construction and operation activities as planned mitigation measures that would result in negligible residual environmental effects (e.g. EIS section 3.2.3, page 3-3: "Right-of-way clearing will be conducted in similar segments with clearing being completed during the winter months to minimize potential adverse environmental effects"; EIS section 3.4.2., page 3-20: "To the extent possible, the timing of blasting activities will consider area-specific environmental sensitivities"; Appendix 8-1, page 50: "placement and removal of temporary crossing structures will be timed to avoid high fish migration periods"; Appendix 8-1, Table 7).	A. Confirm that construction activities will not proceed until a decision statement has been issued under CEAA 2012. B. Update the construction timeline to describe the project activities (Table X) by: • time of year, • frequency, and • Duration (e.g., 2 months in Year 1, 24 hours per day). If there are changes to the timing of activities indicate whether there would be additional effects to the environment under section 5 of CEAA 2012 and if necessary, what mitigation measures would be implemented to address these effects. C. As the Project is proposed to be constructed in approximately 10 segments beginning from both Berens River First Nation and Poplar River First Nation (EIS, page 3-3), and as segments will be	A. With regard to construction activities proceeding prior to a decision statement being issued: Construction activities will proceed in accordance with applicable legislation. B. With regard to construction timeline and activities, The construction activities, timelines and schedule can be found in Chapter 3 of the EIS: • Section 3.2.1 *Planning Phase*; • Section 3.2.2 *Design Phase*; • Section 3.2.3 *Construction Phase*; • Section 3.2.4 *Operation and Maintenance Phase*; and in • Table 3.9 *Planned Schedule for the P4 All-Season Road*, in the EIS. Note: All construction dates identified in the schedule are dependent on the issuance of environmental approvals such as approval under CEAA 2012 and budget. For discussion purposes advance the dates identified in Table 3.9 by one year (start a year after currently shown). Time of year information has been provided including timing windows and

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				The EIS also provides a general schedule of project activities in Table 3.9 which states that construction of the all-season road between Berens River First Nation and Poplar River First Nation is scheduled to begin in November 2016 (EIS, section 3.11, page 3-31). Section 6 of the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) prohibits proponents from undertaking any act or thing in connection with the carrying out of a designated project, in whole or in part, if that act or thing may cause an environmental effect unless the Agency has determined that no environmental assessment is required or the proponent is complying with the conditions included in the decision statement issued to the proponent with respect to that project.	constructed and right of way cleared sequentially and prior to the construction of the four proposed bridges, describe the construction project activities through the seasonal round for the construction period (estimated 8 years). Review residual effects and proponent conclusions on effects levels, noting any additional residual effects presented by spatial and temporal overlaps of project activities and any resulting changes to conclusions on residual effects levels. This information should also inform a response to CEAA-22. D. As the Project is proposed to operate indefinitely (>50 years), update the operation timeline to describe project activities by: • time of year, • frequency, and • Duration (e.g., 2 months in Year 1, 24 hours per day). If there are changes to the timing of activities indicate whether there would be additional effects to the environment under section 5 of CEAA 2012 and if necessary what mitigation measures would be implemented to address these effects. E. For typical operations and considering the maintenance lifecycle anticipated, describe operation phase project activities (e.g., mowing and herbicide application, winter snow clearing and traction material application, bridge cleaning, dust control measures, quarry operation and blasting) through the seasonal round for the operation period (estimated >50 years). Review residual effects and proponent conclusions on effects levels, noting any additional residual effects presented by spatial and temporal overlaps of project activities and any resulting changes to conclusions on residual effects levels. This information should also inform a response to CEAA-22. F. Define and consistently apply terms (e.g. late spring, winter) when used instead of names of months or	exclusions for certain activities such as vegetation clearing, in-water works etc. Time of year will also be dependent on accessibility as well as specific site conditions i.e. soil conditions. For example road bed construction in bog/fen environments occurs during winter months. Additional summary of construction timing constraints pertaining to environmental sensitivities are outlined in Chapter 5, Appendix 5-3 *Environmental Protection Procedures* and 5-4 *GR130s Environmental Protection Specifications*, in the EIS. Relevant requirements and procedures are listed below: • EPP1 4.2 *Wildlife;* • EPP1 4.11 *Wildlife;* • EPP6 4.2 *Working Within or Near Fish Bearing Waters;* • EPP6 4.3 *Working Within or Near Fish Bearing Waters;* • EPP11 4.1 *Culvert Maintenance and Replacement* • EPP12 4.1 *Blasting Near a Watercourse;* • EPP14 4.13 *Wildlife;* • EPP15 4.3 *Wildfires;* • EPP19 4.1.3 *Borrow Pit Decommissioning;* • EPP19 4.2.7 *Borrow Pit Decommissioning;* • EPP20 7.2.12 *Quarry Site Selection and Requirements;* • GR130.12.3 *Blasting Near a Watercourse;* • GR130.15.2 *Wildfires;* • GR130.15.5.6 *Wildfires;* • GR130.15.9.1 *Wildfires;* • GR130.15.11.1 *Wildfires; and* • GR130.17.1.2 *Concrete Area Management Practices* Frequency and duration of activities will be dependent on the allocation of government funding for the project on an annual basis. Estimates for the completion of various components of the project can be found in Chapter 3, Table 3.9 *Planned Schedule of the P4 All-Season Road* in the EIS. Construction activities are primarily performed during winter months due to logistics. If construction activities are required outside of frozen conditions applicable regulatory requirements will be followed. C. With regard to a description of construction activities through the seasonal round and a review of residual effects: the potential for overlapping

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					dates to describe timing avoidance mitigation measures throughout the EIS. Provide a summary table that correlates the planned timing (i.e. time of year, frequency, and duration) of construction activities listed in Table 3.4 (EIS, page 3-12) with the avoidance of seasonal periods of higher potential for effect on fish, birds, wildlife and current use activities (e.g. hunting, trapping, fishing, gathering) which are identified throughout the EIS and Environmental Protection Procedures.	construction work (spatial and temporal) in the 10 segments has already been contemplated with respect to the assessment of effects. There are no changes to the conclusions regarding residual effects. Construction activities are phased in accordance with budget availability, logistical considerations (i.e. contractor's ability to access site) and constraints as identified in the EIS (i.e. timing windows for in-water works to protect the fish and fish habitat). The EIS contemplates that construction activities can occur through the 8 year period with consideration of the aforementioned. D. With regard to an updated operation timeline, the standard operation and maintenance lifecycle will be for snow clearing in winter which will see snow pushed into adjacent ditch areas as required. Road maintenance (dragging of the road to smooth out gravel) will occur monthly during the late spring, summer and early fall as required. Culverts will be inspected and maintained (removal of debris where necessary) throughout the open water season. Mowing activities will occur throughout the growing season as required. Bridge will be inspected in accordance with requirements and necessary maintenance undertaken as required. Maintenance activities are phased in accordance with the need for the specific maintenance activity, budget availability, logistical considerations (i.e. contractor's ability to access site) and constraints as identified in the EIS; activities will be undertaken in relation to current regulatory requirements (i.e. timing windows for in-water works to protect the fish and fish habitat). Blasting for maintenance activities will occur infrequently and will be associated with specific requirements (i.e. repair of washout, stockpiling of gravel). Quarry permits are obtained on an annual basis and will be subject to Manitoba legislation; the Mines and Mineral Act as well as the Crown Lands Act. Blasting restrictions will be incorporated into permits as appropriate. The EIS contemplates that maintenance activities will occur through the operation period with consideration of the aforementioned. Residual effects of operation and maintenance phase activities are provided in the EIS. For further information, see following EIS sections: Chapter 7 *Physical Environment*: • 7.2.4 *Effects on Surface Water, Air Quality and Noise*; • 7.2.4.1.2 *Operations and Maintenance Effects and Mitigation (Surface Water)*;

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						• 7.2.4.2.2 *Operations and Maintenance Effects and Mitigation (Air Quality)*; • 7.2.4.3.2 *Operations and Maintenance Effects and Mitigation (Noise)*; • Table 7.13 *Summary of Residual Project Effects and Significance Conclusions for Air Quality*; • Table 7.14 *Summary of Residual Project Effects and Significance Conclusions for Noise and Vibration*, in the EIS; Chapter 8 *Aquatic Environment*: • 8.3 *Summary of Project Residual Effects and Conclusion;* Chapter 9 *Terrestrial Environment*: • 9.2.4.2.2 *Operations and Maintenance Effects and Mitigation (Vegetation)*; • Table 9.16 *Summary of Potential Operations and Maintenance-Related Environmental Effects on Vegetation Communities and Plant Species of Cultural Importance and Proposed Mitigation Measures*; • 9.2.4.2.3 *Summary of Project Residual Effects and Conclusion (Vegetation)*; • Table 9.17 *Summary of Residual Project Effects and Significance Conclusions for Vegetation Communities and Plant Species of Cultural Importance*; • Table 9.22 *Summary of Potential Operations and Maintenance Related Environmental Effects on Moose and Proposed Mitigation Measures*; • 9.2.5.1.3 *Summary of Project Residual Effects and Conclusion* (*Effects on Moose*); • Table 9.23 *Summary of Residual Project Effects and Significance Conclusions for Moose*; • Table 9.26 *Summary of Potential Operations and Maintenance-Related Environmental Effects on Boreal Woodland Caribou and Proposed Mitigation Measures*; • 9.2.5.2.3 *Summary of Project Residual Effects and Conclusion (Effect on Woodland Caribou)*; • Table 9.27 *Summary of Residual Project Effects and Significance Conclusions for Boreal Woodland Caribou*; • Table 9.32 *Summary of Potential Operations and Maintenance-Related Environmental Effects on Aquatic Furbearers and Proposed Mitigation Measures*; • 9.2.5.3.3 *Summary of Project Residual Effects and Conclusion (Effects on Aquatic Furbearers)*; • Table 9.33 *Summary of Residual Project Effects and Significance*

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						Conclusions for Aquatic Furbearers; • Table 9.38 *Summary of Potential Operations and Maintenance-Related Environmental Effects on Terrestrial Furbearers and Proposed Mitigation Measures*; • 9.2.5.4.3 *Summary of Project Residual Effects and Conclusions (Effects on marten)*; • Table 9.39 *Summary of Residual Project Effects and Significance Conclusions for Terrestrial Furbearers;* • Table 9.43 *Summary of Potential Operations and Maintenance-Related Environmental Effects on Forest Birds and Proposed Mitigation Measures*; • 9.2.5.5.3 *Summary of Project Residual Effects and Conclusion (Effects on Forest Birds)*; • Table 9.44 *Summary of Residual Project Effects and Significance Conclusions for Forest Birds*; • Table 9.48 *Summary of Potential Operations and Maintenance-Related Environmental Effects on Waterbirds and Proposed Mitigation Measures*; • 9.2.5.6.3 *Summary of Project Residual Effects and Conclusion (Effects on Waterbirds)*; • Table 9.49 *Summary of Residual Project Effects and Significance Conclusions for Waterbirds*; • Table 9.51 *Summary of Potential Operations and Maintenance-Related Environmental Effects on Environmentally Sensitive Wildlife Sites and Proposed Mitigation Measures*; • 9.2.5.7.3 *Summary of Project Residual Effects and Conclusion (Effects on Environmentally Sensitive Wildlife Sites)*; • Table 9.52 *Summary of Residual Project Effects and Significance Conclusions for Environmentally Sensitive Wildlife Sites*; • Table 9.54 *Summary of Potential Construction and Operations and Maintenance-Related Environmental Effects on Environmental Sensitive Wildlife Sites and Proposed Mitigation Measures*; • Table 9.55 *Summary of Residual Project Effects and Significance Conclusions for Herptiles*; Chapter 10 *Socio-Economic and Cultural Environment*: • 10.2.4.1.2 *Operations and Maintenance Effects and Mitigation (Effects on Tourism)*; • Table 10.11 *Summary of Potential Operations and Maintenance-Related Socio-Economic Effects on Tourism and Proposed Mitigation Measures*; • 10.2.4.3.2 *Operations and Maintenance Effects and Mitigation (Effects*

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						on Travel Routes); • Table 10.13 *Summary of Potential Construction-Related Socio-Economic Effects on Travel Routes and Proposed Mitigation Measures*; • 10.2.4.4.2 *Operations and Maintenance Effects and Mitigation (Effects to Cultural, Heritage and Archaeological Resources)*; • 10.2.4.5.2 *Operations and Maintenance Effects and Mitigation (Effects on Human Health and Safety);* • Table 10.16 *Summary of Potential Operations and Maintenance-Related Socio-Economic Effects on Human Health and Safety and Proposed Mitigation Measures*; • Table 10.17 *Summary of Residual Project Effects and Significance Conclusions for Tourism*; • Table 10.18 *Summary of Residual Project Effects and Significance Conclusions for Hunting, Trapping, Fishing and Gathering*; • Table 10.19 *Summary of Residual Project Effects and Significance Conclusions for Travel Routes*; • Table 10.20 *Summary of Residual Project Effects and Significance Conclusions for Human Health and Safety*, and Chapter 13 *Cumulative Effects*: • Appendix 13-1 *Scoping of VCs Predicted to Experience Residual Effects of the Project* E. With regard to maintenance lifecycle anticipated operation phase project activities, please see response CEAA-05(D). F. With regard to definition and application of seasonal terminology; seasonal descriptions of activities are given when the activity is dependent on climatic conditions (i.e. winter refers to frozen and snow covered conditions which varies from year to year). Specific timeframes (i.e. months) are used when timing windows are known or specified by regulatory bodies or guidance materials. (i.e. fish spawning timing windows).
Effect Assessment - Methodology						
CEAA-06	5(1)	EIS Guidelines, Part 1, Section 4.2	Chapter 6, Environmental Impact Assessment Scope	Table 6.3 in Chapter 6 of the EIS includes a description of assessment criteria and levels of potential environmental effects but it does not present VC-specific definitions for the three-level ranking	A. For each VC assessed in the EIS, identify the VC-specific thresholds or limits used to define levels for criteria and assign significance ratings to any predicted residual adverse effects. Ensure the definitions for levels identified for each VC are specific to the VC. Include these definitions in all	A. With regard to VC specific thresholds used to define criteria levels for assigning significance to predicted residual adverse effects, Chapter 6, Table 6.3 *Description of Assessment Criteria and Levels of Potential Environmental Effects* of the EIS provides descriptions of the assessment criteria and definitions for the levels of potential environmental effects as per standard Environmental Impact Assessment practice, this table

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
			and Approach Chapters 7, 8, 9, 10, 11, 12, 13	system used by the proponent to qualify the degree or level of residual effects. For the criteria "Magnitude", for example, levels of effect are described by comparison of the change to a baseline reference, standards/guidelines, or established thresholds of acceptable change. These limits or thresholds are not defined for each VC in summary tables presented in Chapters 7, 8, 9, 10, and 15. A table evaluating significance of effects for all VCs assessed in the EIS is required.	summary tables rating significance. B. Where the VC is a composite of several species, describe how species-specific ecological context information was used to support significance determination for the VC. C. For ecological context criteria, define thresholds or limits used to describe levels of effect for each VC and provide a rationale for their selection. D. For each section 5-related species at risk, include reference to critical habitat, and landscape or population thresholds, where available in evaluating magnitude of effect, spatial extent, and ecological context criteria.	consolidates individual VCs into groups where the level of effects are similar. These criteria as outlined in Table 6.3 were used to assess all VC's. The evaluation of individual VCs is found in Chapter 7 *Physical Environment, Chapter* 8 *Aquatic Environment, Chapter* 9 *Terrestrial Environment,* and Chapter 10 *Socio-Economic and Cultural Environment*. For further clarification, a table that provides interpretation of each level for the magnitude and ecological context criteria of individual terrestrial species at risk is presented in Annex 2. The evaluation of effects for species at risk is found in Chapter 9, Appendix 9-7: Table 9-7a *Regulatory and Ecological Context for Species at Risk that Potentially Occur in the Project 4 Region* and Table 9-7b *Project 4 Environmental Effects Analysis for Species at Risk* of the EIS and Chapter 8, Table 8.4 *Potential Species at Risk in the Local Assessment Area,* Appendix 8-2 *Summary of Potential Construction Effects on Aquatic Valued Components Prior to Mitigation, and* Appendix 8-3 *Summary of Potential Operations and Maintenance Effects on Aquatic Valued Components Prior to Mitigation* for added clarification. For further clarification, see Annex 3 Project 4 Regulatory and Ecological Context for Aquatic Species at Risk and Annex 4 Project 4 Environmental Analysis for Aquatic Species at Risk. B. With regard to conducting a species-specific assessment of ecological context for VCs that are composites of several species, this request is not consistent with the purpose of VCs for the determination of significance under CEAA 2012 and as described by CEAA. VCs for this Project were selected in accordance with section 3.3.2 of the *Guidelines For The Preparation Of An Environmental Impact Statement Pursuant To The Canadian Environmental Assessment Act, 2012: Project 4 – All-season Road Connecting Berens River and Poplar River First Nation* (The Guidelines). VCs presented in the EIS reflect the knowledge acquired on the environment through public consultation and Aboriginal engagement. The EIS describes the methods used to predict and assess the adverse environmental effects of the project on these components in Section 6.4 of Chapter 6, and is consistent with the VC requirements as identified in section 3.3.2 of the guidelines.

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						Section 6 of The Guidelines state that "the EIS will present baseline information in sufficient detail to enable the identification of how the project could affect the VCs and analysis of those effects." The EIS provides this information for each of the selected VCs within their respective chapters (Chapter 7 *Physical Environment*, Chapter 8 *Aquatic Environment,* Chapter 9 *Terrestrial Environment*, and Chapter10 *Socio-Economic and Cultural Environment*. Ecological context was assessed for each VC at the VC level. As such the assessment of ecological context for composite VCs remains as shown in the EIS. Assessing ecological context on an individual species level would not change the results as presented in the EIS. Further, the examples of assessments provided by the agency also combined several species into broad VC groups (i.e. wildlife as one VC). The EIS has been modeled in accordance with these examples provided by CEAA. C. With regard to thresholds used to describe levels of effect on ecological context criteria: For terrestrial or aquatic species, boreal woodland caribou is the only VC that has published thresholds, these are linked to critical habitat and were used in the assessment of ecological context for this VC. There are established criteria for air quality, water quality and noise (human health). This criteria has various thresholds that relate to ecological context. The assessment of these VCs has already considered these varied criteria, as it relates to ecological context. See Chapter 7 of EIS, Section 7.2.4 *Effects on Surface Water, Air Quality, and Noise.* Since no other thresholds or limits exist, the assessment of ecological context for other VCs was based on the detectable disruption of ecological function; as described in Chapter 6, Table 6.3 *Description of Assessment Criteria and Levels of Potential Environmental Effects* in the EIS. D. ***The Species at Risk Act defines critical habitat*** as "the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species". Boreal woodland caribou is the only CEAA Section 5-related species at risk potentially found in the project area that has defined critical habitat in accordance with this definition.

IR Number (e.g. HC-IR-01)	*Project Effects Link to CEAA 2012*	*Reference to EIS Guidelines*	*Reference to EIS*	*Context and Rationale*	*Specific Question / Request for Information*	*Response*
						Critical habitat and landscape or population thresholds for section 5 related terrestrial species at risk is found in the EIS: • Table 9-7a: *Regulatory and Ecological Context for Species at Risk that Potentially Occur in the Project 4 Region* and • Table 9-7b *Project 4 Environmental Effects Analysis for Species at Risk* in Appendix 9-7 in the EIS Chapter 8, Section 8.1.5 *Aquatic Species at Risk* describes information related to aquatic species at risk. No critical habitat and landscape or population thresholds have been defined for section 5 related aquatic species at risk. For added clarity, Project 4- Regulatory and Ecological Context for Aquatic Species at Risk, in Annex 3, clarifies that there is no critical habitat for aquatic species at risk.
Proponent Mitigation Commitments						
CEAA-07	5(1), 19(1)	EIS Guidelines, Part 2, Section 6.4 Mitigation	Chapters 5 through 15	Mitigation measures should be specific, achievable, measurable and verifiable, and described in a manner that avoids ambiguity in intent, interpretation, and implementation.”	A. Review and revise all mitigation measures commitments in Chapter 5 and appendices, Chapter 15: summary of key mitigation measures commitments table, and throughout the EIS to remove ambiguity and confirm that proposed mitigation measures commitments are specific. Where mitigation measures commitments remain non-specific, describe and assess the residual effects which would result should the mitigation measures not be applied.	A. With regard to removing ambiguity and confirming proposed mitigation measures commitments are specific detailed: Information on mitigation measures is presented in the EIS. The mitigation measures as described are specific, achievable, measurable and verifiable, and described in a manner that avoids ambiguity in intent, interpretation, and implementation. Project activity-specific mitigation measures are documented in construction specifications seen in Chapter 5, Appendix 5-3 *Environmental Protection Procedures*, Appendix 5-4 GR130s Environmental Protection Specification and Appendix 5-5 GR140s Workplace Safety and Health Specifications in the EIS. The purpose of these procedures and requirements is to ensure construction, operation and maintenance activities are performed according to applicable legislation, regulations, guidelines, permits, and contracts and appropriate mitigation measures to protect the environment are implemented. Identified potential environmental effects prior to mitigation have been described and assessed in the following sections of the EIS: Chapter 6 *Environmental Impact Assessment Scope and Approach :* • 6.4.2 *Identification of Potential Environmental Effects of the Project Prior to Mitigation*; • 6.4.3 *Initial Screening of Potential Environmental Effects*; Chapter 7 *Physical Environment*: • 7.2.2 *Assessment of Potential Effects*; • 7.2.4 *Effects on Surface Water, Air Quality and Noise*;

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						• 7.2.4.1.1 *Construction Effects and Mitigation (Surface Water)*; • 7.2.4.2.1 *Construction Effects and Mitigation (Air Quality)*; • 7.2.4.3.1 *Construction Effects and Mitigation (Noise and Vibration)*; • Appendix 7-2 *Ecological Land Classification in the Project Area*; Chapter 8 *Aquatic Environment:* • 8.2.2 *Assessment of Potential Effects (Aquatic)*; • 8.2.4 *Effects on Fish Habitat, Fish and Harvested Fish and Aquatic Species at Risk*; • 8.2.4.1.1 *Construction Effects and Mitigation (Fish Habitat);* • 8.2.4.3.1 *Construction Effects and Mitigation (Aquatic Species at Risk)*; • Appendix 8-2 *Summary of Potential Construction Effects on Aquatic Valued Components Prior to Mitigation*; • Appendix 8-3 *Summary of Potential Operations and Maintenance Effects on Aquatic Valued Components Prior to Mitigation*; Chapter 9 *Terrestrial Environment*: • 9.2.2 *Assessment of Potential Effects*; • 9.2.4 *Effects to Vegetation*; • 9.2.4.2.1 *Construction Effects and Mitigation (Vegetation)*; • 9.2.4.2.2 *Operations and Maintenance Effects and Mitigation (Vegetation)*; • 9.2.5 *Effects to Wildlife*; • 9.2.5.1.1 *Construction Effects and Mitigation (Moose)*; • 9.2.5.1.2 *Operations and Maintenance Effects and Mitigation (Moose);* • 9.2.5.2.1 *Construction Effects and Mitigation (Woodland Caribou)*; • 9.2.5.2.2 *Operations and Maintenance Effects and Mitigation (Woodland Caribou)*; • 9.2.5.3.1 *Construction Effects and Mitigation (Beaver)*; • 9.2.5.3.2 *Operations and Maintenance Effects and Mitigation (Beaver)*; • 9.2.5.4.1 *Construction Effects and Mitigation (Marten)*; • 9.2.5.4.2 *Operations and Maintenance Effects and Mitigation (Marten)*; • 9.2.5.5.1 *Construction Effects and Mitigation (Forest Birds)*; • 9.2.5.5.2 *Operations and Maintenance Effects and Mitigation (Forest Birds);* • 9.2.5.6.1 *Construction Effects and Mitigation (Waterbirds)*; • 9.2.5.6.2 *Operations and Maintenance Effects and Mitigation (Waterbirds)*; • 9.2.5.7.1 *Construction Effects and Mitigation (Environmentally Sensitive Wildlife Sites)*;

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						• 9.2.5.7.2 *Operations and Maintenance Effects and Mitigation (Environmentally Sensitive Wildlife Sites)*; • 9.2.5.8.1 *Construction and Operations and Maintenance Effects and Mitigation (Species at Risk)*; Chapter 10 *Socio-Economic and Cultural Environment*: • 10.2.2 *Assessment of Potential Effects (Socio Economic and Cultural Effects);* • 10.2.4.3.1 Construction Effects and Mitigation *(Travel Routes);* • 10.2.4.4.1 *Construction Effects and Mitigation (Cultural, heritage and archaeological resources)*; • 10.2.4.5.2 *Operations and Maintenance Effects and Mitigation (Effects on human health and safety);* • Appendix 10-3 *Summary of Potential Construction Effects on the Socio-Economic and Cultural Environment Valued Components Prior to Mitigation*; and • Appendix 10-4 *Summary of Potential Operations and Maintenance Effects on the Socio-Economic and Cultural Environment Valued Components Prior to Mitigation*.
Fish and Fish Habitat						
CEAA-08	5(1)(a)(i) Fish and Fish Habitat	EIS Guidelines, Part 2, Sections 6.1 Project setting and baseline conditions, 6.1.5 Fish and Fish Habitat EIS Guidelines, Part 2, Sections 6.3 Predicted	Chapter 8 and Appendix 8-1 Chapter 3, 3.4.5 and 3,4,6	Within the Project Footprint and Local Assessment Area, water bodies include wetlands, watercourses, streams and lakes. The EIS describes watercourse crossings in Chapter 3 (sections 3.4.5 and 3.4.6), potential effects to fish and fish habitat in Chapter 8, and an appended Technical Report (Appendix 8-1). Area water bodies intersected by the project are described as either fish-bearing watercourses containing fish habitat (ten crossing locations), non-fish bearing watercourses (at 23 crossing locations), or where there are no defined channels but drainage equalization is required, i.e. wetlands (approximately 284 drainage equalization culverts). Field data collected in July 2014 was a small sample of the total proposed crossing	A. Clarify what mitigation measures will be applied to each crossing type installation (i.e. in either fish bearing or non-fish bearing watercourses) and the rationale for their selection. B. Describe what mitigations will apply to equalization culverts. C. Describe where retention ponds will be constructed (Chapter 8, page 8-22: “culvert and bridge crossings will be designed to divert stormwater runoff from the road into vegetated areas or retention ponds.”). D. Describe how and when fish presence/absence will be confirmed prior to work in and around watercourses where field sampling has not been completed. E. Identify what mitigation measures will be applied to fish and fish habitat if fish are found to be present in water bodies which had been considered non fish-bearing.	A. Mitigation measures that will be applied to each crossing type are found in Chapter 5 *Environmental Protection and Sustainable Development* Appendix 5-4 *GR130s Environmental Protection Specification*: • GR130.3 *Submittals;* • GR130.4 *Environmental Approvals and Authorization;* • GR130.5 *Record Keeping;* • GR130.6 *General;* • GR130.7 *Inspections; and* • GR130.8 *Designated Areas and Access.* Chapter 5 in the EIS specifies the suite of mitigation measures the contractor to use to protect aquatic environments. The specific measure used will depend on site specific conditions, details on the application of each measure are found Chapter 5, Appendix 5-3 *Environmental Protection Procedures*: • EPP6 *Working Within or Near Fish Bearing Waters;* • EPP7 *Stream Crossings;* • EPP8 *Temporary Stream Diversions;*

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
		effects on valued components, 6.3.1 Fish and Fish Habitat		locations and effects to fish habitat (fish-bearing water bodies and water bodies supporting habitat quality in downstream water bodies) may be underestimated. As mitigation measures presented in Chapter 5 are to be applied to known fish bearing waters and potential fish-bearing waters (Chapter 5, Environmental Protection Procedures, EP6 to 12), the assumption of non-fish bearing status for 23 watercourses and numerous wetlands within the Project Footprint may also result in unanticipated residual effects to fish and fish habitat.	F. See CEAA-07 on specific language required in mitigation measures commitments. Review and revise mitigation measures addressing Project effects to fish and fish habitat described in Section 8 the Chapter 15 Summary Table of key mitigation measures commitments.	• EPP9 *Fish Passage;* • EPP10 *Fish Salvage;* • EPP11 *Culvert Maintenance and Replacement, and* • EPP16 *Erosion and Sediment Control*. As described in Chapter 5, Appendix 5-3 *Environmental Protection Procedures*. The Contract Administrator enforces the terms of the contract (GR130s, construction drawings, and any applicable permits received for the work) and the EPP provides guidance for this enforcement. There are three stages of oversight in the project: • Design phase. The project design is reviewed at various stages with consideration of measures for the protection of the aquatic environment. This review references the EPPs as guidance. Where potential adverse effects to aquatic environments may occur (potential for serious harm to fish or fish habitat) the crossing design/ in water work is submitted to DFO for review. • Contract document development - contract documents incorporate measures to protect the aquatic environment as described in the EPPs and EIS. Prior to the start of work, the contractor submits to the proponent for approval a Water Quality and Fish Protection Plan as identified in GR130.3.2.3 of Appendix 5-4 *GR130s Environmental Protection Specification*s of EIS. The plan includes construction phase erosion and sediment control measures, in-water works, water quality monitoring, isolation plan, fish salvage, mussel salvage. Measures outlined in permit, authorizations and letters of advice are incorporated as appropriate are into the contract documents. • Construction inspection – inspections are conducted throughout the construction period to monitor that mitigation measures as outlined are applied. Monitoring continues during the one year warranty period to ensure permanent protection measures are in place and working as appropriate. Measures applied are appropriate to specific site conditions (terrain, soils, time of year, sensitivity of watercourse, species within watercourse, nature of in-water work) i.e. installation of a culverts whether it be in fish bearing or non-fish bearing streams or in bog/fen complexes will typically require some form of sediment and erosion control measures to be

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						installed prior to commencement of work. Culvert installations conducted under frozen conditions (ie. small stream frozen to the bottom) will not require fish salvages, water quality monitoring or temporary stream diversions during construction. Typical culvert installation activities are described in Chapter 3, Section 3.4.6 *Culvert Installation Activities* of EIS. B. With regard to mitigation efforts applied to equalization culverts: Equalization culverts do not connect to fish bearing habitat. They are designed and installed to ensure that surfical groundwater hydraulics are maintained in non-fish bearing bog/fen areas. They are typically installed under frozen conditions. Erosion and sediment control is applied as appropriate for protection of the equalization culvert and to prevent sedimentation of the ditch. C. With regard to where retention ponds will be constructed: Retention ponds as discussed in the EIS are small excavations of typically no more than 20 sq. meters. They are generally constructed in the project footprint in response to evolving site conditions and are a temporary measure used during the construction phase to collect runoff water from the active construction site. The retention ponds provide for the settling of sediment and/or the diversion of runoff water from the construction site to prevent it from reaching waterbodies. These ponds are backfilled once they are no longer required. D. With regard to how and when fish presence/absence will be determined: Fish presence/absence was confirmed during the baseline study phase. Field investigations at crossing sites assessed for the presence/absence of aquatic species. Traditional knowledge information provided by knowledgeable land users was also crossed referenced. The field investigations and traditional knowledge information correlates. Small waterbodies, boreal wetlands and headwater wetlands were identified as non-fish bearing due to the absence of a stream channel and upstream or downstream connectivity to larger fish-bearing waterbodies. These small isolated waterbodies typically have shallow water depth with low pH and low dissolved oxygen levels, and generally freeze through their depth; these conditions do not support fish populations. Figure 8-1 *Aquatic Environment Study Area and Water Crossings* found in Chapter 8 of the EIS identifies the water crossing locations and Table 8-1 *List of*

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						Watercourse Crossing Sites found in Chapter 8 of the EIS summarizes the findings from the fish bearing stream investigations. Additional supporting information can be found in Chapter 8, Section 8.1 *Existing Conditions* and Appendix 8-1 *Aquatic Environment Report* in the EIS. E. With regard to what mitigation measures will be applied if fish are found to be present in water bodies previously classified as non-fish bearing, the contracts provide protection for any fish bearing water, whether previously identified or not (GR130s). The contract provides a mechanism for the Contract Administrator/site supervisor to require additional protection at any site as required. See section Chapter 3, Section 3.4.6 *Culvert Installation Activities* and GR130s found in Appendix 5-4 for these measures. Also find related EPPs in Appendix 5-3 *Environmental Protection Procedures*: • EPP6 *Working Within or Near Fish Bearing Waters*; • EPP7 *Stream Crossings*; • EPP8 *Temporary Stream Diversions*; • EPP9 *Fish Passage;* • EPP10 *Fish Salvage;* • EPP11 *Culvert Maintenance and Replacement;* and • EPP16 *Erosion and Sediment Control.* F. With regard to reviewing and revising mitigation measures that address project effects to fish and fish habitat as per Question: CEAA-07, please see responses to CEAA -07 (A) and CEAA-08 (A) and CEAA-08 (B) above.
CEAA-09	5(1)(a)(i) Fish and Fish Habitat	EIS Guidelines, Part 2, Section 6.1.5 EIS Guidelines, Part 2, Section 6.3.1		Riparian vegetation is described in the EIS (p. 8-24) as consisting of "a variety of streamside grasses, forbs, shrubs and trees that contribute nutrients to lakes, rivers and creeks through leaf litter, woody debris and terrestrial insect drop. The removal of riparian vegetation to accommodate temporary crossings, culvert crossings, bridge approaches, or line of sight requirements may reduce nutrient inputs into the aquatic food web." The EIS describes the permanent destruction of approximately 180 m of	A. Revise Table 8.6 (p.8-31) to correct the quantification of residual riparian habitat loss (area) which is described in the table as an area in square metres (m^2) while in the text of the report it is reported as a linear measurement (e.g. 180 m or 192 m of riparian habitat). Correct the values and update the table accordingly. B. Report riparian habitat loss associated with right of way clearing and crossing culvert installations for the five other watercourse crossings with described fish habitat (Table 8.2, "marginal habitat", p. 8-10): Unnamed Tributary of Etomami River (Site P4-X03), Unnamed Tributary of North Etomami River (Site P4-X05), Unnamed Tributary	A. With regard to changing Table 8.6 to reflect area rather than linear distance: Table 8.6: *Summary of Net Fish Habitat Change Due to Construction of the P4 All-Season Road*, "Riparian Destruction $(m)^2$" and "Riparian Alteration $(m)^3$" are referring to notes (2, 3) listed below the table. These are not to be taken as units of area or volume. The table will remain unchanged. B. With regard to reporting riparian habitat loss associated with right-of-way clearing and culvert installations of selected water crossings; summaries of stream crossing assessment that describe the class of vegetation present at the stream crossing locations (grass, shrub, deciduous, coniferous, mixed) can be found in Appendix 6 of the *Aquatic Assessment Report* (Appendix 8-1 of EIS). Riparian loss was calculated for crossings where fish habitat was assessed as contributing to a

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
				riparian habitat to accommodate construction of bridge and culvert crossings and the alteration of approximately 192 m of riparian habitat as part of initial right-of-way clearing activities at only five of the ten watercourses described as providing fish habitat.	of Pamatakakowin Lake (Site P4-X24), and Unnamed Tributaries of Okeyakkoteinewin Creek (Sites P4-X29 and P4-X31). Assess potential effects, propose mitigations measures, describe residual effects and evaluate significance of these riparian habitat losses within the Project Footprint and Local Assessment Area. C. Specify locations where the proposed 100 m setback distances for construction activities cannot be maintained and define riparian habitat losses associated with project construction within the 100 m setback.	commercial, recreational or Aboriginal (CRA) fishery as per the *Fisheries Act 2012*. Sites P4-X03, P4-X05, P4-X24, P4-X29 and P4-X31 were assessed and do not contribute to a CRA fishery (Table 8.1 *List of Watercourse Crossing Sites* of EIS). C. With regard to locations where a 100 m setback for construction activities cannot be achieved: Currently the project maintains a 100m set back from all water courses along the proposed P4 All-Season Road alignment with the exception of crossing sites. However, field conditions (soil conditions, newly identified sensitive site, etc) encountered during construction may dictate that the setback cannot be maintained. While this is an unlikely occurrence, the mitigation is as follows; Where a 100 m setback is not obtainable, a buffer of undisturbed vegetation equal to 10 m plus 1.5 m times the slope gradient, or 30 m whichever is greater will be left between the road and adjacent waterbodies as recommended in the Manitoba Stream Crossing Guidelines (http://www.gov.mb.ca/waterstewardship/fisheries/habitat/sguide.pdf) Also find related mitigation measures for working within the 100m setback in EPPs in Appendix 5-3 *Environmental Protection Procedures* in the EIS: • EPP1 *Clearing and Grubbing*; • EE6 *Working Within or Near Fish Bearing Waters;* • EPP18 *Dust Suppression Practice;* and • EPP20 *Quarry Site Selection and Requirement.*
DFO-01	5(1)(a)(i) Fish and Fish Habitat	EIS Guidelines, Part 2, Section 6.1.5 EIS Guidelines, Part 2, Section 6.3.1	Chapter 8, Section 8.3 Summary of Residual Effects and Conclusion	As noted in the EIS, there will be residual effects remaining after mitigation for fish habitat following construction. DFO understands that the proponent has noted the residual footprint of the watercourse crossing structures following construction. However, it is probable that there will also be in stream footprints from temporary impacts during the construction phase of the project. If there is an alteration of fish habitat during construction that results in serious	A. Identify the potential alteration of fish and fish habitat that may result in serious harm to fish during construction (i.e. temporary impacts to facilitate construction). Provide the rationale if no harm to habitat is expected. B. Add a column in Table 8.6, and update it accordingly to account for the Temporary Footprint during Construction.	A. With regard to identifying potential alteration of fish and habitat during construction: Information on temporary works is not available at this point in the planning phase. This information will become available during the construction phase at which time contractors supply their plans for temporary construction works as required by GR130.3.2.3 *Submittals* found in Appendix 5-4 *GR130s Environmental Protection Specification* of the EIS: A Water Quality and Fish Protection Plan including but not limited to: • Erosion and sediment control measures; • In-water works; • Water quality monitoring; • Isolation plan;

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				harm (i.e., in stream cofferdams/working platforms, etc.), a DFO *Fisheries Act* Authorization may be required, as well as mandatory offsetting.		• Fish salvage; and • Mussel salvage (Annex 5 - EPP24 *Mussel Salvage*). The process that the proponent and DFO have utilized for Project 1 temporary works is as follows: The contractor is forwarded details for in-water works to DFO for their review. DFO reviews the submission and makes determination of serious harm. DFO requirements from Authorization, Letter of Advice or other recommendations are then incorporated into the contractor's plans and are binding under the construction contract. B. With regard to adding an additional column to Table 8.6: *Summary of Net Fish Habitat Change Due to Construction of the P4 All-Season Road*, temporary works do not typically result in serious harm as per the experience of Project 1: PR304 to Berens River All-Season Road. The requested information cannot be provided at this time as the details of temporary construction works are not available. The contractor is required to submit plans for in-water works as identified in GR 130.3.2.3 *Water Quality and Fish Protection Plan* found in Appendix 5-4 *GR130s Environmental Protection Specification* of the EIS. Part A response to this question (DFO-01) outlines the approval process used for temporary works on Project 1 that will be followed for Project 4.

DFO-02	5(1)(a)(i) Fish and Fish Habitat	EIS Guidelines, Part 2, Section 6.1.5
		
		EIS Guidelines, Part 2, Section 6.3.1
			Chapter 8. Table 8.6	No estimates have been provided for temporary and permanent footprints below the high water level (HWL) for the five culvert crossings in fish bearing streams.	A. The proponent should include in Table 8.6 the estimated footprint below the HWL for all culvert crossings on fish bearing watercourses in order to provide an accurate summary of temporary and permanent impacts to fish habitat in these watercourses.	A. With regard to including the estimated footprint of all culvert crossings of fish bearing waters in Table 8.6: The footprint of the impacted area (below Q2) cannot be determined until the final design phase of the project. The final design phase will confirm the final bridge designs (clear span, two-span, three span), as well as culvert sizes and depths or need for multiple culverts. Culvert size and installation depths are based on requirements in the Fisheries Act- RSC, 1985 and measures listed in Appendix 5-3 *Environmental Protection Procedures* and Appendix 5-4 *GR130s Environmental Protection Specification*:
						• EPP9 *Fish Passage;*
						• GR130.15 *Working Within or Near Water*:
						  • GR130.15.6 *Base Flow, Diversions, and Fish Passage;* and
						  • GR130.15.9 *Culvert Maintenance and Replacement.*
						
						These factors along with engineering factors and site conditions will determine the footprint necessary for the culvert installation. Refer to *Stream Crossing Assessments* found in Appendix 6 of the *Aquatic*

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						Assessment Report (Appendix 8-1 of EIS).
DFO-03	5(1)(a)(i) Fish and Fish Habitat	EIS Guidelines, Part 2, Section 6.1.5 EIS Guidelines, Part 2, Section 6.3.1	Chapter 8, Section 8.3 Appendix 8-1	EIS states that residual effects remaining after mitigation for fish habitat include permanent destruction of 206.5 m2 of in stream habitat and 180 m of riparian zone habitat (p.8-39), as well as a temporary increase in total suspended solids as a result of construction sedimentation of streams (Appendix 8-1., Table 8). The final decision regarding the determination of serious harm to a commercial, recreational or aboriginal (CRA) fishery and residual effects lies with DFO once all final details regarding each watercourse crossing design and construction methodology are finalized. Offsetting measures may be required under the *Fisheries Act* in the event a *Fisheries Act* Authorization is required for the Project.	A. Identify what mitigation will be applied to address the permanent loss of in stream and riparian zone habitat. B. Revise Table 8.9 to include the potential offsetting measures to address the residual effects to fish habitat.	A. With regard to mitigation applied to loss of stream and riparian zone habitat, the project is being designed to minimize effects to fish and fish habitat including loss of fish habitat. i.e. Routing alignment to minimize crossing distance, using clear spans where possible and if not possible minimizing number of piers used for each bridge project as evidenced by the proposed crossing structures: Berens River-bridge (single-pier), North Etomami River bridge (clear-span), and Leaf River bridge (clear-span). The construction of the road including bridges and culverts will result in permanent loss of in-stream and riparian habitat as shown in Table 8.6. Riparian habitat along the winter road at waterbody crossings will regrow and offset the permanent loss of riparian zone habitats along the proposed All-Season Road. Mitigation measures such as environmental protection procedures, specifications and proposed mitigation measures shown in Table 8.7 *ESRA's Protection Procedures and Specifications for Fish Habitat, Fish and Harvested Fish and Aquatic Species at Risk*, Table 8.8 *Summary of Potential Construction –Related Environmental Effects on Fish Habitat and Proposed Mitigation Measures*, and Table 8.9 *Summary of Potential Construction –Related Effects on Fish Habitat and Proposed Mitigation Measures* in Chapter 8 of the EIS will be applied as needed based on evolving site conditions during construction. The DFO Authorization and Compensation Process: 1. As preliminary designs are refined they are reviewed for application of mitigation measures (Table 8.7 *ESRA's Protection Procedures and Specifications for Fish Habitat, Fish and Harvested Fish and Aquatic Species at Risk*, Table 8.8 *Summary of Potential Construction –Related Environmental Effects on Fish Habitat and Proposed Mitigation Measures*, and Table 8.9 *Summary of Potential Construction –Related Effects on Fish Habitat and Proposed Mitigation Measures*.) 2. Detailed design is complete and provided to DFO for review under the *Fisheries Act.* 3. DFO determines serious harm and offsetting requirements.

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						4. Offsetting plan is provided. One offsetting project was identified for Project 1 (Sanders Creek spawning shoals) that was approved by DFO for compensation that has not been used that could be applied to this project. See Annex 6 – Aquatic Habitat Offsetting Project Example for details. B. With regard to revising Table 8.9 *Summary of Potential Construction – Related Effects on Fish Habitat and Proposed Mitigation Measures* to including potential offsetting measures: Details of a possible offsetting project that would address 435m^2 of spawning habitat for walleye and white sucker is identified in Annex 6 - Aquatic Habitat Offsetting Project Example. This project was identified as possible compensation for Project 1-PR304 to Berens River All Season Road and reviewed with DFO, and accepted in principle. However, this offsetting was not required for Project 1 and could be utilized as offsetting for Project 4, given both are in the Lake Winnipeg Watershed and same ecoregion. As discussed in the DFO-03 Part A Response, through the Fisheries Act approvals process, it will be confirmed with DFO offsetting requirements at the time of Fisheries Act Authorization. This approach has been previously used on Project 1 and has been accepted by DFO for Project 4 (pers.comm T. Schweitzer, June 16, 2016)
DFO-04	5(1)(a)(i) Fish and Fish Habitat 5(1)(a)(ii) Aquatic Species	EIS Guidelines, Part 2, Section 6.1.5 EIS Guidelines, Part 2, Section 6.3.1	Section 5. Appendix 5-3 ESRA's Environmental Protection Procedures (EPP).	The EIS does not currently contain Environmental Protection Procedures for Mussel Salvage.	A. Given the uncertainty regarding the location of Mapleleaf Mussels, describe how the presence or absence of Mapleleaf Mussel will be verified and what environmental protection procedures will be applied including mussel salvage, if Mapleleaf Mussels are found.	A. *"Quadrula quadrula* occurs in a variety of habitats ranging from medium to large rivers..." (COSEWIC 2006). Given the uncertainty regarding the location of Mapleleaf Mussels, all medium to large rivers that cross the P4 alignment were sampled for mussels. Smaller tributaries were not sampled because they are unsuitable Mapleleaf habitat for the following reasons: • Shallow water depths that are prone to ice formation to the creek bottom which would result in mortality; • Fine substrates overlain by organic material (not suitable for Mapleleaf); • Presence of barriers to fish movements, inhibiting access by Channel Catfish (host species); and • Unsuitable habitat for Channel Catfish. Mapleleaf Mussels were found in the Berens River; surveys of the Etomami, North Etomami and Leaf rivers did not identify the presence of Mapleleaf or any other mussel species and fish sampling did not identify the presence of Channel Catfish, the host species of Mapleleaf. Of these

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						three rivers, a crossing structure that requires an in stream structure (pier) is only required at the Etomami River. Where in-water work is required in suitable Mapleleaf Mussel habitat (i.e. medium to large rivers) and presence of Mapleleaf Mussels has not been identified, their presence/absence relative to the in-water work footprint will be confirmed prior to construction. To verify the presence/absence of Mapleleaf Mussels prior to construction of the Etomami River bridge, DFO will be contacted to discuss SARA permitting requirements as well as survey, relocation, monitoring and reporting details. A qualified Fish Biologist will conduct the mussel survey and if Mapleleaf Mussels are found, they will be relocated, monitored and reported on in compliance with conditions of the SARA Permit obtained from DFO. Where Mapleleaf mussels have been identified within a waterbody designated for in-water work (i.e. Berens River) standard practice is as follows: 1. A *Species at Risk Act* (SARA) permit will be obtained through the SARA application process with DFO. 2. A qualified Fisheries Biologist will conduct a Mussel Salvage, where identified and cataloged mapleleaf mussels will be relocated a minimum of 150 m upstream from the proposed in-water works based on Protocols described by G.Mackie, T.J. Morris, and D. Ming in the *Protocol for the Detection and Relocation of freshwater Mussel Species at Risk in Ontario-Great Lakes Area.* 3. Submit report to DFO. Construction will proceed once SARA permit criteria are satisfied, and DFO Authorization or Letter of Advice (LOA) is received for the work. See Annex 5 – EPP24 Mussel Salvage. To verify the presence/absence of Mapleleaf Mussels prior to construction of the Etomami River bridge, DFO will be contacted to discuss SARA permitting requirements as well as survey, relocation, monitoring and reporting details. A qualified Fish Biologist will conduct the mussel survey and if Mapleleaf Mussels are found, they will be relocated, monitored and reported on in compliance with conditions of the SARA Permit obtained from DFO.

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						The following sections in Chapter 8 *Aquatic Environment* show the summary of potential construction, operation, and maintenance-related environmental effects on aquatic species at risk and their proposed mitigation measures: • Table 8.8 *Summary of Potential Construction-Related Environmental Effects on Fish Habitat and Proposed Mitigation Measures*; • Section 8.2.4.1 *Fish Habitat, Fish and Harvested Fish and Aquatic Species at Risk* • Section 8.2.4.1.2 *Operations and Maintenance Effects and Mitigation* • Section 8.2.4.3 *Aquatic Species at Risk* • Section 8.2.4.3.1 *Construction Effects and Mitigation* • Section 8.2.4.3.2 *Operations and Maintenance Effects and Mitigation*
ECCC-WQ-IR-01	5(1)(a)(i) Fish and Fish Habitat	EIS Guidelines, Part 2, Sections 6.1.4 Groundwater and Surface Water and 6.2.2 Changes to Groundwater and Surface Water	Chapter 8 Aquatic Environment, Section 8.1 Existing Conditions and Appendix 8-1 Aquatic Environment Report	Project effects to water quality are predicted by the proponent for water bodies including streams, rivers, lakes, and wetlands throughout the Project Footprint and Local Assessment Area (EIS Chapter 8, Chapter 5). Environmental Protection Procedures (Chapter 5 Appendices, GR130.15.8 Water Quality Monitoring) includes: • "1. Water quality monitoring shall be required for in-water work in fish-bearing watercourses and may be required when working near fish-bearing watercourses or tributaries to fish bearing watercourses to demonstrate that deleterious substances are not entering into the watercourse. Water quality monitoring shall also occur when working upstream and within 5 km of a water treatment plant intake." • "2. A Fish and Water Quality Protection Plan shall be prepared by the Contractor in advance of	A. Describe what additional baseline monitoring will be conducted with respect to water quality and sediment quality, in order to characterize the natural baseline conditions (including seasonal and interannual variation). B. Water quality parameters should include water temperature, turbidity, TSS, pH, dissolved oxygen profiles, nutrients, metals, nitrogen and naturally occurring contaminants, with baseline salinity also included if road salts would potentially be applied to the road in future. C. Evaluate the potential effects on water quality against these baseline conditions (e.g., water quality and sediment quality) at all water crossings, including culvert stream crossings.	A. Water quality has been measured at sites assessed as supporting a commercial, recreational and aboriginal fishery to establish baseline water quality and reported on in the *Aquatic Assessment Report* found in Appendix 8-1, Chapter 8 of the EIS. Seasonal variability is known without conducting seasonal and interannual assessments. Furthermore, seasonal variability does not influence project effects. Where there is a potential for an effect i.e. in-water works, monitoring will be conducted immediately prior to, during and immediately after in-water work or near water work as appropriate to provide real time comparison to water quality parameters at and downstream from in-water construction activities, as described in GR130.15.8 *Water Quality Monitoring*, in Chapter 5, Appendix 5-4 *GR130s Environmental Protection Specification*. With respect to monitoring of sediment quality, information to support potential effects assessment was collected. Information needed to assess potential effects of the project activities is substrate composition. Further, environment protection practices required at each site depend on the nature of the substrate composition. Substrate composition was determined using side scan sonar for Class 1 streams and was estimated at each transect in Class 2 streams. The primary potential effect of in-stream construction activities for the proposed Project 4 All-Season Road is sediment re-suspension and erosion in relation to disturbance to the stream bank and alteration to channel hydraulics. Information that is required to assess the potential effect and identify mitigation measures is sediment composition. The

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				construction works and any amendments must be submitted 15 days in advance of the start of work requiring or may requiring water quality monitoring. The Plan shall include a description of the works and measures proposed to mitigate adverse changes to water quality." Post-construction monitoring of water quality as it relates to fish habitat is described in the EIS in Chapter 14 (p.14-4 to 14-5) to evaluate Project effects and the effectiveness of mitigations measures. This monitoring requires sufficient detail to characterize pre-construction baseline in the receiving water bodies found within the Project Footprint and Local Assessment Area. The current baseline dataset does not meet the EIS Guidelines requirements to describe "seasonal water quality… at several representative local stream and water body monitoring stations established at the project site" and "sediment quality analysis for key sites likely to receive road effluents."		primary indicator for these impacts is total suspended solids (TSS) with turbidity serving as a surrogate for rapid on-site monitoring. Monitoring compares water quality from downstream to background water quality upstream of the crossing (i.e. an area not affected by the road or crossing activities). Water quality measurements will be taken prior to and during the in water work as described in section 14.1.4, Chapter 14 of the EIS. Requirements for water quality monitoring during construction of in-water works are included as a standard specification in the construction contracts found in GR130.15.8 *Water Quality Monitoring*, in Chapter 5, Appendix 5-4 *GR130s Environmental Protection Specification* and Annex 7- Example of Special Provision Clauses Included in (Fish Bearing) Watercourse Crossing Construction Projects. The monitoring confirms sediment and erosion control measures are working as planned. Additional sediment quality measurements (sediment analysis) being requested by EC is not necessary for the type, scope and scale of the P4 Project for the following reasons: • Project activities will not change sediment quality, with the exception of an accidental release. The only potential introduction of chemicals is through accident release (spills) and the EIS identifies mitigation measures that will be employed to minimize the risk of occurrence and reporting procedures if an accident does occur, see EPP 3 *Spill Response*, in Chapter 5, Appendix 5-3 *Environmental Protection Procedures* of the EIS. • The development of the area is minimal (only roads, no industry) and sediments have not been previously contaminated. Therefore the existing environment (contaminated sediments are not present) and will not adversely affect the Project. For additional information see response given to CEAA-20. Additional mitigation information can also be found in, but are not limited to, the following sections of the EIS: Chapter 5 *Environmental Protection and Sustainable Development:* • Section 5.2.1 *Design Mitigation and Community and Stakeholder Input;* • Table 5.1: *Design Mitigation Resulting from Community Feedback Related to Changes in the P4 All-Season Road Route Options;* • Appendix 5-4 *GR130s Environmental Protection Specifications;* ▪ EPP3 – *Spill Response;*

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						▪ EPP6 – *Working Within or Near Fish Bearing Waters:* ○ EPP6 1.2; ○ EPP6 4.1; ○ EPP6 4.2; ○ EPP6 4.3; ○ EPP6 4.9; ○ EPP6 4.13; ○ EPP6 4.14; ○ EPP6 4.15; ○ EPP6 4.17; ▪ EPP7 – *Stream Crossings:* ○ EPP7 4.1; ○ EPP7 4.3; ○ EPP7 4.4; ○ EPP7 4.5; ○ EPP7 4.8; ○ EPP7 4.9; ○ EPP7 4.10; ○ EPP7 4.11; ○ EPP7 4.12; ▪ EPP8 – *Temporary Stream Diversions:* ○ EPP8 4.1.1; ○ EPP8 4.1.2; ○ EPP8 4.1.3; ○ EPP8 4.1.4; ○ EPP8 4.1.5; ○ EPP8 4.2.1; ○ EPP8 4.2.3; ▪ EPP9 – *Fish Passage;* ▪ EPP10 – *Fish Salvage;* ▪ EPP11 – *Culvert Maintenance and Replacement:* ○ EPP11 4.1; ○ EPP11 4.2; ○ EPP11 4.3; ○ EPP11 4.4; ○ EPP11 4.5 ○ EPP11 4.6; ○ EPP11 4.7; ▪ EPP16 – *Erosion and Sediment Control:*

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						○ EPP16 4.1; ○ EPP16 4.2; ○ EPP16 4.3; ○ EPP16 4.4; ○ EPP16 4.5; ○ EPP16 4.6; ○ EPP16 4.7; ○ EPP16 4.9; ▪ EPP12 – *Blasting Near a Watercourse;* ▪ EPP20 - *Quarry Site Selection and Requirements;* ▪ EPP21 – *Site Selection – Temporary Works;* • *Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat* –May 1996; • *Freshwater Intake End-of-Pipe Fish Screen Guidelines – Department of Fisheries and Oceans* 1995; • Applicable Fisheries and Oceans Canada (DFO) Authorizations or Letters of Advice ; B. With regard to including various water quality parameters, water quality data has been collected for those parameters that either support the characterization of individual water bodies and habitat provided and/or provide information that can be used to assess potential effects. Baseline water quality assessment has captured water temperature, turbidity (NTU), conductivity, pH, and dissolved oxygen, ammonia, nitrates, phosphorus, organic carbon, chlorophyll, phaeophytin. TSS/Turbidity relationship . For example, dissolved oxygen levels and pH determine whether conditions are acceptable for various aquatic species. The presence/absence of metals in concentration that would be observed naturally is not relevant to the characterization of the project or the assessment of the effects because the project activities will not influence metal concentrations. The project will not be using road salts during the operational phase. Road salts are not necessary or effective on gravel roads in winter. Road salts are not used on bridges due to the corrosive factor. Furthermore

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						due to the limited number of structures, the application of salt would be prohibitively expensive. C. With regard to evaluating potential effects on water quality against baseline conditions at all crossings, please refer to: • Chapter 7, Table 7.8: *Summary of Potential Construction Related Environmental Effects on Surface Water and Proposed Mitigation Measures* of the EIS; • Chapter 8, Section 8.2.4: *Effects on Fish Habitat, Fish and Harvested Fish and Aquatic Species at Risk* of EIS; and • Stream Crossing Assessments found in Appendix 6 of the Aquatic Environment Report (found in Chapter 8, Appendix 8-1 of the EIS) for information on the effects of the project on water quality as it relates to fish habitat. In addition to this: • Sewage from the camp sites are transported to licensed wastewater treatment facilities as found in Chapter 3, section 3.9 *Waste and Hazardous Materials Handling, Disposal and Treatment* in the EIS; • The Manitoba *Water Protection Act*, prohibits the application of nutrients within 100m of a waterbody (Nutrients Management Regulations) as found in Chapter 1, Section 1.4.2.2 *Other Provincial Regulatory Approvals and Legislation* of the EIS. The Project uses hardy, local native seeds suited to the local soils and seeding that does not require fertilizer applications as found in Chapter 3 – Appendix 3-6 *Native Seed Mix for Revegetation* of the EIS; and • Changes in nutrient loading in waterbodies as a result of the removal of the small amount of riparian vegetation at stream crossing sites will not be measurable. Therefore, there is no condition under which nutrient levels in the waterbody would be changed as a result of project activities.
ECCC-WQ-IR-02/ CEAA-10	5(1)(a)(i) Fish and Fish Habitat – water quality	EIS Guidelines, Part 2, 6.2.2 Changes to Groundwa	Chapter 5 Environmental Projection Chapter 8	As indicated in the EIS (Chapter 8, p.8-25) "Explosives used in blasting use oxidizing agents such as ammonium nitrate, calcium nitrate and sodium nitrate. Nitrates from these materials may enter the watercourse due to accidental spills, leaching from wet blastholes, or in runoff from undetonated	A. Describe the mitigation measures that will be implemented to protect water quality from the effects of ammonium explosives. If mitigation measures will be incorporated from regulatory guidance documents or "necessary approvals" (Chapter 5, Appendix 5-4, GR130, p.18), describe these requirements and regulated outcomes - in	A. Mitigation measures that are applied to protect water quality from the effects of ammonium explosives are as follows: • Quarry Sites are selected to be a sufficient distance (a minimum 100m) away from waterbodies EPP20 *Quarry Site Selection and Requirements*, Chapter 5, Appendix 5-3 *Environmental Protection Procedures* and GR130.15.2 Chapter 5, Appendix 5-4 *GR130s Environmental Protection Specifications* of EIS.

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
		ter and Surface Water and 6.3.1 Fish and Fish Habitat	Fish and Fish Habitat Chapter 14 Monitoring and Follow-up	explosives in blast rock. Increased nitrate levels can have toxic effects on aquatic organisms and cause eutrophication of surface waters. In addition, if ammonium nitrate is introduced into water, it dissociates to form ammonia, which can have both lethal and sublethal effects on fish." Without appropriate mitigation and protective measures, ammonium explosives may degrade water quality. Chapter 5 appendices include GR130 Environmental Specification examples provided from Project 1, the all-season road being constructed by the proponent from PR304 to Berens River, which state: "Blasting near watercourses classified as fish habitat shall adhere to set back and weight of explosive charge guidelines as referenced in Fisheries and Oceans Canada document *Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters 1998*. Where these guidelines cannot be met, blasting plans shall be submitted to the Contract Administrator for ESRA's application to Fisheries and Oceans Canada to obtain necessary approvals prior to commencement of blasting in areas that could affect fish habitat".	this case, describe water quality in receiving water bodies near blasting locations and quarry sites. B. Update water quality/fish habitat monitoring plans to incorporate any water bodies receiving blast residue and provide the revised plans described in Chapter 14.	• The contractor is required to submit blast plans as detailed in GR140.34.2 *Loading and Blasting* found in Appendix 5-5 *GR140s Workplace and Health Specifications* of the EIS. Submitted blast plans are evaluated against standard procedures of certified blasters in Manitoba and include: i. Use of DFO's *Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (*Wright and Hopky 1998 *) (http://www.dfo-mpo.gc.ca/Library/232046.pdf).* ii. The types of explosives used for each specific site. Stick powder, sausage, or plastic sleeve blended emulsion (gel/putty) (water resistant explosive products) are used when blasting near or in water. The oil emulsion is very water resistant, the thin film of oil surrounding the salt solution minimizes contact with external water sources making it difficult to introduce nitrogen into water systems. This results in no spillage, efficient blasting and little to no remaining residue. iii. The methods of blasting proposed for each specific site. The practice of double capping all holes near water is used to prevent misfires while blasting. B. With regard to updating the water quality/fish monitoring plans to incorporate water bodies receiving blast residue and revising plans described in Chapter 14 *Monitoring and Follow Up* of the EIS, waterbodies are not anticipated to receive blast residues. No in-water blasting is anticipated and certified blaster's blast plans are reviewed for blasting near waterbodies to confirm that appropriate mitigation measures are being incorporated based on site specific conditions and in relation to the *Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters* (Wright and Hopky 1998).
CEAA-11	5(1)(a)(i) Fish and Fish Habitat – water quality		Chapter 5 Environmental Projection	The Chapter 5 Environmental Protection Procedures *EP17 Concrete Washout Management* note "Where water for concrete washout activities is taken from a watercourse or water body, the Department of Fisheries and Oceans	A. Describe what "legislative and mitigative measures" will be applied for the protection of fish and fish habitat, including water quality and quantity in habitat for aquatic species at risk during concrete washout management, and operation of concrete batch plants or cast-in	A. With regard to describing legislative and mitigative measures to be applied for the protection of fish habitat, the contractor is responsible for acquiring a series of Manitoba permits for each batch plant including an Environment Act License, Work Permit, and Water Use Permits and adhering to license and permit conditions.

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
				Freshwater Intake End-of- Pipe Fish Screen Guidelines, the [Provincial] *Water Rights Act* and other appropriate legislative and mitigative measures must be followed."	place bridge construction. B. Identify source water bodies for water withdrawal required for concrete batch plant operation. Describe, assess, and propose specific mitigations for the potential effects of consumptive water use on in stream flow, fish and fish habitat, aquatic species at risk. C. Incorporate any water bodies used for concrete washout management, operation of concrete batch plants or cast-in place bridge construction in water quality monitoring plans described in Chapter 14.	These conditions as imposed by Manitoba address protection of water quality and fish habitat. In addition, the contractor is required to adhere to contract specifications as identified in GR130.21 *Cement Batch Plant and Concrete Wash out Area* (Appendix 5-4 *GR130s Environmental Protection Specifications*) and further described in EPP6.4.17 *Working Within or Near Fish Bearing Waters*, EPP 17 *Concrete Washout Area Management Practices* (Appendix 5-3 *Environmental Protection Procedures*) of the EIS. Concrete for cast-in place bridge construction will be isolated from local water sources via a coffer dam scenario or socketing pier sleeves into bedrock to create isolated conditions for concrete pour and curing. Chapter 5, Appendix 5-3 *Environmental Protection Procedures,* GR130.15.1.9 indicates that no deleterious material shall enter the water and GR130.3.2.3 requires isolation of in water works for the protection of water quality, fish and fish habitat. *The Freshwater Intake End-of-Pipe Fish Screen Guidelines (http://www.dfo-mpo.gc.ca/Library/223669.pdf)* are followed in situations where water is being taken from a fish bearing stream to protect fish. *B.* With regard to identifying source water bodies for water withdrawal required for batch plants: The contractor applies for a license for their batch plant, under the Manitoba Environment Act. Manitoba specifies environmental protection measures for placement and operation of concrete batch plants including setbacks from waterbodies. Furthermore, water withdrawals are regulated under the Manitoba Water Rights Act and permits are required for water withdrawals from surface or ground waters. In addition, Crown Lands Act Work Permits must be obtained for the batch plant. Work permits issued by Manitoba Sustainable Development (formerly Manitoba Conservation) provide specific environment protection measures for the site. Since batch plants are owned by the contractor, Manitoba requires the contractor to obtain said permits. The requirement for the contractor to obtain these permits is also stipulated in Chapter 5, Appendix 5-4 *GR130s Environmental Protection Specifications,* GR130.21 *Cement Batch Plant and Concrete Wash Out Area*.

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						The construction contracts also specify requirements for the contractor which provide protection for waterbodies such as minimum setbacks from waterbodies, and requirement and approval of site layout plans. A requirement of the contract is for the contractor to have all appropriate permits for the work in advance of operation. Contract clauses of General Conditions apply: • Section 7.33-The contractor must comply with all laws, by-laws, ordinances, regulations, codes and orders of authorities having jurisdiction which are or come into force during the performance of Work and which relate to the Work. Where there are two or more laws, by-laws, ordinances, regulations or codes applicable to the Work, the most restrictive will apply; and • Section 7.34- The contractor will obtain approvals, clearances, permits, licenses and certificates required by law or by any by-laws, ordinances, regulations, codes or orders of the authorities having jurisdiction for the performance of the Work. C. With regard to incorporating water bodies used for concrete washout management, operation of concrete batch plants, or cast-in-place bridge construction in the water quality monitoring plans described in Chapter 14 *Monitoring and Follow Up* of the EIS, waterbodies are not used for concrete washouts, see response to CEAA-11 B for mitigation measures proposed. Waterbodies used for providing water for operation of concrete batch plants will be selected in the construction phase by the contractor based on proximity to batch plant locations and suitability of the water supply. The Manitoba Environmental License that is issued for the batch plant will specify measures to protect water quality, fish and fish habitat as appropriate.
Migratory Birds						

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
CEAA-12 / ECCC-CWS-01	5(1)(a)(ii) Migratory Birds	EIS Guidelines, Part 2, 6.2.3., 6.3.2, and 6.3.3.	Chapter 9	Project effects to the Migratory Bird VC have been evaluated by considering bird species in two sub-groups - Forest birds (including *Species at Risk Act* listed land birds) and Water birds (Trumpeter Swan and Yellow Rail). The selected bird species within these two groups (species that are rare, uncommon or associated with habitat types not predominant within the Project Footprint) do not adequately represent the Migratory Birds species which may be found within the Project Footprint during construction and operation activities (Chapter 9, Appendix 9-1). Project effects on ducks and geese, bird species valued for current use by Indigenous Peoples within the Regional Assessment Area (Chapter 9, Appendix 9-1), have not been assessed.	A. Identify and assess Project construction and operation effects to one or more bog inhabiting bird species, such as the Palm Warbler; forest birds such as the Lincoln Sparrow; and any bird species of importance to Indigenous groups such as ducks and geese. Provide a clear rationale for excluding any species. B. Identify and describe species-specific mitigation measures required to address Project effects to birds inhabiting the specific habitats associated with the Project Footprint and Local Assessment Area. C. For each habitat type, describe mitigation measures that will be required to avoid the incidental taking of nests, eggs, or young or the creation of waters harmful to migratory birds. D. If mitigation measures currently presented in Chapter 5 and Appendices are considered to address these species sufficiently, provide a rationale. E. Update the EIS to reflect the analysis for the newly assessed species within the residual effects assessment and significance rating for the migratory bird VC. Reflect this within the cumulative effects assessment in Chapter 13. F. Correct all tables in Chapter 9 presenting habitat types within the Project Footprint, Local Assessment Area, and Regional Assessment Area. Column headings include an error that under represents values in the column “Proportion (%)”. The heading incorrectly suggests the values are percentages while they are not (i.e. Table 9.4 column suggests 0.67 % of the Project Footprint is bog and fen complex instead of the correct 67%).	A. With regard to identifying and assessing effects on bog inhabiting bird species: construction and operational effects of the Project have been assessed for bog, fen and wetland inhabiting bird species, forest birds, and to bird species of importance to aboriginal groups. As listed in Section 9.2.5.5 *Forest Birds* of Chapter 9 in the EIS, the Forest Bird VC includes species such as Olive-sided Flycatcher, Canada Warbler, Common Nighthawk and Eastern Whip-Poor-Will. Section 9.2.5.6 *Waterbirds* of Chapter 9 in the EIS lists Trumpeter Swan, yellow rail, geese and ducks. The aforementioned sections and species descriptions demonstrate that the selected VCs include consideration of bog, fen, wetland and forest inhabiting bird species, and that ducks and geese are considered culturally important to local indigenous groups. Table 64 of the *Wildlife Technical Report* (Appendix 9-1 of the EIS), provides further consideration of bird species by linking VCs to common bird species through habitat association. Therefore, residual effect and significance conclusion tables for forest birds (Chapter 9, Table 9.44 *Summary of Residual Project Effects and Significance Conclusions for Forest Birds*) and waterbirds (Chapter 9, Table 9.49 *Summary of Residual Project Effects and Significance Conclusions for Waterbirds*) are applicable to all forest birds not only those species explicitly identified in the EIS. B. With regard to identifying and describing species specific mitigation measures required to address effects on birds inhabiting the specific habitats associated with the project footprint and the local assessment area, mitigation measures for birds are found in • Table 9.41 *Summary of Potential Construction – Related Environmental Effects on Forest Birds and Proposed Mitigation Measures;* • Table 9.43 *Summary of Potential Operations and Maintenance – Related Environmental Effects on Forest Birds and Proposed Mitigation Measures;* • Table 9.46 *Summary of Potential Construction – Related Environmental Effects on Waterbirds and Proposed Mitigation Measures; and* • Table 9.48 *Summary of Potential Operations and Maintenance – Related Environmental Effects on Waterbirds and Proposed*

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						Mitigation Measures.
						
						The suite of mitigation measures presented in the EIS apply to all birds species in all habitat types, as well as mitigation measures that apply universally to specific categories of birds (i.e. Waterfowl) and their associated habitat types. These are listed in Appendix 5-3 *Environmental Protection Procedures* and Appendix 5-4 *GR130s Environmental Protection Specifications of Chapter 5 of the EIS*:
						• EPP1 *Clearing and Grubbing*:
						  ○ EPP1 4.2;
						• EPP14 *Wildlife*:
						  ○ EPP14 4.4;
						  ○ EPP14 4.8;
						  ○ EPP14 4.10;
						• GR130.17 *Clearing and Grubbing:*
						  ○ GR130.17.1.2;
						• GR130.19 *Wildlife:*
						  ○ GR130.19.1;
						  ○ GR130.19.4;
						  ○ GR130.19.8; and
						  ○ GR130.19.9.
						
						C. With regard to describing mitigation measures to avoid incidental taking of nests, eggs, or young or the creation of waters harmful to migratory birds, the Environmental Protection Procedures include mitigation measures to prevent the incidental take of nests, eggs or birds. These mitigation measures apply to all habitat types, and can be found in Appendix 5-3 *Environmental Protection Procedures* and Appendix 5-4 *GR130s Environmental Protection Specifications* in EIS under:
						• EPP1 *Clearing and Grubbing*:
						  ○ EPP1 4.2;
						• EPP14 *Wildlife:*
						  ○ EPP14 4.4;
						  ○ EPP14 4.8;
						  ○ EPP14 4.10;
						• GR130.17 *Clearing and Grubbing:*
						  ○ GR130.17.1.2;
						• GR130.19 *Wildlife:*
						  ○ GR130.19.1;

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						○ GR130.19.4; ○ GR130.19.8; and ○ GR130.19.9. With respect to concern for creation of water harmful to migratory birds; unlike oil sands or large scale mineral extraction development, the project will not require or create pools of hazardous or contaminated water. Concrete washout areas are small (typically no larger than 2.5 x 2.5 m) and do not typically create standing surface water. Retention or settlement ponds are small, no greater than 20m^2, temporary in nature and are used to settle out suspended sediments for erosion and sedimentation control (no hazardous substances). D. With regard to a providing rationale for mitigation measures presented in Chapter 5 and Appendices: The incidental take disturbance or destruction of nests, eggs or birds have been addressed through mitigation measures that incorporate avoidance practices at the planning and design stage, incorporation of strict construction requirements in contract documents such as timing windows for clearing, and site inspection during construction for compliance. The combination of mitigation measures presented in *Environmental Protection Procedures* and Appendix 5-4 *GR130s Environmental Protection Specifications*: • EPP1 *Clearing and Grubbing*: 4.2; • EPP14 *Wildlife:* 4.4, 4.8, 4.10; • GR130.17 *Clearing and Grubbing:* ○ GR130.17.1.2 ; • GR130.19 *Wildlife:* ○ GR130.19.1; ○ GR130.19.4; ○ GR130.19.8; and ○ GR130.19.9. These measures will sufficiently protect migratory birds. Proposed clearing restriction dates found in *Clearing and Grubbing* EPP1- 4.2, Appendix 5-3 *Environmental Protection Procedures* and GR130.17.1.2, Appendix 5-4 *GR130s Environmental Protection Specifications* in the EIS are consistent with the *General Nesting Periods for Migratory Birds*

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						in zone C5 (Environment Canada: https://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4F39A78F-1). Mitigation measures have been applied to works on Project 1: *PR304 to Berens River All-Season Road* and there have been no known cases of an active or multigenerational bird nest, or eggs, being destroyed or taken. E. With regard to updating the EIS to reflect the analysis for the newly assessed species within the residual effects assessment: Although not specifically listed in the Forest Bird or Waterbird VC groups, the EIS makes reference to bird species associated with representative habitats (Chapter 9, Appendix 9-1, Section 12.2 Table 64: *Examples of Habitat Associations for Bird Species that were Modelled*). As such, species such as Palm Warbler and Lincoln Sparrow are considered in the residual effects assessment tables for these VCs. Ducks and geese are explicitly listed as members of the waterbird VC (Chapter 9, Section 9.2.5.6 *Waterbirds*) and were included on the basis of their importance as a harvested and culturally important species. As per section Chapter 13, section 13.2 *Scoping*, Forest Birds and Waterbirds were not deemed to experience residual effects as a result of the Project. These VCs were screened using the Cumulative Effects Assessment Criteria as noted in the EIS, Chapter 13, Figure 13-1: *Approach to Scoping and Screening of VCs for Further Cumulative Effects Analysis.* F. With regard to correcting the typographical error in Tables 9.1, 9.2, 9.3, 9.4 in Chapter 9 of and Appendix 9-1 of EIS. The heading “Proportion (%)” is to read “Proportion”.
Species at Risk						

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
CEAA-13	5(1)(a) – aquatic Species at Risk, migratory bird Species at Risk			The environmental assessment must include the following information to support the analysis of potential effects to species at risk: residences, seasonal movements, movement corridors, interprovincial ranges, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable), and general life history of species at risk that may occur in the project area or be affected by the project. The EIS identifies 20 federally listed or assessed species at risk with likely potential to occur and use habitat in the Project Footprint/Local Assessment Area/Regional Assessment Area (Chapter 8, Table 8.4, and Appendix 9-7). The EIS does not carry forward all of these species as a VC or component species within a VC. Two listed bird species at risk (Short-eared Owl, Horned Grebe) are identified in Appendix 9-7 as potentially present in the Project Footprint and Local Assessment Area but are not addressed in the EIS. Another species at risk, Least Bittern, is similarly not addressed in the EIS main text but was described in the appended wildlife technical report (Appendix 9-1), as a species assessed under the Waterbirds VC. This species was also listed in Appendix 9-6: List of Bird Species in the Local Assessment Area and Their Conservation Status.	A. For each potentially present species listed under the *Species at Risk Act* or assessed and recommended for listing by the Committee on the Status of Endangered Wildlife in Canada that may occur in the project area or be affected by the project provide the following information: i. Residences, seasonal movements, movement corridors, interprovincial ranges, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable) and general life history. B. For project components with locations undefined (e.g. camps, quarries), describe mitigation measures to avoid effects to species at risk that will be considered in location selection. C. Correct the reference in the EIS (Section 8.2.4.3.2, p.8-37) that indicates " In the event that aquatic species at risk are found in any other watercourses in the Local Assessment Area, the mitigation measures outlined in section 8.2.2.1.2 will be applied". This section does not exist in the EIS. D. Review Chapter 5 mitigation measures and describe how contractors will be asked to confirm endangered species habitat for the species at risk identified as potentially present in the Project Footprint or Local Assessment Area.	A. With regard to including information on potentially present SARA listed species, the EIS is not intended to provide a comprehensive documentation of every individual species that may be found within the project area. Rather, the EIS documents the identification and assessment of potential effects on VCs including species at risk with consideration of relevant factors. Background information is intended to set the stage for the discussion, identification and assessment of effects on VCs and relevant information is provided as appropriate. i. Table 9-7a: *Regulatory and Ecological Context for Species at Risk that Potentially Occur in the Project 4 Region* in Appendix 9-7, Chapter 9 in the EIS, and Table 8.4: *Potential Species at Risk in the Local Assessment Areas* in Chapter 8 of EIS includes information on habitat, critical habitat, and potential occurrence in the Local Assessment Areas or Regional Assessment Area. This has been further summarized in Annex 4 - *Project 4 Environmental Effects Analysis for Aquatic Species at Risk*. • With the exception of caribou, there are no defined movement corridors for the species at risk in the area. Published information on movement corridors for migratory species is so general that it is not applicable to the assessment of project related effects. • Interprovincial ranges does not influence the assessment of project related effects. • Seasonal movements and general life history information that is relevant to the assessment of project related effects was considered in the identification and assessment of effects. Three aquatic species at risk have been identified in the project area: Lake Sturgeon, Mapleleaf Mussel, and Shortjaw Cisco. COSEWIC status reports have been completed for each species and are cited in the EIS (COSEWIC 2006a, 2006b, 2004) as is Cleator et al. (2010, Canadian Scientific Advisory Secretariat -Information Relevant to a Recovery Potential Assessment of Lake Sturgeon: Red-Assiniboine Rivers – Lake Winnipeg Populations - DU4). These documents provide general descriptions of the residences, seasonal movements, movement corridors, interprovincial ranges, habitat requirements, key habitat areas, and general life history as known at the time of the assessments. Critical habitats have not been identified for any of the species at risk

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						identified. As it is expected that the regulators will have a familiarity with the COSEWIC and Canadian Scientific Advisory Secretariat documents, the EIS has not attempted to duplicate this information, but has supplemented it with additional information specific to the study area that has become known since the assessments were completed. The EIS has also taken this information into consideration when assessing potential effects on the species at risk. In Chapter 8 of the EIS, Section 8.1.3 *Fish Community*, Lake Sturgeon were identified as one of 42 fish species present in the project assessment area, occurring in the Berens and Pigeon rivers. Mapleleaf Mussels were identified only from the Berens River as noted in Section 8.1.4 *Mussels*. Their life cycle is depicted in Figure 8.2 *Freshwater Mussel Reproductive Cycle (Freshwater Mussel Conservation Society 2015)*. As stated in Section 8.1.4, the collection of the Mapleleaf Mussel from the Berens River is the first documented occurrence of the species in this watershed; therefore, the population size and distribution within the river are unknown. Chapter 8 of the EIS, Section 8.1.5 *Species At Risk* provides further information on the aquatic species of risk occurring in the assessment area. Table 8.4 *Potential Species at Risk in the Local Assessment Area* summarizes their preferred habitats and their known presence in the study area. It also summarizes the status of each species in regards to listing under SARA. Section 8.1.5.1 *Lake Sturgeon* provides a general description of the range, distribution, and preferred habitats of Lake Sturgeon and the threats to and potential impacts on Lake Sturgeon and their habitat in relation to project effects. Section 8.1.5.2 *Mapleleaf Mussel* provides a general description of the range, distribution and preferred habitats of Mapleleaf Mussel and the threats to and potential impacts on Mapleleaf Mussel and their habitat in relation to project effects. Section 8.1.5.3 *Shortjaw Cisco* provides a general description of the range, distribution, and preferred habitats Shortjaw Cisco. This species is only known to occur in Lake Winnipeg and therefore has no potential to be affected by the project.

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response

						B. With regard to mitigation measures associated with species at risk at project components with undefined locations: Locations of temporary work areas, including camps and quarries are not undefined. They are in or directly adjacent to the right of way and the effects assessment and mitigation measures that have been presented in the EIS have considered this. Furthermore, preference for temporary work areas is in pre-existing disturbed areas.
						
						Mitigation measures for the avoidance of species at risk and selection of undefined temporary work components such as camps and quarries are listed under Appendix 5-3 *Environmental Protection Procedures* and Appendix 5-4 *GR130s Environmental Protection Specifications* of the EIS:
						• EPP14 *Wildlife:*
						  ○ EPP14 4.2;
						• EPP20 *Temporary Work – Site Selection:*
						  ○ EPP20 5.2; and
						  ○ EPP20 5.3.
						
						Section 5.2 of EPP20 *Temporary Work – Site Selection*, specifically addresses site selection of such features. Mitigation measures are applied to such sites regardless of their location.
						
						C. With regard to correcting the typographical error to the reference in the EIS (Section 8.2.4.3.2, p.8-37), the reference “8.2.2.1.2” is to read “8.2.4.1.2”.
						
						D. With regard to reviewing Chapter 5 mitigation methods and describing how contractors are to confirm endangered species habitat: Contractors are not responsible to confirm endangered species habitat. Where known, locations have been avoided through design mitigation and routing of the alignment.
						
						Table 4.6 states that sensitive site areas are considered throughout the EIS and the design phase. They have been used to refine the proposed route alignment and to identify appropriate mitigation through setbacks and restricted access including erecting temporary barriers to prohibit access during construction. Further reference to this can be found in Chapter 2 *Project Justification and Alternatives Considered*, Chapter 7 *Physical Environment*, Chapter 8 *Aquatic Environment*, and Chapter 9 *Terrestrial Environment* in the EIS.

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						Chapter 9, Section 9.1.3 *Wildlife* in the EIS describes the studies conducted on the Local and Regional Assessment Area to identify wildlife Species at Risk with consideration to land use, movement patterns, home range sizes, core range use, habitat selectivity and other variables. Chapter 9, Section 9.2.3 *Mitigation* states mitigation measures incorporated into the Project design to mitigate potential adverse effects on the terrestrial environment, including VCs and Species at Risk. The following tables in Chapter 9 *Terrestrial Environment* show the summary of potential construction, operation, and maintenance-related environmental effects, and their proposed mitigation measures: • Table 9.15 *Summary of Construction-Related Potential Environmental Effects on Vegetation Communities and Plant Species of Cultural Importance and Proposed Mitigation Measures*; • Table 9.16 *Summary of Potential Operations and Maintenance-Related Environmental Effects on Vegetation Communities and Plant Species of Cultural Importance and Proposed Mitigation Measures*; • Table 9.21 *Summary of Potential Construction-Related Environmental Effects on Moose and Proposed Mitigation Measures*; • Table 9.22 *Summary of Potential Operations and Maintenance Related Environmental Effects on Moose and Proposed Mitigation Measures*; • Table 9.25 *Summary of Potential Construction-Related Environmental Effects on Boreal Woodland Caribou and Proposed Mitigation Measures*; • Table 9.26 *Summary of Potential Operations and Maintenance-Related Environmental Effects on Boreal Woodland Caribou and Proposed Mitigation Measures*; • Table 9.31 *Summary of Potential Construction-Related Environmental Effects on Aquatic Furbearers and Proposed Mitigation Measures*; • Table 9.32 *Summary of Potential Operations and Maintenance-Related Environmental Effects on Aquatic Furbearers and Proposed Mitigation Measures*; • Table 9.37 *Summary of Potential Construction-Related Environmental Effects on Terrestrial Furbearers and Proposed Mitigation Measures*; • Table 9.38 *Summary of Potential Operations and Maintenance-Related Environmental Effects on Terrestrial Furbearers and Proposed Mitigation Measures*; • Table 9.41 *Summary of Potential Construction-Related Environmental*

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						Effects on Forest Birds and Proposed Mitigation Measures; • Table 9.43 *Summary of Potential Operations and Maintenance-Related Environmental Effects on Forest Birds and Proposed Mitigation Measures*; • Table 9.46 *Summary of Potential Construction-Related Environmental Effects on Waterbirds and Proposed Mitigation Measures*; • Table 9.48 *Summary of Potential Operations and Maintenance-Related Environmental Effects on Waterbirds and Proposed Mitigation Measures*; • Table 9.50 *Summary of Potential Construction-Related Environmental Effects on Environmentally Sensitive Wildlife Sites and Proposed Mitigation Measures*; • Table 9.51 *Summary of Potential Operations and Maintenance-Related Environmental Effects on Environmentally Sensitive Wildlife Sites and Proposed Mitigation Measures*; and • Table 9.54 *Summary of Potential Construction and Operations and Maintenance-Related Environmental Effects on Herptiles and Proposed Mitigation Measures.* Stated throughout Chapter 9 *Terrestrial Environment* of the EIS, environmentally sensitive sites, such as mineral licks, dens, and nests, will be anonymously identified in construction drawings as restricted access areas. Also stated through Chapter 9, in the event that dens, heron rookeries, hibernacula, large stick nests or mineral licks are found during construction, operations and maintenance activities, these areas will be marked and isolated as Environmentally Sensitive Sites.
CEAA-14	Species at Risk 19(a) – cumulative effects 19(b) – significance of effects	Section 6.6.3 (b), (d), (e)	Chapter 9, Chapter 13, Appendix 9-1	The EIS (chapter 9, Appendix 9-1) includes a description of total habitat disturbance within the Atikaki-Berens Boreal Woodland Caribou Management Unit relative to the sustainable threshold of 65% undisturbed (35% disturbed) habitat identified by Environment Canada (2012). In cases presented from 1960 to 2025, disturbance ranged from 48.1% (due to fire disturbance) to 33.4%. The EIS states that "Decommissioning of the winter road is expected to provide an	A. Provide justification for describing as moderate magnitude the exceedance of a sustainability threshold, that is the 65% undisturbed (35% disturbed) habitat value identified by Environment Canada (2012) in the *Recovery Strategy for the Woodland Caribou Boreal Population*. B. Provide scientific evidence, analysis, and methodology used to support the assertion in the EIS that the habitat created by decommissioning the winter road will be suitable woodland caribou habitat by the year 2020. C. Provide an analysis of the cumulative habitat disturbance for the Atikaki-Berens management unit	A. These questions were addressed during the meeting with Environment Canada on June 21, 2016. With regard to providing a justification for describing a the exceedance of a 65% undisturbed sustainability threshold as moderate magnitude: Chapter 13, Table 13.4 *Total Percentage of Cumulative Habitat Disturbance over Time for the Atikaki-Berens Boreal Woodland Caribou Management Unit* of the EIS and Table 19 *Disturbance Factors and Extent of Disturbance of the Atikaki-Berens Management Unit* of the *Wildlife Technical Report* Chapter 9 Appendix 9-1 of the EIS demonstrate that the disturbance threshold remains below 35% with inclusion of the construction of the Project, and in consideration of cumulative effects.

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				additional 31 ha of mixed habitat types in the Local Assessment Area and an additional 112 ha of mixed habitat types in the Regional Assessment Area" (p. 9-78) and therefore that the total percentage of cumulative habitat disturbance for the Atikaki-Berens Boreal Woodland Caribou Management Unit will realize a positive habitat gain for caribou by the year 2020 (Table 13.4).	in which the winter road habitat is not suitable woodland caribou habitat by the year 2020. Indicate how this would impact the significance determination for project effects to caribou (Table 9.27) and the significance determination for the cumulative effect analysis (Table13.5). Provide a worst-case scenario analysis that also takes into account the region's natural fire disturbance cycle (e.g. 40 year fire return cycle and forest fire in 2020). Update the predicted disturbance areas in Table 13.4 (p.13-15), the proposed mitigation measures, and the significance conclusions in Table 13.5 (p. 13-17) for cumulative effects to woodland caribou as appropriate.	B. These questions were addressed during the meeting with Environment Canada on June 21, 2016. With regard to providing scientific evidence to support the assertion that decommissioned winter road will be suitable woodland caribou habitat: By 2020, portions of the winter road will no longer be operational. The predominant vegetation cover type intersected by the winter road consists of low-height fen and bog vegetation. Little regeneration of vegetation on the winter road (regrowth of forbs and sedges) is required for use of the winter road by caribou. Furthermore, because there is little differentiation between surrounding vegetation, and vegetation along the winter road itself, once no longer operational the disturbance buffer of 500m along the winter road is no longer applicable, and therefore, all of the area within 500m of the winter road becomes useable habitat. As per Section 6.1 *Methods* of the *Wildlife Technical Report* (Chapter 9, Appendix 9-1 of the EIS), vascular plants, lichen and bryophytes are expected to return to decommissioned winter roads within 5 years. Conifer species would be expected to re-establish within 5 years, but may take several years to reach mature canopy height. Where vegetation has been removed, plants will begin to re-establish as soon as the year after the winter road is no longer in use. Map 07 *The land Cover Classification in the Local Project Study Area* of the *Wildlife Technical Report* (Chapter9, Appendix 9-1 of the EIS) shows the land cover classification in the area surrounding the Project RAA. As shown, the majority of the winter road traverses fen and bog (wetland - shrub and wetland – herb) cover types. These land cover classes closely coincide with current summer core use and calving areas for caribou shown in map S-04, submitted to Environment Canada on June 17, 2016. Further, Map 9 *Caribou Predicted High Quality Calving Habitat for Project 4 Study Area* of the *Wildlife Technical Report* shows that substantial tracts of predicted high quality calving habitat exist along the current winter road alignment, again, this area correlates with bog and fen cover types. This scientific evidence demonstrates that caribou in this region utilize open habitat complexes. As the road is decommissioned, habitat is expected to regenerate as discussed in Section 6.1 *Methods* of the Wildlife Technical

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						Report (Chapter 9, Appendix 9-1 of the EIS) and Annex 8 - *Bloodvein Vegetation Recovery Assessment* Report. Re-establishment of vascular plants, grasses, forbs, and shrubs is anticipated within a few years. Slower regeneration times for conifer species are not anticipated to affect habitat use as natural canopy cover in these areas is very limited. The *Bloodvein Vegetation Recovery Assessment* determined within 5 years of winter road closure tree species regeneration was up to 25%, including black spruce, jack pine, tamarack as well as deciduous species. Herbaceous cover has regenerated quicker than tree species although tree species regeneration is expected to gradually increase annually at a rate that is considered normal. This has been further summarized in Annex 8 – *Bloodvein Vegetation Recovery Assessment* Report. C. With regard to providing an analysis of the cumulative habitat disturbance for the Atikaki Barens management unit: Fire-disturbed areas regenerate to mature habitat for use by caribou approximately 40 years post-fire (Environment Canada. Recovery Strategy for Woodland Caribou). Although habitat will still be used prior to maturation it is considered to be fully available for use 40 years post-fire. A worst case scenario for cumulative effects assessment of boreal woodland caribou is that fire results in the immediate loss of habitat for caribou, but would ultimately return to mature habitat and full use after 40 years (as shown by 1960 data). With regard to the cumulative habitat disturbance these questions were addressed during the meeting with Environment Canada on June 21, 2016.
CEAA-15 / ECCC-CWS-02	5 - caribou 5(1)(c)(iii) – current use, caribou		Chapter 9, 9.2.5.2 Boreal Woodland Caribou	Analysis of historic and current collaring data collected from 2011 to 2015 indicates that the all-season road (total length 94.53 km) will intersect 26.3 km of caribou summer core use, and 25.2 km of boreal woodland caribou winter core use (Table 9.24; Joro Consultants 2015a). More details regarding the movement patterns and habitat use of the caribou is required to evaluate proposed mitigation measures and potential residual effects. Residual effects from Project related mortality are assumed to be negligible	A. Provide additional detail (e.g., mapping) information on the annual movements and habitat use of caribou (calving, wintering habitat) including seasonal movements across the proposed new all-season road corridor and existing linear features (e.g. winter road and power transmission line). B. Update the cumulative effect assessment to consider information on caribou use areas and detailed seasonal habitat use. C. Describe the mitigation measures to address potential barriers to caribou and wildlife movement posed by quarries. D. Provide additional detail regarding the mitigation measures to address construction and blasting	A. With regard to providing additional detail on the annual movements and habitat use of caribou: Meetings (June 21, 2016) and submissions (June 17, 2016) to Environment Canada have addressed these questions. B. With regard to updating the cumulative effect assessment to consider information on caribou use areas and detailed seasonal habitat use: The cumulative effects assessment for caribou was conducted on the basis of disturbance thresholds identified in the *Environment Canada Recovery Strategy for Woodland Caribou*. Environment Canada identified critical habitat for boreal woodland caribou as the entire range, not by use area or seasonal habitat. C. With regard to describing the mitigation measures to address potential barriers to caribou and wildlife movement posed by quarries: Quarries

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				given the absence of reported caribou collisions during 4 years of construction for Project 1 (p.9-81). However an evaluation of Project related mortality has not been completed considering the increased traffic volumes anticipated during operation of the Project. Indigenous groups have also identified that traffic volumes are underestimated. An updated analysis of Project related mortality is required for the increased traffic volumes. No residual effects are identified for predation related mortality to caribou. The proponent assumes there will be no change to wolf predation risk to caribou in the RAA and LAA as a result of the Project due to decommissioning of the temporary access routes and winter road. However, even with the future natural reclamation and revegetation of the winter road the Project will create a new linear disturbance enabling predator travel within caribou habitat resulting in a residual effect. Disturbance and displacement of animals as a result of quarry blasting and other construction activities is described; however, mitigation measures are not clearly detailed. Caribou interactions with project-created hazards such as retention ponds or quarries are not evaluated. The EIS (p.9-71), states that there is limited hunting use of boreal woodland caribou: "Boreal woodland caribou were traditionally hunted by some communities on the east side, but use of this species as a food source has declined or ceased as the	effects during spring calving. For construction activities and blasting, how long would activities be suspended and at what distance from known calving areas would this be done? Describe potential residual effects with a clear rationale if residual effects are considered negligible. E. Update the residual effects assessment for project effects to caribou (e.g. Tables 9.26 and 9.27) to include mortality effects to caribou from predicted increases in traffic volumes and predators (see IR CEAA-29). Describe mitigation measures to address these effects. F. Describe how potential effects on caribou would affect current use (e.g. hunting), availability of country foods, and the potential impacts to rights. Identify proposed mitigation/accommodation measures and describe the view of Indigenous groups on these measures.	developed and operated for the Project are not anticipated to act as barriers to caribou or wildlife movement. Design mitigation measures have located the road alignment on suitable terrain and soil conditions (see section 2.2.2.1 *Background* of Chapter 2 *Project Justification and Alternatives Considered*, section 3.3.6 *Quarries and Borrow Areas* of Chapter 3 *Project Description* and section 5.2.1 *Design Mitigation and Community Stakeholder Input* of Chapter 5 Environmental Protection and Sustainable Development in the EIS). The selected route optimizes use of materials within the right-of-way and thus, greatly reduces the number of quarries required to source construction materials. Secondly, the small size of quarries, in combinations with vast expanses of undisturbed habitat between and adjacent to quarries provides ample area for wide-ranging ungulates such as caribou to avoid quarry sites. This is consistent with caribou movements observed in relation to Project 1 PR304 to Berens River All-Season Road. Mitigation measures addressing potential barriers to caribou and wildlife movement, including quarry development and operation are described in Appendix 5-3 *Environmental Protection Procedures* and Appendix 5-4 *GR130s Environmental Protection Specifications:* • EPP1 *Clearing and Grubbing:* ○ EPP1 4.0.1; ○ EPP1 4.0.2; ○ EPP1 4.0.4; ○ EPP1 4.0.5; ○ EPP1 4.0.7; ○ EPP1 4.0.9; ○ EPP1 4.0.11; ○ EPP1 4.0.13; ○ EPP1 4.1.2; • EPP14 *Wildlife:* ○ EPP14 4.0.3; ○ EPP14 4.0.6; ○ EPP14 4.0.8; ○ EPP14 4.0.13; • GR130.17 *Clearing and Grubbing:* ○ GR130.17.1.1; ○ GR130.17.1.2;

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
				communities have become aware of its status. Licensed hunting of boreal woodland caribou is not permitted in Manitoba (MCWS 2015c).” However, Poplar River First Nation has indicated that two families within Poplar River’s traditional territory continue to harvest woodland caribou annually and there may be others who hunt caribou when there is an opportunity to do so.		○ GR130.17.1.5; ○ GR130.17.2.2; ○ GR130.17.2.3; ○ GR130.17.3.1; ○ GR130.17.4.2.1; • GR130.19 *Wildlife:* ○ GR130.19.1; ○ GR130.19.2; ○ GR130.19.3; ○ GR130.19.6; and ○ GR130.19.8. D. With regard to providing additional detail on mitigation measures to address construction and blasting effects during spring calving: Specific mitigation measures to reduce construction and blasting effects during the spring calving season are identified in Appendix 5-3 *Environmental Protection Procedures* and Appendix 5-4 *GR130s Environmental Protection Specifications* of the EIS: • EPP14 *Wildlife:* ○ EPP14 4.6; ○ EPP14 4.13; and • GR130.19 *Wildlife*: ○ GR130.19.6, In Manitoba, quarries require additional permits at the time of development and operation. Manitoba considers site-specific information and includes conditions as part of permitting requirements. E. With regard to updating the residual effects assessment for caribou to include increased traffic volumes and predators: In Manitoba, instances of vehicle collisions with caribou are rare. There have been no documented occurrence of vehicle collisions with caribou on the lower portion of Project 1 (PR304 to Berens River All-Season Road), located on the east side of Lake Winnipeg. This portion of the road has been in existence since the early 1980s. Road salts, a known attractant for ungulates, which is considered to be a factor in wildlife-vehicle collisions will not be applied during construction or operation of Project 4.

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						Information from Project 1 and caribou and predator monitoring on the east side of Lake Winnipeg has not demonstrated any increase in mortality from predators near roads. Data from collared wolves illustrate no significant use of Project 1 or other linear features, and are mainly foraging on moose in associated habitats. Increased mortality from vehicle collisions and predation were assessed in the EIS in sections 9.2.5.2.1 *Construction Effects and Mitigation*, 9.2.5.2.2 *Operations and Maintenance Effects and Mitigation* in Chapter 9 *Terrestrial Environment* and Section 8.3 *Wolf Collaring – Effects on Moose* of the *Wildlife Technical Report* (Chapter 9, Appendix 9-1 of EIS). Only items deemed to have residual effects were carried over to Table 9.26 *Summary of Potential Operations and Maintenance-Related Environmental Effects on Boreal Woodland Caribou and Proposed Mitigation Measures* and Table 9.27 *Summary of Residual Project Effects and Significance Conclusions for Boreal Woodland Caribou*. F. With regard to describing how potential effects on caribou would affect current use and availability of country foods: Boreal woodland caribou are protected under the Manitoba Endangered Species and Ecosystems Act. Licensed boreal woodland caribou hunting is not permitted in Manitoba. Similarly, Berens River and Poplar River First Nations indicated that they no longer hunt caribou (SNC Lavalin et al. 2009, SNC Lacvalin2011c, CIER 2015, Chapter 10, Section 10.1.6.1 *Hunting*, p.10-33 of EIS). As such there will be no impact to the availability of country foods, or aboriginal and treaty rights.
Atmospheric Effects						
ECCC-AQ-IR-03 / CEAA-16	5(1)(b) – change to the environment on federal lands, other province, outside of Canada	EIS Guidelines, Part 2, Section 6.2 Predicted Changes to the Physical	Chapter 13, Cumulative Environmental Effects, Appendix 13-5	The Greenhouse Gas Emissions Assessment estimates have several inconsistencies and irregularities.	A. The summary analysis presented in Appendix 13-5, *Greenhouse Gas Emissions (GHG) Assessment for East Side Road Authority All-Season Road Projects* relies on external documents (GHG quantification and assessment reports for Project 1) that are not publicly accessible to describe the GHG quantification methods employed for Project 4. Describe the methodology used. B. Present GHG emissions by individual pollutant as	A. With regard to describing the methodology used in the GHG assessment: The Original report is provided as an attachment to this document. Methodology can be found in Section 3 (p. 5-30) of *PR 304 to Berens River All –Season Road Environmental Impact Assessment Greenhouse Gas Emissions Assessment Report - Project No. 10-3402 July 2011* (Annex 9) B. With regard to presenting GHG emissions by individual pollutant: Please see Annex 9 for Tables 4.3 and 4.4 from Appendix 13-5 of the EIS broken

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
		Environment and 6.3.5 Trans-boundary Environment	Greenhouse Gas Emissions Assessment, Section 4, Tables 4.3-4.8.		requested in *Consideration of greenhouse gas emissions in environmental assessment for the proposed Project 4 – All-season Road Connecting Berens River and Poplar River First Nation*, CEAA letter to ESRA, February 11, 2016). C. Address the inconsistencies and apparent errors present between the EIS and the GHG assessment in Appendix 13 -5. i. Appendix 13-5, Table 4.4 does not include Project activities associated with operations and maintenance of the all-season road which are listed in the EIS as Project activities (grading, plowing, mowing, bridge maintenance, culvert cleanouts/ steaming, etc.). ii. The construction period is described in the GHG assessment as 7 years in duration vs 8 years described in the EIS. iii. Predicted operation phase effects are limited to only 10 years, despite the predicted +50 years (permanent) operation duration. iv. The wetland area considered in the GHG assessment appears to be held equal between baseline and Project scenarios despite the wetland area loss apparent in the Project Footprint. D. A comparison of Tables 4.3 (baseline, winter road) and 4.4 (Project 4, all-season road) indicates a reduction in emissions associated with vehicular use, going from the ice and winter road in the baseline scenario (802 tonnes CO2e) to the all-season road (717 tonnes CO2e). Discuss why vehicular emissions would be expected to decrease with the use of an all-season road. E. In Table 4.4, expected vehicular emissions in year 3 and 4 are given as 7174 tonnes instead of 717 tonnes as in the other years. Confirm whether this number is correct.	down to display individual pollutants. C. With regard to inconsistencies in Appendix 13-5: i. Emissions due to maintenance activities will be low in volume. It is estimated that maintenance will require 1 day activity per month (1 piece of heavy equipment with a supply truck i.e. gravel, gravel production once every 3 years estimated to be 4 days in duration) the additional GHG production will not be significant. ii. The additional year in the EIS covers minor construction activities such as mobilization and revegetation occurring prior to and following the major construction effort. Estimate from Appendix 13-5 of the EIS covers the heavy construction period. Minor construction activities are equivalent to or less than annual maintenance in terms of GHG production and therefore will not be significant and not expected to be different than current seasonal road use and future ASR use. iii. 10 years of operation is the point where the ASR shows a net benefit over the seasonal road system. Further extrapolation of the scenario beyond 10 years only increases the benefit of the ASR in terms of GHG production. The methodology can be found in section 3 (pg 5-30) of *PR 304 to Berens River All – Season Road Environmental Impact Assessment Greenhouse Gas Emissions Assessment Report - Project No. 10-3402 July 2011* (Annex 9). iv. The “wetlands” in this project area are bog and fen areas. The road itself floats on the fen and bog. There is nominal reduction in GHG production due to removal of surface area of biomass that is accounted for in Table 4.4 (post construction). When compared to Table 4.3 (pre construction) there is a decrease in wetland-related methane emissions (approximately 27 percent) due to reduced footprint (emissions are calculated per square meter). This accounts for less than one percent of total emissions. Methodology can be found in Section 3.1.2 (pg 7-9) of *PR 304 to Berens River All –Season Road Environmental Impact Assessment Greenhouse Gas Emissions Assessment Report - Project No. 10-3402 July 2011* (Annex 9). D. With regards to the reduction of emissions associated with transitioning from the ice and winter road to the all season road: Decreased emission

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						are due to decreased travel times and increased vehicle efficiency as a result of road surface improvements. Portions of the winter road as it currently exists occur over difficult terrain and as such results in increased GHG production. Methodology can be found in Section 3 of *PR 304 to Berens River All –Season Road Environmental Impact Assessment Greenhouse Gas Emissions Assessment Report - Project No. 10-3402 July 2011* (Annex 9) E. With regard to the vehicular emissions in year 3 and 4 of Table 4.4 of Appendix 13-5: Total vehicular use in years 1-10 of the operational phase on table 4.4 is 7169 Tonnes CO_2e. In year 3 and year 4 vehicular use is incorrectly listed as 7174 and should be 717 tonnes CO_2e (Annex 10).
ECCC-AQ-IR-06		EIS Guidelines, Part 2, 6.2 and 6.3.5	Appendix 13.5: Greenhouse Gas Emissions Assessment	The GHG assessment is lacking in detail and has inconsistencies to properly confirm the assessment of GHG emission impacts.	A. Provide details and analysis of proposed activities, such as the number of flights, vehicle trips, ferry trips, etc.; the number of km travelled by each of these modes; and the emission factors used to properly confirm the assessment of GHG emission impacts, taking into consideration responses provided to questions above on GHG emissions.	A. With regard to providing details and analysis of proposed activities and emissions used to assess impacts: The methodology can be found in Section 3 (pg 5-30) of *PR 304 to Berens River All –Season Road Environment Assessment Report* - Project No. 10-3402 July 2011 (Annex 9). Details and analysis are found in the report.
ECCC-AQ-IR-04	5(1)(b) – change to the environment on federal lands, other province, outside of Canada	EIS Guidelines, Part 2, 6.2 and 6.3.5	Chapter 13 (Cumulative Environmental Effects), Appendix 13-5 (Greenhouse Gas Emissions Assessment)	In EIS Appendix 13-5, pg. 22, the proponent recommends "that the wetland areas within the ROW remain as wetlands in order to maintain their carbon sequestration potential. Provisions for the management of flows (e.g. equalization culverts) should be considered to protect and preserve the wetlands systems through appropriate design measures".	A. Tables 4.3-4.8 do not consider carbon sequestration in wetlands but instead consider the methane emissions from wetlands and identify the reduced methane emissions from the reduced wetland area as a GHG benefit when considering the impacts of the all-season road. Explain this apparent contradiction in the GHG emissions assessment.	A. With regards to the comment about the possible contradiction in the GHG emissions assessment found in Tables 4.3 to 4.8 of Appendix 13-5: Dillon (2011, pg 8) cites studies of northern Manitoba wetlands where it was determined that they actively sequester carbon and emit methane simultaneously. This flux is factored into the calculations and the methodology can be found in Section 3 (pg 5-30) of *PR 304 to Berens River All –Season Road Environmental Impact Assessment Greenhouse Gas Emissions Assessment Report - Project No. 10-3402 July 2011* (Annex 9). There still remains carbon sequestration because the majority of the bog/fen is retained. The road floats over fen and bog.
Indigenous Peoples						
CEAA-17	5(1)(c) – an effect occurring in Canada of any change that may be caused to the			Potentially affected Indigenous groups, including Manitoba Métis Federation, have expressed concerns that traditional knowledge collected in the project area has not been considered; therefore, potential	A. Demonstrate how Aboriginal traditional knowledge, including but not limited to, information related to traditional land and resource use, was considered in the baseline information for each VC and assessment of environmental effects.	A. With regard to demonstrating how Traditional knowledge was considered in the baseline assessment of environment effects: Aboriginal Traditional knowledge (TK) is described in detail in the EIS. TK methods are presented in Chapter 4, and the manner by which TK was incorporated for various VCs is documented in Chapter 7 *Physical Environment*, Chapter 8 *Aquatic*

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
	environment on i) Health and socioeconomic conditions ii) Physical and cultural heritage iii) The current use of lands and resources for traditional purposes, or iv) Any structure, site or thing that is of historical, archaeological, paleontological or architectural significance			environmental effects have not been adequately characterized in the EIS. *Manitoba Métis Federation Traditional Knowledge and Land Use Study (TKLUS) for the study area identified by ESRA to include P4, P7 and P7a* was submitted to ESRA on May 31, 2016 after the submission of the EIS and contains information relevant to the Project 4 regional and local study areas.	B. If/where differences between Aboriginal and Western knowledge arise, include both information sources in the assessment and provide a rationale on the decision to consider one source of information over another.	*Environment, Chapter* 9 *Terrestrial Environment* and Chapter 10 *Socio-Economic and Cultural Environment* of the EIS. See Annex 11 for a flow chart documenting the approach and methodology for collecting and incorporating TK data into the project. TK is considered at every stage of the environmental assessment process and project planning, including the collection of baseline information, aboriginal and public engagement process (APEP), selection of VCs and design of mitigation measures. Traditional knowledge studies were undertaken with aboriginal communities to inform the scope of baseline studies and the environmental assessment. The collection of traditional knowledge within the regional assessment area commenced as part of the Large Area Network Study in 2009, which comprised of two rounds of engagement that included TK surveys and community meetings (see Section 4.2.2.1 *Aboriginal and Public Engagement – Round 1*; 4.2.3 *Large Area Network Study*; and, 4.2.3 *Aboriginal and Public Engagement - Round 2*). TK was also collected as part of the EIS for *Project 1 –PR304 to Berens River All Season Road*, which included land use and resource use data for Poplar River and Berens River First Nations. This information was further refined at the project level for the Project 4 EIA, including community-specific studies with First Nations in the LAA and the commissioning of a Traditional Land Use study by the MMF. The proponent provided funds in September 2015 to further the MMF study (undertake additional TK interviews). The manner by which traditional knowledge was considered for selection of VCs and assessment of environmental effects is documented throughout the EIS, including: Chapter 4 – *Aboriginal and Public Engagement* ▪ 4.1: Approach to aboriginal engagement, which includes “respecting and incorporating community and TK into the process” ▪ 4.1.3 and Figure 4-2: Description of the proponent’s TK philosophy and how it informs the Project Chapter 6 – *Environmental Impact Assessment Scope and Approach* ▪ 6.3.3, 6.3.4, and 6.4.1: Description of the TK studies, the sources of info, and how it was collected ▪ Appendix 6.1: VCs and Rationale for their Selection – e.g. ungulates

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						(moose), fish and harvested fish selected for aboriginal community cultural and traditional activities Chapter 7 – *Physical Environment* ▪ 7.1.1: Description of Anishinabek view of climate and the history of climate change ▪ 7.1.6, p.7-17: *"…the assessment of potential environmental effects of the proposed Project has focused on the physical environment components that area particularly important to local communities…"* ▪ 7.2.1, p.7-18: "*Baseline physical environment data compiled and collected for the Regional Assessment Area has been supplemented with traditional knowledge provided by the Berens River and Poplar River First Nations to develop a thorough understanding of the physical conditions affecting, and potentially affected by, the Project*" ▪ 7.2.3: Description of how the design and routing of the Project was informed by traditional knowledge, and how input of the local communities informed the design of mitigation measures. Chapter 8 – *Aquatic Environment :* ▪ Introduction: Description of how TK informed baseline information on the existing conditions for fish and fish habitat, and aquatic species at risk. ▪ 8.1.1: Overview of TK knowledge relating to fish a fish habitat, including species harvested and locations ▪ 8.1.3: Acknowledgement of TK's contribution to the identification of 42 fish species from 16 different families in the area ▪ 8.2.2: Description of how input from community members was used to validate and refine the proposed all-season road alignment and the design of environmental protection measures for pre-construction, construction and post-construction stage of the Project. This includes using traditional knowledge information to assess the potential effects of the Project on aquatic environment, and in particular fish species harvested for food, income and cultural purposes. Chapter 9 – *Terrestrial Environment*: ▪ Introduction: Acknowledgement of how traditional subsistence and cultural activities informed the description of existing conditions for vegetation and wildlife within the project area. ▪ 9.1.1: Description of methods used to document TK regarding the terrestrial environment. ▪ 9.2.2: Description of community member's input in the assessment of potential effects to the terrestrial environment.

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						▪ 9.2.3: Description of community member's input for validating and refining the all-season road alignment and design of mitigation measures for the terrestrial environment. ▪ 9.2.4.2 : Plant Species of Cultural Importance ▪ 9.2.4.2.1: Plant Species of Cultural Importance considered throughout the Construction Effects and Mitigation section. ▪ Table 9.8: TK incorporated into the selection rationale for terrestrial VCs ▪ Table 9.15: Summary of Potential Construction-Related Environmental Effects – plant species of cultural importance assessed ▪ 9.2.5.1 Moose: Selected as a culturally and economically important terrestrial mammal species, due to consumptive use by both Aboriginal and non-Aboriginal people. Chapter 10 – *Socio-Economic and Cultural Environment* ▪ 10.1.6: Traditional Knowledge and Land Use: summarized finding of the traditional knowledge studies carried out for the Project. B. With regard to including both Aboriginal and Western knowledge if/when differences arise: Rather than considering one knowledge source over another, knowledge bases were drawn (including TK) were drawn on in advance of, and throughout this EIS process, to inform the selection of VCs, the design of project mitigation measures, and identify which VCs require monitoring. By following this iterative process, not only does TK complement and support Western knowledge, it helps frame the overall project planning, and EIA. Aboriginal Traditional knowledge (TK) gathered for the Large Area Network Study informed the project planning, including influencing the scope of the baseline studies. This includes the TK studies with all the communities in the regional study area (Poplar River First Nation, Berens River First Nation, Little Grand Rapids First Nation, and Pauingassi First Nation) as well as Hollow Water First Nation and the MMF (2011). Additional TK studies (CIER and Poplar River, 2015; CIER 2015) focusing on the local assessment area and information provided by the MMF also informed the selection of VCs which were presented at community meetings, as part of the Aboriginal and Public Engagement Program (APEP). At these meetings First Nations community members were asked for their input on VC selection and proposed mitigation measures, to ensure they were consistent with the information gathered during TK studies.

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						After several months of discussions with the MMF they identified interested in expanding the number of interviewees for the TK study 2011. Funding was made available to MMF to undertake this work in September 2015. During this time no additional VCs were identified. Unfortunately the MMF was not able to conclude their work by the time for submission of EIS.
CEAA-18	5(1)(c) – an effect occurring in Canada of any change that may be caused to the environment on i) Health and socioeconomic conditions ii) Physical and cultural heritage iii) The current use of lands and resources for traditional purposes, or iv) Any structure, site or thing that is of historical, archaeological, paleontological or architectural significance	EIS Guidelines, Part 2, 5.1, 6.1.8; and 6.3.4	Chapter 10	The EIS (Chapter 10 pg. 10-3, Figure 10-2) defines the Socio-Economic Regional Assessment Area as the area beyond the Local Assessment Area within which most indirect and cumulative effects would be expected to occur and areas in which the Project may have effects on the regional environment and those who use this area. The RAA as defined by the proponent and presented in Figures in the EIS does not include Manitoba Métis locals or Hollow Water First Nation. Baseline information described in Chapter 10 (section 10.1.3) on land and resources use for Indigenous peoples in the RAA, including Manitoba Métis Federation, Bloodvein First Nation, Hollow Water First Nation, Little Grand Rapids First Nation, and Pauingassi First Nation, is insufficient to assess residual effects to Aboriginal peoples' health and socioeconomic conditions, physical and cultural heritage, current use of lands and resources for traditional purposes, or heritage structures, sites, or things. Additional information sources that are to be considered by the proponent are the *Manitoba Métis Land Use and Occupancy Study for the East Side Road Authority Project* (Shared Values Solutions, 2016) and *Manitoba Métis Federation Traditional Knowledge and Land Use Study (TKLUS) for*	A. Based on spatial and temporal scope selected for the assessment, provide baseline information for Bloodvein First Nation, Hollow Water First Nation, Little Grand Rapids First Nation, Pauingassi First Nation and Manitoba Métis Federation to support the analysis of predicted effects on Aboriginal peoples. B. Revise Figures in Chapter 10 and Figure 13-2 to include Manitoba Métis locals. C. Evaluate potential Project effects, including cumulative effects, to the current use of lands and resources by people within the RAA and describe proposed mitigation measures. Identify potential impacts on groups exercising rights in the RAA, proposed accommodation measures, and view of the group on those measures. D. Describe the mitigation measures to address the potential Project effects, including cumulative effects on the environment, which will impact the health and socioeconomic conditions of peoples within the RAA. Clarify which mitigation measures apply to which groups. E. Describe the mitigation measures to address the potential Project effects, including cumulative effects on the environment, which will impact physical and cultural heritage, and structure, site or things of historical, archaeological, paleontological or architectural significance to Aboriginal peoples within the RAA. Clarify which mitigation measures apply to which groups. F. Describe the follow-up and monitoring plan, including the indicators to evaluate the impacts of changes to the environment on the health and socio-economic well-being of Aboriginal Peoples	A. With regard to providing baseline information for Bloodvein First Nation, Hollow Water First Nation, Little Grand Rapids First Nation, Pauingassi First Nation and Manitoba Métis Federation: As documented in the EIS, Hollow Water First Nation falls outside of both the regional assessment area (RAA) and cumulative effects area; therefore, it was not specifically included based on information given during the Project 1 EIA. Baseline information for Bloodvein First Nation, Little Grand Rapids First Nation, and Pauingassi First Nation is documented in EIS: • Section 10.1.3 Overview of Regional Communities • Section 4.2.2 East Side of Lake Winnipeg All-Weather Road Feasibility Study • Section 4.2.3 Large Area Network Study • Table 4-2 Summary of Community Comments Related to Existing and Future Road Networks Compiled by the Feasibility Study For further baseline information on these communities, see Annex 12. The communities of Bloodvein First Nation, Little Grand Rapids First Nation and Pauingassi First Nation have defined their traditional use areas through the *East Side Traditional Land Planning Initiative and Special Protected Areas Act*. In all instances these areas fall outside the LAA. Correction to Figure 13-2 Cumulative Effects Assessment Area in EIAs provided in Annex 13. B. With regard to revising figures in Chapter 10 and 13-2 to include Manitoba Métis locals: There are no MMF Locals within the RAA/cumulative effects spatial area. (Personal Communication MMF's Southeast Regional Office Clerk on July 20, 2016). C. With regard to evaluating potential project effects to current use of lands and resources and describing mitigation measures: No significant effects, including cumulative effects, to local community resource use are expected after mitigation measures are applied. There may be a positive effect of improved community access to new hunting locations, and potentially more local community resource use and resource use by Manitoba Métis;

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				the study area identified by ESRA to include P4, P7 and P7a which were submitted to the proponent and the Agency in May 2016 following the proponent's submission of the EIS.	within the RAA.	however, both First Nations communities have articulated that any Métis use in the Project area occurs by invitation or permission of the local First Nation communities. Current land and resource use, and description of the land use planning areas is documented in EIS sections: Chapter 10 – *Socio-Economic and Cultural Environment* • 10.1.5 *Land and Resource Use;* • 10.1.6 *Traditional Knowledge and Land Use* (hunting, fishing, trapping, gathering, travel routes); • 10.1.7 *Valued Components* (for socio-economic and cultural environmental); • 10.2.2 *Assessment of Potential Effects*; • 10.2.3 *Mitigation*; • 10.2.4 *Effects on the Socio-Economic and Cultural Environment*; • Table 10.6 *Socio-Economic and Cultural Environment Valued Components and Selection Rationale*; • Table 10.7 *Key Project Activity Interactions with Socio-Economic and Cultural Environment Valued Components*; • Table 10.8 *Summary of Potential Construction-Related Socio-Economic Effects on Tourism and Proposed Mitigation Measures*; and, • Table 10.9 *Summary of Potential Operation and Maintenance-Related Socio-Economic Effects on Tourism and Proposed Mitigation Measures* D. With regard to describing mitigation measures to address the potential project effects on health and socioeconomic conditions of people within the RAA: Effects and mitigation measures are documented in Chapter 10, 10.2.4 – *Effects on the Socio-Economic and Cultural Environment*; Appendix 4-8 *Project Comments from First Nations Community Engagement and ESRA Responses*, and Appendix 4-9 *Project Comments from Manitoba Métis Federation and ESRA Responses*. Mitigation measures to protect the environment and in directly the health and economic conditions of Aboriginal peoples are found in Chapters 5 and summarized in Chapter 15. E. With regard to describing mitigation measures to address the potential project affects impacting things of cultural significance to the Aboriginal peoples within the RAA: Measures describing the protection of heritage resources are also provided for in GR130.18 *Heritage Resources* and EPP13 *Heritage Resources*, as described in Chapter 5 of the EIS. Under Manitoba Heritage Resources Act "sites of heritage significance" are protected and

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						managed, and any work, activity or development is subject to the approval of the minister *(Section 13(1) Manitoba Heritage Resources Act*. Part II, section 12(1) of the Act requires that a Heritage Resources Impact Assessment be conducted and proponents undertake appropriate measures to protect resources regardless of their cultural lineage under the supervision of Manitoba Historic Resources Branch. The Branch maintains a record of Heritage Resources found in the province of Manitoba which was also consulted as part of this EIA. Extensive engagement with Berens and Poplar River was done to identify areas and sites of cultural and heritage resource interest including site visits with elders. Similar information was requested from the MMF; no sites were identified. Potential impacts to heritage resources are mitigated by avoidance. As described in Appendix 10-2 HRIAs completed in 2013 and 2015 resulted in changes to the Project's road alignment. Mitigation measures to address effects to Aboriginal peoples are documented in Chapter 10 and the following appendices: • 10-2 (Summary of Heritage Resource Impact Assessment Studies); • 10-3 (Summary of Potential Construction Effects on the Socio-Economic and Cultural Environment Valued Components Prior to Mitigation); • 10-4 (Summary of Potential Operations and Maintenance Effects on the Socio-Economic and Cultural Environment Valued Components Prior to Mitigation); The GR130s (Appendix 5-3 *Environmental Protection Procedures* and GR130.18 *Heritage Resources*) further mitigates any potential unforeseen encounters of archaeological or historic sites during construction. F. With regard to the follow-up and monitoring plan to evaluate impacts of changes to the environment on the health and socio-economic well-being of Aboriginal Peoples within the RAA: Environmental effects are not predicted to result in indirect effects to the socio-economic, and the health of Aboriginal peoples. Where changes to the environment are identified through monitoring that are of a significant enough nature to indirectly affect socio-economic, and the health of Aboriginal peoples, monitoring programs can be adjusted if necessary at that time. In the event of an

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						emergency or malfunction, regulatory requirements under various provincial and federal legislation would apply requiring additional monitoring be implemented at that time, as appropriate. Environmental Protection Programs, general construction requirements (GR130s), and an outline of the Environmental Monitoring Program (which include health and safety and socio-economic dimensions) are documented in EIS Chapter 5: • Figure 5-1 *ESRA's Environmental Program Across Project Stages* • Figure 5-2 *ISO 14001 Environmental Management System Structure* • Chapter 5 Section 5.3.2 *Environmental Protection Procedures (EPPS)* • Chapter 5 Section 5.4.1 *Contract Specifications* • Chapter 5 Section 5.4.2 *Contractor Required Plans* • Chapter 5 Section 5.5 *Environmental Protections – Operations and Maintenance* • Appendix 5-1 *Environmental Protection Policy* • Appendix 5-2 *Framework for Proponent's Environmental Management Plan* • Appendix 5-3 *Environmental Protection Procedures* • Appendix 5-4 *GR130s Environmental Protection Specifications* • Appendix 5-5 *GR140s Workplace Safety and Health Specifications*. A specific socio-economic monitoring program is not proposed as it has been determined that there are not significant socio-economic effects stemming from environmental effects after the application of mitigation measures.
HC-IR-01/02/05 /ECCC-AQ-IR-05	5(1)c(i) – health and socio-economic conditions (Air Quality)	EIS Guidelines, Part 2, 6.1.1 Atmospheric Environment	Chapter 7 Physical Environment Section 7.2.4.2.1 Construction Effects and Mitigation	Section 7.2.4.2.1 of the EIS states that no exceedances of air quality guidelines are anticipated within the local assessment area from construction activities. However, no baseline air quality data or predicted contaminant concentrations were presented in the EIS. The proponent's assessment of air quality included only particulates and VOCs. Health Canada's *Human Health Risk Assessment for Diesel Exhaust* (http://healthycanadians.gc.ca/publications/healthy-living-vie-saine/exhaust-dieselgaz-	A. Include air quality contaminants listed in the EIS Guidelines ($PM_{2.5}$, PM_{10}, SOx, and NOx) in the assessment of Project effects to the environment because they are relevant to the evaluation of potential Project effects to health in local communities. B. Include in the analysis PAHs, (benzo[a]pyrene), and diesel particulate matter considering Health Canada information (Human Health Risk Assessment for Diesel Exhaust, http://healthycanadians.gc.ca/publications/healthy-living-vie-saine/exhaust-dieselgaz-echappement/index-eng.php). The exclusion of	A. With regard to including air quality contaminates listed in the EIS guidelines: These contaminants are not expected to have an impact on human health. Potential effects of airborne dust and emissions during Project construction are expected to be primarily localized within the Project Footprint and adjacent Local Assessment Area. Emissions of NOx and SOx are mitigated at the fuel production stage. Particulate matter is not expected to travel outside of the footprint, and if it is does it is expected to be captured by the vegetation surrounding the project. Protection procedures and specifications regarding air quality are listed in Chapter 7, Tables 7.9 *ESRA's Protection Procedures and Specifications for Air Quality* and 7.10 *Summary of Potential Construction-Related Environmental Effects on Air Quality and Proposed Mitigation* in the EIS.

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
				echappement/index-eng.php) identifies a short-term (2-hour) exposure guidance value of 10 mg/m3 and a chronic exposure guidance value of 5 mg/m3 for diesel exhaust. Without appropriate mitigation measures, concrete batch plants can be a source of inhalable particulate matter. Locations of batch plants and mitigation measures to address the potential effects to air quality related to batch plants for the generation of concrete and asphalt are not discussed in the EIS.	these contaminants during the construction and operation phase may underestimate population exposure and risk. Provide a rationale for contaminants not being considered in the analysis. C. Provide baseline air quality data and compare against predicted future concentrations as a result of project development to evaluate the impacts to local receptors. See Health Canada's (2010) Useful Information for Environmental Assessments for Health Canada's recommended methodology for evaluating air in environmental assessments. D. Indicate which mitigation measures will be put in place to reduce dust emissions from concrete and/or asphalt batch plants (e.g., use of bag houses, strategic placement of batch plants). E. The proponent should evaluate all chemicals of potential concern before concluding there are no exceedances of air quality guidelines. The proponent is requested to provide additional rationale to support the conclusion that there will not be significant effects from the construction, operation, and maintenance phases.	B. With regard to including PAHs and diesel particulate matter in the analysis: These contaminants are not expected to have an impact on human health. Potential effects of airborne emissions (PAH's and diesel particulate matter) during Project construction are expected to be primarily localized within the Project Footprint and adjacent Local Assessment Area. At any given time, the active construction area will extend 1-4 kms therefore it does not simulate a localized point source scenario (not constrained to one small contained area). Protection procedures and specifications regarding air quality are listed in Chapter 7, tables 7.9 *ESRA's Protection Procedures and Specifications for Air Quality* and 7.10 *Summary of Potential Construction-Related Environmental Effects on Air Quality and Proposed Mitigation* in the EIS. C. With regard to providing baseline air quality data: No air quality monitoring stations are located in the Regional Assessment Area or close to this area. Environment Canada operates two monitoring stations in the Province: one in Winnipeg and one in Brandon. Regional Assessment Area air quality is expected to be of very high as there are no emissions sources in the Regional Assessment Area or nearby. Major industrial facilities that may reduce air quality are well removed from the Regional Assessment Area with the closest industrial facilities located in Flin Flon, Thompson and Winnipeg. There are no major sources of air pollution which could be blown into the Regional or Local Assessment Areas by prevailing winds. Thus, air quality is influenced by periodic events (forest fires). Localized anthropogenic sources from Berens River and Poplar River First Nations related to on-reserve operations of vehicles and vehicle use of the winter road when open are of a low volume to influence air quality. Chapter 7, Section 7.1.2, pg 7-4 *Air Quality*. D. With regard to mitigation measures applicable to concrete batch plants: The proponent's environmental policy regarding batch plants can be found in EPP 17 (Chapter 5, Section 5.3.2 of the EIS), and GR130.21 (Appendix 5-4 of the EIS) requires any batch plant in use in the project to be licence under provincial legislation (Environment Act). The Province of Manitoba regulates and licences the operation of batch plants and restrictions and requirements associated with work permits issued under the Crown Lands Act. Additionally, contractors are required to be certified under the COR safety program administered by the Manitoba Heavy Construction Association (or the Construction Safety Association of Manitoba) which

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						publishes a Best Management Practice document regarding batch plants (https://www.gov.mb.ca/conservation/eal/registries/5637mapleleaf/mhca_redi-mix-concrete-facilities.pdf). E. With regard to evaluating all chemical of potential concern: The project involves limited chemical usage and no emissions of significance are anticipated. Potential adverse effects to human health related to the temporary, periodic increases of fugitive dust and emissions in the Local Assessment Area are not anticipated to be significant due to the distance of the community residences from the Project. Rationale to support conclusions and assumptions regarding air quality can be found in the following EIS sections: • 7.1.2 *Air Quality* • 7.2.4.2 *Air Quality (Effects)* • 7.3.2 *Air Quality (Summary of Project Residual Effects)*
HC-IR-03/04	5(1)c(i) – health and socio-economic conditions (Air Quality) (Noise)	EIS Guidelines, Part 2, Section 6.1.1 Atmospheric Environment	Chapter 6, section 6.2.1, Figure 6-1; Chapter 7, section7.2; Chapter 10, section 10.1.6.2	It is important to clearly describe the location and distance from the project site(s) of all potential human receptors (permanent, seasonal or temporary) — taking into consideration the different types of land uses (e.g. residential, recreational, industrial, etc.) and identifying all sensitive receptor locations (e.g. schools, hospitals, retirement complexes or assisted care homes). In the EIS, the local assessment area (LAA) is described and shown as generally extending 5 km from the centerline of the proposed all-season road. Figure 6-1 shows the local assessment area boundary ends at the reserves for both Poplar River First Nation and Berens River First Nation. The terminus at each end of the road right-of-way is 1.4 km from the nearest building on the Berens River First Nation reserve and 530 m to the nearest building on Poplar River First Nation reserve but it is unclear how these receptors were considered in	A. Clarify if the communities on the reserves were included in the air quality assessment and noise assessment. If the reserves are not included in the local assessment area provide rationale for their exclusion. B. Provide rationale for using the same LAA for noise and air quality. C. Clearly identify all potential receptors within the LAA, including Indigenous people that may be involved in current use activities, and assess potential effects to these. For example, include watercourse crossing P4-X29 given its proximate location to Many Bays Lake and valued moose habitat.	A. With regard to whether on Reserve communities were included in the LAA: a Local Assessment Area (LAA) is defined as the area within which Project effects are measurable and extend beyond the Project Footprint. The communities on reserve were not included in the local assessment area (as the project terminates at the reserve boundary) but are included in the Regional Assessment Area (RAA). The closest proximity of the proposed road right of-way to buildings on the Berens River and Poplar River First Nation Reserves is 1.4 km and 530 m, respectively (Chapter 7, Section 7.2.4.3.1, pg 7-35 of the EIS). At the point of reception air quality will not be adversely impacted. Construction or operational activity noise will be well below that which could adversely affect human health. Noisy construction activities such as blasting are confined to day light times 8-6pm by Manitoba Regulations (Mines and Minerals Act) HC-IR-03-04 B. B. With regard to using the same LAA for noise and air quality, the LAA is defined as the area where direct project effects may be measurable. The LAA for Project 4 has been defined by a 5 km buffer on either side of the project for all VCs. For specific VCs such as noise and air quality, the effects do not extend throughout the entirety of the LAA. C. With regard to potential effects on receptors within the LAA, please see Chapter 10 for an outline of human activities within the LAA and RAA. Section 10.2.4.5 *Effects of the Socio-Economic and Cultural Environment Human Health and Safety* and 10.3.5 *Summary of Project Residual Effects*

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				the assessment of potential Project effects to human health through air quality and noise effects. In Chapter 10, the EIS states there are 10 registered traplines within the LAA. Additionally, it states that hunting and gathering activities occur within the LAA but these receptors (e.g. campsites, traplines) were not identified.		*and Conclusion Human Health and Safety* specifically address human health and safety. Impacts are not anticipated to be significant.
CEAA-19/ HC-IR-06	5(1)c(i) – health and socio-economic conditions (Noise)	EIS Guidelines, Part 2, Section 6.1.1 Atmospheric Environment	Chapter 7	In Chapter 7 (page 7-34), the EIS concludes that there are few human receptors to noise and vibration, with the majority located within the communities of Berens River First Nation/NAC and Poplar River First Nation. However, specific blasting locations, timing and duration are not yet defined. The noise assessment should consider effects to community receptors and traditional use areas (e.g. traplines, campsite locations), effects on current use and potential impact on groups, mitigation/accommodation measures, and views of Indigenous groups on those measures.	A. Describe any mitigation or accommodation measures for Project noise effects on community receptors and traditional use areas, and impacts on s.35 rights. Provide a clear rationale regarding conclusions of no effects on the receptors, and the views of groups on effects and impacts. B. Provide content from the report referenced in the EIS (RWDI Consulting Engineers & Scientists. (2015). Final Report: Blasting Noise and Vibration Guidance. Report prepared for Manitoba East Side Road Authority. March, 2015) to support the proponent's assertion of no effect.	A. With regard to mitigation and accommodation measures for project related noise effects on community receptors and traditional use areas: The minimum distance from a quarry boundary to the closest building is 6.6 km (Berens River) and 2.3 km (Poplar River) and the minimum distance from the ASR roadway to a Berens River building is 1.4 km and to a Poplar River building is 530 meters. Road construction sites expose workers to noise that ranges from 85-100 dBA when heavy equipment is operating or blasting is occurring (Worker's Compensation Board of BC, 2000). For environments where a worker is likely to be exposed to a noise that exceeds 85 dbA Lex, standard construction practices such as informing the worker about the hazards of the level of noise and providing workers with hearing protector that complies with CAN/CSA Z94.2-02 as required by the Manitoba Workplace Safety and Health Regulation 217/2006 part 12 will mitigate the effects on workers. Given that construction sites are closed to non-construction workers for safety reasons, others are not at risk. Other human receptors with the potential to experience health related effects from by noise are individuals living near the construction activities. Noise, including construction noise, is attenuated with distance from source, and further attenuated by terrain and other existing natural features, such as forest cover. Loud construction noise dissipates by approximately 6 decibels every 30 m (Washington State Department of Transportation 2010), which is further attenuated by surrounding forest conditions which have been calculated to attenuate at a rate of 10 dBA for 60 m. Based on closest proximity housing the construction noise would be fully dissipated to levels akin to

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						background measured at 45dB. See Annex 14. The sound level from construction activities at the quarry based on measured attenuation outside the Poplar River building would be less than 60 decibels as measured using the "A" weighting network and slow meter response on a sound level meter that meets the requirements for a Type 2 meter as specified by ANSI Standard ANSI S1.4-2003 (Annex 15) for sound attenuation calculations and ambient sound levels. Taking into account the dense forest the sound level would further drop by an additional 10 decibels. Disturbance effects are further mitigated by the majority of construction activities occurring during daylight hours with blasting activities restricted by provincial regulation (Manitoba Quarry Minerals Regulation 1992 44(1)) to business hours (9am to 4pm Monday through Friday). Adding the attenuated factor of home insulation would further reduce the decibel levels within the structure. Mitigation measures comprise of posting information in communities to notify/update people on construction activities, including blasting schedules. As described in Section 10.1.6.1 *Hunting*, Poplar River members expressed an interest in potential short-term effects of noise on their ability to hunt in the immediate area, thinking the animals would move away (during the noise) but would return after construction has completed. Monitoring of wildlife during construction of Project 1: PR304 to Berens River All-Season Road did not find any notable change in wildlife behaviour during construction. Noise levels dissipate to background levels in less than 300 m from the construction site. B. With regard to providing the RWDI report: The RWDI Consulting Engineers and Scientists report does not address human health or implications to human health.
HC-IR-07	5(1)c(i) – health and socio-economic conditions (Noise)	EIS Guidelines, Part 2, Section 6.1.1 Atmospheric	Chapter 7, sections 7.15, 7.22, 7.2.4.3.1, 7.3.3	There is no ambient noise data in the EIS and predicted noise levels are not compared against guideline values.	A. Compare current ambient noise levels against predicted future levels as a result of Project development to evaluate the impacts to local receptors. If the proponent does not have measured data, a value of 35 dBA (ERCB Directive 038, revised Feb 16, 2007) is suggested to be used for a quiet rural area.	A. With regard to comparing current ambient noise levels to predicted future levels as a result of project development: see response given to CEAA-19/HC-IR-06(A), measured background decibel levels in Annex 15, and spreadsheet of typical construction noise and expected attenuation in Annex 14. Sound levels in this spreadsheet were taken as part of the Safety and Health program on various work sites from the current Project 1. Average job site sound levels (at the trailers within work

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
		Environment			B. See Health Canada's (2010) *Useful Information for Environmental Assessments* for Health Canada's recommended methodology for evaluating noise in environmental assessments (http://publications.gc.ca/site/archivee-archived.html?url=http://publications.gc.ca/collections/collection_2015/sc-hc/H128-1-10-599-eng.pdf)	areas as measured by proponent Safety Officers) are 81.4 dB, and with the exception of drilling, sound will be below 70 dB by 50 m and below ambient noise levels b 1 km. Foliage is expected to further reduce sound levels by approximately 10 dB once outside the project footprint (Annex 14). Average ambient noise in the region is 45dB (Annex 14). B. With regard to the topics discussed in Health Canada's (2010) *Useful Information for Environmental Assessments* for Health Canada's recommended methodology for evaluating noise in environmental assessments: see previous answers regarding noise effects to human health receptors. • Noise-induced hearing loss – The only human receptors exposed to higher levels of noise which could result in hearing loss are construction personnel. The health and safety requirements mitigate risk to hearing with proper PPE. • Sleep disturbance - construction activities occur during daylight hours and blasting is regulated between the hours of 8am to 4pm, unless otherwise authorized by Manitoba Mines Branch. • Interference with speech comprehension – Outside the project footprint, noise decibel levels will attenuate to levels that will not adversely affect speech comprehension. • Complaints, and change in percent highly annoyed (%HA) – Given the distance to the closest receptor, complaints are not anticipated. Also, contract specifications include a process to address public complaints.
HC-IR-08/09	5(1)c(i) – health and socio-economic conditions (Drinking Water Quality)	EIS Guidelines, Part 2, Sections 6.1.8/6.3.4 Aboriginal Peoples	Chapter 7, Table 7.8, sections 7.3.1, 7.2.4.1.1; Chapter 14, section 14.3	The significance evaluation for the effects on water quality from the Project construction is marked as Not applicable in Table 7.8. The EIS states that monitoring will be undertaken during construction activities and post-construction, however, no detailed information about the water quality monitoring plan is provided.	A. Provide the rationale that supports the "Not applicable" significance evaluation under the Water Quality effects in Table 7.8. B. Provide detailed water quality monitoring plans for the protection of drinking water quality (including locations, frequency, duration, etc.). C. Describe any mitigation measures that will be implemented in the event that monitoring indicates a deterioration of water quality that may affect human health (e.g. stop construction) and any proposed communication plans to inform potentially affected communities. D. Discuss whether there will be a formal complaint-	A. With regard to the rational supporting the "Not applicable" significance evaluation: The "Not applicable" significance evaluations under the Water Quality effects in Table 7.8 are applied to instances where, with the application of standard mitigation measures, there will be no residual effect in relation to drinking water. Accidents and malfunctions are addressed separate to this in Chapter 12 of the EIS. Contractors are required to submit an environmental emergency plan for spill response and remediation (GR130.3.2.1, Appendix 5-4 of the EIS) meeting the requirements GR130.10 Appendix 5-4 of the EIS spills and remediation and spill response. These plans require measures to contact potential adversely affected stakeholders including local communities. B. With regard to providing detailed water quality monitoring plans for the

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
					response process for drinking water for the communities and what measures will be taken to deal with any complaints. E. Provide information on the planned substances for ice control (road salt, sand, etc.) and dust control (e.g. water, chemical dust suppressants, etc.) during dry periods. Describe any potential impacts that the introduction of these substances may have on drinking water quality.	protection of drinking water quality: A water quality monitoring plan would be developed in response to an incident. Chapter 10, Table 10.4 Poplar River First Nation obtains its water from the Poplar River, and has a water treatment plant. P4 will not cross this watercourse or come within its vicinity based on the project design, as well as adherence to EPPs and GR130s (listed below). As such, it has been determined that no water quality monitoring plan is required for this drinking water source. Berens River NAC obtains its water from Lake Winnipeg, over 5 km away from the Berens River and Etomami River crossing sites. Berens River First Nation's water intake is also several km downstream from the proposed bridge crossing sites. Water quality monitoring procedures during watercourse crossing construction are described in the following environmental protection procedures and general construction requirements: • EPP2 *Petroleum Handling and Storage;* • EPP3 *Spill Response;* • EPP5 *Materials Handling and Storage;* • EPP7 *Stream Crossings;* • EPP6 *Working Within or Near Fish Bearing Waters;* • EPP7 *Stream Crossings;* • EPP12 *Blasting Near a Watercourse;* • EPP16 *Erosion and Sediment Control;* • GR130.9 *Materials Handling, Storage and Disposal;* • GR130.10 *Spills and Remediation and Emergency Response; and,* • GR130.16 *Erosion and Sediment Control.* Water quality will be monitored for in-water components of Berens River and Etomami River. Baseline water quality will be taken prior and during any in water work only during the construction phase. (See Chapter 14, Section 14.1.4). Water quality monitoring is required for in-water works as outlined in the construction specifications (Special Provisions section - Annex 7). Given the distance downstream there will be ample opportunity to both contain and inform community of an accidental spill for a temporary shutdown of the water intake if necessary. Spills to a waterbody are required to be immediately reported to the provincial response line (linked to Environment Canada). C. With regard to describing mitigation measures that will be implemented in the event that monitoring indicates a deterioration of water quality that may affect human health: planned construction will not adversely affect

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						water quality to a level that would affect human health. Accidents and malfunctions are addressed in Chapter 12 of the EIS. Actions will be taken in accordance with GR130.10 *Spills and Remediation and Emergency Response,* which includes immediate reporting to Manitoba Sustainable Development (formerly Manitoba Conservation) and the Contract Administrator. The contractor is required to submit an Environmental Emergency Plan for Spill Response and Remediation which requires informing local communities regarding in-water spills. D. With regard to discussing whether there will be a formal complaint response process and what measures will be taken to deal with complaints around drinking water, there is a process for complaints to be brought to the attention of the Contract Administrator and addressed through contract provisions. Chief and Council are briefed on contract activities and schedules and information are posted in community with contact information for further information. As noted in Chapter 4, Table 4-7 *Summary of Proposed Future Engagement Activities & Notifications* engagement activities (in-community meetings and public open houses) will continue during construction where community members can provide input on construction and Project related aspects. E. With regard to providing information on the planned substances for ice control and dust control: Impacts to drinking water quality are not anticipated. Ice control is not required for gravel surfaces. The application of salt is not planned for ice control at bridge crossings, due to its corrosive effects on bridge structures. Because of the proximity to the surface waterbody, only chemicals permitted for use near bodies will be utilized at bridge sites. However, due to the remote location, sand will be the preferred ice control method due to ease of application and local accessibility. Dust suppression will include the application of water or approved dust suppressants only, as per GR130.11 *Dust and Particulate Control* of Chapter 4, Appendix 5-4 *GR130s Environmental Protection Specifications of the EIS.*
CEAA-20	5(1)(c) – an effect occurring in Canada of any change that may be caused to the		Chapter 7, Chapter 8, Chapter 4, Chapter 10	The EIS (Chapters 4, 7 , 8, 10) identifies concerns raised by Indigenous groups on potential project effects to water quality and fish habitat quality in waterbodies within the Project Footprint or Local	A. Define any additional water quality mitigation measures proposed for project components to be located between KM 0 and KM 25 (near Berens River, Etomami River, North Etomami River), between KM 25 and KM 55 (near Leaf River,	A. With regard to defining additional water quality mitigation measures for project components between KM 0 and KM 25 resulting from proponent discussions with indigenous groups following posting of the EIS, water quality mitigation measures are based on successful measures used on Project 1: *PR 304 to Berens River All-Season Road*. These measures were

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
	environment on i) Health and socioeconomic conditions ii) Physical and cultural heritage iii) The current use of lands and resources for traditional purposes, or iv) Any structure, site or thing that is of historical, archaeological, paleontological or architectural significance			Assessment Area (e.g. Berens River, Leaf River, Etomami River, North Etomami River, Okeyakkoteinewin Creek, Kapawepakuk Creek, Pamatakakowin Lake, Bull Lake). Poplar River, for example, is noted by Poplar River First Nation as being of high value in the EIS, Chapter 8 (p.8-21): "it is where we get our life from; it is the source of our clean drinking water; it is the most important place on earth, it is our survival, our livelihood" (CIER and Poplar River First Nation 2015).	Pamatakakowin Lake, Bull Lake), and between KM 55 and KM 94.1 (near Poplar River, Okeyakkoteinewin Creek, and Kapawepakuk Creek) resulting from proponent discussions with Indigenous groups following the May 10, 2016 posting of the EIS. B. Assess potential impacts to rights anticipated from project changes to water quality in rivers, streams, lakes that provide drinking water or may provide drinking water. Identify the potential effects on Poplar River (a site of cultural significance), any impacts on rights and mitigation or accommodation measures, as well as the views of the groups on these measures.	discussed with the communities (Chapter 4 *Aboriginal and Public Engagement* of EIS) and adjustments to these measures are reflected in measures described in the EIS including the EPPs, Appendix 5-3 *Environmental Protection Procedures*, GR130s, Appendix 5-4 *GR130s Environmental Protection Specifications* and in Chapter 8 *Aquatic Environment*. For further information on water quality capture and reporting, see the response given to question ECCC-WQ-IR-01. Additional mitigation information can be found in, but are not limited by, the following sections: Chapter 5 *Environmental Protection and Sustainable Development:* • 5.2.1 *Design Mitigation and Community and Stakeholder Input;* • Table 5.1 *Design Mitigation Resulting from Community Feedback Related to Changes in the P4 All-Season Road Route Options;* • Appendix 5-3 *Environmental Protection Procedures:* ▪ EPP3 *Spill Response;* ▪ EPP6 *Working Within or Near Fish Bearing Waters:* ○ EPP6 1.2; ○ EPP6 4.1; ○ EPP6 4.2; ○ EPP6 4.3; ○ EPP6 4.9; ○ EPP6 4.13; ○ EPP6 4.14; ○ EPP6 4.15; ○ EPP6 4.17; ▪ EPP7 *Stream Crossings:* ○ EPP7 4.1; ○ EPP7 4.3; ○ EPP7 4.4; ○ EPP7 4.5; ○ EPP7 4.8; ○ EPP7 4.9 ○ EPP7 4.10 ○ EPP7 4.11; ○ EPP7 4.12; ▪ EPP8 *Temporary Stream Diversions:* ○ EPP8 4.1.1; ○ EPP8 4.1.2;

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						○ EPP8 4.1.3; ○ EPP8 4.1.4; ○ EPP8 4.1.5; ○ EPP8 4.2.1; ○ EPP8 4.2.3 ▪ EPP9 *Fish Passage;* ▪ EPP10 *Fish Salvage;* ▪ EPP11 *Culvert Maintenance and Replacement:* ○ EPP11 4.1; ○ EPP11 4.2; ○ EPP11 4.3; ○ EPP11 4.4 ○ EPP11 4.5; ○ EPP11 4.6; ○ EPP11 4.7; ▪ EPP16 *Erosion and Sediment Control:* ○ EPP16 4.1; ○ EPP16 4.2; ○ EPP16 4.3; ○ EPP16 4.4; ○ EPP16 4.5; ○ EPP16 4.6; ○ EPP16 4.7; ○ EPP16 4.9; ▪ EPP12 *Blasting Near a Watercourse;* ▪ EPP20 *Quarry Site Selection and Requirements;* ▪ EPP21 *Site Selection – Temporary Works;* • *Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat* –May 1996 ; • *Freshwater Intake End-of-Pipe Fish Screen Guidelines* – Department of Fisheries and Oceans 1995; • Applicable Fisheries and Oceans Canada (DFO) Authorizations or Letters of Advice ; B. With regard to assessing the potential impacts to rights anticipated from project changes to water quality and identifying potential effects on Poplar River, impacts on rights, mitigation or accommodation measures, and views of groups on these measures: No changes are anticipated to water quality in rivers that provide drinking water. Please reference the

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						Stream Crossing Assessments found in Appendix 8-6 of the *Aquatic Environment Report* (found in Chapter 8, Appendix 8-1 of EIS), which consider the effects on water quality. With the application of mitigation measures identified in the EIS, there is no adverse effect to Poplar River or treaty and Aboriginal rights. As stated in Chapter 5, a particularly important influence on the Project design mitigation has been Project-specific input received from elders, elected officials and members of the local First Nations as well as other aboriginal communities and stakeholders during the *Large Area Transportation Network Study* (SNC-Lavalin *et al.* 2010a,b,c; 2011a,b) and Project engagement. Receipt of local and traditional knowledge of environmentally and culturally sensitive areas allowed for the mitigation of potential adverse effects through a series of modifications to the proposed road corridor culminating in the selection of the preferred road alignment as proposed and assessed in this EIS. See Table 5.1 *Design Mitigation Resulting from Community Feedback Related to Changes in the P4 All-Season Road Route Options* Also, see Chapter 4 *Aboriginal and Public Engagement* for input from the Aboriginal and Public Engagement Program.
CEAA-21 / HC-IR-10	5(1)c(i) – health and socio-economic conditions (Country Foods)	EIS Guidelines, Part 2, Section 6.1.1 Atmospheric Environment, 6.3.4 Aboriginal Peoples	7.2.4.2, 10.1.6, 10.1.6.1, 10.1.6.2, 10.1.6.4 9.2.4 Effects to Vegetation 10.2.4.5 Human Health and Safety	Section 10.1.6 through 10.1.6.4 state that hunting, trapping, and gathering all occur within the LAA, however, the effect of the Project construction, operation and maintenance on country foods (foods trapped, fished, hunted, harvested or grown for subsistence or medicinal purposes, or obtained from recreational activities such as sport fishing and/or game hunting), particularly the effect of dust deposition from the construction and operation of an unpaved road is not assessed in the EIS. The effects assessment of the Project construction, operation and maintenance	A. Assess the effects of changes in air quality, water quality, and noise levels on the availability and quality of country foods. Identify any potential effects on current use and potential impacts on potential or established rights (e.g., hunting, fishing, gathering). B. Assess the effects of the project on the consumption of country foods and the potential for adverse human health effects. C. Describe the proposed mitigation measures and anticipated residual effects. D. Clarify the terminology used for the thresholds and evaluation of the magnitude/geographic extent of Project effects on travel routes and human health. E. Describe what measures will be taken to identify potential archaeological or historical resources	A. The requested information is provided in the EIS. With regard to assessing the effects of changes in air quality and noise levels on the availability and quality of country food, Table 7.8: *Summary of Potential Construction Related Environmental Effects on Surface Water and Proposed Mitigation Measures,* Table 7.10: *Summary of Potential Construction Related Environmental Effects and Proposed Mitigation Measures on Air Quality,* and Table 7.11: *Summary of Potential Construction Related Environmental Effects and Proposed Mitigation Measures on Noise and/or Vibration* found in Chapter 7 of the EIS note that there will be no significant adverse effects to the air quality, water quality and noise. Therefore, with the application of proposed mitigation measures, the project will not cause significant effects to the availability or quality of country foods. This has been noted in Chapter 10 *Socio-Economic and Cultural Environment* of the EIS: • Table 10.10: *Summary of Potential Construction – Related Socio-Economic Effects on Hunting, Trapping, Fishing and*

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
			Appendix 10-3, Appendix 10-4, Appendix 10-5.	on vegetation (EIS, section 9.2.4) does not include an assessment of the potential changes to water quality and air quality that may affect vegetation. The effects assessment of the Project construction, operation and maintenance on human health (EIS, section 10.2.4.5) does not assess the potential effects of changes to air quality, water quality and noise levels on the quality and availability of country foods.	during construction. What measures will be taken to respond to accidental discoveries of archaeological or historical resources? How will the Project's construction and operation affect medicinal plants and harvesting of medicinal plants north of Berens River? Describe mitigation and accommodation measures to address these potential effects and the views of the groups on the proposed measures.	*Gathering, and Proposed Mitigation Measures*; • Table 10.20: *Summary of Residual Project Effects and Significance Conclusions for Human Health and Safety;* • Section 10.2.4.5 *Human Health & Safety*; • Section 10.3.2 *Hunting, Trapping, Fishing & Gathering;* and • Section 10.3.5 *Human Health and Safety*. B. The requested information is provided in the EIS. See also previous answer CEAA- 21(A). With regard to assessing the effects of the project on the consumption of the country foods and the potential human health effects, the potential for an adverse effect on country foods is described in Chapter 10 *Socio-Economic and Cultural Environment* of the EIS: • Table 10.10: *Summary of Potential Construction – Related Socio-Economic Effects on Hunting, Trapping, Fishing and Gathering, and Proposed Mitigation Measures*; • Table 10.20: *Summary of Residual Project Effects and Significance Conclusions for Human Health and Safety;* • Section 10.2.4.5 *Human Health & Safety;* • Section 10.3.2 *Hunting, Trapping, Fishing & Gathering;* and • Section 10.3.5 *Human Health and Safety.* C. With regard to describing the proposed mitigation and anticipated residual effects on country foods: See responses given to questions CEAA-21 / HC-IR-10(A) and CEAA-21 / HC-IR-10(B) for mitigation and residual effects. There are no adverse residual effects anticipated. D. With regard to clarifying the terminology used for the thresholds and evaluation of the magnitude/geographic extent of project effects on travel routes and human health: Table 6.3 *Description of Assessment Criteria and Levels of Potential Environmental Effects* in Chapter 6 of the EIS provides descriptions of the assessment criteria and definitions for the levels of potential environmental effects. Additional information on the assessment of effects, mitigation and residual effects is provided in Chapter 10 of the EIS Table 10.19 *Summary of Residual Project Effects and Significance Conclusions for Travel Routes* and Table 10.20 Summary *of Residual Project Effects and Significance Conclusions for Human Health and Safety.*

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						E. With regard to describing measures to be taken identify potential archeological or historical resources and respond to accidental discoveries of archeological or historic resources: These are described in Chapter 10 of the EIS in 10.2.4.4 *Cultural Heritage and Archeological Resources and* Table 10.14 *Summary of Potential Construction Related Socio-economic Effects on Cultural, Heritage and Archeological Resources and Proposed Mitigation Measures.* Detailed descriptions of mitigation measures, in the event that an archeological or historical resource discovery occurs are listed in Appendix 5-3 *Environmental Protection Procedures* and Appendix 5-4 *GR130s Environmental Protection Specifications* of the EIS*:* • EPP13 *Heritage Resources* ○ EPP13 4.0.2 ○ EPP13 4.0.3 • GR130.18 *Heritage Resources* ○ GR130.18.2 ○ GR130.18.3 Heritage Resources Impact Assessment and Traditional Knowledge Studies were conducted for the project prior to construction to identify heritage resources and areas of importance to the communities. Alignments and quarry sites were selected so as to not interfere with areas of importance (heritage resources, cultural sites) and appropriate setbacks have been applied through consultation with communities and Manitoba Heritage Resources Branch. Additional information to protect heritage resources during prior to and during construction can be found in Appendix 5-3 *Environmental Protection Procedures* and Appendix 5-4 *GR130s Environmental Protection Specifications* of the EIS: • EPP13 4.1-4.3 *Heritage Resources*; • EPP20 5.2, 5.4.3 *Quarry Site Selection and Requirements*; and • GR130.18.1-GR130.18-3 – *Heritage Resources*. With regard to discussing the requirements from Manitoba Heritage Resources Branch in the event of accidental finds: Information regarding Manitoba Historic Resources Branch requirements are identified in the Manitoba Heritage Resources Act, which can be accessed on their website http://web2.gov.mb.ca/laws/statutes/ccsm/h039-1e.php. Part IV Section 46 of the Act "*Report of findings"* states that *"every person who finds a heritage object, [which includes archaeological, palaiontological, natural heritage objects, or object designated as a*

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						heritage object] shall...report the find to the minister and shall not handle, disturb or do anything to the object or the remains…" p.34. Procedures for accidental finds of heritage resources during construction are outlined in EPP13 *Heritage Resources*, and General Requirement GR130.18 *Heritage Resources*, which is included in Chapter 5 Appendix 5-3 *Environmental Protection Procedures* and 5-4 *GR130s Environmental Protection Specifications* of the EIS. These reflect required procedures of the Act in the event of an accidental find. With regard to how the Project's construction and operation will affect medicinal plants and the harvesting of medicinal plants north of Berens River: As noted in Chapter 9, Section 9.1.1.1: *Vegetation,* communities have been worked with through the Traditional Knowledge Studies to identify which plants are used for medicinal purposes. Baseline Vegetation Studies were conducted to identify vegetation present in the local assessment area and the existing plant communities at the regional level, included in this was the identification of plants that local communities indicated that were valuable to them for food, medicine, and cultural purposes and the areas where these were harvested. Chapter 10. Section 10.1.6 *Traditional Knowledge and Land Use* identifies the Traditional Knowledge studies that were carried out for the project, as well as knowledge contained in local area management plans and other studies that are relevant to the P4 Project and the First Nations communities. As stated in Chapter 10's *Mitigation* section (10.2.3), the design and routing of the proposed All-Season Road was developed in conjunction with Elders, elected officials and community members of Berens River First Nation, Berens River NAC, Poplar River First Nation, and based on input provided by the MMF. The planned alignment does not impact current plant gathering areas. Additional information regarding the no overlapping effects between construction, operation, and gathering, and associated mitigation and accommodation measures can be found in the response to CEAA-22, and in the following Chapter 10 tables and sections: • Table 10.10: *Summary of Potential Construction – Related Socio-Economic Effects on Hunting, Trapping, Fishing and Gathering, and Proposed Mitigation Measures*; • Table 10.20: Summary of Residual Project Effects and

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						Significance Conclusions for Human Health and Safety; • Section 10.2.4.5 Human Health and Safety; • Section 10.3.2 Hunting, Trapping, Fishing and Gathering; and • Section 10.3.5 Human Health and Safety.
CEAA-22	5(1)(c) – an effect occurring in Canada of any change that may be caused to the environment on i) Health and socioeconomic conditions ii) Physical and cultural heritage iii) The current use of lands and resources for traditional purposes, or iv) Any structure, site or thing that is of historical, archaeological, paleontological or architectural	EIS Guidelines, Part 2, Section 6.3.4	Chapter 10, Table 10.7	The EIS contains in Table 10.7 (Chapter 10, p.10-45) a summary of interactions between socio-economic and cultural environment VCs and Project activities during construction and operation phases. As noted in IR CEAA-05, the EIS also includes numerous references to the timing of construction activities or notification to communities regarding the timing of activities as planned mitigation measures that would negate residual environmental effects; however, the EIS does not adequately describe the timing of spatial and temporal overlaps anticipated between Project activities (construction and operation phases) and current uses of lands and resources for traditional purposes. This limits evaluation of the effectiveness of the proposed mitigation measures and means that residual effects described for Project effects to traditional use activities and health may be underestimated.	A. Provide a description and analysis of specific timing for Project construction and operation activities related to the timing of traditional practices. B. Describe potential effects resulting from overlapping periods and provide associated proposed mitigation measures. Incorporate into residual effects the assessment for the socio-economic and cultural environment VCs. Identify and describe other potential activities in relation to timing of traditional practices. At a minimum, potential overlaps to address include: i. blasting activities and hunting; ii. vegetation clearing and trapline operation; iii. crossing construction and fishing; and iv. closure or access restriction for construction and operational maintenance and travel route use. C. Assess any anticipated potential impacts to rights. Propose accommodation measures and describe views of Indigenous groups on any proposed accommodations.	The answers to A, B and C can be found within Chapter 10 *Socio-Economic and Cultural Environment*. Chapter 10 provides descriptions and analysis of specific timing for project construction and operation activities related to the following traditional practices: Fishing – No effects as identified in Chapter 10, 10.2.4.2, 10.2.4.2 (no effects to fishing) and also 8.2.4.1.1 (minimal effects to fish habitat, effect limited to minimal disruption of habitat at new bridge site), therefore there are no overlapping effects or specific timing considerations between construction and traditional activity. Construction of water crossings will not effect the fishery, and navigation will be maintained throughout construction activities as found in GR130.6.5, Table 10.8 (*Summary of Potential Construction-Related Socio-Economic Effects on Tourism and Proposed Mitigation Measures)*, 10.2.4.2 *Hunting, Trapping, Fishing and Gathering*, Table 10.10 (*Summary of Potential Construction-Related Socio-Economic Effects on Hunting, Trapping, Fishing and Gathering, and Proposed Mitigation Measures)*, and Table 8.8 (*Summary of Potential Construction-Related Environmental Effects on Fish Habitat and Proposed Mitigation Measures*). Proponent will provide notification of construction activities and navigation hazards to local communities. Hunting (Moose) - Limited effect to active construction zone, as identified in 10.2.4.2 *Hunting, Trapping, Fishing and Gathering*, and Table 10.10 (*Summary of Potential Construction-Related Socio-Economic Effects on Hunting, Trapping, Fishing and Gathering, and Proposed Mitigation Measures)*, community notified of construction activities, and acknowledge the potential temporary disturbance. Safety requirements prohibit hunting within active construction zone (GR130.19.1). Design mitigation measures avoid prime moose habitats and favored moose hunting areas as noted by community members, therefore there are no overlapping effects or specific timing considerations between construction and traditional activity. Hunting (Waterfowl, Chickens) – No effect as identified in 10.2.4.2 *Hunting, Trapping, Fishing and Gathering*, and Table 10.10 (*Summary of Potential Construction-Related Socio-Economic Effects on Hunting, Trapping, Fishing and Gathering, and Proposed Mitigation Measures)*, construction activities will not

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
	significance					overlap with preferred hunting areas, therefore there are no overlapping effects or specific timing considerations between construction and traditional activity. Blasting should not affect animals beyond a 500 m range (see response to question CEAA-19/HC-IR-06(A)). Proponent will provide notification of construction activities to local communities. Trapping (For Food and Other Traditional Uses) - The project identifies key trapping areas and for the most part avoids high use areas (see response CEAA-03(A)(iv)). The contract specifications GR130.17.3 requires that contractor will not alter access to existing trails, trap lines, portages, and other travel corridors. Minimal effect on *Travel Routes*, as identified in 10.2.4.3, will occur as disruption will be temporary as each segment is completed, and continual engagement with communities throughout the project construction phase will aim to identify, accommodate and preserve access along travel routes. Table 5.1 and Table 10.12 identify design mitigation as a result of community feedback and potential socio-economic effects. The proponent will provide notification of construction activities to local communities. Therefore there is limited overlapping effects, as identified in 10.2.4.2 *Hunting, Trapping, Fishing and Gathering*, and Table 10.10 (*Summary of Potential Construction-Related Socio-Economic Effects on Hunting, Trapping, Fishing and Gathering, and Proposed Mitigation Measures),* between construction and traditional activity (trapping). Trappers are working with the project proponent to collect baseline information and monitor project effects. The incomes received for this work help offset any potential adverse effects to trapping success. Plant Gathering (Medicinal Plant Harvesting) – No effect as identified in 10.2.4.2 *Hunting, Trapping, Fishing and Gathering*, and Table 10.10 (*Summary of Potential Construction-Related Socio-Economic Effects on Hunting, Trapping, Fishing and Gathering, and Proposed Mitigation Measures)*, therefore there are no overlapping effects or specific timing considerations between construction and traditional activity. Practicing Cultural Activities – There will be accommodations for elders to visit culturally important sites in advance of construction activities occurring in proximity to the site as noted in 10.1.6.6, therefore there are no overlapping effects or specific timing considerations between construction and traditional activity. Based on the Project 1: PR304 to Berens River All-Season Road, effects (noise

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						disturbance) are not expected to occur beyond 300 meters of construction activities and beyond 500 meters of blast sites, and conditions are anticipated to return to baseline once construction/blasting in the area has ceased.
CEAA-23	5(1)(c) – an effect occurring in Canada of any change that may be caused to the environment on i) Health and socioeconomic conditions ii) Physical and cultural heritage iii) The current use of lands and resources for traditional purposes, or iv) Any structure, site or thing that is of historical, archaeological, paleontological or architectural significance	EIS Guidelines Part 1, Section 3.3.2 Valued Components to be examined Part 2, Section 5. Aboriginal Engagement and Concerns	6.4.1 Selection of Valued Components Chapter 10 Socio-economic and Cultural Environment	Concerns with regard to potential effects to traditional land use, traditional lands, and the traditional way of life as a consequence of increased access by visitors are expressed in several places in the EIS (and validated through consultation with Manitoba Métis Federation and Poplar River First Nation). No mitigation has been proposed to address these concerns regarding the effects of increased access on traditional land use. There is no analysis of the potential impacts to rights that may occur from these potential effects.	A. Determine how increased access to previously remote areas by people from the outside would affect harvesting success by local residents. B. If access has the potential to affect different species or different types of traditional land use activities in different ways, these must be examined separately. Determine how impacts to traditional land use as a consequence of increased access would affect the quantity of country foods available to local residents. C. Assess potential impacts to rights anticipated. Propose accommodation measures and describe views of Indigenous groups on any proposed accommodations.	A. With regard to determining how increased access to previously remote areas would affect harvesting success by local residents, non-local increased access to the Project area is not expected to have a notable impact on the harvest success of local residents; significant increase in non-local harvesting is not anticipated due to the following construction and design mitigation measures: • Communities have provided input to design identifying key harvest areas for avoidance in terms of location of alignment and temporary work areas during construction • The alignment has been revised to avoid preferred harvesting areas as identified by local communities • Boat launches at water crossings will not be incorporated into the project design and riprap installation at major waterbody crossings will inhibit non-local hunter and fisher access to waterways at roadways • Pull off areas will not be incorporated into the project design will inhibit non-local hunter access to surrounding areas • Signage will be installed to advise no stopping along road • During construction phase, temporary access roads will be decommissioned or access to temporary work areas blocked and vegetation regrowth will be encouraged to further deter non-local hunters from using these temporary areas as a back country access points. Additionally, it is understood that the Manitoba Sustainable Development is in discussions with local First Nations communities regarding potential wildlife refuge buffering the road, as additional means of protecting big game populations. This measure would occur under regulation and must be undertaken of the Government of Manitoba and falls outside of the purview of the Project proponent. B. With regard to determining how impacts to traditional land use as a consequence of increased access would affect the quantity of country foods, after application of mitigation measures, access is not predicted to

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						negatively impact different species or traditional land use activities. C. With regard to assessing anticipated potential impacts to rights, proposing accommodation measures, and describing views of indigenous groups: The project has been designed in a manner that has avoided impacts on aboriginal rights, including practices, traditional and customs that include fishing, hunting and trapping on traditional lands. Considerable efforts have been taken to engage communities to identify key traditional use areas and to design the project to avoid these areas. Community feedback to date has been positive. See EIS Appendix 4-8 (Project Comments from First Nations Community Engagement and ESRA Responses), and Appendix 4-9 (Project Comments from Manitoba Métis Federation and ESRA Responses) for further details.
CEAA-24	5(1)(c) – an effect occurring in Canada of any change that may be caused to the environment on i) Health and socioeconomic conditions ii) Physical and cultural heritage iii) The current use of lands and resources for traditional purposes, or iv) Any structure, site or thing that is of historical, archaeologi	EIS Guidelines, Part 2, sections, 5.1, Aboriginal Groups to Engage and Engagement Activities, 6.1.8 Aboriginal Peoples, 6.3.4 Aboriginal Peoples, 6.4 Mitigation	Chapter 10, section 10.1.6 Traditional Knowledge and Land Use	Manitoba Métis Federation has asserted that there are potential effects of the Project on Métis land use in the LAA and RAA. The *Manitoba Métis Land Use and Occupancy Study (MLUOS) for the East Side Road Authority Project* (May 2016) was submitted to the proponent by Manitoba Métis Federation after the EIS was submitted to the Agency.	A. Update Chapter 10, Socio-Economic and Cultural Environment, to reflect information presented in the Manitoba Métis Federation's MLUOS. This update shall include baseline information, information on potential effects, and mitigation measures proposed to minimize those effects. B. Given the concerns raised by MMF, please identify how the proponent identified potential effects, the proposed mitigation measure to address potential effects, and the views of groups on these measures.	A. With regard to updating Chapter 10 to reflect information presented in the Manitoba Métis Federation's MLUOS: This report has not provided additional substantive information which would change the original evaluation of effects and mitigation measures for Project P4. The MMF report was received after the P4 EIS was submitted to CEAA. Despite several extensions, MMF was unable to submit the extended TK report in advance of the EIS submittal to CEAA. MMF land and resource use within the LAA was documented in its 2011 report, which described essentially no traditional land use within the LAA, and the RAA. These results are consistent with the information provided in the extended MMF MLUOS study (2016). B. With regard to MMF concerns and how potential effects were identified, mitigation measures, and views of groups: During the Project 4 EIS process, ESRA met with MMF to obtain their input on environmental effects of the proposed project. The only specific comments raised were related to the protection and preservation of heritage resources. Non-specific concerns were raised with respect to harvesting. A commitment has been made to contact the MMF should heritage sites be encountered during project construction activities, and include them in the discussion of how to proceed. As indicated in the response to CEAA - 18, known heritage resources are protected by avoidance (altering the route alignment). Procedures to protect heritage resources if encountered during construction are described in Appendix 5-3 *Environmental Protection*

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
	cal, paleontological or architectural significance					*Procedures*, GR130.18 *Heritage Resources*, Chapter 5 of the EIS, and protected under the Manitoba Heritage Resources Act. Given that there were no specific comments provided with respect to harvesting, several mitigation measures have been identified to protect the environment and avoid effects to resource users. While these measures were developed with specific and direct discussions with local First Nations, they will also apply to any Métis resource user. Particularly as it relates to the LAA, the First Nations have maintained that any use of the land within their territories by other parties including Métis is not a traditional right, but rather has occurred by invitation or permission of Poplar River First Nation or Berens River First Nation. For MMF comments relating to the project please see Appendix 4-9 *Project Comments from Manitoba Métis Federation and ESRA Responses* found in Chapter 4 in the EIS.
CEAA-25	5(1)(c) – an effect occurring in Canada of any change that may be caused to the environment on iii) The current use of lands and resources for traditional purposes	EIS Guidelines, Part 2, section 6. Effects Assessment, section 6.3.4 Aboriginal Peoples	Chapter 10, section 10.2.4 Effects on the Socio-Economic and Cultural Environment	Appendix 10-3 *Summary of Potential Construction Effects on the Socio-Economic and Cultural Environment Valued Components Prior to Mitigation* and Appendix 10-4 *Summary of Potential Operations and Maintenance Effects on the Socio-Economic and Cultural Environment Valued Components Prior to Mitigation* do not include a summary of effects on hunting, trapping, fishing and gathering or on commercial fishing and trapping. In order to assess effects to traditional land use, Chapter 10 should include a thorough assessment of the potential effects to the species/groups important to the current use of lands and resources by Aboriginal Peoples (Appendix 10-5). This assessment must include, among other things, an analysis of preferred harvesting areas for each species in relation to the relevant LAA and RAA, and for each Indigenous group within each LAA and RAA.	A. Include hunting, trapping, fishing and gathering, and commercial fishing and trapping in summary tables in Appendix 10-3 and 10-4. Define potential effects and provide an analysis. B. Within the analysis of potential construction, operation and maintenance effects to traditional land use (10.2.4.2) include an analysis of preferred harvesting areas for each of the species outlined in Appendix 10-5 in relation to the relevant LAA and RAA, for each species, and outline how these effects relate to each of the groups in the local and regional assessment areas. The focus of this assessment should be on traditional resource use activity rather than on the state of the resource VCs.	A. With regard to including hunting, trapping, fishing, gathering, and commercial fishing and trapping in summary tables of appendix 10-3 and 10-4: The Summary Table 10.18 *Summary of Residual Project Effects and Significance Conclusions for Hunting, Trapping, Fishing and Gathering* of Chapter 10 in the EIS presents the evaluated potential effects to hunting, trapping, fishing and gathering. Potential project-related effects to hunting, trapping, fishing, gathering and commercial fishing and trapping are documented in the following sections of Chapter 10 *Socio-Economic and Cultural Environment* in the EIS: • 10.1.6.1 *Hunting;* • 10.1.6.2 *Trapping* (including commercial); • 10.1.6.3 *Fishing* (including commercial); • 10.1.6.4 *Gathering;* • 10.3.2 (evaluation of residual effects on hunting, trapping, fishing and gathering activities); and, • 10.2.4 *Effects on the Socio-Economic and Cultural Environment* B. With regard to including analysis of preferred harvesting areas by species in the potential effects to traditional land use and outlining how these effects relate to groups in the local and regional assessment areas: Preferred harvesting area information provided through TK studies has been considered relative to all phases of the development. The effects on

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						traditional resource use areas is described in Chapter 10 of the EIS, in Sections: • 10.1.6.1 *Hunting*, • 10.1.6.2 *Trapping*, • 10.1.6.3 *Fishing*, and • 10.1.6.4 *Gathering*. The list of harvested species in Appendix 10-5 *List of Species/Groups Important to the Current Use of Lands and Resources of Aboriginal Peoples* supports the assessment of effects within Chapter 10 of the EIS as summarized in Table 10.18 *Summary of Residual Project Effects and Significance Conclusions for Hunting, Trapping, Fishing and Gathering*, as found in Chapter 10 of the EIS. Specific locations of preferred harvesting areas have been provided in confidence by the First Nations and the MMF (2011). As such, the explicit and detailed information as requested by CEAA has been intentionally excluded from the public EIS document. Permission to release this information to the Agency has not been granted by the First Nation.
CEAA-26	5(1)(c) – an effect occurring in Canada of any change that may be caused to the environment on i) Health and socioeconomic conditions ii) Physical and cultural heritage iii) The current use of lands and resources for traditional purposes, or	Part 2,Section 5,Aboriginal engagement and Concerns	Chapter 4, Table 4.7, p. 4-39	Table 4.7 does not make it clear how future engagement activities and notifications planned by the proponent will differ by group.	A. Outline plans for future engagement activities for each Indigenous group identified in the EIS Guidelines Part 2, Section 5.1.	A. This item has been addressed in the EIS. With regard to outlining plans for future engagement activities: Future engagement activities are documented in EIS Chapter 4, Table 4.7 *Summary of Proposed Future Engagement Activities & Notifications*.

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
	iv) Any structure, site or thing that is of historical, archaeological, paleontological or architectural significance					
CEAA-27	5(1)(c) – an effect occurring in Canada of any change that may be caused to the environment on i) Health and socioeconomic conditions ii) Physical and cultural heritage iii) The current use of lands and resources for traditional purposes, or iv) Any structure, site or thing that is of historical, archaeologi	Part 2, Section 6..8, Aboriginal Peoples, physical and cultural heritage	10.1.5.8 Cultural, Heritage and Archaeological Record, p. 31	With regard to Heritage Resource Impact Assessment work done in the Berens River Traditional territory, the EIS states that, ”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.”	A. Outline plans to engage Berens River First Nation to determine the appropriate management of the potential effects to their traditional use sites. If this engagement has already taken place, how will these effects be mitigated? B. Assess potential impacts to rights anticipated. Propose accommodation measures and describe views of Indigenous groups on any proposed accommodations.	A. With regard to the plans for engaging Berens River First Nation to determine the appropriate management of affects on their traditional use sites: Chapter 4, Table 4.7 of the EIS Summary *of Proposed Future Engagement Activities & Notifications* summarizes the proposed future engagement activities with local communities, which includes Berens River First Nation. Traditional use sites were documented and assessed as part of the TK studies under the SNC Large Area Network Study, the P1 PR304 to Berens River All-Season Road EIS, and for the TK studies undertaken specifically for Project P4 EIA. Chapter 10 sections 10.1.6.1 *Hunting*, 10.1.6.2 *Trapping*, 10.1.6.3 *Fishing*, 10.1.6.4 *Gathering*, 10.3.2 (assessment of Project residual effects for hunting, trapping, fishing, and gathering), and 10.2.4 (effects on the socio-economic and cultural environment) document traditional use areas. A description of how potential effects will be mitigated is provided in Table 10.18 *Summary of Residual Project Effects and Significance Conclusions for Hunting, Trapping, Fishing and Gathering* of the EIS. Traditional use sites are further protected as documented in Chapter 5. i.e. protection of cultural sites, Environmental Protection Procedures (*EPP13 Heritage Resources*) and general construction requirements (e.g. *GR130.17 Clearing and Grubbing, GR 130.18 Heritage Resource*) outlined in Chapter 5 of the EIS and its appendices. Resource users, including trappers, will be notified of pending work. In addition, resource users will be included in the data collection and monitoring of wildlife and traditional use sites through the project’s

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
	cal, paleontological or architectural significance					Trapper Participation Program. B. With regard to assessing potential impact to rights anticipated, proposing accommodation measures, and describing views of indigenous groups on proposed accommodations: Treaty 5 states the requirement for preservation of Aboriginals "right to pursue their avocations of hunting and fishing…" Assessment of the impacts to these activities, as well as, trapping and gathering, is presented discussed in Chapter 10, Section 10.3.2. *Hunting, Trapping, Fishing and Gathering*, and summarized in Table 10.18 *Summary of Residual Project Effects and Significance Conclusions for Hunting, Trapping, Fishing and Gathering*. Consistent with the TK approach outlined in Chapter 4, section 4.1.1 *Objectives*, the APEP provides for the engagement of local Aborigianl communities through all phases of the project development, from project planning, EIS process, through to the duration of the project life cycle. As such, the views of all aboriginal communities have been considered, with particular effort to engage the two communities most directly affected by the project; Berens River FN and Poplar River FN, which are in the closest proximity of the project and whose traditional territories the Project interacts with. Other Aboriginal communities have also been directly engaged with. Aboriginal input on mitigation measures, some of which are accommodations (i.e. ensuring trapper access to traplines - GR130.17.3 *Grubbing*) were provided and described in Chapter 4 of the EIS, and are presented in Chapter 5, Appendix 5-4 *GR130s Environmental Protection Specifications* of the EIS. Potential effects to traditional uses were assessed in relation to the information provided in the EIA's traditional knowledge studies and APEP, which are documented in Chapter 10. The format of engagement activities, such as community meetings, open houses, and TK workshops, allows for an open dialogue where specific questions, comments and points of interest about the project can be raised at any stage of the APEP process, including discussions surrounding potential impacts to Aboriginal rights and land use. In addition, Round 6 of the APEP focused specifically on proposed mitigation measures, to solicit specific comments and questions that were raised at different stages of the APEP and discuss their appropriateness.

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						By utilizing this approach, the views of the communities have influenced the location of the alignment, the framework of the development of the project, the identification of VCs, effects assessment and proposed mitigation measures. Further information is also provided in Appendices 4-9 *Project Comments from Manitoba Métis Federation and ESRA Responses*, and 4-10 *Project Comments from First Nations Community Engagement and ESRA Responses*
CEAA-28	5(1)(c) – an effect occurring in Canada of any change that may be caused to the environment on i) Health and socioeconomic conditions ii) Physical and cultural heritage iii) The current use of lands and resources for traditional purposes, or iv) Any structure, site or thing that is of historical, archaeological, paleontological or architectura	EIS Guidelines, Part 2, 6.4, Mitigation	Chapter 9, Section 9.2.3, Table 10.10, Table 10.14	Use of language such as "where feasible" or "to the extent possible" makes it difficult to determine if and when such mitigation measures will be applied and what will happen should the proposed mitigation measures not be feasible or possible. Examples include: • Selection of quarry and borrow areas to avoid sensitive areas (e.g., culturally important sites, wetland areas, wildlife breeding areas) to "the extent feasible" • 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"(p.10-54) • Routing all-season road to avoid areas of high quality habitat where feasible" (p.10-55) In terms of accidental finds, the EIS does not indicate what is required by Manitoba Heritage Resources Branch should previously unknown sites be discovered.	A. In all cases throughout the EIS, indicate the factors that will determine feasibility of a particular mitigation measure and what will be done in those cases where proposed mitigation measures are deemed not to be feasible or possible. B. Discuss what is required by Manitoba Heritage Resources Branch should the proponent make accidental finds of previously unknown cultural or heritage sites or objects.	A. With regard to indicating factors that will determine feasibility of mitigation measured and what will be done in cases where mitigation measures are deemed not to be feasible: Proposed mitigation measures have been utilized effectively with past projects, including *Project 1 - PR304 to Berens River All Season Road*. These represent a suite of mitigation measures that can be applied as appropriate based on site conditions (terrain, soils, time of year, surrounding species habitat, nature of work) During the planning stage, adaptations to mitigation measures will be discussed with the communities and local permitting agencies as appropriate. During construction and maintenance, alternative mitigation measures will be developed with input from subject matter experts and the parties involved (Contractor, Contract administrator) and where appropriate the local community and regulatory bodies. i.e.) Mitigation measures will be adapted to reflect site conditions and logistical constraints- application of next best available alternative on a temporary basis such as spreading of woody debris on exposed soils prior to the installation of permanent or semi permanent erosion controls. B. With regard to discussing the requirements from Manitoba Heritage Resources Branch in the event of accidental finds: Information regarding Manitoba Historic Resources Branch requirements are identified in the Manitoba Heritage Resources Act, which can be accessed on their website http://web2.gov.mb.ca/laws/statutes/ccsm/h039-1e.php. Part IV Section 46 of the Act "*Report of findings"* states that *"every person who finds a heritage object, [which includes archaeological, palaiontological, natural heritage objects, or object designated as a heritage object] shall…report the find to the minister and shall not handle, disturb or do anything to the object or the remains…"* p.34. Procedures for accidental finds of heritage resources during construction are outlined in EPP13 *Heritage Resources*,

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
	l significance					and General Requirement GR130.18 *Heritage Resources*, which is included in Chapter 5 Appendix 5-3 *Environmental Protection Procedures* and 5-4 *GR130s Environmental Protection Specifications* of the EIS. These reflect required procedures of the Act in the event of an accidental find.
CEAA-29	5(1)(c) – an effect occurring in Canada of any change that may be caused to the environment on i) Health and socioeconomic conditions ii) Physical and cultural heritage iii) The current use of lands and resources for traditional purposes, or		Chapter 10, Table 10.16, p.	Table (EIS, Table 10.16, p.10-79), suggested that the replacement of the winter road with an all-season gravel road will result in a reduced risk of accidents. The winter road operated for two months per year where the all-season road will be operational year long. The EIS states that "traffic volume on the proposed all-season road is expected to be less than 500 vehicles annually." Accurate estimates of vehicle travel are needed to assess potential increases in the risk of accidents and malfunctions, increases in wildlife mortality from vehicle collisions), changes in air quality (e.g. in proximity to community receptors near the road), Project greenhouse gas emissions, and potential Project effects on health and socio-economic conditions and current uses of lands and resource for traditional purposes.	A. Provide traffic volume statistics for the winter road operation over a recent period of at least 5 years. B. Discuss how the all-season road traffic volume was estimated C. Reevaluate and report on predicted traffic-related effects for all-VCs, assuming a doubling of predicted traffic volume (i.e. 1000 vehicles annually). i. Include predicted effects to air quality (noise, air quality, GHG emissions), mortality effects for wildlife (e.g. moose, boreal woodland caribou, migratory birds, species at risk), effects to health and socio-economic conditions, effects to current use of lands and resources, effects to risk associated with accidents and malfunctions. ii. Propose additional mitigation measures and update residual effects analyses and the cumulative effects assessment. iii. Describe potential impact to rights, proposed accommodate measures, and views of groups listed Section 5 of Part 1 of the EIS guidelines on proposed accommodations	A. With regard to providing traffic volume statistics for winter road operation: Winter road traffic volume estimates are provided in the GHG assessment Dillon 2011 (Annex 9) which represents the best available information for winter road traffic volume. Statistics collected for traffic at Berens River, Rice River and Little Grand Rapids in 2016 are provided below and in Annex 16. The winter road opened January 19, 2016 for Rice River and Berens River, and opened February 31, 2016 for Little Grand Rapids. The winter road closed for all three communities on March 9, 2016. **Community** / **2016 Season Total of Vehicles** Rice River: 10128 Berens River: 11528 Little Grand Rapids: 902 B. With regard to discussing how the all season road traffic volume was estimated: Due to a formatting error, the Geometric Design Criteria (GDC) outlined in Chapter 3,Table 3.1 in the EIS is missing a second row which should read: "Predicted Average Annual Daily Traffic" of <500. This text error was incorrectly carried through to Chapter 7, Section 7.2.4.2.2 *Operations and Maintenance Effects and Mitigation* (Air Quality) and Chapter 10, Section 10.2.4.5.2 *Operations and Maintenance Effects and Mitigation* (Human Health and Safety) in the EIS should be interpreted as an Average Annual Daily Traffic of <500. The evaluation of effects is based on the average annual daily traffic of <500. A recent technical engineering review has re-evaluated the traffic volume estimate for the P4 all-season road to be <300 Average Annual Daily Traffic. This is consistent with estimates for other project areas within the Large Area Network. C. With regard to reevaluating and reporting on predicted traffic related effects on all VC, the potential effects on identified VCs were assessed based on traffic volume statistics outlined in response given to question CEAA-29(B) and therefore do not require re-evaluation.

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
Accidents and Malfunctions						
CEAA-30/ ECCC-EE-IR-07	19(1)(a) - accidents and malfunctions 19(1)(b) – significance of effects 5(1)(a)(i),(ii), and (iii) 5(1)(b) 5(1)(c)	EIS Guidelines, Part 2, 6.6.1	Chapter 5.0 - Environmental Protection and Sustainable Development (page 5-12), Chapter 12 - Accidents and Malfunctions (page 12-6, 12-7)	The EIS does not present sufficient detail on worst case scenarios evaluated for the accidents and malfunction events described (Chapter 12, and Table 12.1), including how events and responses made differ between construction and operation phases. Chapter 12 also describes four classes of accidents and malfunctions but Table 12.1 omits one of these, accidental encroachments, from further analysis of potential environmental effects. The EIS does not present sufficient detail on environmental site sensitivities that are to be considered in environmental response plans (Chapter 5), or on how specific environmental site sensitivities associated with the Project's landscape will modify environmental response plans (e.g. timing, notification to regulators, reporting requirements).	A. Revise Table 12.1. Define ratings terms used in Table 12.1 to describe the probability of accident or malfunction after application of preventative / contingency mitigation measures and the evaluation of potential environmental risk. Include all accident and malfunctions described in Chapter 12 (e.g. accidental encroachments). If more than one type of accident or malfunction event falls under a given category of accident or malfunction, include an analysis of the probability of each event. B. Describe worst-case scenarios, and include information on the anticipated effectiveness of mitigation measures proposed and the probability of worst-case scenarios occurring. C. For each possible accident or malfunction event, identify potential environmental effects (as defined in CEAA 2012 section 5), taking into account the varied possible receiving environments throughout the Project area D. Identify the magnitude of an accident or malfunction, including the quantity, mechanism, rate, form and characteristics of the contaminants and other materials likely to be released into the environment during an accident or malfunction event. Assess the potential for adverse environmental effects as defined in section 5 of CEAA 2012.	A. Ratings terms used in Chapter 12, Table 12.1: *Potential Accidents and Malfunctions, Mitigation Measures, and Evaluation of Environmental Risk* of the EIS to describe the probability of accident or malfunction of preventative / contingency mitigation measures and the evaluation of potential environmental risk. Table 1 has been revised for clarity and can be seen in Annex 25. B. With regard to describing worst case scenarios and anticipated effectiveness of mitigation, worst case scenarios are unlikely to occur. Chapter 12, Table 12.1 *Potential Accidents and Malfunctions, Mitigation Measures, and Evaluation of Environmental Risk.* Requirements to report spills to Manitoba Sustainable Development (formerly Manitoba Conservation) as per regulations are found in: • EPP 2 *Petroleum Storage (Section 4.2.5)* • EPP 3 *Emergency Response Plan for Spill (Section 4.2.4)* • GR130.10 *Spills and Remediations and Emergency Response* C. Potential environmental effects of accidents or malfunctions are identified in Chapter 12: • 12.1 *Accidental Release of Hazardous Substances* • 12.2 *Fires and Explosions* • 12.3 *Accidental Collisions* • 12.4 *Accidental Encroachments* D. With regard to identifying the magnitude of and assessing the potential adverse effects of accidents or malfunctions: See Annex 26 - Table of Accidents and Malfunctions.
ECCC-EE-IR-08	19(1)(a) - accidents and malfunctions 19(1)(b) – significance of effects 5(1)(a)(i),(ii), and (iii)	EIS Guidelines, Part 2, 6.6.1	Chapter 12 - Accidents and Malfunctions	Adequate mitigation measures will lessen the frequency and magnitude of accidents and malfunctions. Contingency and response plans need to be in place to ensure preparedness and effective response in the case of accidents and malfunctions. The EIS does not sufficiently describe the emergency response plans that will be implemented for all phases of the Project.	A. Describe the active and passive preventative measures and design safeguards, as well as the emergency response capacities and contingency procedures in place if accidents and/or malfunctions occur. Detailed contingency and response plans should be presented for all phases of the project.	A. With regard to describing the active and passive preventative measures and design safeguards in place in accidents or malfunctions occur: The following section is taken from Chapter 12, page 12.5 from the EIS: Specific sections of the Environmental Protection Specifications (GR130s; Chapter 5, Appendix 5-4) that describe emergency measures that will be implemented in the event of an accident or malfunction include: • GR130.08 *Designated Areas*; • GR130.09 *Materials Storage/Handling*; • GR130.10 *Spills and Remediation and Emergency Response*;

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
	5(1)(b) 5(1)(c)					• GR130.13 *Planned and Unplanned Shutdowns*; and, • GR130.20 *Wildfires*. The GR130s found in Appendix 5-4 *GR130s Environmental Protection Specification*, GR140s found in Appendix 5-5: *GR140s Workplace Safety and Health Specifications* and the EPPs found in Appendix 5-3 *Environmental Protection Procedures* in combination outline project management practices that will prevent the frequency and magnitude of malfunctions or accidents during the construction phase of the Project. Under GR130.3.2 *Submittals*, found in Chapter 5, Appendix 5-4 *GR130s Environmental Protection Specification* of the EIS, the contractors will be required to submit to the proponent for review and approval, prior to initiating work on the Project, the following emergency response plans: • Environmental Emergency Plan for Spill Response and Remediation (Annex 17 - Spill Response and Containment Plan); • Material Management Plan in the event of an Unplanned Shutdown (Annex 18); and • Evacuation and Emergency Preparedness Plan in the Event of a Wildfire. Under GR140.5 *Safe Work Plan,* found in Chapter 5, Appendix 5-5 *Workplace Safety and Health Specifications*, the contractor(s) will also be required to submit to the proponent for review and approval, prior to initiating work on the Project, a safe work plan which includes emergency response plans prepared for personal injury, fires, explosions and spills (GR 140.15.5). These plans address evacuation, as well as medical assistance. Under safety requirements, the contractor(s) responsible for Project construction and maintenance will have designated and qualified Emergency Response Coordinators and back-up Coordinators on-site while work is being conducted. The Emergency Response Coordinator will have the authority to redirect workers and equipment to respond quickly and efficiently in the event of an accident, malfunction, or other environmental emergency. Follow-up actions will include inspections of construction/maintenance sites and work locations, review of incident and inventory reports and records, and periodic testing and evaluation of emergency response procedures.

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						Table 12.1 *Potential Accidents and Malfunctions, Mitigation Measures*, and Evaluation of Environmental Risk of Chapter 12 of the EIS provides a list of the most likely potential accidents or malfunctions that may occur during the construction phase of the project (assuming plausible worst case scenarios), the mitigation measures and standard practices that will be followed throughout the life of the Project to minimize the risk of such events from occurring, and an evaluation of the potential magnitude of risk to the environment in consideration of applied mitigation to reduce the likelihood of such events occurring.
Effects of the Environment on the Project						
CEAA-31	19(1)(h) – change to the project caused by the environment	EIS Guidelines, Part 2, 6.6.1	Chapter 11	The EIS does not describe how the environmental conditions will impact the specific Project components such as camps or quarries. The discussion on flooding only focuses on the proposed mitigation of designing culverts to address a 1:100 year flood. The discussion of climate change does not describe how weather patterns may change and in turn affect the environmental conditions considered in the EIS. There is no discussion of how the adequacy of proposed mitigation measures under climate change scenarios. For example, the EIS states that Project components have been designed to accommodate a 1:100 year flood. The EIS does not describe how climate change may affect the frequency of this size of flood event and whether the mitigation measures proposed would continue to be adequate.	A. For each environmental condition or event considered describe how specific Project components (road, watercourse crossings, quarries, camps, etc.) will potentially be affected and what proposed mitigation measures will be implemented. B. Provide an analysis of the potential effects of climate change on each of the environmental conditions or events considered and subsequent effects on the Project. Identify if additional mitigation measures are required and, if not, provide a rationale.	A. With regard to describing how project components will potentially be affected by environmental conditions: Chapter 11 states potential conditions or events that could potentially affect Project components. Further information on the affects and mitigation methods can be found in response B (below). B. With regard to providing an analysis of the potential effects of climate change on the environmental conditions that may affect project components see Chapter 7, Section 7.1.1 *Climate and Climate Change* for a description of climate and the history of climate change. There is a variety of opinion of climate change effects on this area of Manitoba may be, with no consensus. Possible climate change effects may include increased or decreased annual precipitation rates and or increases or decreases in temperature levels. During operation and maintenance, severe weather events could force closure of the road for extended periods of time due to heavy snow accumulations during winter and stream washouts during the spring and summer seasons. Increased precipitation rates or increased magnitude of storm events will be accommodated by design and snow clearing practices. These include: Sufficient depth of rock base layer in the roadbed design coupled with the placement of large-diameter (≥ 900 mm) stream crossing culverts, and equalization culverts in fen and bog complexes, are key elements in the road design that are expected to mitigate the probability of washout/erosion and sedimentation events. Culverts have been sized

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						to accommodate 1 in 100 year flood events, which is well above the 1:10 year flood event which is the standard that culverts are currently designed elsewhere in the province. Chapter 11 *Effects of the Environment on the Project*, Sections 11.2 *Flooding* and 11.3 *Forest Fires* of the EIS discuss mitigation measures that will be implemented in the event of less predictable and more extreme events due to flooding and forest fires. Drought conditions may change the vegetative communities in the area. Drought conditions and associated factors such as forest fires will not affect the integrity of Project components (bridge; roads). Although severe weather events may result in localized erosion and sedimentation, landslides are not anticipated due to the relatively flat topography (Chapter 7 *Physical Environment*, Section 7.1.3.1 *Overview*, in the EIS). As stated within Chapter 11 *Effects of the Environment on the Project*, Table 11.1 *Evaluation of Effects of the Environment on the Project*: – Suspend construction activities during extreme weather events (summer/winter storms) including flooding or forest fires. – Monitor erosion protection and sediment control during construction and repair and augment as required. – Emergency response plans for road construction will include response to extreme weather events or flooding. – Inspect and repair Project components as required after extreme weather events or flooding. Additional mitigation information can be found in, but are not limited by, the following sections found in Appendix 5-3 *Environmental Protection Procedures* and Appendix 5-4 *GR130s Environmental Protection Specifications*: • EPP3 *Spill Response;* • EPP6 *Working Within or Near Fish Bearing Waters:* ▪ EPP6 1.2; ▪ EPP6 4.1; ▪ EPP6 4.2; ▪ EPP6 4.3; ▪ EPP6 4.9;

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						▪ EPP6 4.13; ▪ EPP6 4.14; ▪ EPP6 4.15; ▪ EPP6 4.17; • EPP7 *Stream Crossings:* ▪ EPP7 4.1; ▪ EPP7 4.3; ▪ EPP7 4.4; ▪ EPP7 4.5; ▪ EPP7 4.8; ▪ EPP7 4.9; ▪ EPP7 4.10; ▪ EPP7 4.11; ▪ EPP7 4.12; • EPP16 *Erosion and Sediment Control:* ▪ EPP16 4.1; ▪ EPP16 4.2; ▪ EPP16 4.3; ▪ EPP16 4.4; ▪ EPP16 4.5; ▪ EPP16 4.6; ▪ EPP16 4.7; ▪ EPP16 4.9; • EPP21 *Site Selection – Temporary Works;* • GR130.16.7 *Erosion and Sediment Control;* • GR130.16.11*Erosion and Sediment Control; and* • GR130.20.1 *Wildfires.* During construction, safety plans are required of the contractor that include emergency evacuation procedures in the event of forest fires or any major weather event as per GR140.5 *Safe Work Plan*.
Cumulative Effects						
CEAA-32/ INAC-01/02	5 – caribou, moose, GHGs 19(a) – cumulative effects 19(b) –	EIS Guidelines, Part 2, 6.6.3 (e)	Chapter 13, Appendices 13-1, 13-2, 13-4,	The EIS includes a table in Appendix 13-1 "Scoping of VCs Predicted to Experience Residual Environmental Effects of the Project." The table only rates two criteria: Spatial Extent of the Residual Effect, and Temporal Extent (Duration) of Residual Effect. This provides only a partial	A. Provide an analysis of the significance of the residual adverse environmental effects for the VCs carried through to the cumulative effects assessment of the Project. In addition to the information presented in Appendix 13-1, include an explicit description of the effect levels for magnitude, geographic extent, duration and	A. With regard to providing an analysis of the significance of the residual adverse environmental effects for the VCs carried through to the cumulative effects assessment of the project Annex 19 - Appendix 13-1. Scoping of VCs Predicted to Experience Residual Effects on the Project (columns added). B. With regard to updating Appendix 13-1 *Approach to Scoping and Screening*

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
	significance of effects			characterization of residual effects by presenting only two criteria. All potential residual effects must be described to determine whether a cumulative effects assessment is required. Where a VC is a species-at-risk, the cumulative effects assessment should be conducted on any adverse residual effects of the Project in combination with any threats to the species-at-risk, as identified in its recovery or action plan. For caribou the cumulative effects assessment only considers changes to habitat. Other potential effects must be included. The EIS describes future physical activities that are certain and reasonably foreseeable in Table13.1 (p.13-8) and describes several Infrastructure developments. Additional proposed physical activities have been identified by Indigenous and Northern Affairs including: • Several First Nations located along the southeast of Lake Winnipeg have been in discussion with provincial representatives regarding Forest Management License #1. It is reasonably foreseeable that forestry activities could occur within the temporal boundary for cumulative effects (2000-2037) by First Nation communities and/or business entities. • Within the next five (5) years (and potentially beyond that time frame) there will be many infrastructure projects and changes	frequency criteria for each VC to support conclusions of significance. B. Update Appendix 13-1 "Scoping of VCs Predicted to Experience Residual Environmental Effects of the Project" with any VCs where residual effects are identified from additional analysis. Provide a rationale for the omission of a VC from the cumulative effects analysis. C. Where cumulative effects are identified for VCs that were not previously assessed, describe the mitigation measures that will be implemented. D. Include forestry activities that could occur within the temporal boundary for cumulative effects (2000-2037) by First Nation communities and/or business entities in the cumulative effects assessment. E. Include changes to mortality in the cumulative affects assessment for caribou. F. If on-reserve resources are required and residual effects are identified, cumulative effects should be considered and assessed from the following projects: i. Berens River: remediation of contamination at the school and maintenance yard, and the construction of a landfarm(s); decommissioning and/or rehabilitation of wharf; construction of community access road to connect to P4; construction of new landfill; airport runway expansion or rehabilitation; and upgrade/rehabilitation of the Berens River bridge. ii. Poplar River: remediation of contamination at the school and maintenance yard, and the construction of a landfarm(s); construction of community access road to connect to P4; and, construction of a new school. G. Describe how the potential creation of Pimachiowin Aki – proposed as a UNESCO World Heritage Site for land including traditional territory of Poplar River	*of VCs for Further Cumulative Effects Analysis* with any VCs where residual effects are identified from additional analysis and providing rational for omission from the cumulative effects analysis: Criteria for Magnitude of Adverse Cumulative Effects for VCs are found in Table 13.3 *Criteria for Magnitude of Adverse Cumulative Effects for VCs*. Significance conclusions are described in Section 13.5 *Significance Conclusions*. C. With regard to describing mitigation measures that will be implemented for previously unassessed effects: This request assumes more species will be carried forward, and specific mitigation identified for those VCs. Mitigation for all VCs are already contained in the EIS D. With regard to including forestry activities that could occur within the temporal boundary for cumulative effects: Scoping for the cumulative effects assessment is described in section 13.2 *Scoping* of the EIS. Forestry activities were considered for inclusion in cumulative effects assessment. There are no known or planned forestry operations in the LAA or RAA. This was therefore not included in the cumulative effects assessment. Any further restart of forestry operations on the east side of Lake Winnipeg is inhibited by the decommissioning of the mill at Pine Falls MB and supporting infrastructure (rail line). Cumulative effects assessment did however consider past logging activities within caribou ranges. Further concurrent effects were not carried forward as these areas would have regenerated to a level that resembles early successional forests. E. With regard to including changes to mortality for caribou in the cumulative effects assessment: The Project is not expected to result in increased mortality rates for caribou. Cumulative effects assessment for caribou was performed on the basis of habitat disturbance as outlined in the federal boreal woodland caribou recovery strategy. This disturbance threshold is defined as critical habitat for boreal caribou ranges, and if maintained, provides a measurable probability that the caribou population will be self-sustaining. F. With regard to considering and assessing the cumulative effects of remediation of the school and maintenance yard in Berens River and Poplar

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
				that will be occurring on-reserve in both Berens River and Poplar River FNs. Should the proponent or any contractors or sub-contractors utilize on-reserve resources (e.g., quarry site) or services (e.g., waste disposal, water use, wastewater disposal, equipment and fuel storage, temporary construction camps, etc.) during the temporal timeframe noted for cumulative effects (2000-2037), on-reserve effects should be considered.	First Nation – will affect the cumulative effects assessment. H. Describe potential impact to rights, propose accommodation measures, and describe views of groups listed in Section 5 of Part 1 of the EIS Guidelines on the proposed accommodations.	River and the construction of Land farms: This information is included in the EIS. Chapter 6, Section 6.1 *Scope of the Environmental Impact Assessment* in the EIS indicates that only past, present and reasonably-predictable or publicly-known or expected future projects and activities were considered for cumulative effects assessment. This is discussed further in Chapter 13, Appendix 13-1 *Scoping of VCs Predicted to Experience Residual Environmental Effects of the Project* in the EIS including the community access road to connect to P4. All other potential future projects and activities mentioned in F had not been defined as projects during the drafting period of the EIS. G. With regard to describing the affect of the creation of Pimachiowin Aki (UNESCO World Heritage Site) on the cumulative effects assessment: The creation of Pimachiowin Aki reflects the existing traditional land use plans, completed by local First Nations under Bill 6 the *Manitoba East Side Traditional Lands Planning and Special Protected Areas Act*, including Poplar River First Nation's Asatiwisipe Aki Management Plan; Little Grand Rapids First Nations "Ni-Kes" Lands Management Plan, Pauingassi First Nation "The Land of Fair Wind" Lands Management Plan for Manitoba Planning Area, and Bloodvein First Nation Land Use Plan "Pimitotah – To Care for Our Land". The Pimachiowin Aki is a UNSECO designation that is consistent with current and planned land use in the region. H. With regard to describing the potential impacts on rights, proposing accommodation measures, describing and views of groups in section 5 of Part 1 of the EIS Guidelines on the proposed accommodations: Treaty 5 states the requirement for preservation of Aboriginals "right to pursue their avocations of hunting and fishing…" Assessment of the impacts to these activities, as well as, trapping and gathering, is presented discussed in Chapter 10, Section 10.*2 Socio-Economic and Cultural Effects and Mitigation*, Section 10.3.2. *Hunting, Trapping, Fishing and Gathering*, and summarized in Table 10.18 *Summary of Residual Project Effects and Significance Conclusions for Hunting, Trapping, Fishing and Gathering*. Potential effects to traditional uses were assessed in relation to the information provided in the EIA's traditional knowledge studies and APEP, which are documented in Chapter 10. Further information is provided in Appendices 4-9 *Project Comments from*

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
						Manitoba Métis Federation and ESRA Responses, and 4-10 *Project Comments from First Nations Community Engagement and ESRA Responses*
Follow-up and Monitoring Programs						
CEAA-33	5(1)(a), (b), (c) 5(2) – effects also taken into account as a result of a federal authority's exercise of a power or performance of a duty or function 19(1)(a) – cumulative effects 19(1)(a) – accidents and malfunctions 19(1)(b) – significance of effects 19(1)(g) – alternative means and environmental effects of alternative means 19(1)(h) – any change to the project caused by the environment	EIS Guidelines, Part 2, 8.1 and 8.2	Chapter 14 Chapter 5 Appendix 5-2 GR130.15.8.	Chapter 14 and the EIS summary identifies general monitoring and follow-up programs or studies that would be implemented for Caribou, Moose and Furbearers, Fish Habitat, Mapleleaf Mussel, Tourism and Hunting, Trapping, Fishing, and Gathering VCs. These descriptions are very generic. There is no discussion of monitoring or follow-up for migratory birds and avian species of cultural importance. The EIS Chapter 5, Appendix 5-2 is the proponent's All-Season Road Project Framework (October 2015) which includes a reference to Monitoring and Follow-up Plans to be included in ESRA contracts through General Requirements and the Environmental Protection Procedures: • Environmental Management Procedures • Wildlife Monitoring Plan • Aquatic Environment Monitoring Plan (includes water quality, fish passage, fish habitat offsetting, bank stabilization) • Decommissioning Plan related to closure and reclamation of temporary construction facilities and borrow pits • Winter Road Closure and Reclamation Plan • Emergency Response Plan for environmental accidents and spills.	A. Describe the monitoring and follow-up programs for potential effects to migratory birds and wildlife species of cultural significance, including objectives and any monitoring measures (i.e., thresholds) that will be implemented to verify the predictions of effects and evaluate the effectiveness of the proposed mitigation measures. If follow-up programs and management plans are not required, please provide reasoning. B. Describe the valued components for which follow-up is planned, including main characteristics of the studies proposed to evaluate changes to the environment that will affect socio-economic VCs: Tourism and Hunting, Trapping, Fishing, and Gathering. Review IR CEAA-07 on removing ambiguity and strengthening language in proponent commitments. C. Present an outline of the preliminary environmental monitoring program that includes those requirements outlined in the EIS Guidelines, Part2, Sections 8.1 and 8.2. For plans described in Appendix 5-2 of the EIS, provide outlines and examples of typical content, such as that applied to Project 1, the all-season road connecting PR304 and Berens River, for Monitoring and Follow-up Plans to be included in ESRA contracts through General Requirements and the Environmental Protection Procedures: i. Environmental Management Procedures; ii. Wildlife Monitoring Plan; iii. Aquatic Environment Monitoring Plan (includes water quality, fish passage, fish habitat offsetting, bank stabilization); iv. Decommissioning Plan related to closure and	A. With regard to describing the monitoring and follow-up programs form potential effects to migratory bird and wildlife species of cultural significance: Monitoring for adherence to mitigation measures will be conducted during construction of the project. The mitigation measures are consistent with those recommended by Environment Canada (https://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=AB36A082-1). The measures proposed have proven to be successful on other similar projects including PR304 to Berens River All-Season Road, and therefore a follow-up program is not required. B. With regard to describing the VCs for which follow up is planned to evaluate changes to the environment that will affect socio-economic VCs: No follow up is proposed at this time. Construction monitoring to verify proper application of environmental mitigation measures has been identified. Monitoring of wildlife will occur to confirm protection measures are working as planned. The proposed measures have been adapted from P1: *PR304 to Berens River All Season Road* and are specific, achievable, measurable and verifiable. Monitoring of contractor activities during construction to verify that environmental protection contract requirements (i.e. contract specifications, GR130s, GR140s) are being met. Monitoring will also take place for environmental changes during sensitive activities (i.e. in water works). Post construction monitoring to verify that permanent measures are working as planned and provides for the implementation of adaptive measures if needed (i.e. erosion control measures, revegetation, fish passage at crossing locations). Post construction monitoring of wildlife will occur to assess changes as a result of the project and provides for the implementation of adaptive measures if needed. C. With regard to presenting an outline of preliminary environmental monitoring programs: Under the *Environmental Protection Specifications* (GR130.2 *Environmental Protection Plan* and GR130.3 *Submittals*), the contractor(s) are required to submit to their Environmental Protection

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question / Request for Information	Response
				Outlines of these plans are not included in the EIS.	reclamation of temporary construction facilities and borrow pits; v. Winter Road Closure and Reclamation Plan; and vi. Emergency Response Plan for environmental accidents and spills.	Plans to the proponent for review and approval, prior to initiating work on the Project. i. Environmental Management Procedures are provided in Chapter 5 and its appendices. ii. The Wildlife Monitoring Plan for the Project will focus on key wildlife species and monitor for the detection of potential adverse effects and to assess the effectiveness of proposed mitigation (see Chapter 9). The Wildlife Monitoring Plan for Project P4 will be similar in scope and duration to what was accepted for implementation under Project P1. A draft Environmental Monitoring Plan containing a draft Wildlife Monitoring Plan is included in Annex 20. It will be finalized with input from regulatory bodies as well as from Manitoba Sustainable Development Wildlife Branch. iii. The contractor would be responsible for drafting a *Water Quality and Fish Protection Plan* (GR130.3.2.3 in Appendix 5-4 *GR130s Environmental Protection Specifications* of EIS, Chapter 5 of EIS), for the proponent's review, prior to the start of work. iv. Manitoba has jurisdiction over natural resources in the province of Manitoba. Requirements for reclamation and closure of temporary construction facilities and borrow pits are permitted under the Crown Lands Act. See Annex 21 - EPP21 Borrow Pit Decommissioning, and Annex 22 - EPP23 Temporary Site Decommissioning. v. Manitoba has jurisdiction over natural resources in the province of Manitoba. Requirements for reclamation and closure of winter roads are permitted under the Crown Lands Act. See Annex 23 - EPP22 Winter Road Closure and Reclamation Plan". vi. Manitoba has jurisdiction over natural resources in the province of Manitoba. GR 130.3.2.1 requires the Contractor to produce an environmental emergency plan for spill response and remediation. See Annex 17- Emergency Plan for Spill Response and Remediation.

Federal Environmental Assessment of Project 4 – All-Season Road Connecting Berens River to Poplar River First Nation

Advice to Proponent from Federal Authorities – Round #1

Reference Number (e.g. HC--01)	*Reference to EIS*	*Context and Rationale*	*Advice to the Proponent*	*ESRA Response*
TC - 01	Section 9.2.3 Mitigation, Page 9-37	To provide clarification with respect to regulatory requirements under the *Navigation Protection Act* pertaining to proposed culvert crossings.	It is TC's understanding that the Proponent intends to opt-in to the *Navigation Protection Act* (NPA) for the four river crossings. The proponent indicates that culvert crossings will be in accordance with Transport Canada regulations. It must be noted that unless the Proponent requests to opt-in to the NPA for the culvert crossings, there is no guarantee that those crossings will be "in accordance with Transport Canada regulations".	Noted
HC-01	Sections 6.2.1, Figure 6-1, 7.2	Receptor locations	It is important to clearly describe the location and distance from the project site(s) of all potential human receptors (permanent, seasonal or temporary) — taking into consideration the different types of land uses (e.g. residential, recreational, industrial, etc.); and identifying all sensitive receptor locations (e.g. schools, hospitals, retirement complexes or assisted care homes).	Addressed. This information was presented through the various maps provided in the EIS in Chapter 3 and Chapter 10, i.e. Figure 10-3. For additional clarification see distances described in Annex 1 – Clarification Map for distances of potential quarries to waterbodies.
HC-02	Sections 7.1.2, 7.3.2	Baseline data and air quality	In order to evaluate potential changes in air quality, it is advisable to consider local, regional, and where appropriate long-range impacts on air quality during all phases of the project. It is advisable to also consider the following: • An inventory of all potential contaminants and emissions from the proposed project: criteria air contaminants [i.e. sulphur oxides (SOx), nitrogen oxides (NOx), particulate matter (PM) including total PM, PM10, and PM2.5, volatile organic compounds (VOCs), carbon monoxide (CO), ammonia (NH3), ground-level ozone (O3), and secondary particulate matter (secondary PM)]; • air pollutants on the List of Toxic Substances in Schedule 1 of the Canadian Environmental Protection Act, 1999; diesel PM; and other possible contaminants; • Information regarding the location of the project and the distance to all potential human receptors for different uses (residential, recreational, etc.) within the area affected by the project; • A characterization of baseline levels of potential contaminants and emissions undergoing further assessment (i.e. pre-project scenario), and a rationale for any project emissions not considered in the assessment; • A comparison of predicted project-related changes in ambient air quality	Atmospheric conditions and potential effects were addressed in correspondence from East Side Road Authority to the Agency during the comment period on the Guidelines for the preparation of an Environmental Impact Statement pursuant to the Canadian Environmental Assessment Act 2012 and in correspondence with the Agency on March 18, 2016. Further to this, the analysis being suggested is well in excess that is required for a project of this scale, scope and potential for effects stemming from the project during construction or operation.

Reference Number (e.g. HC--01)	*Reference to EIS*	*Context and Rationale*	*Advice to the Proponent*	*ESRA Response*
			to applicable air quality benchmarks relevant to human health (Canada-wide Standards, National Ambient Air Quality Objectives, provincial regulations, etc.), and a discussion of the potential effects on human health;	
HC-03	Section 7.2.3	Mitigation Measures	Attached in a separate document (Commonly Applied Construction Noise Mitigation Measures and Considerations for Noise Reduction) are examples of common and effective noise mitigation measures.	The measures identified in the Commonly Applied Construction Noise Mitigation Measures and Considerations for Noise Reduction document are for high density urban environments, and not suitable for low-density, wilderness areas where this project is located.
HC-04	Section 7.2.4.3	Noise impacts	In general, with respect to evaluating noise impacts, Health Canada advises that an assessment of noise exposure consider the following: • The identification of all potential noise-sensitive receptors and their locations relative to the project area, and the identification of areas in which receptors could be considered to have a reasonable expectation of "peace and quiet" (i.e. "quiet rural areas"). The identification of sensitive receptors may include residences, daycares, school, hospitals, places of worship, nursing homes, and First Nations and Inuit communities; • A delineation of the distance of the project to potential receptors using maps that indicate noise levels at various distances from the project site and identify all affected receptors. If any potential receptors are excluded from the assessment, provide a justification; • The identification/assessment of baseline sound levels (measured or estimated) for both daytime (Ld) and nighttime (Ln) at the receptor locations; • The identification of all potential noise sources during construction, operation and decommissioning (e.g. blasting, traffic, heavy equipment or transformers), and the identification of any tonal (e.g. sirens), low-frequency (e.g. wind turbines), impulsive (e.g. quarry or mining	The majority of the Project is located well away from inhabited areas with the exception of the start and end points of the road. Please see Annex 24 – Table of Distances from Construction to Receptors. Please note as provided in: • Chapter 7, Section 7.1.5 *Noise and Vibration* in the EIS, identifies that human receptors for noise and vibration effects are located within the communities of Berens River First Nation/NAC and Poplar River First Nation which are located outside of the LAA, or are construction workers at the project site. Access to the project site is limited and so other receptors will not be present. • Maps are provided in Chapter 3 showing the communities are outside of the LAA. The response to question CEAA-03- (A)(vi) above, the closest building on Berens First Nation reserve land to a potential quarry site is 6.6 km away. The nearest potential quarry location is 6.0 km from the closest cabin. • The response to question HC-IR-03-04(B) above, the closest proximity of the proposed road right of-way to buildings on the Berens River and Poplar River First Nation Reserves is 1.4 km and 530 m, respectively (Chapter 7, Section 7.2.4.3.1 *Construction Effects and Mitigation* of the EIS). Construction or operational activity noise will be well below that which could adversely affect human health. Noisy

Reference Number (e.g. HC--01)	*Reference to EIS*	*Context and Rationale*	*Advice to the Proponent*	*ESRA Response*
			explosions), and highly impulsive (e.g. hammering, pile driving or pavement breaking) types of noise; • A description of the methods (i.e. measured or estimated) used to obtain the baseline and predicted noise levels, including detailed information on how the noise assessment was conducted; • A comparison of baseline noise levels with predicted noise levels at sensitive receptor locations during construction, operation, and/or decommissioning (during daytime and nighttime, and after mitigation, if warranted); • The expected duration of noise due to construction activities (and, if applicable, operation and/or decommissioning activities). Note that Health Canada uses the Alberta Energy and Utilities Board Noise Control Directive 038 (2007) for guidance on whether construction noise should be considered short-term with regard to the prediction of complaint levels; • If construction noise lasts for less than two months at receptors, it may be considered temporary, and community consultation is advised; • For construction noise at receptors with durations of less than one year (i.e. short-term), Health Canada advises that mitigation be proposed if the resulting levels are predicted to result in widespread complaints or a stronger community reaction, based on the U.S. EPA method (U.S. EPA 1974, Michaud et al. 2008); • For construction noise at receptors with durations of more than one year (i.e. long-term), for operational noise, and where noise levels are in the range of 45-75 dB, Health Canada advises that health impact endpoints be evaluated on the change in the percentage of the population (at a specific receptor location) who become highly annoyed (%HA). Health Canada suggests that mitigation be proposed if the predicted change in %HA at a specific receptor is greater than 6.5% between project and baseline noise environments, or when the baseline plus-project-related noise is in excess of 75 dB; • An evaluation of the severity of predicted changes in noise levels and how they may affect human health; • When health effects due to noise are predicted, Health Canada advises the identification of mitigation measures to limit noise, which typically include community consultation programs. In some situations where a specific type of mitigation is not technically or economically feasible, community consultation has achieved success in limiting the number of noise-related complaints; and • Management and noise monitoring plans, including complaint resolution, if applicable.	construction activities such as blasting are confined to day light times between 9am-4pm or to 8am-6pm by special permit under Manitoba Regulations (Mines and Minerals Act).

Reference Number (e.g. HC--01)	*Reference to EIS*	*Context and Rationale*	*Advice to the Proponent*	*ESRA Response*
DFO-01	Section 5. Appendix 5-4 ESRA's Environmental Protection Specifications, GR130.15.9 Working Within or Near Water, Culvert Maintenance and Replacement Also in Section 3, page 3-12.	The fish passage criteria listed in point 7 is no longer relevant.	DFO has updated criteria for fish passage, as outlined in the draft Fish Swimming Performance User Guide (Gervais and Katopodis, May 2015). The EIS should be updated with the new fish passage criteria and all culverts designed for fish passage should be consistent with the information in this document.	DFO has provided a copy of the DRAFT Fish Swimming Performance User Guide (Gervais and Katopodis, May 2015). Criteria for fish passage identified in the Guide will be used to design culverts in fish bearing streams.
DFO-02	Section 5. Appendix 5-3 ESRA's Environmental Protection Procedures, Working Within or Near Fish Bearing Waters, point 22.	DFO's Operational Statements are no longer applicable for use.	References to Operational Statements should be removed from the EIS. All mitigations in the Operational Statements are included in the Measures to Avoid Causing Harm to Fish and Fish Habitat on DFO's website at http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/measures-mesures-eng.html	Mitigations outlined in the Operational Statements are used as best practices. Updates to the Operational Statements have not been issued by the Federal government at time of writing.
ECCC-AQ-01	Chapter 7 (Physical Environment) Section 7.2.4.2.1 (Construction Effects and Mitigation)	Burning vegetation can be a potential source of inhalable particulate matter. The proximity of burning activities to local residences is not discussed in the EIS.	Burning of vegetation: The burning of woody debris should be conducted far enough from residences to reduce community members' exposure to smoke.	Burning is regulated by the Province of Manitoba under the Wildfires Act and permits are issued in accordance with this Act.
ECCC-WQ-01	Section 6.1.4 (Groundwater and Surface Water)	Chapter 8 (Aquatic Environment), Section 8.1 (Existing Conditions) and Appendix 8-1 (Aquatic Environment Report)	Three years of data collection is recommended to characterize water and sediment quality.	Please see the response given to question ECCC-WQ-IR-01.

Reference Number (e.g. HC--01)	*Reference to EIS*	*Context and Rationale*	*Advice to the Proponent*	*ESRA Response*
ECCC-WQ-02	Appendix 8-1 (Aquatic Environmental Report), Section 6.0 (Inspection and Monitoring)	Inspection and monitoring programs are outlined (for pre-construction, construction and post-construction phases) related to the aquatic environment.	This information should be incorporated into project-specific inspection and monitoring plans.	As stated inspection and monitoring programs are outlined all phases (for pre-construction, construction and post-construction phases) related to the aquatic environment. Project inspection and monitoring plans will reference the Environmental Protection Procedures, as well as current best practices and legislative requirements at the time.
ECCC-WQ-03	Appendix 5-3 (ESRA's Environmental Protection Procedures).	Each of the ESRA Environmental Protection Procedures (EPP) provided in Appendix 5-3 includes a 'Legislation and Supporting Documents' section. The *Fisheries Act* is not currently referenced in the EPPs. All relevant EPPs should reference the *Fisheries Act*, including but not limited to the following EPPs: 'Working within or near fish bearing waters', 'Stream Crossings', and 'Erosion and Sediment Control'.	Review all EPP documents, and update the legislation sections as required to ensure that the federal *Fisheries Act* is referenced in all applicable EPPs.	Noted
ECCC-WQ-04	Chapter 1, Table 1.4.1.2 (Other Federal Regulatory Approvals and Legislation)		Table 1.4.1.2, Other Federal Regulatory Approvals and Legislation, from Chapter 1 of the EIS should incorporate the following additional bullets: • The *Fisheries Act* prohibits the deposit of deleterious substances to fish-bearing waters. • The project should employ effective prevention and mitigation to avoid such deposits, including with respect to: erosion and sedimentation, metal leaching, acid rock drainage, ammonia explosives, concrete work, fuels, road salts, wastes, and hazardous substances/materials.	Noted.

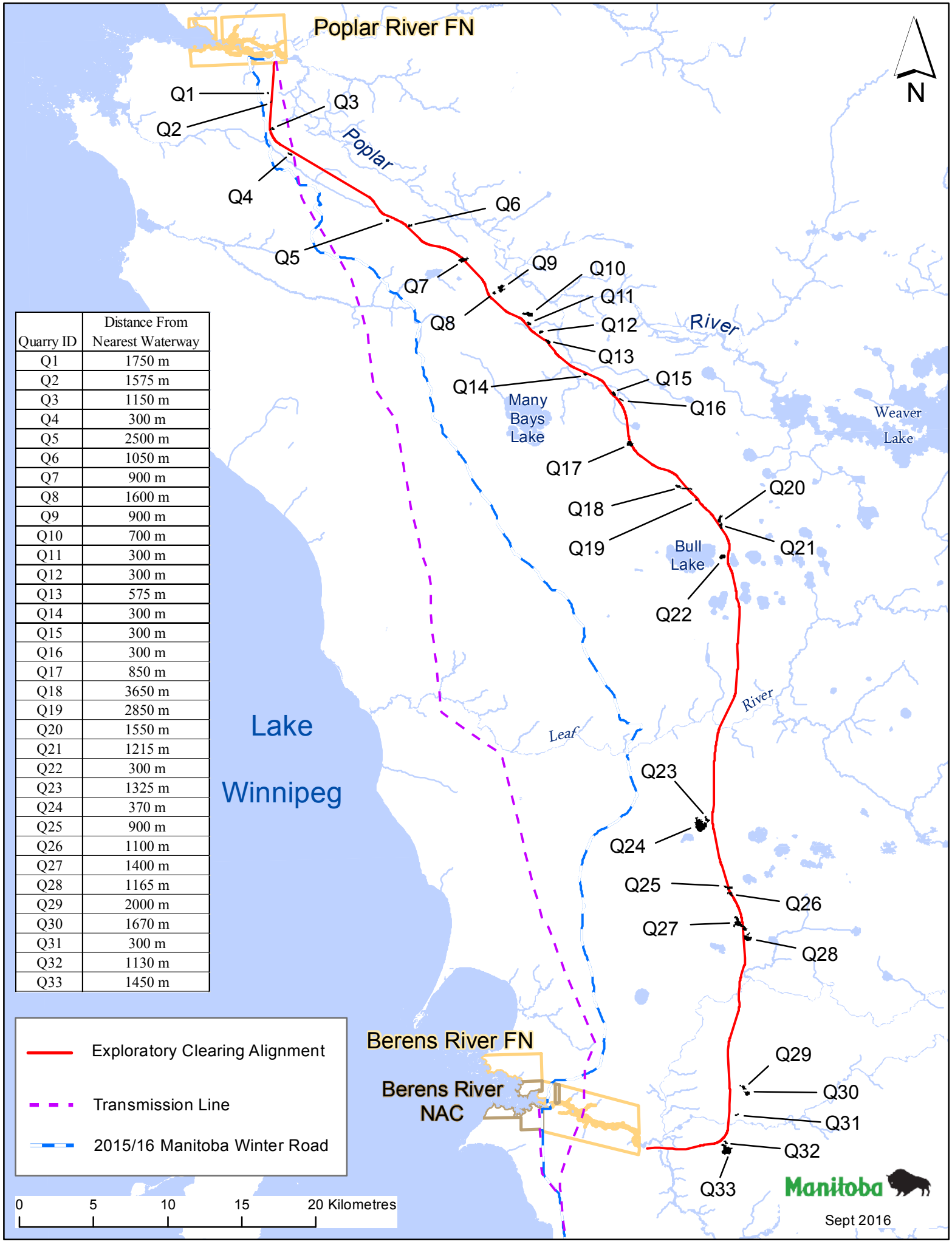
Reference Number (e.g. HC--01)	*Reference to EIS*	*Context and Rationale*	*Advice to the Proponent*	*ESRA Response*
INAC-01	Chapter 10, Section 10.1.3, pages 10-6 to 10-8.	Within this section the population statistics for the First Nation communities are provided from 2011 (Statistics Canada) and 2014 (SERDC). INAC has 2016 population statistics available that would provide a more realistic portrayal of community populations and growth.	ESRA can contact INAC to obtain information from the Indian Registry System.	The EIS was completed prior to the availability of 2016 population statistics.

See enclosed document provided by Health Canada: *Commonly Applied Construction Noise Mitigation Measures and Considerations for Noise Reduction*, adapted from the New South Wales Construction Noise Guideline (August 2008 draft for consultation), Department of Environment and Climate Change, New South Wales, Australia.

Annex

ANNEX # (in order of appearance in IRs)	Document Title
1	Clarifying Map
2	Project 4: Proposed Wildlife Assessment Criteria
3	Project 4 – Regulatory and Ecological Context for Aquatic Species at Risk
4	Project 4 – Environmental Effects Analysis for Aquatic Species at Risk
5	EPP24 – Mussel Salvage
6	Proposed Offsetting Aquatic Habitat for P1 (Sanders Creek and Bradbury River)
7	Example of Special Provision Clauses Included in ESRA's (Fish Bearing) Watercourse Crossing Construction Projects
8	Bloodvein Vegetation Recovery Assessment (Memo)
9	Berens River ASR GHG Assessment
10	Table A - Reproduction of Appendix 13-5 Table 4.3
	Table B - Reproduction of Appendix 13.5 Table 4.4
11	Overview of Traditional Knowledge Study (Flowchart)
12	RAA Community Profiles
13	Cumulative Effects Assessment Area
14	Sound Levels of Typical Construction Equipment from Previous ESRA Construction Projects
15	Project 4 Baseline Sound Levels (Memo)
16	2016 Community Traffic Statistics – Berens River and Little Grand Rapids
17	Emergency Plan for Spill Response and Remediation
18	Material Management Plan In The Event of an Unplanned Shutdown
19	Appendix 13-1. Scoping of VCs Predicted to Experience Residual Effects on the Project (columns added)
20	Environmental Management Plan
21	EPP19 – Borrow Pit Decommissioning
22	EPP23 – Temporary Site Decommissioning
23	EPP22 - Winter Road Closure and Reclamation Plan
24	Table of Distances from Project Construction Components to Receptor Sites
25	Revised Table 12.1. Potential Accidents and Malfunctions, Mitigation Measures, and Evaluation of Environmental Risk
26	Table of Accidents and Malfunctions

Annex 1



Quarry ID	Distance From Nearest Waterway
Q1	1750 m
Q2	1575 m
Q3	1150 m
Q4	300 m
Q5	2500 m
Q6	1050 m
Q7	900 m
Q8	1600 m
Q9	900 m
Q10	700 m
Q11	300 m
Q12	300 m
Q13	575 m
Q14	300 m
Q15	300 m
Q16	300 m
Q17	850 m
Q18	3650 m
Q19	2850 m
Q20	1550 m
Q21	1215 m
Q22	300 m
Q23	1325 m
Q24	370 m
Q25	900 m
Q26	1100 m
Q27	1400 m
Q28	1165 m
Q29	2000 m
Q30	1670 m
Q31	300 m
Q32	1130 m
Q33	1450 m

Annex 2

Project 4: Proposed Wildlife Assessment Criteria

Joro has reviewed the information provided by ESRA on defining criteria and assessing significance with respect to the Project 4 EIS wildlife VCs as requested. This briefing outlines the framework we are looking at to develop draft definitions for significance criteria, which for Project 4 are associated with Levels I, II, and III. The tables below outline the valued components (VCs) and specific definition for the criteria identified in the revised table "**Project 4 Environmental Effects Analysis – Physical Environment"**: Duration (temporal boundary), Magnitude (severity), Geographic Extent (spatial boundary), Frequency (rate of occurrence over time), Reversibility (potential for recovery from a negative effect) and Ecological Context (an animal's role in processes necessary for self-maintenance of the ecosystem). Direction is also considered in the determination of significance, but is not included in the following tables as it is defined in the EIA as either positive or negative (Chapter 6, Section 6.4.5).

Our approach was to first populate the tables below for each effect criteria, using the Ramsay/P7 information as a general guide that was adapted to suit the VC and Species At Risk (SAR) evaluated. This version of the tables separately describes VCs and Species at Risk (SAR) and can be compiled later at ESRA's discretion. Note that generally, the criteria differs for species that are listed as Schedule 1 under *Species at Risk Act* (SARA) or listed as Endangered or Threatened under *The Endangered and Ecosystem Act* of Manitoba (MESEA).

Table 1. Magnitude Definition Regarding Assessing Potential Effects of Wildlife VCs

VC	Level I	Level II	Level III
Caribou and Caribou Habitat (Ungulate; SARA-T, MESEA-T)	Effect is minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be minor, occurring at the population level or potentially affecting habitat availability but is undetectable	Effect is likely to be measurable on population size or habitat availability
Moose and Moose Habitat (Ungulate)	Effect is minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be minor at the level of population size or habitat availability	Effect is likely to be measurable on population size or habitat availability
Terrestrial Furbearers	Effect is minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be minor at the level of population size or habitat availability	Effect is likely to be measurable on population size or habitat availability
Aquatic Furbearers	Effect is minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be minor at the level of population size or habitat availability	Effect is likely to be measurable on population size or habitat availability
Forest Birds	Effect is minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be minor at the level of population size or habitat availability	Effect is likely to be measurable on population size or habitat availability
Waterbirds	Effect is minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be minor at the level of population size or habitat availability	Effect is likely to be measurable on population size or habitat availability
Herptiles	Effect is minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be minor at the level of population size or habitat availability	Effect is likely to be measurable on population size or habitat availability
Environmentally Sensitive Wildlife Sites[a]	Effect is unlikely to occur or be negligible	Effect has the potential to be minor and cause an undetectable effect to wildlife use	Effect is likely to be measurable regarding wildlife use
Species at Risk[b]			
- Little Brown Bat (SARA-E, MESEA-E)	No mortality to an individual, does not affect population size and does not disrupt habitat required for critical life stages	Effect considered minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be measurable on population size or habitat availability
- Wolverine (Western Pop)	Effect is minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be minor at the level of population size or habitat availability	Effect may be measurable on population size or habitat availability
- Bank swallow	Effect is minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be minor at the level of population size or habitat availability	Effect may be measurable on population size or habitat availability
- Barn swallow	Effect is minor, occurring at the individual level and not affecting population size or	Effect may be minor at the level of population size or habitat availability	Effect may be measurable on population size or habitat availability

	habitat availability		
- Canada Warbler (SARA-T, MESEA-T)	No mortality to an individual or disruption of habitat it relies on during a critical life stage	Effect considered minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be measurable on population size or habitat availability
- Chimney swift (SARA-T, MESEA-T)	No mortality to an individual or disruption of habitat it relies on during a critical life stage	Effect considered minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be measurable on population size or habitat availability
- Common Nighthawk (SARA-T, MESEA-T)	No mortality to an individual or disruption of habitat it relies on during a critical life stage	Effect considered minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be measurable on population size or habitat availability
- Eastern Whip-poor-will (SARA-T, MESEA-T)	No mortality to an individual or disruption of habitat it relies on during a critical life stage	Effect considered minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be measurable on population size or habitat availability
Eastern Wood-pewee	Effect is minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be minor at the level of population size or habitat availability	Effect is likely to be measurable on population size or habitat availability
- Olive-Sided Flycatcher (SARA-T, MESEA-T)	No mortality to an individual or disruption of habitat it relies on during a critical life stage	Effect considered minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be measurable on population size or habitat availability
- Peregrine Falcon (SARA-S, MESEA-E)	No mortality to an individual or disruption of habitat it relies on during a critical life stage	Effect considered minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be measurable on population size or habitat availability
- Rusty Blackbird (SARA-S)	No mortality to an individual or disruption of habitat it relies on during a critical life stage	Effect considered minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be measurable on population size or habitat availability
- Short-Eared Owl (SARA-S, MESEA-T)	No mortality to an individual or disruption of habitat it relies on during a critical life stage	Effect considered minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be measurable on population size or habitat availability
Horned Grebe	Effect is minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be minor at the level of population size or habitat availability	Effect is likely to be measurable on population size or habitat availability
- Trumpeter Swan (MESEA-E)	No mortality to an individual or disruption of habitat it relies on during a critical life stage	Effect considered minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be measurable on population size or habitat availability
- Yellow Rail (SARA-S)	No mortality to an individual or disruption of habitat it relies on during a critical life stage	Effect considered minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be measurable on population size or habitat availability

VC	Level I	Level II	Level III
- Snapping Turtle (SARA-S)	No mortality to an individual or disruption of habitat it relies on during a critical life stage	Effect considered minor, occurring at the individual level and not affecting population size or habitat availability	Effect may be measurable on population size or habitat availability

[a]Environmentally sensitive wildlife sites are described in Table 1, footnote[b]

[b]Species at Risk are defined in footnote[c] of Table 1 and described in Table 7

Table 2. Ecological Context Definition Regarding Assessing Potential Effects of Wildlife VCs

Valued Component	Level I	Level II	Level III
Caribou and Caribou Habitat (Ungulate)	Effect results in minimal or no detectable disruption of ecological function[al]	Effect may result in some detectable disruption of ecological function	Effect is likely to result in some detectable disruption of ecological function
Moose and Moose Habitat (Ungulate)	Effect results in minimal or no detectable disruption of ecological function	Effect may result in some detectable disruption of ecological function	Effect is likely to result in some detectable disruption of ecological function
Terrestrial Furbearers	Effect results in minimal or no detectable disruption of ecological function	Effect may result in some detectable disruption of ecological function	Effect is likely to result in some detectable disruption of ecological function
Aquatic Furbearers	Effect results in minimal or no detectable disruption of ecological function	Effect may result in some detectable disruption of ecological function	Effect is likely to result in some detectable disruption of ecological function
Forest Birds	Effect results in minimal or no detectable disruption of ecological function	Effect may result in some detectable disruption of ecological function	Effect is likely to result in some detectable disruption of ecological function
Waterbirds	Effect results in minimal or no detectable disruption of ecological function	Effect may result in some detectable disruption of ecological function	Effect is likely to result in some detectable disruption of ecological function
Herptiles	Effect results in minimal or no detectable disruption of ecological function	Effect may result in some detectable disruption of ecological function	Effect is likely to result in some detectable disruption of ecological function
Environmentally Sensitive Wildlife Sites[b]	Effect results in minimal or no detectable disruption of ecological function	Effect may result in some detectable disruption of ecological function	Effect is likely to result in some detectable disruption of ecological function
Species at Risk[c]			
- Little Brown Bat (SARA-E, MESEA-E)	No effect on ecological function	Effect results in minimal or no detectable disruption of ecological function	Effect may result in detectable disruption of ecological function
- Wolverine (Western Pop)	Effect results in minimal or no detectable disruption of ecological function	Effect may result in some detectable disruption of ecological function	Effect is likely to result in some detectable disruption of ecological function
- Bank swallow	Effect results in minimal or no detectable disruption of ecological function	Effect may result in some detectable disruption of ecological function	Effect is likely to result in some detectable disruption of ecological function
- Barn swallow	Effect results in minimal or no detectable disruption of ecological function	Effect may result in some detectable disruption of ecological function	Effect is likely to result in some detectable disruption of ecological function
- Canada Warbler (SARA-T, MESEA-T)	No effect on ecological function	Effect results in minimal or no detectable disruption of ecological function	Effect may result in detectable disruption of ecological function
- Chimney swift (SARA-T, MESEA-T)	No effect on ecological function	Effect results in minimal or no detectable disruption of ecological function	Effect may result in detectable disruption of ecological function
- Common Nighthawk (SARA-T, MESEA-T)	No effect on ecological function	Effect results in minimal or no detectable disruption of ecological function	Effect may result in detectable disruption of ecological function

Valued Component	Level I	Level II	Level III
- Eastern Whip-poor-will (SARA-T, MESEA-T)	No effect on ecological function	Effect results in minimal or no detectable disruption of ecological function	Effect may result in detectable disruption of ecological function
Eastern Wood-pewee	Effect results in minimal or no detectable disruption of ecological function	Effect may result in some detectable disruption of ecological function	Effect is likely to result in some detectable disruption of ecological function
- Olive-Sided Flycatcher (SARA-T, MESEA-T)	No effect on ecological function	Effect results in minimal or no detectable disruption of ecological function	Effect may result in detectable disruption of ecological function
- Peregrine Falcon (SARA-S, MESEA-E)	No effect on ecological function	Effect results in minimal or no detectable disruption of ecological function	Effect may result in detectable disruption of ecological function
- Rusty Blackbird (SARA-S)	No effect on ecological function	Effect results in minimal or no detectable disruption of ecological function	Effect may result in detectable disruption of ecological function
- Short-Eared Owl (SARA-S, MESEA-T)	No effect on ecological function	Effect results in minimal or no detectable disruption of ecological function	Effect may result in detectable disruption of ecological function
Horned Grebe	Effect results in minimal or no detectable disruption of ecological function	Effect may result in some detectable disruption of ecological function	Effect is likely to result in some detectable disruption of ecological function
- Trumpeter Swan (MESEA-E)	No effect on ecological function	Effect results in minimal or no detectable disruption of ecological function	Effect may result in detectable disruption of ecological function
- Yellow Rail (SARA-S)	No effect on ecological function	Effect results in minimal or no detectable disruption of ecological function	Effect may result in detectable disruption of ecological function
- Snapping Turtle (SARA-S)	No effect on ecological function	Effect results in minimal or no detectable disruption of ecological function	Effect may result in detectable disruption of ecological function

[a] Ecological functions are processes (e.g., food web relationships) that occur as part of the ecosystem and necessary for self-maintenance of the ecosystem

[b] Environmentally sensitive wildlife sites are described in Table 1, footnote[b]

[c] Species at Risk are defined in footnote[c] of Table 1 and described in Table 7

Key Literature Reviewed

Canadian Wildlife Service, Environment Canada. 2004. Environmental Assessment Best Practice Guide for Wildlife at Risk in Canada. First Edition: 27 February 2004

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Northwest Territories: Environment and Natural Resources. 2016. Red-sided Garter Snake. Online at:

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Owling.com. 2016. Short-eared Owl Biology. Online at: http://www.owling.com/Seo_nh.htm

Annex 3

Project 4 - Regulatory and Ecological Context for Aquatic Species at Risk

Species Common Name	Scientific Name	Rare Species Listing Status (Federal and Provincial)					Ecological Context / Habitat Description	Is Critical Habitat in RAA?	Potential Occurrence in Local Assessment Area (LAA) or Regional Assessment Area (RAA)
		SARA	COSEWIC	MBCDC	MESA	Recovery Strategy Plan			
Fish									
Mapleleaf Mussel	*Quadrula quadrula*	Endangered, Schedule 1	Endangered	S2	Endangered	COSEWIC Status report only	The Mapleleaf is found in medium to large rivers with slow to moderate currents and firmly packed substrate of sand, coarse gravel or clay/mud. They area filter-feeders with a diet consisting largely of algae and bacteria obtained from the water column and substrate. Mapleleaf rely on Channel Catfish to serve as a host for dispersal of its larvae (glochidia). Deteriorating water quality due to non- point source nutrient enrichment associated with extensive agriculture is identified as a concern for the species in Manitoba (COSEWIC 2006a).	No - DFO does not identify specific critical habitat	High Potential: Mapleleaf have been found in the Berens River. Potential to occur in LAA and RAA of other medium to large rivers. Surveys of the Etomami, North Etomami and Leaf rivers did not identify the presence of Mapleleaf mussels or Channel Catfish, the host species of Mapleaf. Very Low Potential to occur in smaller tributaries due to unsuitable habitat and environmental conditions: shallow water depths prone to ice formation to the creek bottom; fine substrate overlain by organic material (not suitable for Mapleleaf); presence of barriers to fish movements, inhibiting access by Channel Catfish (host species); and unsuitable habitat for Channel Catfish..
Shortjaw Cisco	*Coregonus zenithicus*	Threatened, Schedule 2	Threatened	S3	Not listed	Yes	The Shortjaw Cisco is found in the deeper waters of large lakes including Lake Winnipeg, Lake of the Woods and George Lake in the Whiteshell. This species is not known to inhabit rivers. It feeds on tiny lake organisms in the water column and at the lake bottom, and is itself an important food source for predators such as Lake Trout and Burbot. Shortjaw Cisco may be vulnerable to competition and predation by Rainbow Smelt. (COSEWIC 2003, Stewart and Watkinson 2004)	No - DFO does not identify specific critical habitat	Low potential in the LAA as the species is not known to inhabit rivers. Occurs within Lake Winnipeg in the RAA.
Lake Sturgeon	*Acipenser fulvescens*	No schedule, no status	Endangered	S2	Not listed	N/A	Lake Sturgeon inhabit large rivers and lakes and they are associated with falls or rapids and through transition zones between riverine and lacustrine habitats. They feed on benthic invertebrates and forage over substrates of mud, clay, sand and gravel. Juvenile Lake Sturgeon have a demonstrated preference for deep water (>10 m) with fine subtrates (sand, silt/clay). Spawning occurs in spring in fast flowing water usually below rapids or waterfalls. Sturgeon will leave lake environments ascending rivers to spawn in the lower reaches (COSEWIC 2006b; MCWS 2012).	No – DFO does not identify specific critical habitat	High Potential: Within the LAA, expected to only occur in the Berens and Poplar Rivers, although population sizes are unknown. Occurs within Lake Winnipeg in the RAA.

COMMITTEE ON THE STAUS OF ENDANGERED WILDLIFE IN CANADA (COSEWIC) 2003. COSEWIC assessment and update status report on the shortjaw cisco *Coregonus zenithicus*. Committee on the Status of Endangered Wildlife in Canada. Ottawa. viii + 19 pp.

COMMITTEE ON THE STAUS OF ENDANGERED WILDLIFE IN CANADA (COSEWIC). 2006b. COSEWIC assessment and status report on the Mapleleaf Mussel *Quadrula quadrula* (Saskatchewan-Nelson population and Great Lakes-Western St. Lawrence population) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 58 pp.

COMMITTEE ON THE STATUS OF ENDANGERED WILDLIFE IN CANADA (COSEWIC). 2006a. COSEWIC assessment and update status report on the Lake Sturgeon *Acipenser fulvescens* in Canada. Ottawa, ON. Xi + 107 pp.

MANITOBA CONSERVATION AND WATER STEWARDSHIP (MCWS). 2012. Manitoba Lake Sturgeon Management Strategy – 2012. Manitoba Conservation and Water Stewardship, Fisheries Branch.

STEWART, K.W. and D.A. WATKINSON. 2004.The Freshwater Fishes of Manitoba. University of Manitoba Press. Winnipeg, Manitoba.

Annex 4

Project 4 Environmental Effects Analysis for Aquatic Species at Risk

			Effects After Mitigation						Residual Effects	Determination of Effects
Biophysical Environmental Component	**Potential Environmental Effects**	**Proposed Mitigation**	**Context**	**Extent**	**Extent**	**Frequency**	**Reversibility**	**Likelihood**		
			Ecological	**Magnitude/ Geographic**	**Duration**					
Shortjaw cisco	No effect likely. The species occurs only in lakes including Lake Winnipeg and not in watercourses crossed by the project. Potential effects include extreme large scale spills of deleterious substances effecting Lake Winnipeg.	• Appropriate hazardous material handling procedures.	No adverse ecosystem effects	No effect expected.	No effect expected.	No effect expected.	No effect expected.	No effect expected.	No effect	Not significant
			Level I	Level 0	Level 0	Level 0	Level 0	Level 0		
Lake Sturgeon	Temporary disturbance to Lake Sturgeon habitat in the Berens River due to instream activities.	• Temporary structures will be placed away from potential suitable Lake Sturgeon habitat. • Instream construction activiites conducted in fish bearing watercourses will be timed to avoid fish spawning and incubation periods in spring (April 1-June 15), summer (May 1-June 30) and fall (September 15-April 30).	No adverse ecosystem effects	Effect minor and at individual level / effects limited to project footprint	Short-term, Effect does not extend beyond construction period	Expected to occur once during construction	Effect reversible over relatively short period	Unlikley to occur	No effect	Not significant
			Level I	Level I	Level I	Level I	Level I	Level I		
	Mortality and injury to Lake Sturgeon due to stranding during cofferdam construction in Berens River	• Instream construction activites conducted in fish bearing watercourses will be timed to avoid fish spawning and incubation periods in spring (April 1-June 15), summer (May 1-June 30) and fall (September 15-April 30). • Fish salvage to be conducted within the isolated work area prior to the commencement of in-stream work	No adverse ecosystem effects	Effect minor / project footprint	Short-term, Effect does not extend beyond construction period	Expected to occur once during construction	Effect reversible over relatively short period	Unlikley to occur	No effect	Not significant
			Level I	Level I	Level I	Level I	Level I	Level I		
	Permanent alteration/destruction of instream habitat from construction of bridges in Berens River.	• The amount of area to be permanently altered/destroyed has been minimized to the extent possible and will avoid important Lake Sturgeon habitats.	No adverse ecosystem effects	Effect minor; no measurable reduction in productivity of the population / project footprint	Effect likely to persist throughout the life of the project	Expected to occur once during construction	Reversible after decomissioning of the road.	Will occur	Loss of instream fish habitat.	Not significant
			Level I	Level I	Level III	Level I	Level III	Level III		
	Impairment of Lake Sturgeon habitat and alteration of stream flows/patterns from in-stream activities during construction	• In-stream construction to be conducted in isolation of flowing water to mitigate downstream sediment transfer • Construction vehicles and machinery to remain above the high water mark during in-stream construction activities to the greatest extent possible • Construction activities will be designed to maintain flow and fish passage	No adverse ecosystem effects	Effect minor, no measurable reduction in productivity of the population / project footprint	Short-term, Effect does not extend beyond construction period	Expected to occur once during construction	Effect reversible over relatively short period	Unlikely to occur	Loss of in-stream fish habitat	Not significant
			Level I	Level I	Level I	Level I	Level I	Level I		
	Permanent alteration/destruction of riparian zone habitat.	• The amount of area to be permanently altered/destroyed has been minimized to the extent possible as part of the crossing designs • 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 beyond the road surface and shoulder. • Clearing within 30 m of a watercourse shall be by hand. • Clearing lmits will be clearly marked prior to riparian vegetation removal to avoid unnecessary damage to or removal of vegetation.	No adverse ecosystem effects	Effect minor; no measurable reduction in productivity of the population / project footprint	Long-tem	Expected to occur once during construction	Reversible after decomissioning of the road.	Will occur	Loss of riparian habitat and its contribution to fish habitat.	Not significant
			Level I	Level I	Level III	Level I	Level III	Level III		
	Impairment of Lake Sturgeon habitat due to erosion and sedimentation from construction of temporary crossings	• Approaches to be stabilized as required to protect stream banks (e.g., swamp pads, logs) • Carry out construction activities in accordance with timing windows in GR130.15.2 Timing of Work	No adverse ecosystem effects	Effect minor, no net loss of fish habitat productivity / project footprint	Short-term, Effect does not extend beyond construction period	Expected to occur once during construction	Effect reversible over relatively short period	Unlikely to occu	No effect	Not significant
			Level I	Level I	Level I	Level I	Level I	Level I		

			Effects After Mitigation						Residual Effects	Determination of Effects
Biophysical Environmental Component	**Potential Environmental Effects**	**Proposed Mitigation**	**Context**	**Extent**	**Extent**	**Frequency**	**Reversibility**	**Likelihood**		
			Ecological	**Magnitude/ Geographic**	**Duration**					
	Impaired Lake Sturgeon habitat due to use of ice bridges and snow fills during construction	• Ice bridges to be constructed of clean water, ice and snow only and not block naturally occurring flows • The withdrawal of water used in the construction of ice bridges not to exceed 10% of the instantaneous flow • When an ice bridge is no longer required or the crossing season has ended, ice bridges to be notched at the centre to prevent the obstruction of fish movement • Snow fills to be constructed of clean snow and not restrict stream flows • When a snow fill is no longer required or the crossing season has ended, compact snow to be removed prior to freshet	No adverse ecosystem effects	Effect minor, no net loss of fish habitat productivity / project footprint	Short-term, Effect does not extend beyond construction period	Expected to occur once during construction	Effect reversible over relatively short period	Unlikely to occu	No effect	Not significant
			Level I	Level I	Level I	Level I	Level I	Level I		
	Impairment of Lake Sturgeon habitat due to use of explosives adjacent to waterways during construction.	• Explosive materials to be handled and stored in manner to minimize accidental spills or releases into watercourses • Explosive materials to be stored a minimum of 100 m from the high water mark • Storage and transport containers to be regularly inspected and maintained to prevent spills • Crew members working with explosives to be trained in spill containment and clean-up procedures • Ammonium nitrate-fuel oil mixtures are not to be used in or near watercourses. • Blasting is not to be conducted in watercourses • Explosives to be detonated at sufficient distance from the watercourse to prevent overpressure levels from exceeding 100 kPa at the land-water interface	No adverse ecosystem effects	Effect minor, no net loss of fish habitat productivity / project footprint	Short-term, Effect does not extend beyond construction period	Expected to occur intermittently during construction	Effect reversible over relatively short period	Unlikely to occur	No effect	Not significant
			Level I	Level I	Level I	Level II	Level I	Level I		
	Mortality and injury to Lake Sturgeon adults, young and eggs due to use of explosives adjacent to waterways during construction		No adverse ecosystem effects	Effect minor, no long term impairment / project footprint	Short-term, Effect does not extend beyond construction period	Expected to occur intermittently during construction	Effect reversible over relatively short period	Unlikely to occu	No effect	Not significant
			Level I	Level I	Level I	Level II	Level I	Level I		
	Impairment to fish and fish habitat due to the introduction of deleterious substances in the watercourse during construction.	• Roads will be located 100 m from waterbodies except at crossings. • A buffer of undisturbded vegetation equal to 10 m plus 1.5 slope gradient of 30 m will remain between adjacent road and waterbodies. • Spill kits will be available on site. • Deleterious substances will be stored a minimum of 100m from the high water mark. • Equipment will be clean of debris and leaks and refuelling will be a minimum of 100 m from the high water mark. • Uncured or partly cured concrete will be kept in isolation of watercourses. • Storm water runoff will be directed into vegetated areas.	No adverse ecosystem effects	Effect minor, no long term impairment, project footprint	Short-term, Effect does not extend beyond construction period	Expected to occur once during construction	Effect reversible over relatively short period	Unlikely to occu	No effect	Not significant
			Level I	Level I	Level I	Level II	Level I	Level I		
	Increased access to Lake Sturgeon habitat and increased harvesting due to improved access by workers and public	• Decommission and rehabilitate construction access roads and winter roads • Prohibit unnecessary access to sensitive areas by work crews • Restrict access to major watercourse crossings using measures such as slope treatment and fencing	No adverse ecosystem effects	Effect may extend beyond project footprint	Effect likely to persist throughout the life of the project	Expected to occur infrequently during construction	Effect reversible over relatively short period	unlikely to occur	No effect	Not significant
			Level I	Level II	Level III	Level I	Level II	Level I		
	Introduction of Aquatic Invasive Species (AIS) and impacts to Lake Sturgeon and habitat from construction and maintenance activities	• Adherence to new federal and provincial regulations that pertain to preventing the spread of aquatic invasive species (federal – SOR/2015-121; provincial – 171/2015). • Provide information on preventing the spread of AIS to local communities as a part of ESRAs Aboriginal and Public Engagement Program.	No adverse ecosystem effects	Effect may extend beyond project footprint	Effect likely to persist throughout the life of the project	Expected to occur throughout the life of the project	Effect reversible with decommission of the road.	unlikely to occur	No effect	Not significant
			Level I	Level II	Level III	Level III	Level III	Level I		
Mapleleaf mussel	Temporary disturbance to habitat in the Berens and Etomami rivers due to instream activities.	• Temporary structures will be placed away from potential suitable Mapleleaf Mussel habitat • Where avoidance of Mapleleaf Mussel habitat is not possible, survey and relocation will be conducted following conditions in a *SARA* Permit obtained for the work.	No adverse ecosystem effects	Effect minor; individual level / project footprint	Short-term, Effect does not extend beyond construction period	Expected to occur once during construction	Effect reversible over relatively short period	Not likely to occur	No effect	Not significant
			Level I	Level I	Level I	Level I	Level I	Level I		

			Effects After Mitigation						Residual Effects	Determination of Effects
Biophysical Environmental Component	**Potential Environmental Effects**	**Proposed Mitigation**	**Context**	**Extent**	**Extent**	**Frequency**	**Reversibility**	**Likelihood**		
			Ecological	**Magnitude/ Geographic**	**Duration**					
	Mortality and injury to Mapleleaf Mussels due to temporary and permanent bridge construction	• Structures will be placed away from potential suitable Mapleleaf Mussel habitat • Where avoidance of Mapleleaf Mussel habitat is not possible and survey and relocation will be conducted following conditions in a *SARA* Permit obtained for the work	No adverse ecosystem effects	Effect minor; individual level / project footprint	Short-term, Effect does not extend beyond construction period	Expected to occur once during construction	Effect reversible over relatively short period	Unlikley to occur. Mapleleaf not expected in footprint.	No effect	Not significant
			Level I	Level I	Level I	Level I	Level I	Level I		
	Permanent alteration/destruction of instream habitat from construction of bridges.	• The amount of area to be permanently altered/destroyed has been minimized to the extent possible and will avoid important Mapleleaf Mussel habitat	No adverse ecosystem effects	Effect minor, no measurable reduction in productivity of the population / project footprint	Effect likely to persist throughout the life of the project	Expected to occur once during construction	Reversible after decomissioning of the road.	Will occur	Loss of instream habitat.	Not significant
			Level I	Level I	Level III	Level I	Level III	Level III		
	Impairment of Mapleleaf Mussel habitat and alteration of stream flows in the project assessment area due to in-stream activities during construction	• In-stream construction to be conducted in isolation of flowing water to mitigate downstream sediment transfer • Construction vehicles and machinery to remain above the high water mark during in-stream construction activities to the greatest extent possible	No adverse ecosystem effects	Effect minor, no measurable reduction in productivity of the population / project footprint	Short-term, Effect does not extend beyond construction period	Expected to occur once during construction	Effect reversible over relatively short period	Unlikely to occur	Loss of in-stream fish habitat	Not significant
			Level I	Level I	Level I	Level I	Level I	Level I		
	Permanent alteration/destruction of riparian zone habitat.	• The amount of area to be permanently altered/destroyed had been minimized to the extent possible as part of the crossing designs • 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 beyond the road surface and shoulder. • Clearing within 30 of a watercourse shall be by hand • Clearing limits will be clearly marked prior to riparian vegetation removal to avoid unnecessary damage to or removal of vegetation.	No adverse ecosystem effects	Effect minor, no measurable reduction in productivity of the population / project footprint	Long-tem	Expected to occur once during construction	Reversible after decomissioning of the road.	Will occur	Loss of riparian habitat and its contribution to fish habitat.	Not significant
			Level I	Level I	Level III	Level I	Level III	Level III		
	Impaired Mapleleaf Mussel habitat due to erosion and sedimentation of streams due to construction of temporary crossings during construction	• Approaches to be stabilized as required to protect stream banks (e.g., swamp pads, logs) • Carry out construction activities in accordance with timing windows in GR130.15.2 Timing of Work	No adverse ecosystem effects	Effect minor, no measurable reduction in productivity of the population / project footprint	Short-term, Effect does not extend beyond construction period	Expected to occur once during construction	Effect reversible over relatively short period	Unlikely to occur	No effect	Not significant
			Level I	Level I	Level I	Level I	Level I	Level I		
	Impaired Mapleleaf Mussel habitat due to use of ice bridges and snow fills during construction	• Ice bridges to be constructed of clean water, ice and snow only and not block naturally occurring flows • The withdrawal of water used in the construction of ice bridges not to exceed 10% of the instantaneous flow • When an ice bridge no longer required or the crossing season has ended, ice bridges to be notched at the centre to prevent the obstruction of fish movement • Snow fills to be constructed of clean snow and not restrict stream flows • When a snow fill is no longer required or the crossing season has ended, compact snow to be removed prior to freshet	No adverse ecosystem effects	Effect minor no net loss of fish habitat productivity / project footprint	Short-term, Effect does not extend beyond construction period	Expected to occur once during construction	Effect reversible over relatively short period	Unlikely to occur	No effect	Not significant
			Level I	Level I	Level I	Level I	Level I	Level I		

Biophysical Environmental Component	Potential Environmental Effects	Proposed Mitigation	Effects After Mitigation						Residual Effects	Determination of Effects
			Context	Extent	Extent	Frequency	Reversibility	Likelihood		
			Ecological	Magnitude/ Geographic	Duration					
	Impairment of Mapleleaf Mussel habitat due to use of explosives adjacent to waterways during construction.	• Explosive materials to be handled and stored in manner to minimize accidental spills or releases into watercourses • Explosive materials to be stored a minimum of 100 m from the high water mark • Storage and transport containers to be regularly inspected and maintained prevent spills • Crew members working with explosives to be trained in spill containment and clean-up procedures • Ammonium nitrate-fuel oil mixtures are not to be used in or near watercourses. • Blasting is not to be conducted in watercourses • Explosives to be detonated at sufficient distance from the watercourse to prevent overpressure levels from exceeding 100 kPa at the land-water interface	No adverse ecosystem effects	Effect minor no net loss of fish habitat productivity / project footprint	Short-term, Effect does not extend beyond construction period	Expected to occur intermittently during construction	Effect reversible over relatively short period	Unlikely to occur	No effect	Not significant
			Level I	Level I	Level I	Level II	Level I	Level I		
	Mortality and injury to Mapleleaf Mussels area due to use of explosives adjacent to waterways during construction		No adverse ecosystem effects	Effect minor, no long term impairment / project footprintt	Short-term, Effect does not extend beyond construction period	Expected to occur intermittently during construction	Effect reversible over relatively short period	Unlikely to occur	No effect	Not significant
			Level I	Level I	Level I	Level II	Level I	Level I		
	Impairment to fish and Mapleleaf Mussel habitat due to the introduction of deleterious substances in the watercourse during construction.	• Roads will be located 100 m from waterbodies except at crossings. • A buffer of undisturbded vegetation equal to 10 m plus 1.5 slope gradient of 30 m will remain between adjacent road and waterbodies. • Spill kits will be available on site. • Deleterious substances will be stored a minimum of 100 m from the high water mark. • Equipment will be clean of debris and leaks and refuelling will be a minimum of 100 m from the high water mark. • Uncured or partly cured concrete will be kept in isolation of watercourses. • Storm water runoff will be directed into vegetated areas.	No adverse ecosystem effects	Effect minor, no long term impairment / project footprintt	Short-term, Effect does not extend beyond construction period	Expected to occur once during construction	Effect reversible over relatively short period	Unlikely to occur	No effect	Not significant
			Level I	Level I	Level I	Level II	Level I	Level II		
	Increased access to Mapleleaf habitat and increased harvest in the local assessment area due to improved access by workers and public	• Decommission and rehabilitate construction access roads and winter roads • Prohibit unnecessary access to sensitive areas by work crews • Restrict access to major watercourse crossings using measures such as slope treatment and fencing	No adverse ecosystem effects	Effect minor, no long term impairment / project footprintt	Effect likely to persist throughout the life of the project	Expected to occur infrequently during construction	Effect reversible over relatively short period	Unlikely to occur. Mapleleaf Mussel is not a harvested species.	No effect	Not significant
			Level I	Level I	Level III	Level I	Level II	Level I		
	Introduction of Aquatic Invasive Species (AIS) and impacts to Mapleleaf Mussel and habitat	Adhere to new federal and provincial regulations that pertain to preventing the spread of aquatic invasive species (federal – SOR/2015-121; provincial – 171/2015). Provide information on preventing the spread of AIS to local communities.	No adverse ecosystem effects	Effect may extend beyond project footprint	Effect likely to persist throughout the life of the project	Expected to occur throughout the life of the project	Effect reversible with decommission of the road.	Unlikely to occur	No effect	Not significant
			Level I	Level II	Level III	Level III	Level III	Level I		

Annex 5

ENVIRONMENTAL PROTECTION PROCEDURES 24

Mussel Salvage

Revision September 2016

Procedure name:
Mussel Salvage

Reference number
EP24

1.0 Description

.1 Mussel survey and if necessary salvage and relocation shall be undertaken as instructed by the East Side Road Authority (ESRA) in advance of various activities, including bridge construction, temporary water crossing structures, spawning shoals or spurs, and/or culvert installation in fish bearing waterways. The Contractor is responsible for ensuring compliance with contract specifications, environmental legislation, permits and authorizations.

2.0 Purpose

.1 The purpose of this procedure is to ensure that mussel survey, salvage and relocation are conducted in accordance with applicable environmental legislation, regulations, guidelines, permits and contracts.

3.0 Legislation and Supporting Documents

- ESRA Contracts and Associated Documents
- Applicable Manitoba Conservation Work Permits
- Applicable Fisheries and Oceans Canada (DFO) Authorizations
- Potentially a Species at Risk (SAR) Permit
- Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat (www.gov.mb.ca/waterstewardship/fisheries/habitat/sguide.pdf)
- Freshwater Intake End-of-Pipe Fish Screen Guidelines – Department of Fisheries and Oceans 1995 (www.dfo-mpo.gc.ca/Library/223669.pdf)
- Protocols for Detection and Relocation of Freshwater Mussel Species at Risk (Mackie et al. 2008) (http://www.dfo-mpo.gc.ca/Library/332071.pdf)
- Environmental Protection Guidelines – Appendix 7.1 of PR 304 to Berens River All-Season Road Environmental Impact Assessment – August 2009
- Best Management Practices – Appendix 7.2 of PR 304 to Berens River All-Season Road Environmental Impact Assessment – August 2009
- Species at Risk Act, S.C. 2002 c.29
- Fisheries Act R.S.C., 1985, c. F-14

4.0 Procedures

1. Permits
    1. Mussel Salvages shall be conducted to remove mussels from in-water footprints of project components.
    2. Necessary permits shall be obtained prior to conducting any in-water mussel work.
        i. Mussel salvage and relocation work shall be conducted under and in accordance with a live fish handling permit obtained from MB Sustainable Development.
        ii. Where a species at risk (SAR), as listed under Schedule 1 of the Species at Risk Act is known to occur, resides in the waterbed, work shall also be conducted under and in accordance with a species at risk (SAR) permit obtained from Department of Fisheries and Oceans (DFO). SAR permit application can be found online at: http://www.dfo-mpo.gc.ca/species-especes/permits-permis/pdf/SARA_permit_application-eng.pdf .
    3. Mussel survey and salvage operations shall be conducted by a qualified biologist:
        i. Mussels captured during the survey will be identified and transported while submerged to a designated location with similar habitat an appropriate distance upstream from the construction work site. (minimum 250 m)
    4. Fish and mussel handling best practices shall be followed to reduce serious harm to mussels or mussel habitat.
    5. If a SAR is found in a new area:
        i. Stop work, inform DFO and obtain SAR permit prior to continuing work
    6. Riparian habitats shall be restored to original pre-work condition;
    7. Applicable measure in *Protocols for detection and relocation of freshwater mussel Species at Risk (Mackie et al. 2008)including:*
        i. Preserve SAR listed mussels which are killed or mortally injured in 95% ethanol and supply to DFO as per permit requirement.
    8. Mussel survey's, salvage and relocation activities and results shall be documented in a report is to be generated by a fish biologist and submitted to ESRA for review and approval.
    9. The report shall contain detailed; descriptions, photos, and drawings of site conditions including;

   i. Location, habitat profile, description of methodology including names of collectors, contact information, organization, and schedule of activities.
   ii. Results including photos, depths, locations, substrate each animal was found, numbers and types of species found.

10. For mussel surveys conducted under a SAR permit there is a requirement to report to a DFO –Species at Risk Biologist. The report has to be detailed, thorough and contain a Fish and Mussel data collection table.
11. Any death of a listed SAR Mussel during the Salvage operation or associated construction must be reported immediately to a Species at Risk Biologist.
12. Any circumstance during the Mussel salvage or associated construction which has lead to the serious harm to fish (including any mussel) or a part of a commercial, recreational, or aboriginal fishery or deposit of deleterious substance in waters with potential fish presence the fish biologist/contractor shall report information to ESRA for submission to DFO under section 38(4) and 38(5) *Duty to Notify*.
13. Where required ESRA will submit reports to DFO.

Annex 6

Aquatic Habitat Offsetting Project Example

Watercourse	Location	Description	Proposed Offsetting Habitat	Area
Sanders Creek	UTM 679080E, 5695130N	Site 14 – Sanders Creek Connectivity to Lake Winnipeg. Substrate: fines, with some coarser substrate ranging from small gravel to cobble immediately downstream from the crossing Habitat: flat/pool perrenial watercourse habitat with one riffle downstream where coarser substrates are present. Fish presence: forage fish, White Sucker, Walleye.	Spawning Shoal	Shoal A – 5 m wide x 25 m long (125 m^2) Shoal B – 5.5 m wide x 11 m long (60 m^2) Shoal C – 9 m wide x 28 m long shoal (250 m^2) Total 435 m^2

Annex 7

Example of Special Provision Clauses Included in ESRA's (Fish Bearing) Watercourse Crossing Construction Projects

SP4. FISH SALVAGE

Notwithstanding and in addition to GR130.5.7, the following shall apply:

- The Contractor is responsible for fish salvage in association with the works in accordance with these specifications.

- The Contractor shall report fish handling mortalities and capture of species at risk to the Contract Administrator.

- A Provincial Live Fish Handling Permit must be obtained and a copy of the permit shall be provided to the Contract Administrator prior to the conduct of fish salvage. Fish salvage must adhere to all conditions of the permit.

- Live fish shall be handled in a manner that ensures maximum survival. Fish shall be held in a bucket or tub filled with water from the subject waterbody.

- Captured fish shall be identified and enumerated by species and all sport fish species will be measured for fork length and weighed. If greater than 100 fish are captured in a single application of effort, a 25%sub-sample shall be documented. The following information shall be collected and recorded in the Fish Salvage Report:
  .1 Date;
  .2 Location (watercourse name and geographic coordinates);
  .3 Description of project/construction works;
  .4 Physical habitat parameters – channel width, wetted width, size (area) and depth of salvage area and water temperature;
  .5 Fish capture method and effort;
  .6 Number of fish collected, by species; and
  .7 Length and weight of a representative proportion of captured fish species.

- Live fish shall be released as quickly as possible downstream of the isolated area at a site that is suitable for fish recovery.

- A maximum of five non-sport fish shall be kept for confirmation of identification.

- The Contractor shall provide the Contract Administrator with a fish salvage report.

SP5. WATER QUALITY MONITORING

- Water quality monitoring shall be required for in-water work in fish-bearing watercourses and may be required when working near fish-bearing watercourses or tributaries to fish bearing watercourses to demonstrate that deleterious substances are not entering into the watercourse. Water quality monitoring shall also occur when working upstream and within 5km of a water treatment plant intake.

- Water quality monitoring activities must be conducted or overseen by a qualified Fish Biologist. No works requiring monitoring shall be undertaken without the presence of a qualified Fish Biologist.

- A Fish and Water Quality Protection Plan shall prepared by the Contractor in advance of construction works and any amendments must be submitted 15 days in advance of the start of work requiring or may requiring water quality monitoring. The Plan shall include a description of the works and measures proposed to mitigate adverse changes to water quality.

- Where monitoring results demonstrate changes above *Manitoba Water Quality Standards, Objectives and Guidelines (*MWQSOGs), the activity shall cease until effective mitigative measures are taken. Where an isolated work area is being dewatered and discharge exceeds guidelines mitigative measures may include diverting waters to splash pads or settling pond prior to water re-entering a watercourse or diverting to the top of bank where the water will not run back into the watercourse.

- The Contractor is responsible for water quality monitoring in association with the works in accordance with these specification unless otherwise advised in writing by the Contract Administrator.

- Where water quality monitoring is being coordinated by others, the Contractor must cooperate and coordinate with Contract Administrator, ESRA and its agents.

- The qualified fish biologist shall establish a TSS/turbidity relationship in advance of monitoring. Where an advance relationship is not possible to establish, the fish biologist shall utilize the CCME criteria as established in the *Protocol for Derivation of Water Quality Guidelines for the Protection of Aquatic Life 2007* and future amendments thereof.

- Water Quality Monitoring shall consist of:
    .1 TSS and turbidity monitoring during stream crossing construction shall be based on an upstream-downstream approach, with sufficient coverage of the study area to define effects in the initial zone of dilution, as well as effects downstream (spatial extent and magnitude of any increases).
    .2 Where equipment is working in water or potentially discharging to water, Benzene Toluene, Ethylbenzene and Xylene (BTEX) and petroleum hydrocarbon fractions F1 to F4 shall also be monitored.
    .3 Data collected at downstream sites shall be compared to data collected at upstream reference sites (background conditions) compared to the Manitoba Water Quality Standards, Objectives and Guidelines (MWQSOGs) for the protection of aquatic life.
    .4 Regular in-situ turbidity monitoring and collection of laboratory Total Suspended Solids samples shall be conducted.

- Water quality analysis shall be conducted at an accredited CALA [Canadian Association for Laboratory Accreditation] laboratory. Field equipment shall be calibrated in accordance with manufacture's specifications.

- The spatial extent and intensity of water quality monitoring during in-water works shall depend upon the presence and velocity of stream flow at the time of construction.

- The Contractor must advise the Contract Administrator 15 business days of work where water quality monitoring is or may be required. The monitoring shall be conducted prior, during and after construction activities. The Contractor shall reconfirm the schedule 5 business days and 48 hours in advance of the start of work. Any alteration to the schedule which results in direct or indirect costs to the Contract Administrator, ESRA or its agent shall be at the Contractors expense.

- The Contractor shall report water quality monitoring exceedances immediately to the Contract Administrator.

- Where the water quality monitoring plan is not being adhered to, the Contractor shall immediately notify the Contract Administrator.

- Water Quality Monitoring Report must include the following information:
    .1 Coordinates of sampling locations;
    .2 Description of the construction activity;
    .3 Description of the Total Suspended Solids (TSS)-Turbidity Relationship;
    .4 Measurements and timing of measurements of Total Suspended Solids and Turbidity; and
    .5 Other sampling data and analysis.

- Exceedances are to be reported to contractor and ESRA. The Contractor is to cease work and take corrective actions to mitigate exceedances prior to the restart of work.

Annex 8

Memorandum

To: Leanne Shewchuk
Manitoba East Side Road Authority

Date: July 13, 2016

From: Kevin Szwaluk
Szwaluk Environmental Consulting Ltd.

Re: Bloodvein Vegetation Recovery Assessment (P1-R6-WR)

Background

The following information provides an assessment of vegetation recovery along a portion of decommissioned winter road (approximately 1.5 km), located east of the community of Bloodvein. The winter road was blocked off in September 2011 from the recently developed P1 all season road and allowed to recover naturally without seeding.

Methods

The decommissioned winter road was surveyed June 25, 2016 to record information on vegetation species composition, structure and cover, based on levels identified from the Canadian Vegetation Classification System. Initially, a reconnaissance of the winter road was conducted by helicopter and photographs were captured of vegetation regeneration.

The full distance of the winter road was also walked by two ecologists (Kevin Szwaluk and Karin Newman) and an environmental officer from East Side Road Authority (Erica Werhun). Coordinates were recorded at two locations along the winter road, where descriptions of vegetation occurred (15U 661612E 5739305N, 661811E 5739967N). Photographs were also captured along the ground.

Vegetation Adjacent to the Winter Road

The surrounding vegetation adjacent to the winter road consists mainly of sparse (10-25%) to open (>25-60%) tree cover, on poorly drained soils. The vegetation dominantly is black spruce (*Picea mariana*) in the tree canopy with an understory of ericaceous shrubs (e.g., *Rhododendron groenlandicum*) and a ground layer of peat mosses (*Sphagnum* spp.) and feather mosses. Also present are areas of tamarack (*Larix laricina*) with speckled alder (*Alnus incana*) and willows (*Salix* spp.). Trembling aspen (*Populus tremuloides*) trees were also observed growing adjacent to the decommissioned winter road.

Vegetation Regeneration on the Winter Road

Vegetation cover on the decommissioned winter road consists dominantly of mixed herbaceous (i.e., forb and graminoid) closed cover (>60%) with a structure of very low (≤0.2 m) to low (>0.2-1m) plant height. The winter road is high in species number, with greater than 50 vascular species recorded. Table 1 includes species recorded on the decommissioned winter road. Common species included speckled alder (*Alnus incana*), wild red raspberry (*Rubus idaeus*), smooth wild strawberry (*Fragaria virginiana*), common horsetail (*Equisetum arvense*), reed grass (*Calamagrostis* spp.), common spike-rush (*Eleocharis palustris*), tufted bulrush (*Scirpus caespitosus*), closed-sheathed cotton-grass (*Eriophorum brachyantherum*) and Bebb's sedge (*Carex bebbi*). Ground cover consists of a variety of mosses, leaf litter, minor exposed soil, and occasional exposed rock.

Invasive and non-native species were mainly recorded along the southern portion of the winter road, and colonized the centreline trail on exposed soil from past vehicle travel. Exposed soil and rutting was generally minor along the winter road. Invasive species on the winter road included common dandelion (*Taraxacum officinale*), alsike clover (*Trifolium hybridum*), Canada thistle (*Cirsium arvense*), field sow-thistle (*Sonchus arvensis*), reed canarygrass (*Phalaris arundinacea*) and black medic (*Medicago lupulina*).

Regeneration of tree species is sparse (2-25%) along the winter road, and at the very low end of this range. Both coniferous (e.g., black spruce, jack pine, tamarack) and deciduous (e.g., trembling aspen, balsam poplar, white birch) species were observed. Heights of these species ranged from very low (≤0.2m) to intermediate (>1-3m). Specifically, heights were recorded for the following species, black spruce (0.1m - 1.5m), tamarack (1.2 – 1.5m), trembling aspen (0.5m – 2.5m), balsam poplar (0.2m), and paper birch (1.5m). Tree regeneration is more prominent near the mid-way of the winter road. Forest tent caterpillar presence was also observed on the winter road.

One species of conservation concern was observed in a wet depression. Northern arrowhead (*Sagittaria rigida*) is ranked rare (S2?) by the Manitoba Conservation Data Centre.

Conclusion

After five years (i.e., 2011 to 2016) of decommissioning the winter road, the natural herbaceous (i.e., forb and graminoid) vegetation consists of closed cover and the recovery rate is considered normal. This rate of recovery is related to ground disturbance, soil moisture and lack of a dominant tall shrub and tree stratum. The winter road was nearly uniform in amount of herbaceous cover however species recovery was variable as a result of soil drainage.

The cover of low shrub and tree regeneration on the winter road after five years of decommissioning is sparse, but the recovery rate is considered normal for the site. Some areas of the winter road were absent of low shrub and tree cover while tree regeneration was clearly evident at other locations. Based on the field assessment of the winter road, natural low shrub and tree regeneration is expected to continue to gradually increase annually, as a result of natural plant succession. Primary sources for tree regeneration will include those present on site, seeds dormant in the soil, and adjacent vegetation. Although black spruce will take decades to reach pre-disturbance conditions as a result of slow growth and the site, deciduous shrubs and trees like trembling aspen will continue to regenerate much quicker.

Minor areas of exposed soil were observed on the winter road and these areas were mainly related to rutting and possibly compaction from vehicle travel. Invasive and non-native species presence was evident in these areas along the southern portion of the winter road, and likely a result of recent construction activities (i.e., P1 all season road). The risk of invasive and non-native species introduction and spread is related to areas where these species have already established, such as existing roads and construction areas, and these plants are able to proliferate where opportunities exist.

The risk of soil erosion on the winter road after five years of decommissioning is low as a result of the flat or very gently sloping surface expression and closed vegetation cover.

The assessment of this winter road does not require any artificial seeding activity. The recovery of vegetation composition and abundance is typical, considering the site and soil drainage of the winter road. It is recommended that a follow-up assessment be conducted within two to three years to re-assess tree regeneration and monitor invasive and non-native species composition and abundance.

Photograph 1: Decommissioned winter road adjacent to the all season road.

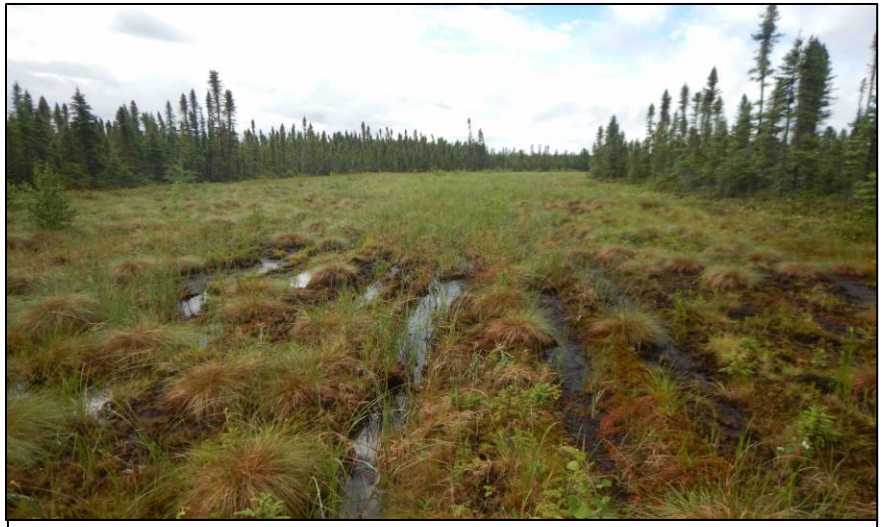
Photograph 2: Herb cover on decommissioned winter road.

Photograph 3: Graminoid cover on decommissioned winter road.

Photograph 4: Invasive species on decommissioned winter road.

Photograph 5: Alder regeneration on decommissioned winter road.

Photograph 6: Black spruce regeneration on decommissioned winter road.



Photograph 7: Rutting on decommissioned winter road.

Photograph 8: Trembling aspen regeneration on decommissioned winter road.

Table 1. Flora of the Bloodvein Decommisssioned Winter Road.

Scientific Name	Common Name	Family
Achillea millefolium	Common Yarrow	ASTERACEAE
Alnus incana ssp. *rugosa*	Speckled Alder	BETULACEAE
Anemone canadensis	Canada Anemone	RANUNCULACEAE
Aralia hispida	Bristly Sarsaparilla	ARALIACEAE
Betula papyrifera	Paper Birch	BETULACEAE
Calamagrostis sp.	Reed Grass	POACEAE
Carex aquatilis	Water Sedge	CYPERACEAE
Carex bebbii	Bebb's Sedge	CYPERACEAE
Carex brunnescens	Brownish Sedge	CYPERACEAE
Carex magellanica	Bog Sedge	CYPERACEAE
Carex rostrata	Beaked Sedge	CYPERACEAE
Chamaedaphne calyculata	Leatherleaf	ERICACEAE
Cirsium arvense	Canada Thistle	ASTERACEAE
Cornus canadensis	Bunchberry	CORNACEAE
Drosera rotundifolia	Round-leaved Sundew	DROSERACEAE
Eleocharis palustris	Common Spike-rush	CYPERACEAE
Equisetum arvense	Common Horsetail	EQUISETACEAE
Equisetum fluviatile	Swamp Horsetail	EQUISETACEAE
Equisetum pratense	Meadow Horsetail	EQUISETACEAE
Equisetum sylvaticum	Wood Horsetail	EQUISETACEAE
Eriophorum brachyantherum	Closed-sheathed Cotton-grass	CYPERACEAE
Fragaria virginiana	Smooth Wild Strawberry	ROSACEAE
Galium boreale	Northern Bedstraw	RUBIACEAE
Geum aleppicum	Yellow Avens	ROSACEAE
Glyceria grandis	Tall Manna Grass	POACEAE
Kalmia polifolia	Pale Laurel	ERICACEAE
Larix laricina	Tamarack	PINACEAE
Lotus corniculatus	Bird's-foot Trefoil	FABACEAE
Medicago lupulina	Black Medic	FABACEAE
Phalaris arundinacea	Reed Canarygrass	POACEAE
Phleum pratense	Timothy	POACEAE
Picea mariana	Black Spruce	PINACEAE
Pinus banksiana	Jack Pine	PINACEAE
Populus tremuloides	Trembling Aspen	SALICACEAE
Rhododendron groenlandicum	Labrador Tea	ERICACEAE
Rubus idaeus	Wild Red Raspberry	ROSACEAE
Sagittaria rigida	Northern Arrowhead	ALISMATACEAE
Salix bebbiana	Bebb's Willow	SALICACEAE
Salix pedicellaris	Bog Willow	SALICACEAE
Salix pyrifolia	Balsam Willow	SALICACEAE
Schoenoplectus tabernaemontani	Soft-stem Bulrush	CYPERACEAE
Scirpus cyperinus	Wool-grass	CYPERACEAE
Scirpus microcarpus	Small Fruited-bulrush	CYPERACEAE
Scutellaria galericulata	Marsh Skullcap	LAMIACEAE

Sium suave	Water Parsnip	APIACEAE
Sonchus arvensis	Field Sow-thistle	ASTERACEAE
Symphyotrichum ciliolatum	Lindley's Aster	ASTERACEAE
Taraxacum officinale	Common Dandelion	ASTERACEAE
Trifolium hybridum	Alsike Clover	FABACEAE
Typha sp.	Unknown Cat-tail	TYPHACEAE
Vaccinium oxycoccus	Small Cranberry	ERICACEAE
Vicia americana	American Vetch	FABACEAE
Viola sp.	Violet	VIOLACEAE

Annex 9

Prepared By:
Dillon Consulting Limited

PR 304 TO BERENS RIVER
ALL-SEASON ROAD

ENVIRONMENTAL IMPACT ASSESSMENT

GREENHOUSE GAS EMISSIONS ASSESSMENT

Report - **Project No. 10-3402**

July 2011

Prepared For:
Manitoba East Side Road Authority

PR 304 to Berens River All-Season Road Environmental Impact Assessment – Greenhouse Gas Emissions Assessment *Final Report*

July 2011

Project No. 10-3402

Prepared For:

East Side Road Authority

Prepared By:

Dillon Consulting Limited

EXECUTIVE SUMMARY

A greenhouse gas (GHG) assessment of the PR 304 to Berens River All-Season Road (ASR) project (Project) was conducted in support of the EA approvals process. The quantification and reporting employed the CAN/CSA-ISO 14064 suite of protocols. The GHG assessment estimated the total direct and indirect GHG emissions due to the Project and compared this estimate with the GHG emissions (direct and indirect) under the business as usual Baseline scenario (i.e., without the Project). The assessment was conducted over the time period 2010 to 2023 inclusive which includes up to four (4) years of construction and 10 years of operation of the ASR.

The Baseline scenario resulted in a total of approximately 136 kt CO_2e being emitted from 2010 to 2023 inclusive. The Project scenario was estimated to emit a total of approximately 163 kt CO_2e over the same time period which is roughly 19% more than the Baseline emissions. The net change in GHG emissions due to the Project was therefore estimated to be approximately +27 kilo-tonnes (kt) CO_2e over the time period 2010 to 2023. The significant portions of the GHG emission are due to the construction of the ASR (approximately 33% of the total). The construction of the ASR was estimated to increase the Province's construction based GHG emissions by approximately 13 % based on the 2008 estimates of 0.098 Mt CO_2e. This increase is temporary so that once construction of the ASR has been completed it would result in the reduction of the Province's construction-based GHG emissions. Another increase is the estimated vehicular traffic between Winnipeg and Berens River. However the anticipated improvements in future vehicular technology that result in emissions reductions have not been included in this assessment. The GHG emissions due to the road transportation with the ASR in place was estimated to be less than 0.2% of the Province's total GHG emissions of 5.13 Mt CO_2e due to road transportation in 2008.

Potential GHG emissions abatement and / or offsets during the construction and operational phases of the Project were suggested. In particular, construction best management practices would help to reduce the GHG emissions associated with this phase of the Project. For the operational phase of the project, preservation of the wetland areas surrounding the ASR, reforestation of the ROW, inter-community transit service, and in the future the paving the ASR may potentially reduce the GHG emissions during this phase of the Project. Recommendations on developing mitigation plans and policies, monitoring and data collection, and verification were provided. This will help to verify the initial estimates of the GHG emissions associated with the Project provided in this report and assist in positioning the Province to participate in future provincial, regional and federal carbon trading mechanisms.

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Cover Photos

Right photo (forest): stock photography from www.dreamstime.com
Left photo (truck): © 2008 Martin Male (EclecticBlogs – Flickr)

1. Introduction

1.1 Background

A greenhouse gas assessment of the PR 304 to Berens River All-Season Road (ASR) project is part of the environmental impact assessment process and is included as part of the Environment Act Licensing. Federally, the Canadian Environmental Assessment Agency (2003) in its guidance document recommends that practitioners address greenhouse gas (GHG) considerations that include:

1. Preliminary scoping for GHG considerations. This preliminary scoping assesses whether there are likely GHG considerations associated with the project.
2. Identify GHG considerations. This process considers the potential GHG emissions profile of the project in comparison to the industry profile.
3. Assess GHG considerations. This process determines the direct and indirect GHG emissions of the project, the impacts on carbon sinks, and comparison with industry, provincial / territorial and national inventories.
4. GHG management plans. Development of a GHG management plan to mitigate and / or offset emissions if the project results in medium or high emissions.
5. Monitoring, follow-up and adaptive management. This process monitors and verifies the GHG emissions forecast and determines the effectiveness of the GHG abatement / offset measures. Modification of the GHG management plan may be required during this process.

This GHG assessment addresses CEAA considerations 1, 2 and 3 above. Given that this project is an adaptation response to climate change Items 4 and 5 are not necessary. The GHG assessment presented in this report follows the CAN/CSA-ISO 14064 suite of protocols in quantifying and reporting GHG emissions and removals.

1.2 Greenhouse Gas Considerations

The proposed PR 304 to Berens River All-Season Road project (Project) will have GHG emissions associated with the construction and operational (vehicular emissions from the use of the ASR) phases of the Project.

The Project involves the construction and operation of the all-seasons road (ASR) from PR 304 to Berens River. The total distance of the proposed ASR is approximately 155 km. The Manitoba Infrastructure and Transportation (MIT, 2010a) constructs and maintains approximately 19,000 km of all-weather roads and 2,200 km of winter roads. The Project will contribute to an increase of less than 1 % of the total roads in Manitoba.

Environment Canada (2010) provides annual national and provincial GHG emissions per sector since 1990. The most recent GHG inventory year of 2008 indicated that for construction activities in Manitoba, approximately 0.098 Mt CO_2e were emitted in 2008 and the total emissions for road transportation in the province was approximately 5.13 Mt CO_2e. Since 1990, the GHG emissions due to construction have increased in Manitoba by approximately 56 % and for road transportation the increase has been approximately 31 %.

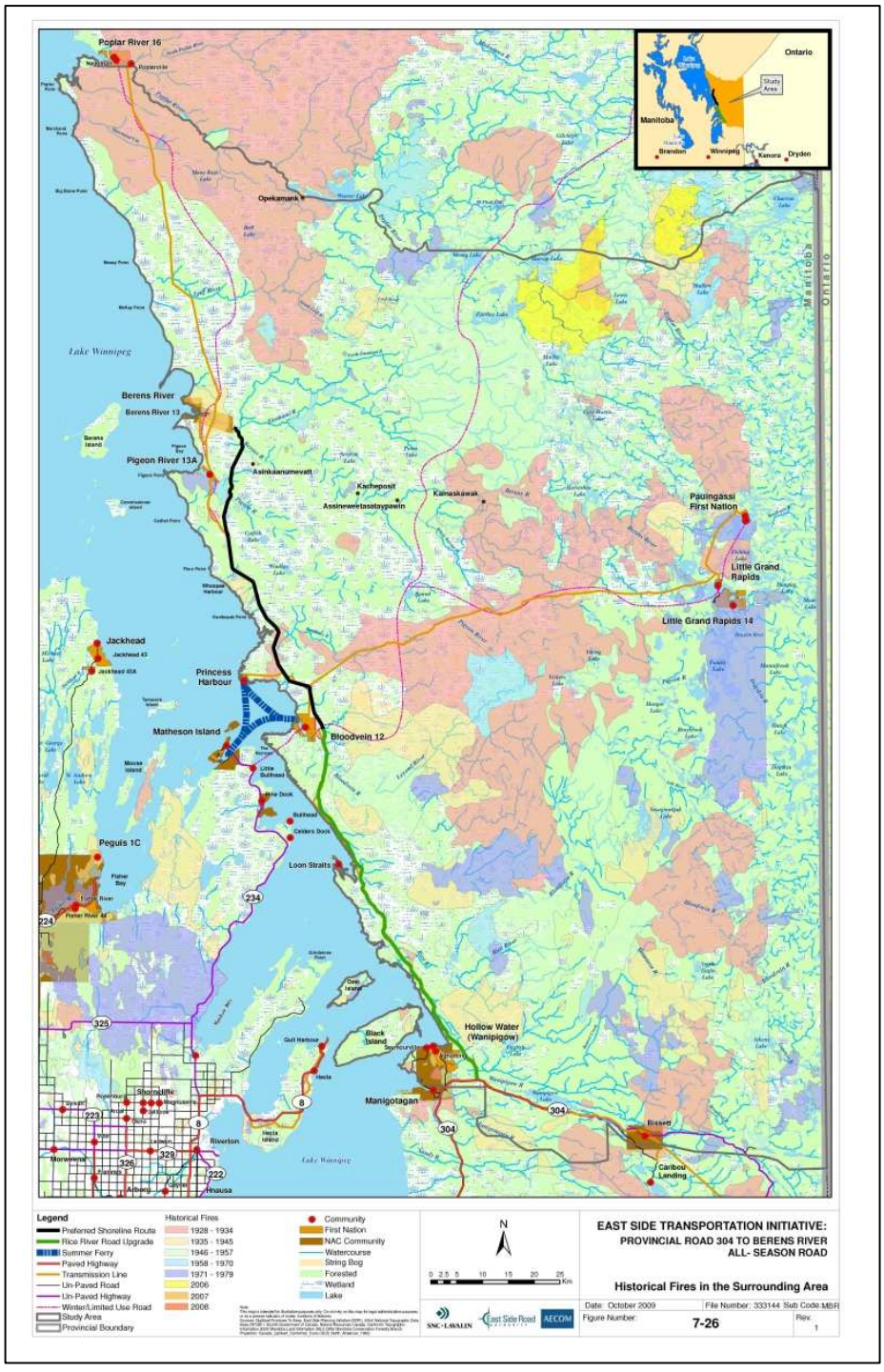
Nationally, GHG emissions from the construction sector in 2008 was estimated to be approximately 1.26 Mt CO_2e, and for the road transportation sector it was estimated at approximately 135 Mt CO_2e (Environment Canada, 2010). The emissions due to construction decreased in 2008 by 33 % from 1990 levels and for the road transportation sector there was an increase of approximately 37 %. Manitoba contributed less than 8 % to the national GHG emissions due to construction and less than 4 % to the national road transportation GHG emissions in 2008.

The Project will contribute to an increase in annual GHG emissions for the Province. Therefore, in order to determine the magnitude of the GHG emissions associated with the Project, a GHG assessment is needed.

2. The Project

The Project study area, shown in **Figure 2.1**, is along the eastern shoreline of Lake Winnipeg and extends from the southern limit of the Hollow Water traditional lands north to Poplar River and east to Pauingassi and Little Grand Rapids First Nation on the Ontario border. The study area encompasses all First Nations traditional lands.

Figure 2.1 – Study Area



Source: Figure 7-26 in East Side Road Authority (2010).

2.1 Existing Conditions

The area to the north and east of Lake Winnipeg is not currently served by an all-season road (ASR) (East Side Road Authority, 2010). The remoteness of communities in the area, their size and lack of economic development has resulted in a costly and limited transportation system. These communities included the Southeast Tribal Council (SERCA) communities of Poplar River, Berens River, Bloodvein, Little Grand Rapids, and Pauingassi, and the Island Lake Tribal Council (ILTC) communities of St. Theresa Point, Wasagamack, Garden Hill, and Red Sucker Lake. For the communities of Bloodvein and Berens River, this transportation system relies on air service, seasonal ferry service during the non-winter months, and a seasonal winter road. The other more remote communities rely on air service and a seasonal road during the winter.

Air service is from Winnipeg and from Matheson Island. Ferry and barge service to Bloodvein occurs from April / May to October inclusive and is from Islandview and Pine Dock harbours. The seasonal road network consists of: an ice road across Lake Winnipeg from Pine Dock to Bloodvein; a winter road from PR 304 north to Bloodvein; a winter road from Bloodvein north to Berens River and then onto Poplar River; and another winter road runs from Bloodvein to Little Grand Rapids and Pauingassi. This latter winter road is also connected to another winter road network that connects the communities of the ILTC. Matheson Island, Islandview and Pine Dock can be accessed from Winnipeg via Provincial Trunk Highway (PTH) 8 and Provincial Road (PR) 234 (a gravel road). PR 304 is a paved provincial trunk road and connects to Winnipeg via Highway 59.

The study area is covered by boreal forest, wetlands, and small rivers and lakes. The predominant forest cover is black spruce with some jack pine. Logging occurs near Hollow Water.

2.2 Project Description

The Project consists of building an ASR between PR 304 and Berens River (East Side Road Authority, 2010). This entails upgrading the existing Rice River forestry road from PR 304 northwards and extending it to Bloodvein, and constructing an ASR from Bloodvein to Berens River. The distance from PR 304 to Bloodvein is approximately 88 km with the extension from the Rice River forestry road to Bloodvein following the winter road and hydro alignment. The distance from Bloodvein to Berens River is approximately 71 km.

The proposed ASR will be a gravel road for the entire length from PR 304 to Berens River. The roadway will be 10 m in width with two 3.7 m wide lanes, 1.0 m shoulders and a 0.3 m shoulder rounding allowance. The roadway will be centred within a 100 m right of way (ROW) and the cleared limit of the roadway will be 60 m within this ROW. Further clearing will be on as required basis to maintain line of sight. In an effort to minimise clearing, where applicable, the alignment will follow the existing winter road and Manitoba Hydro distribution line ROW. The proposed ASR will also entail the construction of a number of bridges in order to cross named and unnamed water courses.

The construction of the proposed ASR is anticipated to be completed within four (4) years. Construction is proposed to commence in the fall of 2010 and the majority of the works expected to be completed by March 2014 (East Side Road Authority, 2010). There will be borrow and quarry areas near the proposed ASR to support construction, operations, and maintenance needs.

3. GHG Emissions Assessment Methodology

In order to evaluate the change in GHG emissions due to the Project, the estimated annual GHG emissions for the Baseline scenario without the Project was compared to the scenario with the Project. In both scenarios the annual GHG emissions was projected 14 years from 2010 inclusive (i.e., to 2023). This projection of 14 years includes four years for construction of the ASR followed by 10 years of operation of the ASR. The ASR will impact the communities of Berens River and Bloodvein and transportation activities between these communities and Winnipeg. The other communities in the study area will not be impacted as they will still rely on air and seasonal road transportation. Hence this assessment focuses on the GHG implications associated with the transportation infrastructure linking Berens River, Bloodvein and Winnipeg. The natural ecosystem sources and sinks are also included to demonstrate their contribution to the overall GHG implications of the Baseline and Project scenarios. The following described in detail the two scenarios considered for this assessment.

3.1 Baseline Scenario

The Baseline scenario assumed the existing conditions and projects 14 years into the future to 2023. The scenario further assumes that the existing climatic conditions will prevail to 2023 as the impacts of climate change to the study region cannot be exactly predicted and is beyond the

scope of this GHG assessment. The changes in climate are expected to impact the transportation patterns of the study region.

The Baseline scenario estimated the GHG emissions and sinks / removals and the resulting cumulative GHG emissions by:

Annual Baseline GHG Emissions (tonnes CO_2e/yr) =

Carbon sequestration due to forest cover along the proposed ASR (tonnes CO_2e/yr)
+ Net GHG emissions due to wetlands along the proposed ASR (tonnes CO_2e/yr)
+ GHG emissions due to air travel to Bloodvein and Berens River (tonnes CO_2e/yr)
+ GHG emissions due to ferry crossing from Islandview/Pine Dock to Bloodvein (tonnes CO_2e/yr)
+ GHG emissions due to transportation between Winnipeg and Islandview/Pine Dock (tonnes CO_2e/yr)
+ GHG emissions due to the construction and maintenance of seasonal road (tonnes CO_2e/yr)
+ GHG emissions due to vehicular travel during winter (tonnes CO_2e/yr).

Details on the above sources and sinks / removals are given in the following sections. Note that there is a non-scheduled ferry servicing Berens River but due to a lack of data this was not included in the assessment. Due to the irregular nature of the service, it was considered to be a non-significant source of GHG emissions.

3.1.1 Carbon Sequestration of Forest Cover

Canada's National Forest Inventory (NFI, 2010) has classified the ecozone in which the study area is located in as Boreal Shield. For the study area, the NFI (2010) plot statistics indicated that the predominant tree species in the study area was Black Spruce followed by Jack Pine based on a 2006 forest inventory. In order to estimate the carbon sequestration rate of the forest cover, the total carbon stock of the forest cover along the proposed ASR was calculated in addition to an estimate of the age of the forest cover.

The methodology used in estimating the total carbon stock was based on the Tree Canada (2009) protocol for calculating the above and below ground carbon stock of the forest cover. The above ground carbon (C) stock can be estimated using the following relationship:

Above Ground C-stock (tonnes CO_2) = above ground tree volume (m^3/ha) × biomass expansion factor (C/m^3) × project area (ha) × C-CO_2 conversion (tonne CO_2/tonne C);

where the *above ground tree volume × biomass expansion factor = above ground dry biomass (tonnes/ha),* and the *C-CO_2 conversion* is 44/12.

The below ground C-stock can be estimated by:

Below Ground C-stock (tonnes CO_2) = root-shoot ratio × Above Ground C-stock;

where the *root-shoot ratio* is dimensionless and is 0.18 for spruce and 0.23 for other hardwoods in Manitoba's boreal shield (Tree Canada, 2009).

The data on the total dry biomass (above ground and below ground) of the forest cover was provided by NFI (2010) and partitioned into the respective above and below ground fractions based on the root-shoot ratio for spruce and hardwoods. The conversion from the dry tree biomass to tree biomass C is 0.5 (tonne C/tonne dry biomass) (Tree Canada, 2009).

The proposed ASR has a 60 m right of way (ROW) running from PR 304 to Bloodvein and from Bloodvein to Berens River. The land cover statistics along the ROW for the length of the ASR was provided by the Manitoba Floodway and East Side Road Authority (2010). These data provided the spatial coverage of softwoods and hardwoods along the ROW of the proposed ASR which were approximately 246 ha and 117 ha, respectively.

3.1.2 Net GHG Emissions from the Land Cover

The route of the proposed ASR will cover both wetlands and forested areas. Boreal wetlands and uplands (forested areas) are known natural sources and sinks of methane (e.g., Bubier et al., 2005, and Potter et al., 2001) and carbon dioxide (Potter et al., 2001, and Trumbore et al., 1999).

The following methodology was used in estimating the net GHG emissions from the wetlands impacted by the ASR:

Net GHG emissions due to wetlands along the proposed ASR (tonnes CO_2e/yr) = Methane flux from forest soils (tonnes CO_2e/ha) × forest area (ha) + Methane flux from wetlands (tonnes CO_2e/ha) × wetland area (ha) + Carbon dioxide flux from wetlands (tonnes C/ha) × wetland area (ha) × C-CO_2 conversion (tonne CO_2/tonne C).

In a study conducted over a boreal wetland and upland near Thompson MB, Bubier et al. (2005) measured methane (CH_4) emissions over the growing season from wetlands that ranged from 10 – 350 mg CH_4/m^2/day and sinks (removals) from black spruce upland soils that ranged from 0 – 1.0 mg CH_4/m^2/day. The wetland consisted of fens, bogs, and small ponds. The forested areas were mature forests 60 years or more in age (since the last burn). Potter et al. (2001) using a process model, estimated CH_4 emissions from a similar landscape of approximately 2.8 mg CH_4/m^2/day from the wetland (fen) and a sink of approximately 0.5 mg CH_4/m^2/day from an old Black Spruce upland.

In the same study area near Thompson, Trumbore et al. (1999) measured and estimated the annual carbon sink from four differing wetlands and using three different estimation methods that ranged from -2.56 to 180 g C/m^2/yr. The negative value indicated that the wetland was a carbon source during the study. Potter et al. (2001) using the same process model described above estimated the carbon sink for similar wetlands in the same study area ranging from -10.7 to -11.8 g C/m^2/yr indicating a source for carbon emissions into the atmosphere.

For the purposes of this study, the mean CH_4 emissions from the wetlands of the two studies (Bubier et al., 2005 and Potter et al., 2001) was calculated to be 86 mg CH_4/m^2/day and assumed to be representative of the CH_4 emissions from the existing wetlands covered by the proposed ASR. Similarly the mean of the CH_4 sinks / removals by the forested areas from the two studies, calculated to be 0.2 mg CH_4/m^2/day, was assumed to be representative of the CH_4 sink of the forest covered by the proposed ASR. The mean CO_2 sink due to the wetlands of the two studies by Potter et al. (2001) and Trumbore et al. (1999) was calculated to be 205.7 g CO_2/m^2/yr (56.1 g C/m^2/yr) and was assumed to be representative of the CO_2 sink of the existing wetlands impacted by the proposed ASR.

These emissions and removals would occur over the growing season of the study area which were estimated to be from April to October (Environment Canada above 0°C temperature normals for Pine Dock climate station located ~ 17 km southwest of Bloodvein). Total net CH_4 emissions (emissions minus removals) were then estimated from the wetland and forested area data provided by Manitoba Floodway and East Side Road Authority (2010).

It should be noted that CO_2 and CH_4 emissions and removals (i.e., flux) are highly variable and intermittent and are dependant on environmental temperature (growing season), moisture and precipitation. Thompson MB, where the studies of Bubier et al. (2005), Potter et al. (2001) and Trumbore et al. (1999) were conducted, is approximately 450 km north of the study area and therefore has lower annual environmental temperatures and rainfall (-3.2°C and 348 mm rainfall, Environment Canada climate normals) than the study area (1.1°C and 425 mm rainfall, Environment Canada climate normals for Pine Dock). It is therefore expected that the net CO_2 and CH_4 flux may be higher for the Project's area than the calculated approximations from these research studies. The above estimated wetland CO_2 removals, and CH_4 emissions and forest soil removals for the Project's study area should therefore be considered as an approximation.

3.1.3 GHG Emissions of Air Travel

Under existing conditions, air travel is between Winnipeg and Bloodvein, between Winnipeg and Berens River, between Matheson Island and Bloodvein, and between Matheson Island and Berens River. This air travel provides a vital link to the south for Bloodvein and Berens River. The GHG emissions based on air travel was estimated from these routes of air travel, the total annual number of flights and their distances, and the projected number of such flights to 2023.

The annual GHG emissions due to the air traffic to and from Berens River and Bloodvein can be calculated from:

$$\textit{Annual Air Travel GHG Emissions (tonnes } CO_2e/yr) = \sum_{Airport} \{\textit{Air Movements} \times \textit{Air Movement Fraction} \times \textit{Trip Duration (hr)} \times \textit{Fuel Consumption Rate (L/hr)} \times EF_{air} \textit{ (g } CO_2e/L) \times 10^{-6} \textit{ (tonnes/g)}\}$$

Where:
Airport refers to the airport at Berens River, and Bloodvein;
Air Movements is the officially recorded total annual air movements given in **Table 3.1-1** at each airport and the estimated annual air movements projected to 2023;
Air Movement Fraction is the 20 / 80 fractional ratio for movements to and from Winnipeg and Matheson Island, respectively;
Trip Duration is the estimated duration of each type of trip;

Fuel Consumption Rate is the estimated average aviation fuel consumption rate for each type of trip; and

EF_{air} = 2607 g CO_2e/L is the aggregated emission factor for aviation turbo fuel (Environment Canada, 2009).

The Government of Manitoba's Infrastructure and Transportation (MIT, 2010b) provided data on the number of air movements at the airports of Bloodvein and Berens River. These data were then used to estimate the existing as well as the potential future volumes of air traffic at these two communities for this study. **Table 3.1-1** summarises the officially recorded air movements from 2000 to 2008 and **Figure 3.1-1** illustrates the data. It should be noted however that actual air movements are higher than those officially recorded as aircraft arrive and depart from the airports outside of official hours. Therefore, when estimating the GHG emissions associated with air traffic movement, the reported air movements given in **Table 3.1-1** were increased by 25% to account for the unrecorded air movements based on feedback from MFESRA (2010b). This increase is a first approximation and subject to revision based on the availability of data.

The annual air movements at Berens River from 2000 to 2008 indicated a continuous annual decline in volume which was best fit (r^2 = 0.89) with a regression equation of:

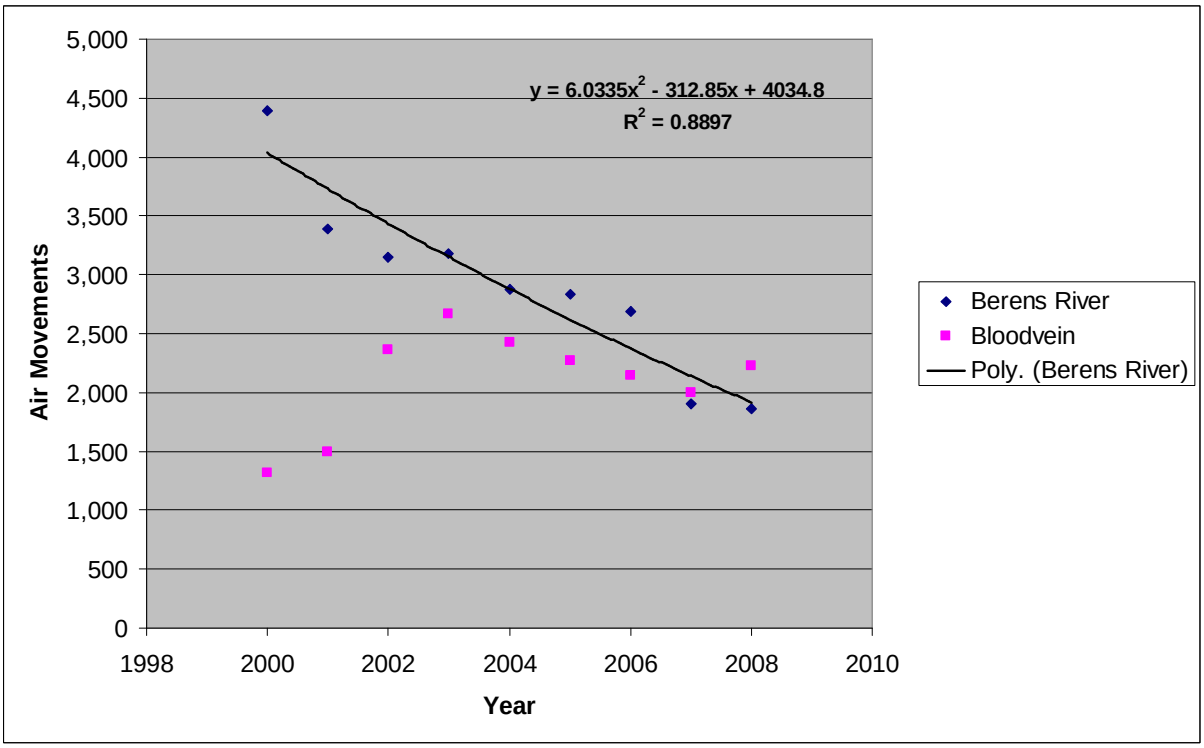
$$Annual\ Air\ Movements = 6.0335 \times (Year - 2000)^2 - 312.85 \times (Year - 2000) + 4034.8.$$

Using this equation, it was estimated that by 2023, total air movement at Berens River airport will decline to 31. For Bloodvein, the total annual air movements remained relatively stable between 2002 and 2008 with an average of 2,301 movements. This annual average was assumed to be consistent to 2023 for the purposes of this study.

Table 3.1-1 Total Air Movements at Bloodvein and Berens River Airports from 2000 to 2008

Community	2000	2001	2002	2003	2004	2005	2006	2007	2008
Berens River	4,392	3,394	3,153	3,175	2,881	2,838	2,686	1,902	1,860
Bloodvein	1,319	1,491	2,361	2,668	2,429	2,272	2,144	1,997	2,233

Figure 3.1-1 Total Air Movement at Bloodvein and Berens River Airports



The trend in the movements between Matheson Island and Berens River is indicated with an $r^2 = 0.89$.

The air service providers and types of aircraft received at Berens River (Dillon, 2010) were of the following:

- Perimeter Airlines from Winnipeg using Beechcraft 99 and Fairchild Metroliners;
- Fast Air from Winnipeg using Beachcraft King Air and Piper Navajo;
- Keystone Airlines from Winnipeg using Beechcraft King Air, Beechcraft 99, Piper Navajo and Piper Chieftan; and
- WamAir from Matheson Island using Cessna 206 and 208.

It was assumed that 20% of the total movements were to and from Winnipeg and 80% was to and from Matheson Island. This breakdown was based on communication with Berens River airport management (Dillon, 2010). It was also assumed that the same air service providers and ratio of flights between Winnipeg and Bloodvein and Matheson Island and Bloodvein were similar (i.e., 20 / 80, respectively, Dillon, 2010).

Based on the available performance data on the aircrafts indicated above, the average cruising speed and fuel consumption rate for the aircrafts flying to and from Winnipeg to the two communities were estimated to be approximately 390 km/h and 271 L/h, respectively. For the Cessna 206/208, the average cruising speed was estimated to be 259 km/h and the average fuel consumption was approximately 120 L/h.

The duration of each type of trip can then be estimated based on the cruising speed of the aircraft type and the round-trip distances of:

- Winnipeg and Berens River: 540 km;
- Winnipeg and Bloodvein: 412 km;
- Matheson Island and Berens River: 140 km; and
- Matheson Island and Bloodvein: 35 km.

3.1.4 GHG Emissions of Ferry Crossing

Under existing conditions, the Government of Manitoba's Infrastructure and Transportation operates the M.V. Edgar Wood ferry while a private concern operates another ferry/barge service. These ferry and barge services provide a vital link for the Bloodvein and Princess Harbour communities and those beyond. The M.V. Edgar Wood ferry carries passengers, vehicles and freight to and from Bloodvein. The ferry crossing is primarily from Island View harbour to Bloodvein with service to Princess Harbour upon special request. The GHG emissions based on the ferry crossing was estimated from the total number of round trips per year, the total duration of each round trip, and the projected number of such round trips to 2023.

The annual GHG emissions due to the M.V. Edgar Wood ferry crossing can be calculated from:

> *Annual Ferry Crossing GHG Emissions (tonnes CO_2e/yr) = Total Annual Number of Round Trips × Duration per Round Trip (hr) × EF_{ferry} (kg CO_2e/hr) × 0.001 (tonnes/kg).*

The Government of Manitoba's Infrastructure and Transportation (MIT, 2010c) provided data on the ferry service which was used to estimate the existing and the potential future annual number of trips conducted by the ferry service. The M.V. Edgar Wood provides two round trips per day on Monday and Friday, one round trip per day Tuesday, Wednesday and Thursday, and one round trip per day on alternate Saturdays resulting in a total of 15 round trips every two weeks. Since 2000, the ferry season has been from either the beginning or end of May to end of October.

For the purposes of this study, it was assumed that the season was from beginning of May to end of October which would result in approximately 197 round trips per year. Each round trip lasts approximately 3 hours.

Communication with Captain David Stephanson of the M.V. Edgar Wood (25 May 2010) indicated that the vessel was equipped with two 215 hp inboard diesel engines. The US EPA NONROAD 2005 mobile emission model (US EPA, 2008) was used to predict the emission factor for the ferry's diesel engines. The NONROAD emission model did not provide the exact power rating, therefore to be conservative the emission factor for 300 hp diesel engine was used resulting in a cumulative EF_{ferry} = 82.6 kg CO_2e/hr.

No data were available for the privately operated ferry/barge. Therefore it was assumed conservatively that the annual GHG emissions associated with this private operation was approximately 50% of the emissions due to the M.V. Edgar Wood ferry. This is a first approximation and subject to revision with the availability of data.

3.1.5 GHG Emissions of Transportation between Winnipeg and Islandview/Pine Dock

Overland travel by trucks and personal vehicles under existing conditions to and from Matheson Island/Islandview/Pine Dock would typically be from Winnipeg and communities along PTH 8 and PR 234. These trips would then cross over to and from Bloodvein and Berens River by air or ferry. For the purpose of this study, it was conservatively assumed that all travel originated or terminated from or in Winnipeg. Estimating the travel distances and patterns from other communities along the PTH 8 and PR 234, and other travel patterns that would flow into these roadways was considered beyond the scope of this study.

GHG Emissions due to Vehicles between Winnipeg and Islandview/Pine Dock

The annual GHG emission due to vehicles travelling between Winnipeg and Islandview / Pine Dock was estimated using the following relationship:

> *Annual GHG Emission Travel between Winnipeg and Islandview/Pine Dock (tonnes CO_2e/yr) = $\sum_{vehicle\ category}$ {Vehicle Category Number of Trips (Trips/yr) × Trip Duration (hr/Trip) × Fuel Use (L/hr) × $EF_{vehicle\ category}$ (g CO_2e/L) × 10^{-6} (tonnes/g)}*

The total travel distance from Winnipeg to PR 234 on PTH 8 was estimated to be approximately 165 km one-way and the estimated minimum vehicular speed was 80 km/h (posted speed limit of 100 km/h). This resulted in an estimated travel time of approximately 2.1 hours. PTH 8 is asphalt. PR 234 from PHT 8 to Islandview / Pine Dock is a gravel road with posted speed limit of 90 km/h and assumed minimum speed of 60 km/h. The total distance was estimated to be approximately 75 km (one-way) resulting in a travel time of 1.25 hr.

The fuel consumption rate of 12 L/hr for a typical pickup truck travelling on asphalt road surface was conservatively assumed to represent the fuel economy for the personal cars and pickup truck vehicle category. For the heavy truck category, a fuel consumption rate of 15 L/hr for a typical heavy truck travelling on asphalt road surface was assumed.

Due to the poorer road surface conditions that a gravel road present in comparison to a paved road surface, the US EPA (2006) has estimated that fuel consumption increases by approximately 19.2% for gravel roads versus paved roadways. This deterioration in fuel economy was applied to travel on PR 234.

The cumulative emission factor (includes CO_2, CH_4 and N_2O) for cars and pickup trucks $EF_{cars,\ pickups}$ = 2498 g CO_2e/L, and for heavy trucks $EF_{heavy\ trucks}$ = 2691 g CO_2e/L was used based on the emission factors given in Environment Canada (2009).

The annual total number of cars and pickup trucks, and heavy trucks travelling between Winnipeg and Islandview / Pine Dock was estimated from the air travel and ferry passenger and freight data and includes the approximate increases due to the unreported air movements and ferry/barge service.

Estimated Annual Volume of Vehicles based on Air Travel

Similarly to the pattern in the annual volume of flights, the number of passengers going to and from Berens River has been decreasing annual since 2000 whereas the number of passengers on flights to and from Bloodvein has remained relatively steady since 2002 (MIT, 2010b). These data were then used to estimate the existing as well as the potential future number of passengers travelling by air to and from these two communities for this study. **Table 3.1-2** summarises the reported air travel passenger volumes from 2000 to 2008 and **Figure 3.1-2** illustrates the data.

The reported annual number of passengers at Berens River airport from 2000 to 2008 indicated a continuous annual decline in volume which was best fit (r^2 = 0.91) with a regression equation of:

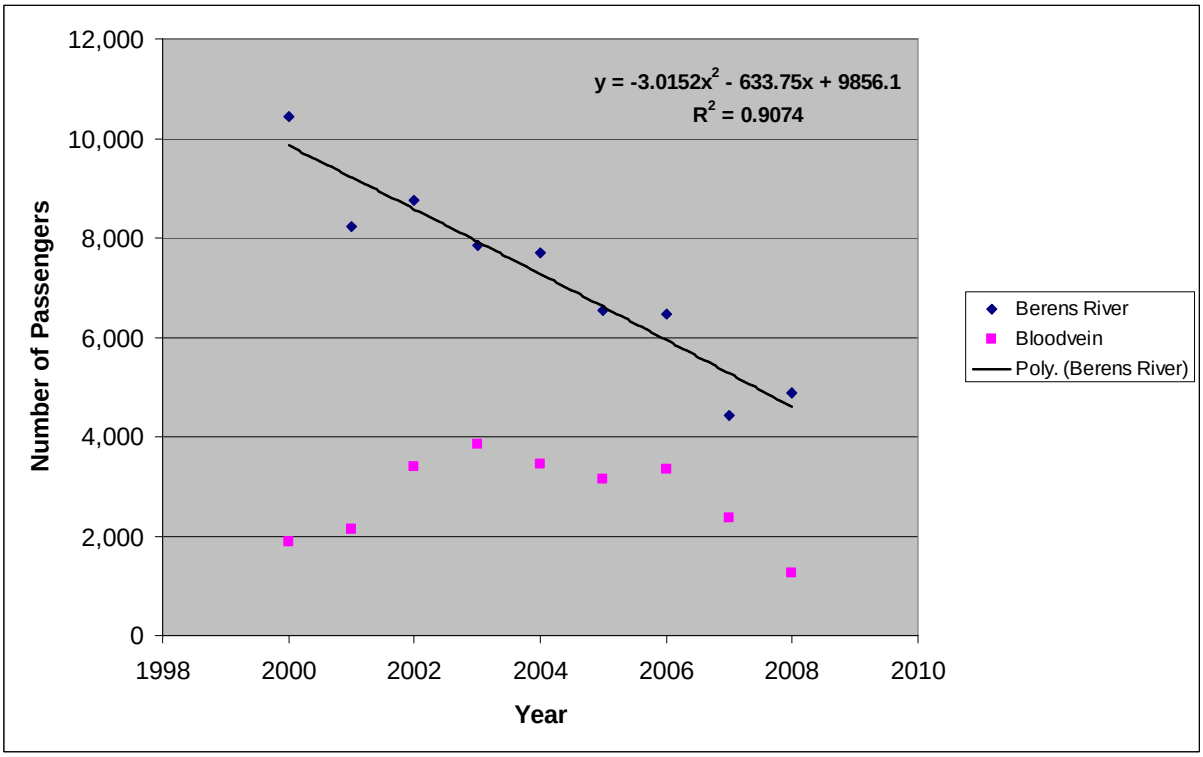
$$\textit{Annual Air Travel Passengers} = -3.0152 \times (\textit{Year} - 2000)^2 + 633.75 \times (\textit{Year} - 2000) + 9856.1$$

This equation was valid until 2014. Beyond this year it was assumed that the number of passengers would remain stable at the 2014 estimated volumes of 393 passengers per year till 2023. For Bloodvein, the reported total annual number of passengers remained relatively stable between 2002 and 2008 with an average of 2,761 passengers per year. This annual average was assumed to be consistent to 2023 for the purposes of this study.

Table 3.1-2 Total Air Travel Passengers at Bloodvein and Berens River Airports from 2000 to 2008

Community	2000	2001	2002	2003	2004	2005	2006	2007	2008
Berens River	10,440	8,214	8,752	7,853	7,697	6,553	6,456	4,418	4,892
Bloodvein	1,880	2,140	3,395	3,851	3,434	3,153	3,353	2,377	1,264

Figure 3.1-2 Total Air Travel Passengers at Bloodvein and Berens River Airports



Due to the small size of the aircrafts operated by WamAir from Matheson Island (i.e, Cessnas), it was assumed that the majority of vehicles travelling to and from the airport would be personal vehicles and light duty trucks.

In order to estimate the number of personal vehicles and light duty trucks travelling between Winnipeg and Matheson Island airport, it was assumed that there were two passengers per vehicle. Since 80% of the air movements at Berens River and Bloodvein originate from Matheson Island, it was assumed that 80% of the volume of passengers would arrive or depart from Matheson Island. This would give a first approximation to the volume of passengers using the Matheson Island airport. However it is noted that aircraft from Winnipeg are larger and would potentially carry more passengers. Note that vehicular volumes to the airport were also increased by 25% to match the unreported air movement volumes.

Estimated Annual Volume of Vehicles based on Ferry Travel

MIT (2010d) provided data on the number of passengers, volumes of vehicles and the vehicle classes that used the ferry to cross to and from Islandview harbour and Bloodvein. **Table 3.1-3** summarises the passenger and vehicular statistics for the ferry from 2000 to 2009. There were no trends in the volume of passengers or vehicles using the ferry from 2000 to 2009. Therefore the averages of 910 cars and pickup trucks, and 218 heavy trucks and buses were used to describe the vehicular volumes using the ferry over this period. These volumes were used to project the annual number of such classes of vehicles using the ferry to 2023. Note that the cars and pickup truck category include vehicles up to ¾ -ton trucks and miscellaneous vehicles (motorcycles and all terrain personal vehicles). The heavy truck category included trucks with single and dual axel over ¾-ton, semi-trailers, buses, graders and loaders.

No data on vehicular volumes and types were available for the privately operated ferry/barge. Therefore it was assumed that the additional traffic going to this ferry/barge was 50% of the traffic reported for the M.V. Edgar Wood.

Table 3.1-3 M.V. Edgar Wood Statistics from 2000 – 2009

YEAR	PASSENGERS	CAR AND UP TO 3/4 TON TRUCK	TRUCK-SINGLE AND DUAL AXLE OVER 3/4 TON	SEMI-TRAILER	BUS	LOADER	GRADER	MISCELLANEOUS	TOTAL vehicles
2000	2990	880	140	110	5	1	27	229	1392
2001	2150	674	185	79	4	0	0	205	1147
2002	1940	553	134	25	8	7	0	157	884
2003	3023	805	121	43	20	17	1	94	1101
2004	2301	677	86	23	10	1	3	170	970
2005	2589	745	87	17	4	3	0	245	1101
2006	2365	823	130	57	7	5	1	175	1198
2007	1883	589	170	67	8	9	0	206	1049
2008	1887	611	156	33	7	7	1	237	1052
2009	2823	742	233	101	9	15	7	284	1391
Average	**2395**	**710**	**144**	**56**	**8**	**7**	**4**	**200**	**1129**

3.1.6 GHG Emissions of Seasonal Road Construction and Maintenance

It was assumed that the seasonal road (i.e., winter road and ice road) would be constructed and operated between January and March. The GHG emissions would be associated with the emissions due to the mobile equipment used to construct the winter road and ice road, and the emissions associated with the equipment used in the general maintenance of the seasonal road, i.e.

Annual GHG Emissions Construction and Maintenance (tonnes CO_2e/yr) = Annual GHG Emissions Construction (tonnes CO_2e/yr) + Annual GHG Emissions Maintenance (tonnes CO_2e/yr)

Construction of the Seasonal Road

The GHG emissions associated with the construction of the seasonal road would be estimated by:

$$\textit{Annual GHG Emissions Constructing Seasonal Road (tonnes } CO_2e\textit{/yr)} = \sum_{\textit{equipment types}} \{\textit{Number of Equipment Type} \times \textit{Duration (hr/year)} \times EF_{\textit{equipment type}} \textit{ (g } CO_2e\textit{/hr)} \times 10^{-6} \textit{ (tonnes/g)}\}$$

The type and quantity of road construction equipment assumed to be used in the construction of the seasonal road is given in **Table 3.1-4**. It was assumed that the ice road would employ all of the equipment listed in the table and take approximately three days to build resulting in a total of 20 hours. For the winter road, it was also assumed that all of the equipment will be used and the construction would take approximately 15 days for a total of 120 hours.

The cumulative GHG emission factors $EF_{equipment\ type}$ for each type of equipment are listed in **Table 3.1-4**. These emission factors were based on US EPA NONROAD 2005 emission model for non-highway mobile equipment (US EPA, 2006).

Table 3.1-4 Equipment Used in Constructing Seasonal Road and GHG Emission Factors

Equipment Type	Quantity	$EF_{equipment\ type}$ (kg CO_2e/hr)
Diesel Off-Highway Tractors - 750 HP	1	287.0
Diesel Graders - 300 HP	1	73.4
Diesel Tractors/Loaders/Backhoes - 100 HP	1	12.7
Diesel Snowblowers - 300 HP	1	57.4
2-Stroke Snowmobiles - 75 HP	4	40.2

Maintenance of Seasonal Road

A similar approach to estimating the GHG emission due to the construction of the seasonal road was used in estimating the GHG emissions associated with the maintenance of the seasonal road:

Annual GHG Emissions Maintaining Seasonal Road (tonnes CO_2e/yr) = $\sum_{equipment\ types}$ {Number of Equipment Type × Duration (hr/year) × $EF_{equipment\ type}$ (g CO_2e/hr) × 10^{-6} (tonnes/g)}

For the maintenance of the seasonal road, it was assumed that only the grader and snowblower, and the same number of snowmobiles would be employed.

For the ice road, it was assumed that there would be approximately four maintenance events per month with each event lasting for 4 hours. This would result in a total of 32 hours per season. For the winter road from Bloodvein to Berens River, it was assumed that there would also be approximately four maintenance events per month. The duration of each maintenance event was estimated to be approximately 28 hours (three days) based on the length of the winter road and typical speed of snow clearing and grading. The total number of hours per season estimated for the maintenance of the winter was approximately 221 hours.

3.1.7 GHG Emissions of Vehicular Travel During Winter

The GHG emissions associated with vehicular travel during the winter was calculated by:

Annual GHG Emissions of Vehicular Travel in Winter (tonnes CO_2e/yr) = Annual GHG Emissions of Vehicular Travel in Winter Between Winnipeg and Pine Dock (tonnes CO_2e/yr) + Annual GHG Emissions of Vehicular Travel on Seasonal Road (tonnes CO_2e/yr).

Where:

Annual GHG Emissions of Vehicular Travel between Winnipeg and Pine Dock (tonnes CO_2e/yr) = $\sum_{vehicle\ category}$ {Vehicle Category Number of Trips (Trips/yr) × Trip Duration (hr/Trip) × Fuel Use (L/hr) × $EF_{vehicle\ category}$ (g CO_2e/L) × 10^{-6} (tonnes/g)}

and

Annual GHG Emissions of Vehicular Travel on Seasonal Road (tonnes CO_2e/yr) = $\sum_{seasonal\ road\ segment}$ $\sum_{vehicle\ category}$ {Vehicle Category Number of Trips (Trips/yr) × Trip Duration (hr/Trip) × Fuel Use (L/hr) × $EF_{vehicle\ category}$ (g CO_2e/L) × 10^{-6} (tonnes/g)}

Vehicular traffic volumes on the seasonal road were estimated for the communities that the seasonal road would service. These communities included the Southeast Tribal Council (SERCA) communities of Poplar River, Berens River, Bloodvein, Little Grand Rapids, and Pauingassi, and the Island Lake Tribal Council (ILTC) communities of St. Theresa Point, Wasagamack, Garden Hill, and Red Sucker Lake. A winter road runs from Bloodvein to Berens River and then onto Poplar River. Another winter road runs from Bloodvein to Little Grand Rapids and Pauingassi. This winter road is also connected to another winter road that connects the communities of the ILTC. All winter roads meet at Bloodvein and an ice road connects Bloodvein to Pine Dock across Lake Winnipeg.

Table 3.1-5 summarises the heavy duty and light duty winter road traffic volumes to and from these communities. Vehicular traffic volumes on the seasonal road were estimated from the winter freight demand per capita of the communities that the seasonal road services. It should be noted that these volumes are a first approximation and subject to change based on revised data, information and assumptions.

The ice road would receive the entire volume of traffic while the winter road from Bloodvein to Berens River would receive the volume associated with traffic from Poplar River and Berens River. It was assumed that the volume on the ice road would continue from Pine Dock to Winnipeg. Note that the focus of this GHG assessment with respect to Baseline conditions during the winter is the emissions associated with traffic between Winnipeg and Bloodvein and between Bloodvein and Berens River. Emissions associated with traffic on the winter roads going to other communities from Bloodvein and Berens River is not included as it is assumed that these emissions would remain unchanged with the installation of the ASR between Bloodvein and Berens River.

Table 3.1-5 Estimated Winter and Ice Road Traffic Volumes

Community	Winter Road (60 Day) Heavy Duty Vehicle Volumes		Winter Road (60 Day) Light Duty Vehicle Volumes		One-Way Daily Traffic to bring in required tonnage		2-Way Daily Traffic (in plus return trip)		Total 2-Way Traffic
	Split	Volume	Split	Volume	HDV	LDV	HDV	LDV	
Southeast Tribal Council (SERCA)									
Poplar River	30%	75	70%	3,485	1	58	2	116	119
Berens River	45%	158	55%	3,870	3	64	5	129	134
Total on Berens River to Bloodvein Segment					4	123	8	245	253
Bloodvein	15%	16	85%	1,853	0	31	1	62	62
Little Grand Rapids	30%	69	70%	3,215	1	54	2	107	109
Pauingassi	30%	37	70%	1,723	1	29	1	57	59
Island Lake Tribal Council (ILTC)									
St. Theresa Point	70%	439	30%	3,761	7	63	15	125	140
Wasagamack	70%	253	30%	2,167	4	36	8	72	81
Garden Hill	85%	495	15%	1,747	8	29	16	58	75
Red Sucker Lake	90%	130	10%	290	2	5	4	10	14
Total on Ice Road Segment between Bloodvein and Pine Dock					28	368	56	737	793

Totals may not add due to rounding to the nearest significant figure.
HDV and LDV mean heavy and light duty vehicles, respectively.

The seasonal road was estimated to be operational for two months from January 1st to March 1st (i.e., approximately 60 days). This assumption provided an estimate on the total number of trips per vehicle category for the season (i.e., year) on a given road segment (ice road or winter road).

It was assumed that travel speed on the ice and winter road would be approximately 30 km/h. The travel distance on the ice road was estimated to be approximately 16 km and the distance of the winter road was approximately 83 km resulting in travel durations of 0.5 hr and 2.8 hr, respectively. The US EPA (2006) estimated that the fuel economy degrades by approximately 20% for travel on snowy gravel roads in comparison to dry paved (asphalt) roads.

For the travel between Winnipeg and Pine Dock, the same assumptions when estimating the GHG emissions during the non-winter seasons were maintained.

3.2 Project Scenario

The Project scenario estimated the GHG emissions associated with four years of construction of the ASR in addition to projecting 10 years to 2023 the emissions associated with the operation of the ASR. As with the Baseline scenario, the Project scenario assumes that the existing climatic conditions will prevail to 2023 and that the impact of climate change is not incorporated into the assessment. The Project scenario also does not assume any growth in the communities of Berens River and Bloodvein or growth in the communities along the route between Winnipeg and Bloodvein. Such growth may potentially impact the traffic volumes on the ASR predicted for the purposes of this GHG assessment and is beyond the scope of this study.

It should be noted that Baseline conditions would persist during the initial construction period and gradually change. For the purpose of assessing the GHG implications of the Project scenario, it is assumed that the Baseline conditions would occur for the first three years of the construction period. From the final (fourth) year of construction, it is assumed that a significant portion of the ASR would be completed and operating so that the Baseline conditions would change significantly and cease to exist.

The Project scenario estimated the GHG emissions and sinks / removals and the resulting cumulative GHG emissions by:

Annual Project GHG Emissions (tonnes CO_2e/yr) =

GHG emissions due to land clearing along the proposed ASR (tonnes CO_2e/yr)
+ Methane emissions due to the wetlands along the proposed ASR (tonnes CO_2e/yr)
+ GHG emissions due to construction of the ASR (tonnes CO_2e/yr)
+ GHG emissions due to air travel to Bloodvein and Berens River (tonnes CO_2e/yr)
+ GHG emissions due to ferry crossing from Islandview/Pine Dock to Bloodvein (tonnes CO_2e/yr)
+ GHG emissions due to transportation on PTH 8 and PR234 (tonnes CO_2e/yr)
+ GHG emissions due to transportation between Winnipeg and Berens River (tonnes CO_2e/yr)
+ GHG sequestration due to reforestation of disturbed land (tonnes CO_2e/yr)

Details on the above sources and sinks / removals are given in the following sections. As in the case of the Baseline scenario, the non-scheduled ferry servicing Berens River was not considered to be a significant source of GHG emissions and would likely end with a reliable ASR. It was therefore not included.

3.2.1 GHG Emissions Due to Land Clearing

GHG emissions associated with land clearing in preparation of the construction of the proposed ASR include the assumed burning of slash and shrubs, emissions due to the decomposition of the root biomass, emissions due to the use of the harvested wood for firewood, and the use of land clearing and construction equipment in the harvesting of the wood and clearing of the land. Total annual GHG emissions are calculated by:

Annual GHG Emissions due to Land Clearing (tonnes CO_2e/yr) = GHG Emissions from Slash and Shrub Burning (tonnes CO_2e/yr) + GHG Emissions from Root Biomass Decomposition (tonnes CO_2e/yr) + GHG Emissions from Firewood (tonnes CO_2e/yr) + GHG Emissions Land Clearing (tonnes CO_2e/yr)

GHG Emissions from Slash and Shrub Burning

The proposed ASR has a 60 m right of way (ROW) running from PR 304 to Bloodvein and from Bloodvein to Berens River. The land cover statistics along the ROW for the length of the ASR was provided by the Manitoba Floodway and East Side Road Authority (2010). These data provided the spatial coverage of treed and shrub areas along the ROW of the proposed ASR

which were approximately 363 ha and 337 ha, respectively. Using the methodology described in **Section 3.1.1**, the total treed biomass and shrub biomass cleared for the ASR was approximately 13,970 tonnes and 1,687 tonnes, respectively.

NRCan (2009) notes that approximately 50% of the harvested tree biomass is converted into durable long lasting products such as wood for construction and the carbon is therefore not readily emitted back into the atmosphere post harvesting. The root fraction of the total tree biomass cover for the ROW of the ASR was estimated to be 16%. Therefore the remaining 34% of the tree biomass was assumed to be subject to burning of which it was assumed that half would be slash burned and half used as firewood. The latter source of emissions is not included in this assessment as this volume of biomass would have been harvested regardless of the project (i.e., would also occur under baseline conditions) and used as firewood by the communities.

The IPCC (2006) methodology was used in estimating the GHG emissions due to slash burning:

> *GHG Emissions from Slash Burning (tonnes CO_2e/yr) = Area of Burn (ha) × Mass of Available Fuel (tonnes/ha) × Cf × EF_{slash} (g/kg dry biomass burnt)*

Where *Cf* is the combustion factor and is considered to be 0.33 for boreal forest post logging slash burn; and EF_{slash} = 1748 g CO2e/kg fuel for extra tropical forests (i.e., temperate, boreal). The Mass of Available Fuel was the sum of the tree biomass available for slash burning and the total shrub biomass cleared for the ASR. The GHG emission due to slash burning was assumed to occur evenly over the four years of construction of the proposed ASR.

GHG Emissions from Root Biomass Decomposition

The total root biomass was estimated to be approximately 16% of the total biomass. Although it may take many years for the root biomass to completely decompose under the climatic environment of the boreal ecozone, it was assumed that the GHG emission due to the decomposition of the root biomass all occurred within the first year of construction for the purposes of this assessment.

The methodology in estimating the GHG emissions from the decomposition of the root biomass was described in **Section 3.1.1**.

GHG Emissions Land Clearing

The GHG emissions associated with the clearing of the land in preparation of the proposed ASR was estimated by:

$$\textit{Annual GHG Emissions Land Clearing (tonnes } CO_2e/yr) = \sum_{equipment\ types} \{\textit{Number of Equipment Type} \times \textit{Duration (hr/year)} \times \textit{Fuel Consumption of Equipment Type (L/hr)} \times EF_{equipment\ type}\ (g\ CO_2e/L) \times 10^{-6}\ (tonnes/g)\}$$

The type and quantity of earth moving, land clearing, and general mobile equipment used in the clearing operation was provided by AECOM (2010) and is given in **Table 3.2-1**. The same equipment was used for mechanical and hand clearing equipment, and mechanical mulching. For mechanical and hand clearing, the equipment were estimated to be employed for 1000 hours per year. For mechanical mulching, the equipment was estimated to be used for 1875 hours per year. The cumulative GHG emission factors, $EF_{equipment\ type}$, for each type of equipment are listed in **Table 3.2-1**. These emission factors were based on US EPA NONROAD 2005 emission model for non-highway mobile equipment (US EPA, 2006).

Table 3.2-1 Equipment Used in Land Clearing and GHG Emission Factors

Equipment Used	Quantity	Fuel Consumption (L/hr)	Net Power (hp)	$EF_{equipment\ type}$ (g CO_2e/L)
Mechanical/Hand Clearing				
CAT D6 wide pad	1	35	150	2701
GMC Sierra 3500 4x4 Service Truck	0	12	360	2713
GMC Sierra 4x4 Quad Cab Truck	1	12	360	2713
Chain saws	4	4	3	2053
Hydro-Axe Mechanical Mulching Unit	0	50	300	2709
Mechanical Mulching				
CAT D6 wide pad	1	35	150	2701
GMC Sierra 3500 4x4 Service Truck	1	12	360	2713
GMC Sierra 4x4 Quad Cab Truck	1	12	360	2713
Chain saws	4	4	3	2053
Hydro-Axe Mechanical Mulching Unit	1	50	300	2709

3.2.2 Net Methane Emissions from Landcover

The proposed ASR is anticipated to cover approximately 27% of the land cleared for the Project. This estimate was based on the width of the ROW of 10 m and the assumption that there is an additional 3 m on each side of the ROW that will be disturbed and cover the existing land

surface. Therefore, it is estimated that the net annual CH_4 emissions under the Baseline scenario would be reduced by 27% due to the coverage of the ASR.

3.2.3 GHG Emissions Due to Construction of the ASR

Construction of the ASR involves the construction of the roadway and bridges. The following was used to estimate the GHG emissions associated with the construction:

Annual GHG Emissions Due to Construction (tonnes CO_2e/yr) = $\sum_{equipment\ types}$ {Number of Equipment Type × Duration (hr/year) × Fuel Consumption of Equipment Type (L/hr) × $EF_{equipment\ type}$ (g CO_2e/L) × 10^{-6} (tonnes/g)}

AECOM (2010) provided data on the list of equipment used in the construction of the ASR, the estimated fuel consumption rate, and the total number of hours of operation for each type of equipment. **Table 3.2-2** summarises the data provided by AECOM (2010) and the $EF_{equipment\ type}$ based on US EPA (2008) NONROAD 2005 emission model results.

Table 3.2-2 Equipment Used in Construction of the Roadway and GHG Emission Factors

Equipment Used	Number of Equipment Used	Fuel Consumption (L/hr)	Annual Hours (hrs/yr)	Net Power (hp)	$EF_{equipment\ type}$ (g CO_2e/L fuel)
Shot Rock Fill					
CAT 740 Articulated Truck	1	45	5156.25	453	2712
CAT D8T Track-Type Tractor Dozer	1	30	5156.25	310 (FP)	2712
CAT 966 H Wheeled Loader	1	27	5156.25	262	2712
CAT 385C L Hydraulic Excavator	1	49	5156.25	513 (NFP)	2713
CAT 450E Backhoe Loader	1	11	5156.25	124	2697
GMC Sierra 3500 4x4 Service Truck	1	12	5156.25	360	2713
GMC Sierra 2500 4x4 Quad Cab	5	12	5156.25	360	2713
Composite Excavation					
CAT D8T Track-Type Tractor Dozer	1	30	4278.75	310 (FP)	2712
CAT 385C L Hydraulic Excavator	1	49	4278.75	513 (NFP)	2713
GMC Sierra 3500 4x4 Service Truck	1	12	4278.75	360	2713
GMC Sierra 2500 4x4 Quad Cab	3	12	4278.75	360	2713
Processed Aggregate Production					
CAT 966 H Wheeled Loader	2	27	6350	262	2712
GMC Sierra 3500 4x4 Service Truck	1	12	6350	360	2713

Equipment Used	Number of Equipment Used	Fuel Consumption (L/hr)	Annual Hours (hrs/yr)	Net Power (hp)	$EF_{equipment\ type}$ (g CO_2e/L fuel)
GMC Sierra 2500 4x4 Quad Cab	3	12	6350	360	2713
CEDARAPIDS Mobile Aggregate Crushing system (MACS)	1	60	6350	600	2711
Aggregate Haul					
CAT 740 Articulated Truck	1	45	5253.75	453	2712
CAT D8T Track-Type Tractor Dozer	1	30	5253.75	310 (FP)	2712
CAT 385C L Hydraulic Excavator	1	49	5253.75	513 (NFP)	2713
GMC Sierra 3500 4x4 Service Truck	1	12	5253.75	360	2713
GMC Sierra 2500 4x4 Quad Cab	5	12	5253.75	360	2713
CAT 16M Motor Grader	1	30	5253.75	297	2712
CAT CS-433E Vibratory Soil Compactor	1	11	5253.75	100 (Gross)	2703
Freightliner M2 2010 Water Truck	1	30	5253.75	450	2714
Abutment/Pier/Box Culvert Extraction					
CAT 330 Hydraulic Excavator	1	45	170	270 (NFP)	2712
CAT D8T Track-Type Tractor Dozer	1	30	170	310 (FP)	2712
CAT 365 Backhoe	1	10	170	87	2697
GMC Sierra 3500 4x4 Service Truck	1	12	170	360	2713
GMC Sierra 2500 4x4 Quad Cab	3	12	170	360	2713
Piling					
GMC Sierra 3500 4x4 Service Truck	1	12	200	360	2713
GMC Sierra 2500 4x4 Quad Cab	1	12	200	360	2713
PILECO Diesel Hammer D19-42	1	35	200	25	2703
Freightliner Classic Truck with low bed trailer	1	35	500	560	2714
Concrete Production					
GMC Sierra 3500 4x4 Service Truck	1	12	650	360	2713
GMC Sierra 2500 4x4 Quad Cab	1	12	650	360	2713
Preem Advantage 101 (Portable Batch Plant)	1	60	100	600	2709
Concrete Pumper Truck	1	20	550	200	2708
Concrete Steel Reinforcement					
Freightliner Classic Truck with low bed trailer	1	35	600	560	2714
Girder Supply and Installation					
GMC Sierra 3500 4x4 Service Truck	1	12	200	360	2713
GMC Sierra 2500 4x4 Quad Cab	1	12	200	360	2713
Freightliner Classic Truck with low bed trailer	1	35	250	560	2714
Linkbelt 138 HSL Lattice Boom Crawler Crane	1	40	200	400	2712

3.2.4 GHG Emissions of Air Travel

It was assumed that air travel to and from Berens River and Bloodvein during the construction period would remain the same as the Baseline scenario between the period 2010 and 2012 (i.e., during the first three years of construction). In the final (fourth) year of construction and first year of ASR operation, it was assumed that air traffic would decline by 80% from the Baseline. From year two of the ASR operating, it was assumed that air traffic to these communities would become near negligible. This large decline in air travel is a potential scenario since the cheaper mode of road transportation would be favoured for both goods and people. The methodology used in estimating the annual GHG emissions due to air travel described in **Section 3.1.3** was applied with the above assumption.

3.2.5 GHG Emissions of Ferry Crossing

As with the air travel, it was assumed that ferry traffic between Islandview/Pine Dock and Bloodvein during the first three years of construction would remain the same as the Baseline scenario between 2010 and 2012. The final year, year four, of construction, ferry/barge traffic and service would decline by one-third of the Baseline scenario. In the first year of the ASR operating, the ferry/barge traffic and service would decline further by two-thirds of the Baseline scenario. Thereafter it was assumed that the ferry/barge services would cease to operate. The methodology used in estimating the annual GHG emissions due to ferry crossing described in **Section 3.1.4** was applied with the above assumptions.

3.2.6 GHG Emissions of Vehicular Travel on PTH 8 and PR 234

It was assumed that travel using the ferry/barge service would continue during the four years of construction and the first year of ASR operation to allow for commuting between Bloodvein / Berens River and communities along PTH 8 and PR 234. A number of assumptions were made when estimating the GHG emissions due to continued travel between Bloodvein / Berens River and PTH 8 over this period:

- Travel by air would be limited due to its cost; and

- The decline in traffic volumes associated with commuting via the ferry/barge and by air would be comparable to the decline in ferry/barge trips and air movements estimated above.

The methodology used in estimating the annual GHG emissions due to vehicular travel between Winnipeg and Islandview/Pine Dock described in **Section 3.1.5** was followed with the above assumptions.

3.2.7 GHG Emissions of Vehicular Travel Between Winnipeg and Berens River

The annual GHG emission due to vehicular traffic from Winnipeg to PR 304, and from PR 304 to Berens River on the ASR was estimated by:

$$\textit{Annual GHG Emissions of Transportation Between Winnipeg and Berens River (tonnes } CO_2e/yr) = \sum_{\textit{vehicle category}} \{\textit{Vehicle Category Number of Trips (Trips/yr)} \times \textit{Trip Duration (hr/Trip)} \times \textit{Fuel Use (L/hr)} \times EF_{\textit{vehicle category}} \textit{ (g } CO_2e/L) \times 10^{-6} \textit{ (tonnes/g)}\}$$

The annual averaged daily traffic (AADT) volume on the ASR was assumed to be 172 for the first 10 years of operation (note that the design of the ASR allows for an AADT of 300, PR 304 to Berens River All-Season Road Environmental Impact Assessment). This AADT was estimated from the total ice road volumes (approximate AADT of 130) and vehicular traffic volumes during the non-winter season (approximate AADT of 13 from the combined traffic due to ferry and airport usage) and assuming an increase of 20% based on ease of travel afforded by the ASR.

Under the Baseline scenario, the percentage of cars and pickup trucks versus heavy trucks travelling to and from Islandview/Pine Dock and Winnipeg was approximately 93% to 7%, respectively. This split in the vehicle categories was assumed to be valid for the traffic between Winnipeg and the new ASR.

The road surface between Winnipeg and PR 304 is asphalt and the surface of the ASR is gravel. For the gravel surfaced ASR, the fuel economy was assumed to deteriorate by approximately 16% (US EPA, 2006). The distance between Winnipeg and PR 304 was estimated to be approximately 200 km. The posted speed limit on PR 304 was 90 km/h with an estimated

minimum travel speed of 60 km/h resulting in the trip duration of approximately 3.3 hours. The total distance of the ASR was approximately 155 km with a posted maximum speed of 80 km/h and a minimum speed of 60 km/h. This results in an estimated travel time on the ASR of approximately 2.6 hours.

The $EF_{vehicle\ category}$ was 2498 g CO_2e/L for cars and pickup trucks assuming conservatively the emission factor for light duty gasoline trucks; and 2691 g CO_2e/L for heavy trucks assuming heavy duty diesel vehicle emission factor (Environment Canada, 2009).

3.2.8 GHG Sequestration Due to Reforestation of the Disturbed Land

In order to mitigation the environmental impacts and GHG emissions associated with the ASR, it is proposed that approximately 106 ha of land cleared along the ASR route will undergo reforestation. Indigenous forest species will be used for the reforestation. The carbon sequestered by the reforestation will occur over a multi-decadal time period. However, for the purposes of this assessment, it was assumed that the carbon sequestered over the time period to establish a mature forest (assumed to be 90 years for this assessment) can be distributed linearly over time. The estimated annual carbon sequestration rate was estimated to be 13.2 tonnes CO_2e/yr.

4. GHG Emissions Estimate

Tables **4.1** and **4.2** summarises the GHG emissions under the Baseline scenario and the Project scenario. The Baseline scenario resulted in a total of approximately 136,201 tonnes CO_2e being emitted from 2010 to 2023 inclusive. The Project scenario was estimated to emit a total of approximately 162,720 tonnes CO_2e over the same time period which is roughly 19% more than the Baseline emissions. The net change in GHG emissions due to the Project was therefore estimated to be approximately +27 kilo-tonnes (kt) CO_2e over the time period 2010 to 2023. The majority of the GHG emission is due to the construction of the ASR (approximately 33% of the total) and the increased traffic between Winnipeg and Berens River (approximately 63% of total).

During the construction period, the average annual GHG emission for road construction related activities was estimated to be approximately 13 kt CO_2e per year. Under the Baseline scenario, the annual GHG emission due to the construction of the seasonal road was estimated to be approximately 0.16 t CO_2e per year over the corresponding time period. Therefore the construction of the ASR is anticipated to increase the GHG emissions over the Baseline scenario by nearly +13 kt CO_2e per year. This annual increase in GHG emissions would increase the provincial GHG emissions of construction activities by approximately 13 % based on the 2008 estimates of 0.098 Mt CO_2e. This increase is temporary so that once construction of the ASR has been completed it would result in the reduction of the Province's construction-based GHG emissions.

With the ASR in place, the average annual GHG emission due to road transportation was estimated to be approximately 10 kt CO_2e, in comparison to the average annual GHG emission over the same time period under the Baseline scenario of approximately 9 kt CO_2e due to road, ferry/barge and air travel resulting in a net annual increase in GHG emissions of approximately 1 kt CO_2e. The GHG emissions due only to the road transportation with the ASR in place was therefore estimated to be less than 0.2% of the Province's total GHG emissions of 5.13 Mt CO_2e due to road transportation in 2008.

Table 4.1 Baseline Scenario GHG Emissions from 2010 to 2023

PERIOD CORRESPONDING TO PROJECT SCENARIO	GHG EMMISIONS (Tonnes CO_2e)										TOTAL PER YEAR (Tonnes CO_2e)
	Seasonal Rd Construction	Seasonal Rd Maintenance	Vehicular Use Highway 8	Vehicular Use PR 234	Vehicular Use Seasonal Road	Ferry Operation	Air Travel	Land Clearing	Forest Carbon Sequestration	Wetland Net GHG Emissions	
Construction											
2010	83	74	296	214	7,805	73	1,054	0	-45	668	10,223
2011	83	74	275	199	7,805	73	977	0	-45	668	10,109
2012	83	74	253	183	7,805	73	905	0	-45	668	9,999
2013	83	74	231	167	7,805	73	838	0	-45	668	9,894
Operation											
2014	83	74	209	151	7,805	73	776	0	-45	668	9,794
2015	83	74	209	151	7,805	73	719	0	-45	668	9,737
2016	83	74	209	151	7,805	73	667	0	-45	668	9,685
2017	83	74	209	151	7,805	73	620	0	-45	668	9,638
2018	83	74	209	151	7,805	73	577	0	-45	668	9,596
2019	83	74	209	151	7,805	73	540	0	-45	668	9,559
2020	83	74	209	151	7,805	73	508	0	-45	668	9,527
2021	83	74	209	151	7,805	73	481	0	-45	668	9,500
2022	83	74	209	151	7,805	73	459	0	-45	668	9,478
2023	83	74	209	151	7,805	73	442	0	-45	668	9,461
Total per Mode	1,158	1,033	3,148	2,274	109,273	1,028	9,562	0	-630	9,356	
Overall Total (tonnes CO_2e)											**136,201**

Table 4.2 Project Scenario GHG Emissions from 2010 to 2023

PERIOD	GHG EMMISIONS (Tonnes CO_2e)										TOTAL PER YEAR (CO_2e)
	ASR Road Construction	Vehicular Use ASR	Vehicular Use Winnipeg Connect.	Vehicular Use PTH 8 + PR 234	Ferry Operation	Air Travel	Land Clearing	Forest Biomass Decomposition	Forest Carbon Sequestration	Wetland Net GHG Emissions	
Construction											
2010	11,685	0	0	0	0	0	1,361	637	0	488	14,170
2011	11,685	0	0	0	0	0	1,361	0	0	488	13,533
2012	11,685	0	0	0	0	0	1,361	0	0	488	13,533
2013	11,685	0	0	120	49	838	1,361	0	0	488	14,541
Operation											
2014	0	5,921	4,274	69	24	155	0	0	-13	488	10,918
2015	0	5,921	4,274	0	0	0	0	0	-13	488	10,670
2016	0	5,921	4,274	0	0	0	0	0	-13	488	10,670
2017	0	5,921	4,274	0	0	0	0	0	-13	488	10,670
2018	0	5,921	4,274	0	0	0	0	0	-13	488	10,670
2019	0	5,921	4,274	0	0	0	0	0	-13	488	10,670
2020	0	5,921	4,274	0	0	0	0	0	-13	488	10,670
2021	0	5,921	4,274	0	0	0	0	0	-13	488	10,670
2022	0	5,921	4,274	0	0	0	0	0	-13	488	10,670
2023	0	5,921	4,274	0	0	0	0	0	-13	488	10,670
Total per Mode	46,739	59,213	42,735	189	74	993	5,443	0	-132	6,830	
Overall Total (tonnes CO_2e)											**162,720**

5. Recommendations for Mitigation and Monitoring

GHG emissions due to the construction and operational phases of the Project can be partially mitigated through the adoption of best management practices and GHG offsets. The following sections explore some of the potential options for the reduction of GHG emissions due to the Project.

5.1 Construction Phase

During the construction of the ASR, construction best management practices should be followed in order to abate GHG emissions (US EPA, 2009). These include, but are not limited to:

- Maintenance and upkeep of all construction equipment in order to meet performance standards set by the manufacturers of the equipment. This will result in efficient use of fuel when the equipment is in operation. Poorly maintained equipment will result in the inefficient use of fuel and the associated increase in GHG emissions.
- Properly size the equipment for the task. Over-sizing or under-sizing the equipment results in excess fuel being consumed and burned.
- Replacing or rebuilding old equipment with more fuel efficient new equipment. The fuel economy, emission rates, and maintenance costs will then be brought up to the current standard resulting in overall lower GHG emissions.
- Driver / operator training for the correct / optimal operation of equipment under different operating conditions. Fuel savings and hence reductions in GHG emissions can be realised through driver / operator training in order to correctly position, operate, and optimise the equipment under different operating conditions. The US EPA (2009) estimated that a typical excavator can save approximately 3 – 8 % in fuel use per year with correct operator training.
- Anti-idling policy for all mobile equipment. Idling of equipment when not in use will result in unnecessary fuel being burned and GHG emissions. Anti-idling policies typically limit the maximum idling time to between 3 and 5 minutes. This policy is especially effective in mitigating GHG emissions during the non-winter months. The installation of fuel-efficient auxiliary power for comfort heating and cooling for equipment operators can also be used in order to abate GHG emissions.

- Busing of construction crew to the construction site and the remote work camp accommodation will reduce the use of private or individual vehicle travel to such sites on a daily basis thereby reducing overall GHG emissions.
- Alternatives to diesel generators. Use of dual fuel (natural gas / propane and diesel) generators can significantly reduce GHG emissions in comparison to diesel generators. The US EPA (2009) estimated an approximate 30 % reduction in emissions for a large 500 kW generator.
- Materials selection, procurement and shipping should be optimised in order to minimise the environmental impact of such activities. It is noted that the aggregate and potentially other materials for the construction of the ASR is accessed from nearby site(s). This will therefore help to abate the GHG emissions associated with transportation. Where appropriate, wood from the harvested forest cover should be used in the construction phase.

5.2 Operation Phase

GHG emissions during the operation of the ARS can be partially mitigated or offset through the following:

- Paving the ASR. The proposed ASR is a gravel surfaced roadway. As noted in the assessment, gravel roads reduce the fuel economy of vehicles thereby increasing the fuel consumption rate by approximately 19 % in comparison to an asphalt road (US EPA, 2006). Paving the ASR with asphalt can therefore reduce the annual GHG emissions due to travel on the ASR by approximately 19 % per year. It should be noted that paving with asphalt will increase the construction based emissions but this added emission can be offset by the reduced annual emissions on the ASR. Note that for paving to occur, a threshold volume on the ASR needs to be met and/or exceeded.
- Inter-community Transit. Private bus transit between Winnipeg and Bloodvein / Berens River may potentially become economical. Such commuting has the potential to reduce the number of vehicles using the ASR by approximately 40 per transit trip.
- Carbon offsets through afforestation / reforestation. The GHG emissions due to the Project has included a carbon offset due to reforestation of approximately 106 ha of disturbed land along the ROW of the ASR.
- It is recommended that the wetland areas within the ROW remain as wetlands in order to maintain their carbon sequestration potential. Provisions for the management of flows

(e.g. equalization culverts) will be enacted to protect and preserve the wetlands systems through appropriate design measures.

5.3 Monitoring

In order to improve upon the accuracy of this GHG assessment and to determine the effect of potential mitigation plans and offsets, it is recommended that monitoring of the Project with respect to GHG emissions inventory calculations and verification be conducted. This procedure includes:

- Development of Best Management Practices for the construction and operational phase of the Project as outlined above.
- A policy / program to collect fuel consumption and equipment use data during the construction phase in order to recalculate the GHG inventory of this phase and determine the effectiveness of mitigation measures as outline the Best Management Practices.
- This program to collect data pertaining to the construction phase should be extended to include data on air, ferry and vehicle travel volumes and statistics once the ASR is open to the public (i.e., during the operation phase of the Project). This will allow for the recalculation of the GHG inventory of the operation phase of the Project and evaluate potential abatement measures as outlined above.
- The reassessment of the GHG emissions inventory will assist in evaluating the potential for carbon offsets, if considered necessary, as well as the potential to participate in any future Provincial, regional (e.g., Western Climate Initiative), and national carbon cap and trade system.

6. Conclusions and Limitations

The GHG assessment estimated the total direct and indirect GHG emissions due to the Project and compared this estimate with the GHG emissions (direct and indirect) under the business as usual Baseline scenario (i.e., without the Project). The assessment was conducted over the time period 2010 to 2023 inclusive which includes up to four (4) years of construction and 10 years of operation of the ASR.

The Baseline scenario resulted in a total of approximately 136 kt CO_2e being emitted from 2010 to 2023 inclusive. The Project scenario was estimated to emit a total of approximately 163 kt CO_2e over the same time period which is roughly 19% more than the Baseline emissions. The net change in GHG emissions due to the Project was therefore estimated to be approximately +27 kilo-tonnes (kt) CO_2e over the time period 2010 to 2023. The significant portions of the GHG emission are due to the construction of the ASR (approximately 33% of the total). The construction of the ASR was estimated to increase the Province's construction based GHG emissions by approximately 13 % based on the 2008 estimates of 0.098 Mt CO_2e. This increase is temporary so that once construction of the ASR has been completed it would result in the reduction of the Province's construction-based GHG emissions. Another increase is the estimated vehicular traffic between Winnipeg and Berens River (**Table 4.2**). However, the anticipated improvements in future vehicular technology that result in emissions reductions have not been included in this assessment. The GHG emissions due to the road transportation with the ASR in place was estimated to be less than 0.2% of the Province's total GHG emissions of 5.13 Mt CO_2e due to road transportation in 2008.

Potential GHG emissions abatement and / or offsets during the construction and operational phases of the Project were suggested. In particular, construction best management practices may help to reduce the GHG emissions associated with this phase of the Project. For the operational phase of the project, preservation of the wetland areas surrounding the ASR, reforestation of the ROW, inter-community transit service, and paving the ASR may potentially reduce the GHG emissions during this phase of the Project. Recommendations on developing mitigation plans and policies, monitoring and data collection, and verification were provided. This will help to verify the initial estimates of the GHG emissions associated with the Project provided in this report and assist in positioning the Province to participate in future provincial, regional and federal carbon trading mechanisms.

It should be noted that the assessment was limited by the assumptions made in the study methodology as a result of data limitations. These assumptions included those made in the calculations of the biogenic sources and sinks, calculations related to the construction of the seasonal (winter and ice) road, seasonal road traffic volumes, and the changes in air and vehicular traffic volumes as a result of the operation of the ASR. The study also did not consider the changes in travel patterns, potential development along the PR 304 and other routes from Winnipeg, and potential development within Bloodvein and Berens River as a result of the increased ease in commuting on the resulting GHG emissions due to the Project.

7. Closure

This GHG assessment report has been prepared based on the information provided and/or approved by the East Side Road Authority. This report is intended to provide a reasonable review of available information within an agreed work scope, schedule and budget. This report was prepared by Dillon for the sole benefit of the East Side Road Authority as supporting documentation for the EA Approvals process. The material in the report reflects Dillon's judgment in context of the information available to Dillon at the time of this report preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Dillon accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

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Annex 10

Table A - Reproduction of Appendix 13-5 Table 4.3 with additional data to include conversion of CO2e to CO2, CH4, and N2O

	GHG ESTIMATE (TONNE)																							
Period	**Ice and Winter Rd Construction**				**Ice and Winter Rd Maintenance**				**Vehicular use Ice and Winter Rd**				**Air Travel**				**Land Clearing**	**Forest Biomass Decomp**	**Forest Carbon Sequestration**	**Wetland Methane Emission**		**TOTAL PER YEAR (TONNE)**			
Construction	**CO2e**	**CO2**	**CH4**	**N2O**	**CO2e**	**CO2**	**CH4**	**N2O**	**CO2e**	**CO2**	**CH4**	**N2O**	**CO2e**	**CO2**	**CH4**	**N2O**	**CO2e/CO2**	**CO2e/CO2**	**CO2e/CO2**	**CO2e**	**CH4**	**CO2e**	**CO2**	**CH4**	**N2O**
Year 1	80	78	0.006	0.006	73	71	0.005	0.005	806	787	0.060	0.059	3116	3042	0.232	0.226	0	0	-27	403	19	4451	3951	19.494	0.296
Year 2	80	78	0.006	0.006	73	71	0.005	0.005	806	787	0.060	0.059	3116	3042	0.232	0.226	0	0	-27	403	19	4451	3951	19.494	0.296
Year 3	80	78	0.006	0.006	73	71	0.005	0.005	806	787	0.060	0.059	3116	3042	0.232	0.226	0	0	-27	403	19	4451	3951	19.494	0.296
Year 4	80	78	0.006	0.006	73	71	0.005	0.005	806	787	0.060	0.059	3116	3042	0.232	0.226	0	0	-27	403	19	4451	3951	19.494	0.296
Year 5	80	78	0.006	0.006	73	71	0.005	0.005	806	787	0.060	0.059	3116	3042	0.232	0.226	0	0	-27	403	19	4451	3951	19.494	0.296
Year 6	80	78	0.006	0.006	73	71	0.005	0.005	806	787	0.060	0.059	3116	3042	0.232	0.226	0	0	-27	403	19	4451	3951	19.494	0.296
Year 7	80	78	0.006	0.006	73	71	0.005	0.005	806	787	0.060	0.059	3116	3042	0.232	0.226	0	0	-27	403	19	4451	3951	19.494	0.296
Operation																									
Year 1	80	78	0.006	0.006	73	71	0.005	0.005	806	787	0.060	0.059	3116	3042	0.232	0.226	0	0	-27	403	19	4451	3951	19.494	0.296
Year 2	80	78	0.006	0.006	73	71	0.005	0.005	806	787	0.060	0.059	3116	3042	0.232	0.226	0	0	-27	403	19	4451	3951	19.494	0.296
Year 3	80	78	0.006	0.006	73	71	0.005	0.005	806	787	0.060	0.059	3116	3042	0.232	0.226	0	0	-27	403	19	4451	3951	19.494	0.296
Year 4	80	78	0.006	0.006	73	71	0.005	0.005	806	787	0.060	0.059	3116	3042	0.232	0.226	0	0	-27	403	19	4451	3951	19.494	0.296
Year 5	80	78	0.006	0.006	73	71	0.005	0.005	806	787	0.060	0.059	3116	3042	0.232	0.226	0	0	-27	403	19	4451	3951	19.494	0.296
Year 6	80	78	0.006	0.006	73	71	0.005	0.005	806	787	0.060	0.059	3116	3042	0.232	0.226	0	0	-27	403	19	4451	3951	19.494	0.296
Year 7	80	78	0.006	0.006	73	71	0.005	0.005	806	787	0.060	0.059	3116	3042	0.232	0.226	0	0	-27	403	19	4451	3951	19.494	0.296
Year 8	80	78	0.006	0.006	73	71	0.005	0.005	806	787	0.060	0.059	3116	3042	0.232	0.226	0	0	-27	403	19	4451	3951	19.494	0.296
Year 9	80	78	0.006	0.006	73	71	0.005	0.005	806	787	0.060	0.059	3116	3042	0.232	0.226	0	0	-27	403	19	4451	3951	19.494	0.296
Year 10	80	78	0.006	0.006	73	71	0.005	0.005	806	787	0.060	0.059	3116	3042	0.232	0.226	0	0	-27	403	19	4451	3951	19.494	0.296
Total per Mode	1360	1328	0.101	0.099	1241	1211	0.093	0.090	13702	13376	1.022	0.995	52972	51713	3.952	3.845	0	0	-459	6851	326				
Overall Total (Tonne)																						**75667**	**67169**	**331.406**	**5.028**

Calculations based on conversion equation provided by Dr. Robert Parsons, Advanced Energy Project Manager, Indigenous and Municipal Relations, Government of Manitoba
Based on: Environment Canada (2008). *National Inventory Report 1990—2006: Greenhouse Gas Sources and Sinks in Canada*. Environment Canada Greenhouse Gas Division.

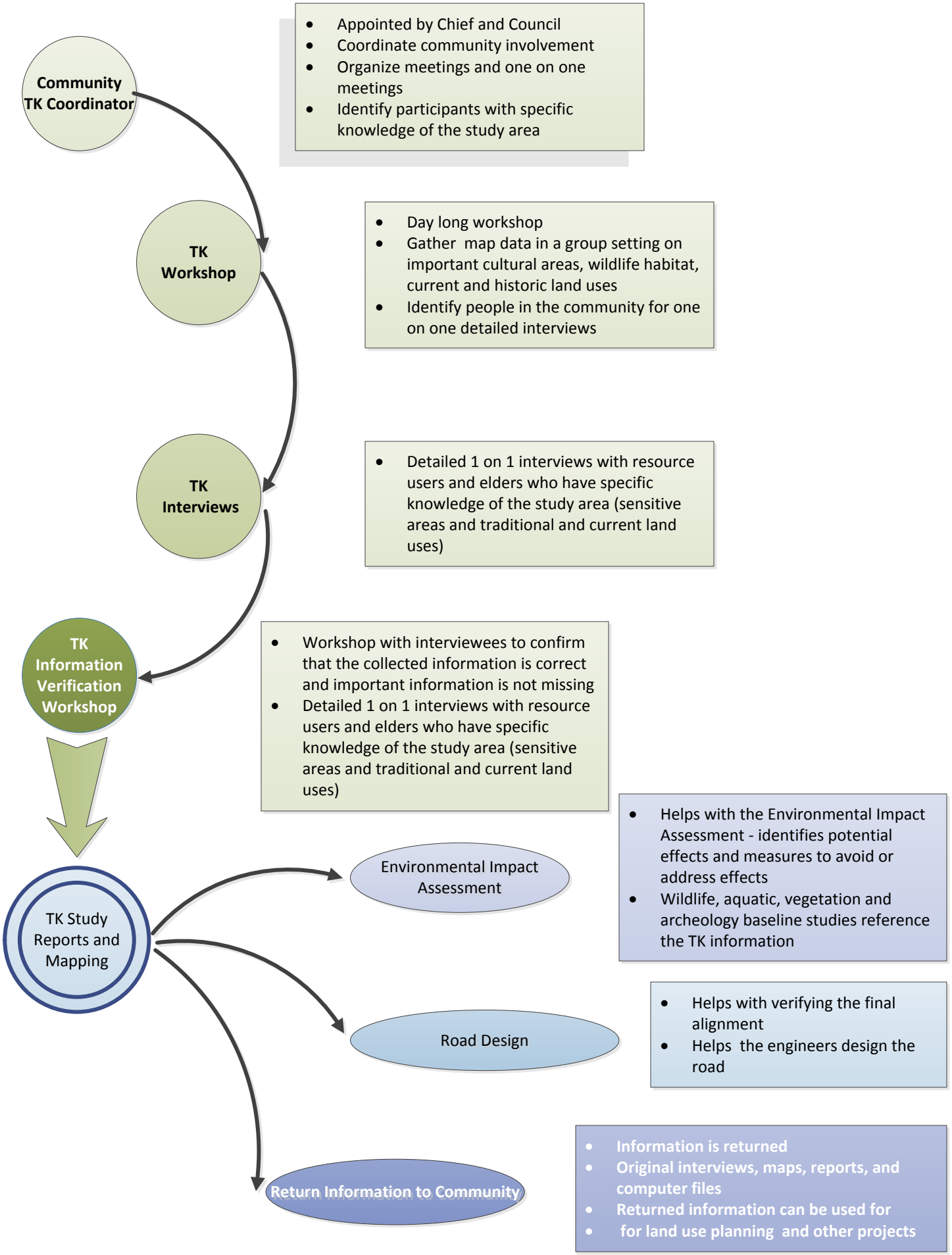
Table B - Reproduction of Appendix 13-5 Table 4.4 with additional data to include conversion of CO2e to CO2, CH4, and N2O

Period	GHG ESTIMATE (TONNE)																TOTAL PER YEAR (TONNE)			
	ASR Road Construction				Vehicular use ASR				Air Travel				Land Clearing	Forest Biomass Decomp	Forest Carbon Sequestration	Wetland Methane Emission				
Construction	**CO2e**	**CO2**	**CH4**	**N2O**	**CO2e**	**CO2**	**CH4**	**N2O**	**CO2e**	**CO2**	**CH4**	**N2O**	**C02e/Co2**	**CO2e/CO2**	**CO2e/CO2**	**CO2e**	**CH4**	**CO2e**	**CO2**	**CH4**	**N2O**
Year 1	4028	3932	0.300	0.292	0	0	0.000	0.000	3116	3042	0.232	0.226	469	384	0	294	14	8291	7827	14.533	0.519
Year 2	4028	3932	0.300	0.292	0	0	0.000	0.000	3116	3042	0.232	0.226	469	0	0	294	14	7907	7443	14.533	0.519
Year 3	4028	3932	0.300	0.292	0	0	0.000	0.000	3116	3042	0.232	0.226	469	0	0	294	14	7907	7443	14.533	0.519
Year 4	4028	3932	0.300	0.292	0	0	0.000	0.000	3116	3042	0.232	0.226	469	0	0	294	14	7907	7443	14.533	0.519
Year 5	4028	3932	0.300	0.292	0	0	0.000	0.000	3116	3042	0.232	0.226	469	0	0	294	14	7907	7443	14.533	0.519
Year 6	4028	3932	0.300	0.292	0	0	0.000	0.000	3116	3042	0.232	0.226	469	0	0	294	14	7907	7443	14.533	0.519
Year 7	4028	3932	0.300	0.292	0	0	0.000	0.000	3116	3042	0.232	0.226	469	0	0	294	14	7907	7443	14.533	0.519
Operation																					
Year 1	0	0	0	0	717	700	0.053	0.052	623	608	0.046	0.045	0	0	-8	294	14	1626	1300	14.100	0.097
Year 2	0	0	0	0	717	700	0.053	0.052	623	608	0.046	0.045	0	0	-8	294	14	1626	1300	14.100	0.097
Year 3	0	0	0	0	717	700	0.053	0.052	623	608	0.046	0.045	0	0	-8	294	14	1626	1300	14.100	0.097
Year 4	0	0	0	0	717	700	0.053	0.052	623	608	0.046	0.045	0	0	-8	294	14	1626	1300	14.100	0.097
Year 5	0	0	0	0	717	700	0.053	0.052	623	608	0.046	0.045	0	0	-8	294	14	1626	1300	14.100	0.097
Year 6	0	0	0	0	717	700	0.053	0.052	623	608	0.046	0.045	0	0	-8	294	14	1626	1300	14.100	0.097
Year 7	0	0	0	0	717	700	0.053	0.052	623	608	0.046	0.045	0	0	-8	294	14	1626	1300	14.100	0.097
Year 8	0	0	0	0	717	700	0.053	0.052	623	608	0.046	0.045	0	0	-8	294	14	1626	1300	14.100	0.097
Year 9	0	0	0	0	717	700	0.053	0.052	623	608	0.046	0.045	0	0	-8	294	14	1626	1300	14.100	0.097
Year 10	0	0	0	0	717	700	0.053	0.052	623	608	0.046	0.045	0	0	-8	294	14	1626	1300	14.100	0.097
Total per Mode	28196	27526	2.103	2.046	7170	7000	0.535	0.520	28042	27375	2.092	2.035	3283	384	-80	4998	238				
Overall Total (Tonne)																		**71993**	**65487**	**243**	**5**

Calculations based on conversion equation provided by Dr. Robert Parsons, Advanced Energy Project Manager, Indigenous and Municipal Relations, Government of Manitoba
Based on: Environment Canada (2008). *National Inventory Report 1990—2006: Greenhouse Gas Sources and Sinks in Canada* . Environment Canada Greenhouse Gas Division.

Annex 11

Overview of Traditional Knowledge Study



Annex 12

Appendix - RB01
Project 4 Regional Assessment Area Community Profiles
Canadian Environmental Assessment Agency – Information Requests Round #1

BLOODVEIN FIRST NATION

The reserve was originally situated in the area of Long Body Creek (Ken Wah Bie Creek) until 1917, at which time Chief and Council requested that the Reserve boundaries be moved to the area around the mouth of the Bloodvein River (Pimitotah to Care for our Land, 2012). This area is a part of Treaty 5, and has long been inhabited by indigenous peoples. The name originates from a major battle between the peoples inhabiting the mouth of the river and one of the neighbouring tribes, where blood flowed into the river. The river was originally called the "Blood River" but was changed to "Bloodvein" by the Hudson's Bay Company. The native language is Ojibway. In 2012, Bloodvein First Nation completed its land use plan for its traditional territory, entitled Pimitotah To Care for our Land. This area is highlighted in EIS Figure 10-8.

Local On-Reserve Economy

Bloodvein has a number of small businesses operating within the community, including:

- Bloodvein Arena
- Bloodvein River Lodge
- Turtle's Café
- Anishinabe Coffee Shop
- Mikisi Towing, Gas Bar & Convenience Store
- Keller & Son's Grocery Store
- Blue Garage
  (Pimitotah to Care for our Land, 2012)

These small businesses represent a small percentage of the active labour force within the area. According to Statistics Canada, the majority of the population (59.5%) does not participate in the labour force. However, 40.5% of the population are active participants in the labour force with only 30% of that group employed.

Table 1: Labour Force in Bloodvein

	TOTAL	MALE	FEMALE
Total population 15 years and over	370	190	175
In the labour force	150	90	65
In the labour force - Employed	110	65	45
In the labour force - Unemployed	45	25	20
Not in the labour force	210	105	115
Participation rate	40.5%	47.4%	37.1%

Employment rate	29.7%	34.2%	25.7%
Unemployment rate	30.0%	27.8%	30.8%
Source: 2011 Statistics Canada			

Table 2: Labour Force by Industry in Bloodvein

	TOTAL	MALE	FEMALE
Total experienced labour force 15 years and over	155	90	65
Agriculture and other resource-based industries	10	10	0
Construction	20	20	0
Manufacturing	0	0	0
Wholesale Trade	0	0	0
Retail Trade	0	0	0
Transportation and Warehousing	10	10	0
Health Care and Social Services	25	0	20
Educational Services	15	0	15
Business Services	20	20	0
Public Administration	35	20	15
Source: 2011 Statistics Canada			

Table 2 illustrates the characteristics of the labour force according to industry and occupation. The data derived from Statistics Canada show that 23% of the experienced labour force was considered as working in the Public Administration industry. The second largest sectors are health care (16%), construction (13%), and business services (13%).

Household Composition

According to Statistics Canada, there were approximately 154 private dwellings in the community in 2006. Of the total private dwellings, 139 were occupied by usual residents. Only a small amount of dwelling are owned (20) and rented (10).

Infrastructure and Services

The community of Bloodvein possesses various infrastructure services including:

Table 3: Infrastructure in Bloodvein

Infrastructure in Bloodvein	
Water Supply	Water is obtained from the Bloodvein River. The water is distributed and treated to the community through either a piped distribution or trucked delivery system. Approximately 52%* of the houses have piped service; 33.8%* have cisterns and 2%* of the houses have water barrels.
Sewage Disposal	Approximately 52% of the homes in the community are served by a piped sewage collection system and 33.8% have trucked sewage pumped from holding tanks. The sewage is treated with a two cell sewage lagoon which is discharged through an effluent force main to an area south of the lagoon.
Garbage Disposal	There is a landfill site and sewage lagoons located within the reserve area.
Roads	There is no permanent access road to the community, although a winter road constructed annually provides access from Pine Dock on the west side of Lake Winnipeg. Pine Dock is accessible by all weather roads via highway #234. There are approximately 9km of internal roads in Bloodvein.
Education	Education facilities include Miskooseepi School which currently has approximately 215 students. The school offers levels from kindergarten to grade nine. After students complete grade nine, they attend high school in Winnipeg, Selkirk or Riverton.
Health	Health/social services include Bloodvein Nursing Station. The nursing station has 3 to 4 nurses on call. A doctor makes community visits to the nursing station every month. For serious or life threatening emergencies, patients are medevaced (transported via air) to Winnipeg.
Recreation	N/A
Child and Family Services	Child and Family Services include: Southeast Child and Family Services Inc, Bloodvien Field Office, and Southeast Child and Family Services Inc.
Electrical Service	Service is provided by land line.

Infrastructure in Bloodvein	
Postal Service	Air mail is provided three times a week from Winnipeg, service provided by Northway Aviation.
Police Protection	The nearest RCMP detachment is in Selkirk. The First Nation employs one First Nation constable.
Fire Protection	The First Nation has limited fire fighting capabilities.
Airport	3,000 foot gravel airstrip. Daily flights available, except Saturdays and Sunday mornings.
** Distribution percentages are estimated as there are variances between the sources utilized. Community profiles are from 2004-2005, while Statistics Canada 2011 indicates the total number of household dwellings.*	
Source: 2004-2005 First Nation Community Profiles; Statistics Canada, 2011	

Tourism

The area surrounding the community of Bloodvein possesses similar natural environmental characteristic as that of Berens River. Bloodvein is situated within close proximity to the Bloodvein River, which is recognized as a canoe route by Manitoba Conversation (East Side Lake Winnipeg Broad Area Planning, 2004). The river runs inland; also southwest toward Atikaki Provincial Park. This area is also famous for sport fishing, specifically sturgeon, northern pike, 'walleye' pickerel and lake trout, whitefish, and channel catfish. There are two lodges in the planning area that are listed with the Manitoba Lodges and Outfitters Association: the Bloodvein River Lodge, owned by a member of the Bloodvein First Nation, and the Sasaginnigak Lodge. There are also outfitters and outcamps in the planning area.

Local Aboriginal Land Use

Treaty Land Entitlement Lands

In Manitoba, the Treaty Land Entitlement Program is responsible for the Crown land clearance and transfer processes of land in accordance with the *Treaty Land Entitlement Framework Agreement.* Bloodvein First Nation has no outstanding treaty land entitlements.

Land Use Areas

Land use areas are specific zones of the Bloodvein Planning Area that have been designated to accommodate the activities of the area. Bloodvein First Nation identifies three land use areas in Manitoba, that include Special Management Zone, Bloodvein Local Community Resource Zone, Atikaki Provincial Park Zone (Bloodvein First Nation, 2012).

The intent for the Special Management Zone is careful management with an emphasis on ensuring continuation of traditional activities and recreation use of the land. Supported in this area are any existing licensed operations, such as lodges, outcamps and outfitted. Waterways as well as historical and cultural sites will be protected.

The Bloodvein Local Community Resource Zone ensures natural landscapes and ecological processes are maintained and montiroed while accommodating community sustainable forestry, the development and maintenance of an all-season road (including quarry leases, casual quarry permits and quarry withdrawal area), and gravel extraction for community use (Bloodvein First Nation, 2012).

The Atikaki Provincial Park Zone follows the Atikaki Provincial Park and BLoodvein Canadian Heritage Rive Management Plan (Government of Manitoba).

LITTLE GRAND RAPIDS & PAUINGASSI FIRST NATIONS

Little Grand Rapids First Nation

Little Grand Rapids First Nation is located in the regional assessment area and is 268 km northeast of Winnipeg by air, on the south shore of Family Lake near the Manitoba/Ontario border. The reserve is spread out over an eight km stretch along the lake shore, and covers 2,005.8 ha. The language spoken is Anishinaabe. The total population of Little Grand Rapids First Nation is 1,558 people, with 1,242 on-reserve. The residents were considered to be part of Berens River First Nation at the time of Treaty 5 signing in 1875. An Order-In-Council in 1930 established the reserve and granted it separate First Nation status as per the 1888 survey of 5,879.3 ha at the narrows of the Berens River. Little Grand Rapids is referred to as *Meeseepawistik* – misi –large, pawistik – rapids). This is a Cree place name that appears to have been adopted by the *Anishinaabeg* (Ojibwa) (Manitoba Conservation 2000). The community has completed two land use plans, one for the Manitoba planning area, *"Ni-Kes" Lands Management Plan* (2012), and the other for the Ontario planning area, *Little Grand Rapids Community Based Land Use Plan* (2011).

Pauingassi First Nation

Pauingassi First Nation, is located within the project area, and is located on a peninsula on Fishing Lake, approximately 280 km northeast of Winnipeg and 24 km north of Little Grand Rapids First Nation. The reserve covers 260.6 ha and the language spoken is Anishinaabe. Its total registered population is 614 people with 568 on-reserve. Pauingassi received reserve status in 1988, and in 1991 became a separate First Nation by Ministerial Order. The mother First Nation is Little Grand Rapids which is signatory to Treaty 5, signed in 1875. Pauingassi means "sandy bar" (pingwi – fine sand). Pauingassi has completed two land use plans, one for the Manitoba planning area, *Naamiwan "The Land of Fair Wind" Lands Management Plan* (2012), and the other for the Ontario planning area, *Pauingassi Community Based Land Use Plan "The Land of Fair Wind"* (2011).

Infrastructure and Services

Infrastructure

Little Grand Rapids and Pauingassi First Nations obtain water from Family Lake. The water is treated and distributed to the community through either piped distribution or a trucked delivery system. The water treatment plants were both established in 1995 and are Level II treatment class. The design capacity, actual capacity and maximum daily volume are 492, 492, 537, and 467, 467, and 295 m^3/d for Little Grand Rapids First Nation and Pauingassi First Nation, respectively (Aboriginal Affairs and Northern Development Canada).

Sewage disposal consists of a piped sewage collection system as well as holding tanks. The distribution system is reported to be affected by extreme cold weather conditions (Community meeting notes 2014). Sewage is treated with a two-cell aerated sewage lagoon which is discharged through an effluent ditch to an inland lake for Little Grand Rapids First Nation. Sewage treatment is provided by a Sequencing Batch Reactor treatment plant for Pauingassi First Nation.

In 2010, a new Royal Canadian Mounted Police detachment building was opened, replacing the trailer used since 1992 when Little Grand Rapids became a permanent detachment rather than a fly-in patrol. The Little Grand Rapids Detachment has five trucks, three snowmobiles, three boats, and two ATVs. Trucks are kept in Pauingassi and Little Grand Rapids, with three permanently stationed in Little Grand Rapids. The detachment consists of one sergeant, one corporal, five constables, and one public service employee. The First Nation employs three First Nation constables for Little Grand and Pauingassi. There are no constables living in Pauingassi.

Education is provided at local First Nation schools that are operated under the Southeast Tribal Division for Schools Inc. Pauingassi School (Omiishosh Memorial School) offers kindergarden to grade nine. There are approximately 104 students who attend the school annually. Little Grand Rapids School offers levels kindergarden to grade nine with enrolment of 253. Members of the First Nations also attend school outside the community.

A 914 m airstrip occurs on Crown land across the lake from Little Grand Rapids First Nation. Northway Aviation, Keystone Air, Bolton Air, Wam Air and Blue Water Air provide air service (Keewatin Tribal Council 2005). No permanent access roads occur to either First Nation. Little Grand Rapids and Pauingassi are accessible by winter roads during January to March. There are approximately nine km of internal all-season roads in Little Grand Rapids First Nation reserve. There is also a private air strip located on the east side of Fishing Lake that services a nearby fishing lodge.

A hydro electric transmission line and corridor follows a similar route to the winter road corridor to the community of Little Grand Rapids First Nation. The transmission line enters the southern portion of Pauingassi traditional area west of Fishing Lake and leads into the community. The First Nations receive sporadic radio reception from Winnipeg, and CBC television is rebroadcast in the communities. Electrical services are provided by land line and single party telephone exchange is available.

Other infrastructure includes houses, general stores, band offices, recreational facilities, fire department, and education and nursing station facilities.

Services

Little Grand Rapids First Nation and the Little Grand Rapids Northern Affairs Community, and Pauingassi First Nation are the nearest service providers. The communities are located in a remote forested setting with scheduled air service and winter road access. Local businesses include several small general stores, water delivery, septic hauling and construction contractors. The Fishing Lake Lodge, when operating, provides overnight accommodations and meals.

Little Grand Rapids and Pauingassi First Nations are located in the Interlake-Eastern Regional Health Authority. Nursing stations are First Nation and Inuit Health Branches. Nursing stations employ two to three health works each. A new nursing station has been recently built in Pauingassi (Keewatin Tribal Council 2005). The nearest hospital is located in Pine Falls,

135 km northeast of Winnipeg. Serious medical cases are airlifted to Winnipeg under the Northern Patient Transportation Program.

Local First Nations have limited firefighting capabilities. Fire protection is operated by volunteer fire departments. Community school bus services are available, and garbage disposal occurs at landfill sites maintained by First Nations. Postal service is provided by highway mail three times a week or by air mail for remote communities. Church services are available in surrounding communities.

Local On-Reserve Economy

The local economy in Pauingassi First Nation and Little Grand Rapids First Nation is supported by employment in social services, education, land use activities, private business and band public service. The schools in the communities provide employment to education professionals and support staff. The Southeast Child and Family Services provide employment for social services professionals and support staff. The community Band Councils provide employment for permanent support staff and employment for season staff under various programs run by the Band. There is a Northern Store in Pauingassi and a privately owned convenience store in Little Grand Rapids that provides employment to local residents. Land use based employment include, guiding for local outfitters and trapping activities. On-reserve infrastructure such as, roads, fuel storage and waste/water treatment and distribution provide employment for construction, maintenance and operation activities. Seasonal employment is created as a result of mining exploration, winter road construction and maintenance, Manitoba Hydro transmission line clearing and forest fire fighting endeavours.

Local Aboriginal Land Use

Treaty Land Entitlement Lands

In Manitoba, the Treaty Land Entitlement Program is responsible for the Crown land clearance and transfer processes of land in accordance with the *Treaty Land Entitlement Framework Agreement.* Little Grand Rapids and Pauingassi First Nations have no outstanding treaty land entitlements.

Traditional First Nations Land Management Planning Areas

Historically, local people from Little Grand Rapids First Nation and Pauingassi First Nation have utilized the general area surrounding Fishing and Family lakes for traditional activities including fishing, hunting, trapping, harvesting and ceremony. At the time of the signing of Treaty 5 in 1875, Little Grand Rapids First Nation was considered part of the Berens River First Nation. In 1930, Little Grand Rapids was granted First Nation status. Little Grand Rapids and Pauingassi were amalgamated into one First Nation despite being historically and traditionally distinct communities. Pauingassi First Nation became a legally recognized reserve in 1988 and became a separate First Nation, with community members moving to the current reserve site on Fishing Lake in 1991 (Pauingassi First Nation and Government of Manitoba 2012), separating from the mother First Nation, Little Grand Rapids.

Manitoba Land Use Areas

Land use areas are specific zones of the Planning Area that have been designated to accommodate the activities of the area. Little Grand Rapids and Pauingassi First Nations identify three land use areas that include Enhanced Management Area, Commercial Area, and Protected Area in Manitoba (Little Grand Rapids First Nation and Government of Manitoba 2012; Pauingassi First Nation and Government of Manitoba 2012) as previously described in Sections 3.5.1 and 3.5.2.

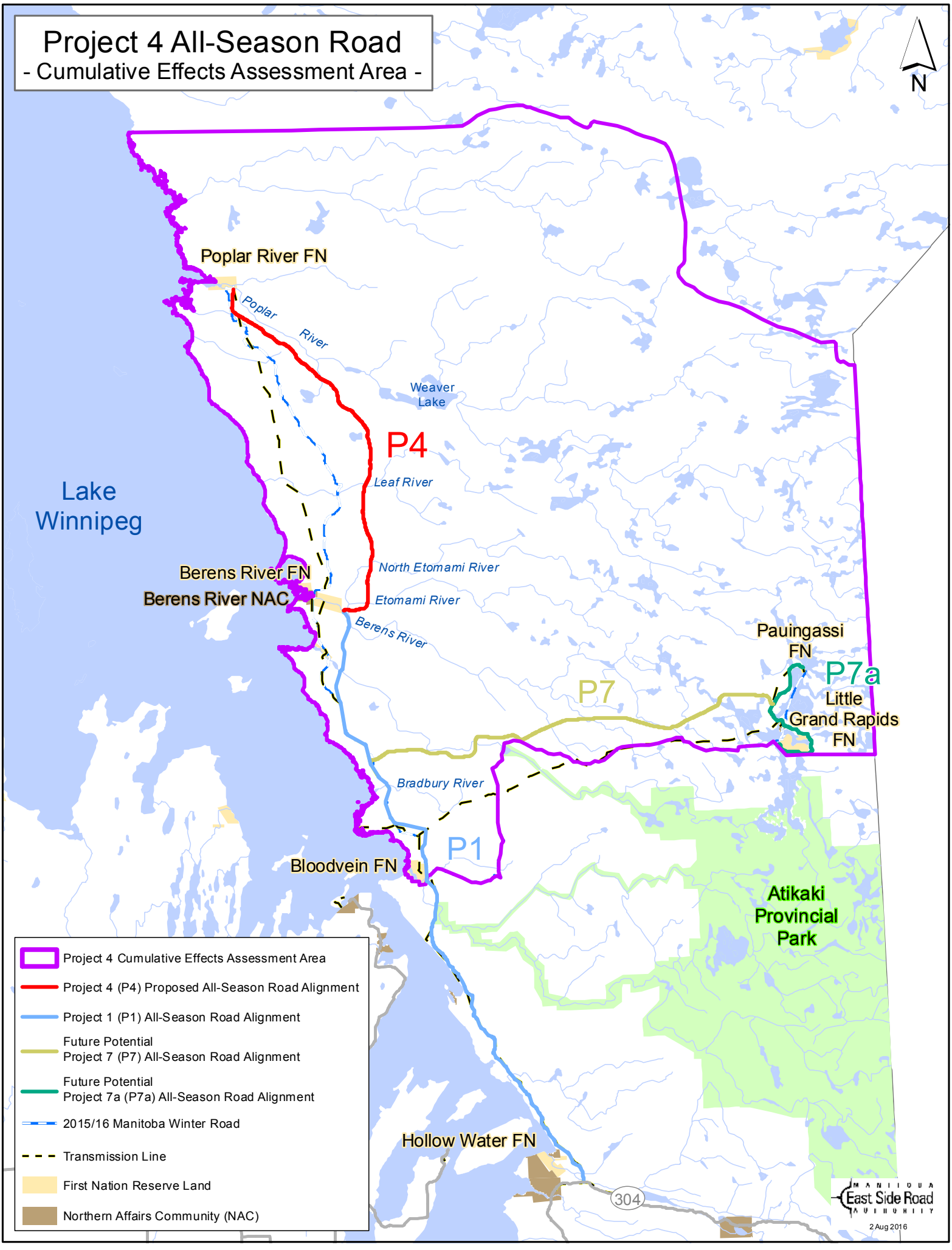
The intent for the Enhanced Management Area is careful management with an emphasis on ensuring continuation of traditional activities. Supported in this area would be activities such as trapping, wild rice harvesting, collection of non-timber forest product, maintenance and construction of cabins, and recreational activities. Historical and cultural sites will be protected. This area will support the continuation of the existing winter road and future all-season road access. The proposed P7a All-Season Road Project would be located on a Community Enhanced Management Areas while the proposed Community Access Roads would be located wholly on First Nation land.

The Commercial Area allows economic development to occur but will be managed to reduce effects on the environment. Activities allowed include mining and mineral exploration, community-based sustainable forestry, upgrading transmission lines and future road development. Continuation of traditional uses and existing tourism is supported.

The Protected Area will be managed to maintain and enhance traditional uses, protect cultural and natural lands, and natural resources. Prohibited in this area are large-scale developments such as commercial forestry, mining, petroleum exploration, and hydro transmission. Roads shall be restricted where possible. The continuation of tourism is supported in this area. Cultural

waterways will be managed for both First Nations. Additional Protected Areas for Little Grand Rapids First Nation that will be managed for land use activities include Mishipawitigong, Pigeon River, and Little Grand Rapids Planning Area portion of Atikaki Provincial Park.

Annex 13


Project 4 All-Season Road
- Cumulative Effects Assessment Area -
N
Poplar River FN
Poplar River
Weaver Lake
P4
Leaf River
Lake Winnipeg
Berens River FN
Berens River NAC
North Etomami River
Etomami River
Berens River
Pauingassi FN
P7a
P7
Little Grand Rapids FN
Bradbury River
P1
Bloodvein FN
Atikaki Provincial Park
Hollow Water FN
304
Project 4 Cumulative Effects Assessment Area
Project 4 (P4) Proposed All-Season Road Alignment
Project 1 (P1) All-Season Road Alignment
Future Potential Project 7 (P7) All-Season Road Alignment
Future Potential Project 7a (P7a) All-Season Road Alignment
2015/16 Manitoba Winter Road
Transmission Line
First Nation Reserve Land
Northern Affairs Community (NAC)
East Side Road Authority
2 Aug 2016

Annex 14

Sound Levels of Typical Construction Equipment from Previous ESRA Construction Projects*

			Sound Pressure (dB)**				
Work Site	**Activity**	**Distance from Source (m)**	**1**	**50**	**500**	**1000**	**5000**
C-17	Excavator (traveling)		97	63.02	43.02	37.00	23.02
C-17	excavator (stationary)		83	49.02	29.02	23.00	9.02
C-17	Tandem Truck		87	53.02	33.02	27.00	13.02
C-17	Loader		86	52.02	32.02	26.00	12.02
C-17	Bobcat		95	61.02	41.02	35.00	21.02
C-19	Excavator (stationary)		84	50.02	30.02	24.00	10.02
C-20	Rock Truck		85	51.02	31.02	25.00	11.02
C-21	Loader		89	55.02	35.02	29.00	15.02
C-22	Dozer (stationary)		98	64.02	44.02	38.00	24.02
C-23	Dozer (traveling)		99	65.02	45.02	39.00	25.02
Km 53 (quarry)	Drill		110	76.02	56.02	50.00	36.02
Km 53 (quarry)	Rock Truck		87	53.02	33.02	27.00	13.02
Km 53 (quarry)	Loader		90	56.02	36.02	30.00	16.02
Km 53 (quarry)	Generator		80	46.02	26.02	20.00	6.02
Km 53 (quarry)	Backhoe		84	50.02	30.02	24.00	10.02
Km 53 (quarry)	Crusher		103	69.02	49.02	43.00	29.02
R2	Roller/Packer		101	67.02	47.02	41.00	27.02
R2	Grader		100	66.02	46.02	40.00	26.02
R2	Dozer		90	56.02	36.02	30.00	16.02
R2	Rock Truck		91	57.02	37.02	31.00	17.02
R2	Backhoe		83	49.02	29.02	23.00	9.02
R2	Loader		90	56.02	36.02	30.00	16.02
R3	Excavator (stationary)		98	64.02	44.02	38.00	24.02
R3	Rock Truck		84	50.02	30.02	24.00	10.02
R3	Grader		84	50.02	30.02	24.00	10.02
R3	Crusher		84	50.02	30.02	24.00	10.02
R3	Drill		111	77.02	57.02	51.00	37.02
B1	Drill		110	76.02	56.02	50.00	36.02
B1	Rock Truck		87	53.02	33.02	27.00	13.02
B1	Loader		90	56.02	36.02	30.00	16.02
B1	Generator		80	46.02	26.02	20.00	6.02
B1	Backhoe		83	49.02	29.02	23.00	9.02

* Measurements taken on ESRA projects as part of Safety and Health Audits

** Calculated at distance using inverse square law

With the exception of drilling sound levels will be below 70 dB by 50m and below ambient noise levels by 1km

Foliage is expected to further reduce sound pressure by approximately 10 dB once outside the project footprint

The following ambient sound levels (dB) were collected in 2015 from the P4 study areas:

- Morning 43.7 dB with 15 samples (April-June)
- Evening 46.2 dB with 15 samples (April – June)
- Average of 45 dB (April – June)

See attachment GC-4 Joro memo re: ambient noise

Sound Levels Measured at Site Trailers / Within Work areas

Contract	**Measured dB**
B1	78
B1	78
Km 53	78
C-18	85
c-17	83
Average	81.4

Sources:

Georgia State University

http://hyperphysics.phy-astr.gsu.edu/hbase/acoustic/isprob2.html

Pen State University

http://www.mne.psu.edu/lamancusa/me458/10_osp.pdf

Sound Services: PA Sound Specialists

www.sound-services.info/pdfs/premier_spl_calculator.xls

Engineering toolbox

http://www.engineeringtoolbox.com/inverse-square-law-d_890.html

EasyCalculation.com

https://www.easycalculation.com/physics/classical-physics/decibels-distance.php

Annex 15

Joro Consultants

599 Portage Ave
Winnipeg MB R3B 3G3
Phone (204) 786-9275

Memo

To: Leanne Shewchuk and Scott Johnstone

From: Blair McMahon

cc: Doug Schindler

Date: July 29, 2016

Re: Project 4 Baseline Sound Levels

This memo responds to your request for an average ambient sound levels (dB) from deployed Autonomous Recording Units (ARUs) in the P4 area (day and night) in 2014 and 2015.

Methods

Four autonomous recording units were deployed within different habitats throughout the Project 4 study area during the following dates: April 25-July 2 in 2015. Each ARU (model SM2+, supplied by Wildlife Acoustics Inc.) was encased in a weather-proof enclosure with four D-cell batteries, up to four 16-gigabyte memory cards, and two external microphones. The recording units were scheduled for specific start and shut off times to capture peak bird call times. ARUs were also programmed to record low frequency sounds down to 3 Hz (at a gain of 48 dB).

Dates, times and Song Meters (SMs) were selected randomly from the database of ARU recordings for Project 4. This information was compiled for morning, evening and night time periods – which were checked with sunrise/sunset schedules for the Project area. The periods analyzed include:

- Morning - the time from sunrise to noon;
- Night - extends from twilight until sunrise

The Song Scope software used in analysis of ARU recordings provide a waveform plot displays as a time-domain representation of the audio signal. ARUs record relative sound pressure in decibels (dB) as a log scale which is *20 log10(|x).* The following conversion factor was applied to the ARU data generated to estimate ambient sound levels: Song Scope Value X (relative sound pressure) + 126 dB - gain = dB SPL (sound pressure level) +/-4dB; the 4dB error is related to microphone factory specifications.

Results and Discussion

The overall average sound pressure, or decibels (+/-4dB), for the Project 4 area in 2015 was 45.0 dB: 43.7 dB during the morning and 46.2 dB at night. These values represent the estimated baseline sound levels based on ARU recordings processed using Sound Scope software in the Project 4 area. The minimum sound pressure limit for the Song Meter 2+ units used in 2015 have a minimum "noise floor" of 32 dB. Considering that this is the noise floor of the microphone and not the environment (i.e., the actual ambient noise values were less than 32 dB but not accurately definable), any recorded value below 32 dB was set to a value of 32 dB in Table 1.

Table 2 Project 4 Ambient Sound Pressure Levels (dB) Recorded by ARUs in 2015

Date	Time	ARU	dB	Comment
Morning				
4/26/2015	6:33:39 AM	SM1	41.4	quiet, slight wind
4/28/2015	8:35:07 AM	SM1	66.5	slight wind (warbler calling outside time)
5/4/2015	8:38:53	SM1	47.5	quiet (woodpecker calling outside time)
5/6/2015	6:37:28	SM1	32.0[1]	quiet (Connecticut warbler calling)
5/12/2015	8:39:39	SM1	32.0	quiet (bird calling)
5/14/2015	8:32:39	SM1	45.0	quiet (bird calling)
5/18/2015	7:38:36	SM4	41.0	slight wind (warbler calling outside time)
5/22/2015	7:32:10	SM1	62.0	moderate wind (birds calling)
5/24/2015	6:38:39	SM1	32.0	quiet (spring peepers and bird)
5/30/2015	7:38:29	SM1	32.0	quiet (bird and spring peeper outside time)
6/1/2015	8:08:30	SM1	32.0	quiet (bird calling outside time)
6/7/2015	7:37:39	SM1	58.0	humming and bird calling
6/9/2015	7:36:39	SM1	42.6	quiet (bird calling)
6/19/2015	7:39:29	SM1	58.4	moderate wind (birds calling)
6/21/2015	6:38:39	SM1	33.8	quiet (birds calling outside)
Morning Sample Size (n)			15	
Morning Average			43.7	
Night				
4/26/2015	23:30	SM4	33.5	very quiet, no wind
4/30/2015	23:33:10	SM4	48.0	wood frogs calling
5/4/2015	23:34:39	SM4	37.5	spring peeper and wood frog calling
5/8/2015	0:36:39	SM4	72.2	very windy, gusting
5/12/2015	23:31:39	SM4	35.0	quiet, wood frog calling
5/16/2015	23:34:17	SM4	78.0	very wind, spring peeper
5/20/2015	0:30:24	SM4	24.0	very quiet, no wind
5/24/2015	23:39:29	SM4	47.8	spring peeper calling
5/28/2015	22:33:49	SM4	56.0	quiet, slight gusting wind
6/1/2015	23:34:39	SM4	51.3	quiet, slight gusting wind
6/5/2015	22:33:32	SM4	42.8	spring peepers calling
6/9/2015	23:34:20	SM4	45.0	Toad and spring peepers calling
6/13/2015	23:32:29	SM4	32.0	spring peepers calling
6/17/2015	0:37:28	SM4	67.5	very windy, gusting
6/21/2015	23:36:28	SM4	32.0	very quiet, no wind
Night Sample Size (n)			15	
Night Average			46.2	
Total Sample Size (N)			30.0	
Overall Average			45.0	

[1] Any recorded value below 32 dB (noise floor of the microphone) was set to a value of 32 dB.

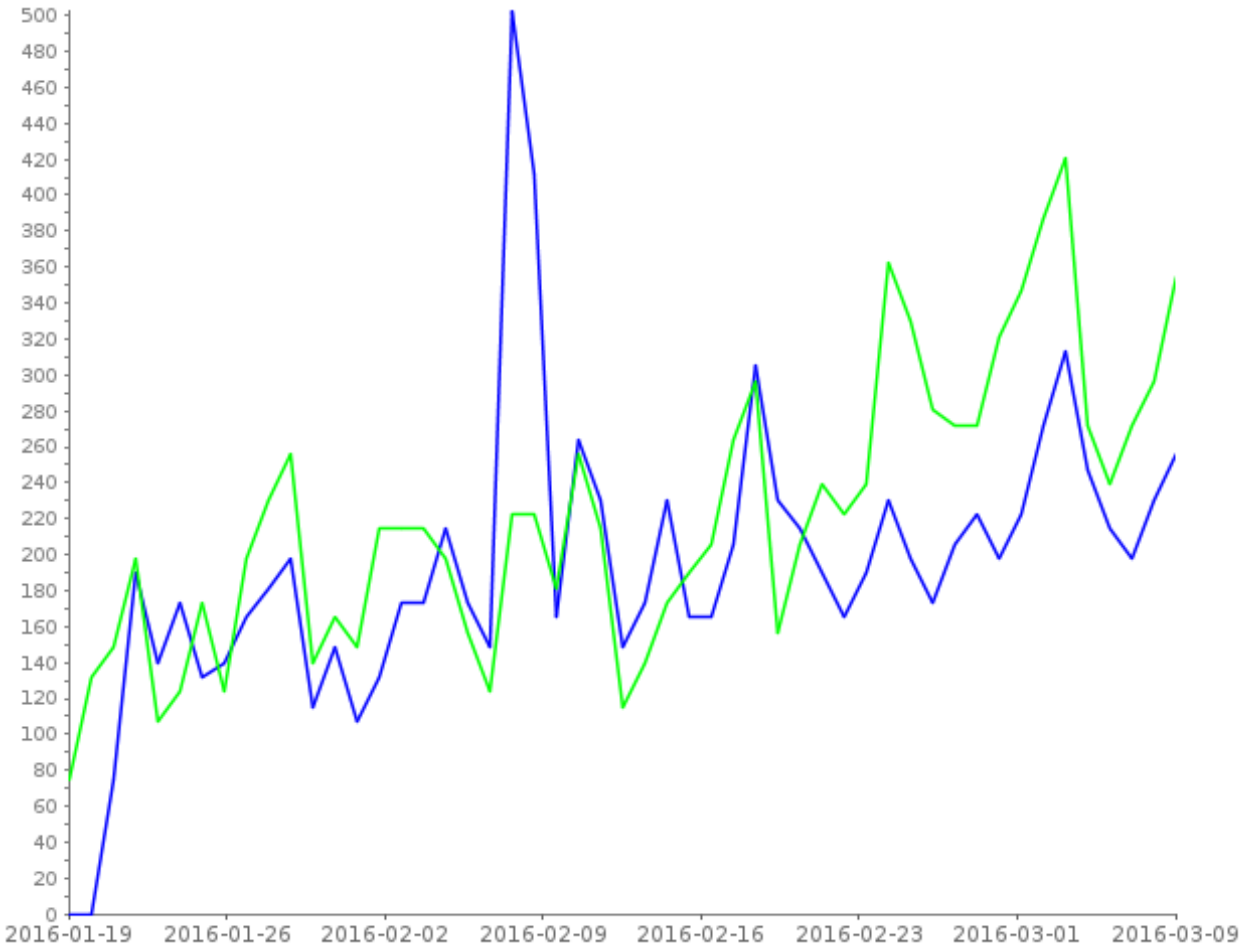
Annex 16

Daily totals report

Covering 51 days from 2016-01-19 to 2016-03-09

Report generated on 2016-04-29 10:58:58 (UTC -06:00) by brad-86@hotmail.ca

www.trafx.net



Site Name		Average	Min	Max
Berens River		226.0	79.0	421.0
Rice River Road		198.6	4.0	503.0

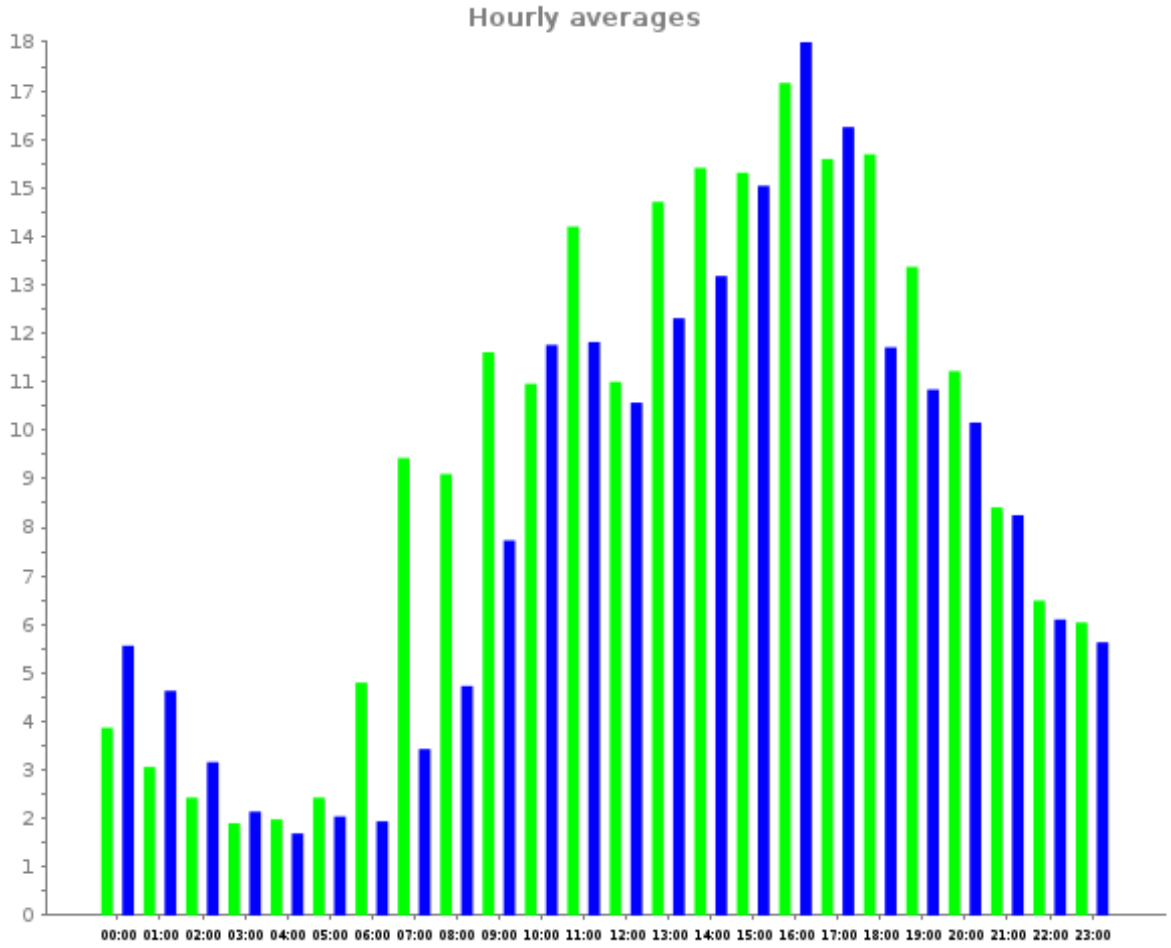
A = adjustment applied, D = divide by 2 applied, F = filtering applied

Hours of the day

From 2016-01-19 to 2016-03-09

Report generated on 2016-04-29 10:57:57 (UTC -06:00) by brad-86@hotmail.ca

www.trafx.net



Site Name		Average	Median	STDV	Min	Max
Berens River		9.4	10.2	5.0	1.9	17.2
Rice River Road		8.3	8.0	4.8	1.7	18.0

A = adjustment applied, D = divide by 2 applied, F = filtering applied

Daily totals report

Covering 49 days from 2016-01-21 to 2016-03-09

Report generated on 2016-04-29 10:59:50 (UTC -06:00) by brad-86@hotmail.ca

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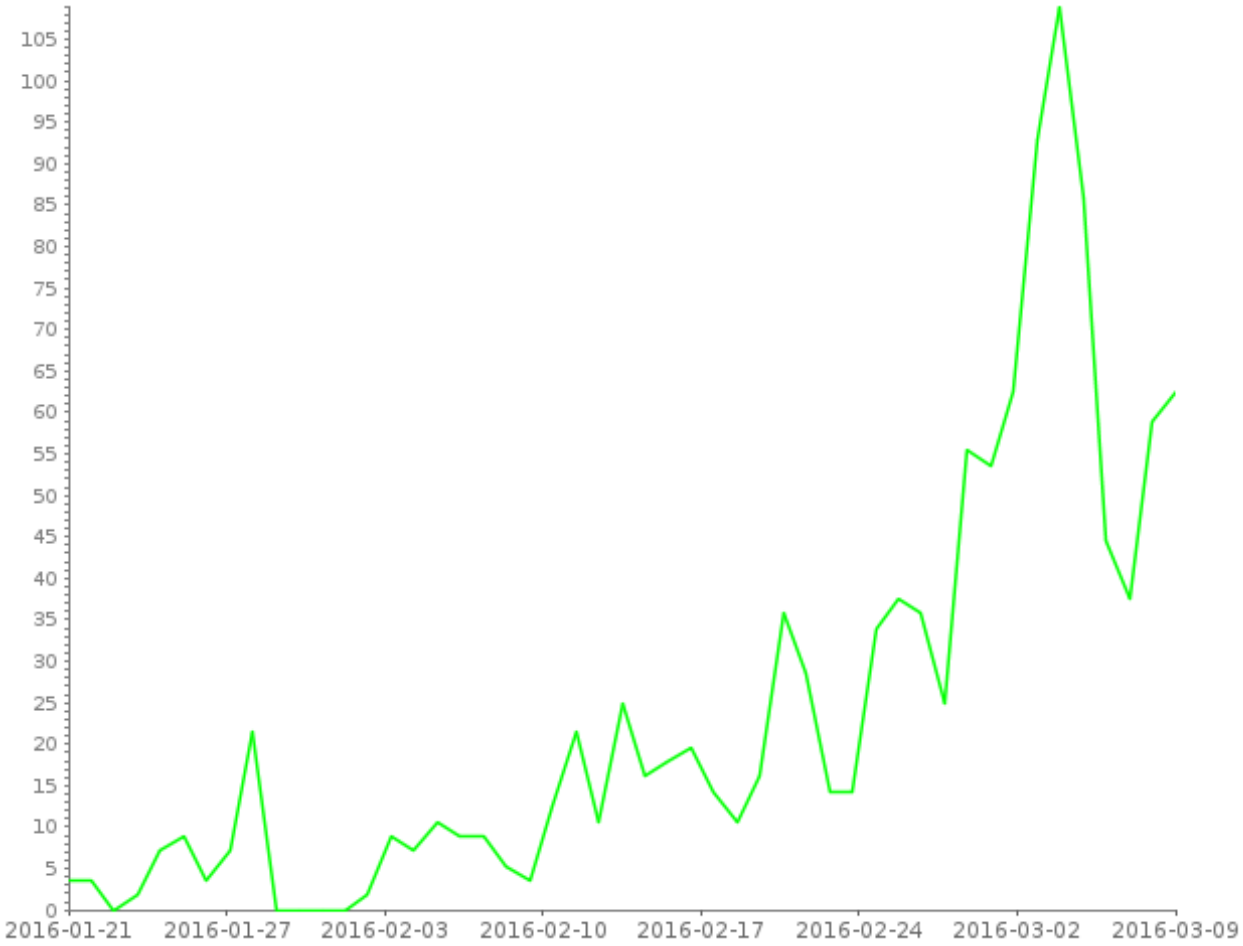

Site Name	Average	Min	Max
LGR JCT	24.6	0.0	109.0

A = adjustment applied, D = divide by 2 applied, F = filtering applied

Hours of the day

From 2016-01-21 to 2016-03-09

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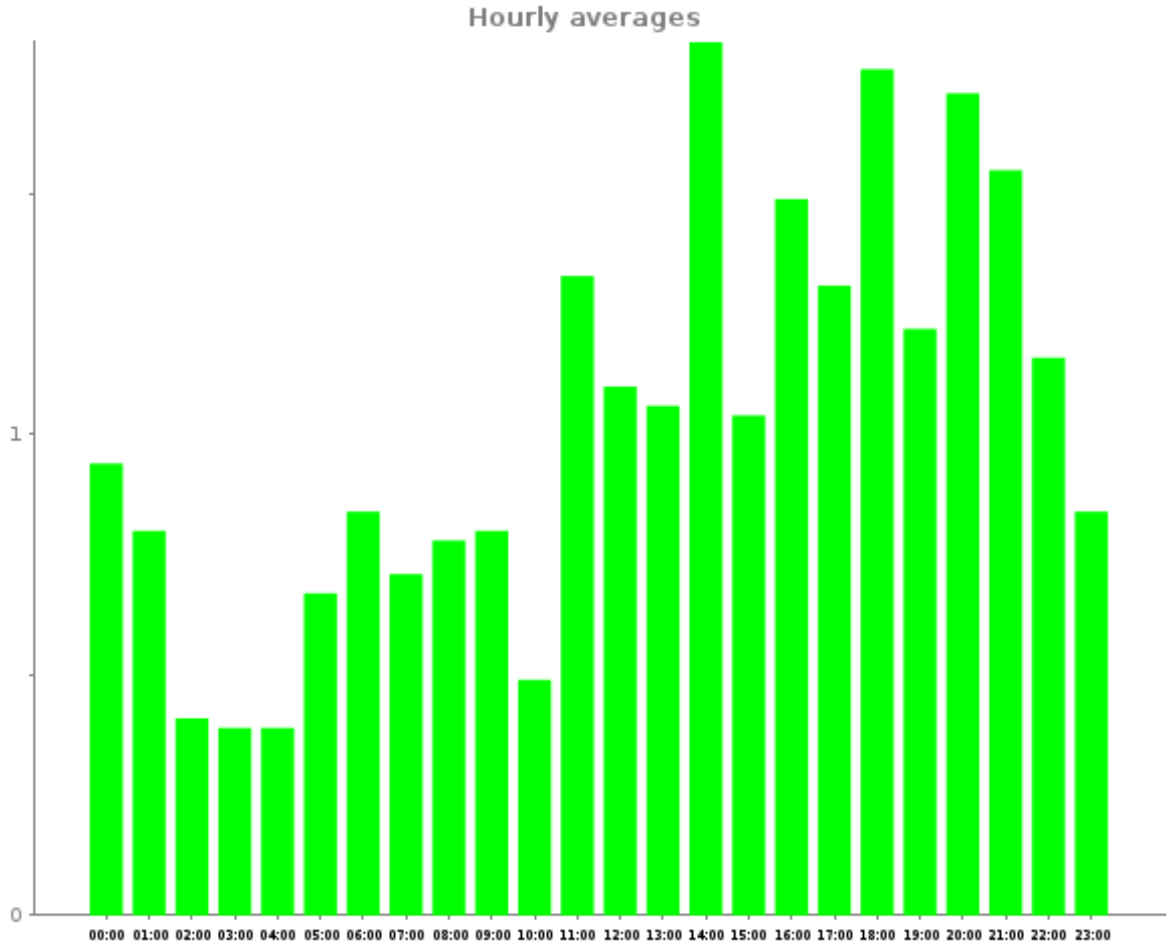

Site Name	Average	Median	STDV	Min	Max
LGR JCT	1.0	1.0	0.4	0.4	1.8

A = adjustment applied, D = divide by 2 applied, F = filtering applied

Annex 17

Guidance Material Provided to East Side Road Authority Contractors

GR130.3.2.1 Environmental Emergency Plan for Spill Response and Remediation

An Environmental Emergency Plan for Spill Response and Remediation must be submitted for review and acceptance 10 business days before the start of work as per GR130.3.2.1. The Environmental Emergency Plan for Spill Response and Remediation must describe how the Contractor plans to ensure that all applicable Federal/Provincial regulations, permit conditions and contract requirements are met in relation to spill response and remediation in the event of an in-stream or on-land spill.

Emergency Spill Procedure

Ensure Safety

- Assess magnitude of spill – If the spill is resulting from a leak or flow of petroleum from a tank or equipment, follow this entire procedure. IF it is a small spill where the source of the spill has been stopped go to Step 3.
- Assess safety of workers – evacuate from area if necessary
- If first aid attention is required, follow Injury Procedures
- Restrict access to the area
- Turn off all equipment and ignition sources
- Notify the Site Supervisor and/or the Environment Coordinator
- Ensure appropriate PPE is worn before cleaning spill
- Ensure safety of community from in-water spills

Stop the Flow

- Assess the landscape for immediate environmental threats, ex. Sloping towards waterway
- If it is safe to do so, approach from upwind.
- Close valves, shut off pumps, plug holes/leaks, set containers upright
- Stop the flow of the spill at its source
- Dyke spilled material with dry, inert sorbent material or dry clay
- Prevent spill material from entering waterways, utilities or other openings by dyking proximity to waterways.
- Contain spill as close to source as possible.

Clean up the Spill

- Assess the spill for size – take photos
- Place absorbent pads on top of the spills to absorb the petroleum product
- Place used absorbent pads in a disposal bag
- Scoop up impacted soil using a shovel and place in the disposal bag or designated Spill Disposal container
- All impacted soils must be delivered to a licensed treatment facility at a later date – copies of the weigh bills must be forwarded to ESRA

Report the Spill

- Complete a ESRA Environmental Incident Report form and forward a copy to the ESRA Environment Officer.
- Larger spills may require notifying Manitoba Conservation – see table below.
    - **Spill Reporting – Manitoba Conservation – 204-944-4888**
- Reporting in-water spills to local community

Table 1. Spills that must be reported to Manitoba Conservation as Environmental Accidents

Classification	Hazard	Reportable Quantity or Volume
1	Explosives	All
2.1	Compressed Gas (Flammable) (ex. propane)	100 L
2.2	Compressed Gas (ex. CO2)	100 L
2.3	Compressed Gas (Toxic)	All
2.4	Compressed Gas (Corrosive)	All
3	Flammable liquids	100 L
4	Flammable Solids	1 Kg
5.1 PG I & II	Oxidizer	1 Kg or 1 L
5.1 PG III	Oxidizer	50 Kg or 50 L
5.2	Organic Peroxide	1 Kg or 1 L
6.1 PG 1	Acute Toxic	1 Kg or 1 L
6.1 PG II & III	Acute Toxic	5 Kg or 5 L
6.2	Infectious	All
7	Radioactive	Any discharge or radiation level exceeding 10 m Sv/h at the package surface and 200 uSv/h at 1m from the package
8	Corrosive (ex. Battery Acid)	5 Kg or 5 L
9.1	Miscellaneous (Except PCB mixtures)	50 Kg
9.1	PCB mixtures	500 grams
9.2	Aquatic Toxic	1 Kg or 1 L
9.3	Wastes (Chronic Toxic)	5 Kg or 5 L

Annex 18

Guidance Material Provided to East Side Road Authority Contractors

GR130.3.2.5 Material Management Plan in the event of an Unplanned Shutdown

A Material Management Plan in the event of an unplanned shutdown must be submitted for review and acceptance 10 business days before the start of work as per GR130.3.2.7. The Concrete Washout Plan must describe how the Contractor plans to ensure that all applicable Federal/provincial regulations, permit conditions and contract requirements are met in relation to material management in the event of an unplanned shutdown. The Material Management Plan must address the following points:

- The plan must show how the Contractor plans to satisfy the contract requirements, paying especially close attention to GR130.13, GR130.8, GR130.9 and GR130.16.
- The plan must provide details outlining the planned procedures used for the relocation/storage of equipment/supplies in the event of a planned or unplanned shutdown.
- The plan must provide details outlining the planned procedures used for the removal of all waste from the construction site in the event of a planned or unplanned shutdown.
- The plan must provide details outlining the planned procedures used for the storage and removal of dangerous goods/hazardous waste in the event of a planned or unplanned shutdown.
- The plan must provide details regarding a plan for the installation of temporary erosion controls on the construction site in the event of a planned or unplanned shutdown.

Annex 19

Appendix 13-1

Scoping of VCs Predicted to Experience Residual Effects of the Project

Appendix 13-1: Scoping of VCs Predicted to Experience Residual Environmental Effects of the Project

Valued Component	Location of Project Effects Assessment Information in EIS	Summary of Residual Project Effects	Direction	Spatial Extent of Residual Effect[1]	Temporal Extent (Duration) of Residual Effect[1]	Magnitude	Frequency	Reversibility	Potential for Significant Adverse Cumulative Effects?
Surface Water	**Chapter 7, Sections 7.2** and **7.3.1**	▪ Minor and localized alteration of surface drainage patterns adjacent to the P4 all-season road. ▪ Minor alterations of ice dynamics at waterbody crossings.		Low (Level I)	High (Level III)				Low
Air Quality	**Chapter 7, Sections 7.2** and **7.3.2**	▪ Minor and temporary increase in fugitive dust and vehicle/machinery emission levels (greenhouse gases and VOCs) due to Project construction and operations and maintenance activities (e.g., clearing and woody debris burning, blasting, roadbed construction and maintenance works). ▪ Minor and localized fugitive dust and emissions (greenhouse gases and VOCs) from vehicles using the road during the operations and maintenance phase. ▪ Minor loss of carbon sink (i.e., removal of vegetation) for permanent Project components (i.e., the P4 all-season road and quarries required for on-going maintenance) and on-going vegetation maintenance along the all-season road right-of-way.		Low to Moderate (Level II to III)	High (Level III)				Low
Noise and Vibration	**Chapter 7, Sections 7.2** and **7.3.3; Chapter 9,**	▪ Minor and temporary sensory disturbance to wildlife due to noise and/or vibrations. ▪ Minor and temporary sensory		Moderate (Level II)	Low (Level I)				Low

Valued Component	Location of Project Effects Assessment Information in EIS	Summary of Residual Project Effects	Direction	Spatial Extent of Residual Effect[1]	Temporal Extent (Duration) of Residual Effect[1]	Magnitude	Frequency	Reversibility	Potential for Significant Adverse Cumulative Effects?
	Section 9.2.5	disturbance to local communities/people due to noise and/or vibrations.							
Fish Habitat, Fish and Harvested Fish, and Aquatic Species at Risk	**Chapter 8, Sections 8.2** and **8.3**	▪ Permanent destruction of a maximum of 206.5 m^2 of instream habitat and 180 m of riparian zone habitat.		Low (Level I)	High (Level III)				Low
Vegetation Communities	**Chapter 9, Section 9.2.4.1**	▪ Loss or impairment of vegetation communities in the Project Footprint due to clearing of vegetation. ▪ Introduction and spread of non-native and invasive species in the Project Footprint or Local Assessment Area.		Low to Moderate (Level II to III)	High (Level III)				Low
Plant Species of Cultural Importance	**Chapter 9, Section 9.2.4.2**	▪ Loss or impairment of plants species of cultural importance in the Project Footprint due to clearing of vegetation. ▪ Introduction and spread of non-native and invasive species in the Project Footprint or Local Assessment Area.		Low to Moderate (Level I to II)	High (Level III)				Low
Ungulate: Moose	**Chapter 9, Section 9.2.5.1**	▪ Loss, alteration and fragmentation of moose habitat. ▪ Temporary sensory disturbance.		Low (Level I)	Low to High (Level I to III)				Low
Ungulate: Boreal Woodland Caribou	**Chapter 9, Section 9.2.5.2**	▪ Loss, alteration and fragmentation of habitat. ▪ Temporary sensory disturbance.		Low (Level I)	Low to High (Level I to III)				Low

Valued Component	Location of Project Effects Assessment Information in EIS	Summary of Residual Project Effects	Direction	Spatial Extent of Residual Effect[1]	Temporal Extent (Duration) of Residual Effect[1]	Magnitude	Frequency	Reversibility	Potential for Significant Adverse Cumulative Effects?
Furbearer: Beaver	**Chapter 9, Section 9.2.5.3**	▪ Loss, alteration and fragmentation of habitat. ▪ Temporary sensory disturbance.		Low (Level I)	High (Level III)				Low
Furbearer: Marten	**Chapter 9, Section 9.2.5.4**	▪ Loss, alteration and fragmentation of habitat. ▪ Temporary sensory disturbance.		Low (Level I)	High (Level III)				Low
Migratory Birds: Forest Birds	**Chapter 9, Section 9.2.5.5**	▪ Loss, alteration and fragmentation of habitat. ▪ Temporary sensory disturbance.		Low (Level I)	High (Level III)				Low
Migratory Birds: Waterbirds	**Chapter 9, Section 9.2.5.6**	▪ Loss, alteration and fragmentation of habitat. ▪ Temporary sensory disturbance.		Low (Level I)	High (Level III)				Low
Environmentally Sensitive Wildlife Sites	**Chapter 9, Section 9.2.5.7**	▪ Loss, alteration or physical disturbance of overwintering dens, heron rookeries, hibernacula, large stick nests or mineral licks. ▪ Temporary sensory disturbance.		Low (Level I)	Low to High (Level I to III)				Low
Herptiles (Amphibians and Reptiles)	**Chapter 9, Section 9.2.5.8**	▪ Increased mortality due to vehicle collisions. ▪ Loss or alteration of breeding or feeding habitat due to construction or operations and maintenance activities located near waterbody or bog and fen areas having suitable habitat for the species.		Low (Level I)	Low to High (Level I to III)				Low

Valued Component	Location of Project Effects Assessment Information in EIS	Summary of Residual Project Effects	Direction	Spatial Extent of Residual Effect[1]	Temporal Extent (Duration) of Residual Effect[1]	Magnitude	Frequency	Reversibility	Potential for Significant Adverse Cumulative Effects?
Tourism*	**Chapter 10, Sections 10.2.4.1** and **10.3**	▪ Potential for Increase in tourism business opportunities in the Local assessment area. ▪ Temporary reduced interest in tourist activities due to disturbance of tourism-related activities in the Local or Regional Assessment Areas.		Low (Level I) for temporary disturbance effect; Moderate (Level II) for increased tourism opportunities	Low (Level I) for temporary disturbance effect; High (Level III) for increased tourism opportunities				Low
Hunting, Trapping, Fishing and Gathering	**Chapter 10, Sections 10.2.4.2** and **10.3**	▪ During project construction, temporary impairment of traditional resource use (hunting, trapping, fishing and gathering) and licensed resource use (hunting, fishing) including limited access or detoured access to land trails and waterways used to access those resources use areas. ▪ Increased access to new areas for hunting, trapping, fishing and gathering areas for edible, medicinal and cultural plants.		Low (Level I) for temporary disturbance effect; Moderate (Level II) for increased access effect	Low (Level I) for temporary impairment effect; High (Level III) for access improvement effect				Low

Valued Component	Location of Project Effects Assessment Information in EIS	Summary of Residual Project Effects	Direction	Spatial Extent of Residual Effect[1]	Temporal Extent (Duration) of Residual Effect[1]	Magnitude	Frequency	Reversibility	Potential for Significant Adverse Cumulative Effects?
Travel Routes	**Chapter 10, Sections 10.2.4.3** and **10.3**	▪ Temporary limited access or detoured access to travel routes including land trails and waterway routes that intersect with the Project right-of-way (during project construction and maintenance activities). ▪ The Project represents a substantial additional travel route (P4 all-season road) that is connected to the southern Manitoba road network. ▪ The Project provides access to new potential travel routes that may be established off the P4 all-season road.		Low (Level I)	Moderate (Level II)				Low
Cultural Heritage and Archaeological Resources	**Chapter 10, Sections 10.2.4.4** and **10.3**	▪ Refer to the above VCs regarding hunting, trapping, fishing, gathering and travel routes as aspects of cultural heritage resources. ▪ No residual adverse effects on cultural, heritage, and archaeological resources are anticipated.		N/A (no adverse residual effects anticipated)	N/A (no adverse residual effects anticipated)				N/A
Human Health and Safety	**Chapter 10, Sections 10.2.4.5** and **10.3**	▪ Minor risk to health of road users from accidents or collisions. ▪ The Project provides a substantial improvement and benefit to all-season travel for community members.		Low (Level I)	Low (Level I)				Low
		▪ Minor risk to health of community members and road users from changes to drinking water quality, air quality and noise exposure levels		High (Level III)	Low to High (Level I to III)				Low
		▪ Minor risk to the health of community		Low to	Low to				Low

Valued Component	Location of Project Effects Assessment Information in EIS	Summary of Residual Project Effects	Direction	Spatial Extent of Residual Effect[1]	Temporal Extent (Duration) of Residual Effect[1]	Magnitude	Frequency	Reversibility	Potential for Significant Adverse Cumulative Effects?
		members from changes to the availability or quality of country foods (short-term during construction and long-term operation).		High (Level I to III)	High (Level I to III)				

[1] **See column #2 for location of temporal ('duration') and spatial ('extent') assessment information for each VC and see Chapter 6, Table 6.3 for those assessment criteria definitions. Chapter 15, Appendix 15-1 provides a summary of residual effects for each VC.**

Note: *Potential effects to tourism are considered positive. Therefore, the 'tourism' VC is not carried forward in the cumulative effects analysis.

Annex 20

All Season Road Connecting Berens River to Poplar River First Nation

Draft: Wildlife Monitoring Plan for Boreal Caribou, Moose, Furbearers and Other Species

2016

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1.0 INTRODUCTION

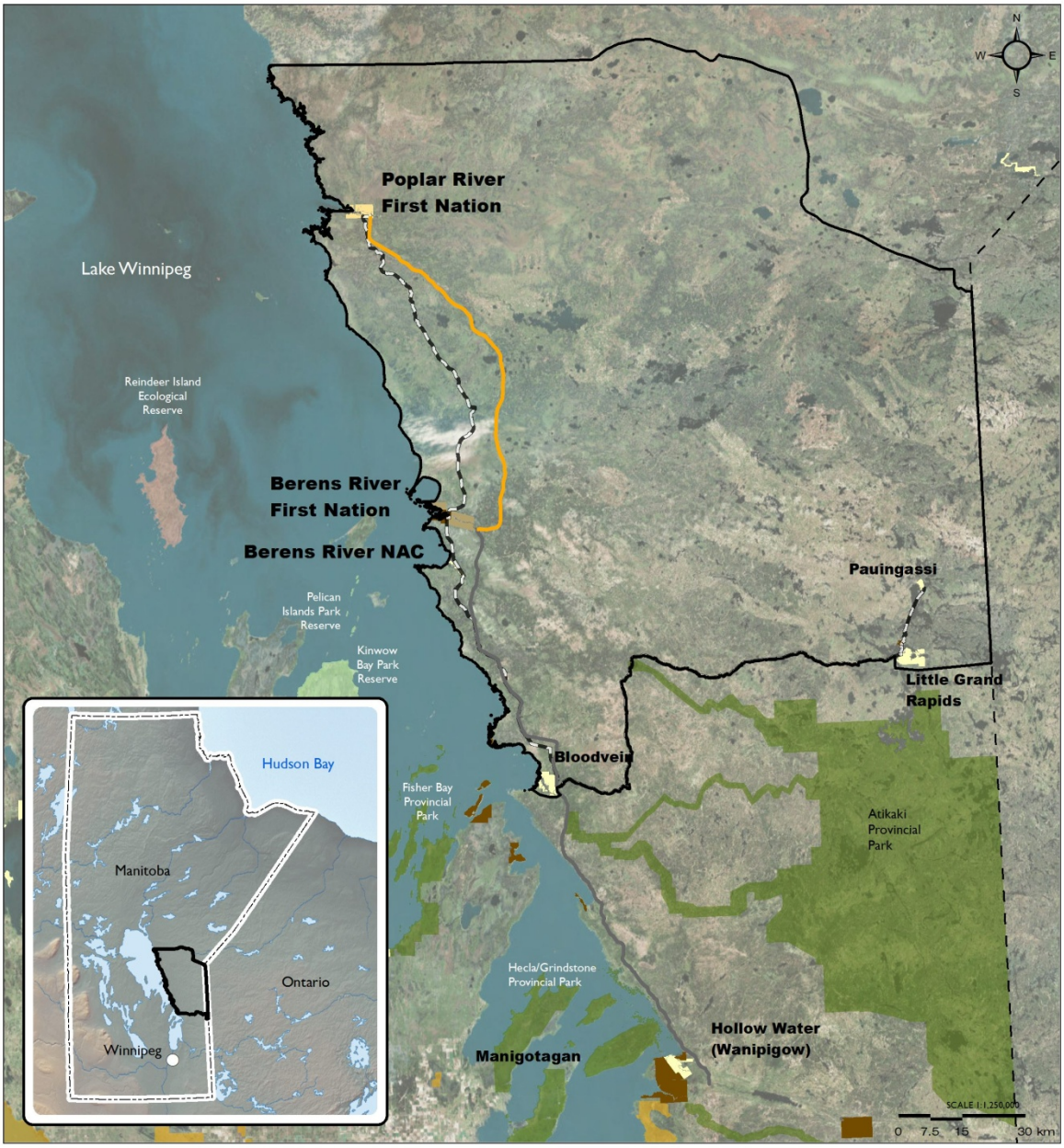
The Manitoba East Side Road Authority (ESRA) has submitted an Environmental Impact Statement (EIS) for the project known as Project 4 – All Season Road Connecting Berens River and Poplar River First Nation. Environmental monitoring of the various effects associated with construction and operation is required, as outlined in the EIS. Specifically, monitoring under this plan is in addition to construction inspection monitoring proposed in the EIS. Construction inspection monitoring focuses on adherence to permits, licences, contract specifications, contract requirements and other authorizations related to ASR construction.

Commitments made in this monitoring plan will assess for predicted effects identified in the EIS and for the effectiveness of proposed mitigation to boreal caribou, moose and furbearers as identified in the EIS. The development of the monitoring plan considered the assessment of the various potential effects as outlined in the EIS including their direction, duration, magnitude, extent, frequency and reversibility. Opportunities and approaches that facilitate adaptive management during construction were also considered.

This monitoring plan was developed with reference to the background information, projected environmental effects on presented key terrestrial species, and proposed mitigation and monitoring in the Project 4 EIS. The Plan sets forth a recommended strategy for Manitoba Infrastructure (MI) to accomplish the main goal of monitoring potential effects on key species; mainly boreal caribou, moose and furbearers in order to apply adaptive management measures as required during construction and operation of the ASR. This plan represents a proactive approach to monitoring that is intended to reduce costs in future years, while providing high quality and meaningful information moving forward with both Project 4 and other future ASRs on the east side of Lake Winnipeg.

1.1 Background and Context

Monitoring activities described in this plan are focused on addressing the specific effects described in the Project 4 EIS as they relate to activities of the ASR. The proposed construction is being “phased” in and sections of the road will be operational and available for monitoring in advance of the overall completion of the Project. This proposed monitoring plan is a three year plan. Any future monitoring program of the project will be considered, and if needed, developed based on an assessment of results of the initial three year program.



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

Figure 6-2

Regional Assessment Area

Northern boundary of the Regional Assessment Area follows the northern boundary of the First Nations Protected Area Accord as indicated in the Asatiwisipe Aki Lands Management Plan (Poplar River First Nation 2011). The southern boundary follows the Bloodvein First Nation (FN) boundary to the south, then follows the winter road to Little Grand Rapids FN boundary, then follows that FN boundary to the south, then straight east to the Ontario border from the SE corner of the Little Grand Rapids FN boundary.

- 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
- Provincial Park
- Ecological Reserve
- Manitoba / Ontario Border

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: 10/28/2015

MANITOBA East Side Road AUTHORITY

Figure 1: Project Study Area and Proposed Project 4 All Season Road Alignment

2.0 MONITORING GOALS AND OBJECTIVES

The overall objective of this monitoring plan is to fulfill the requirements set forth in the Environment Act License relative to monitoring the various effects identified on key valued species so as to apply adaptive management. A secondary objective is to conduct strategic monitoring and research that link to future EISs that will be required as part of broader study area planning. For example, monitoring specific to moose and caribou will have utility in future assessments for ASR EISs and construction projects, as well as meeting the need to apply adaptive management to this project.

2.1 Monitoring Components

The project is being phased over an 8 year time frame. This will result in the road being operational in certain sections while construction is ongoing at other stretches. The 3 year monitoring program will capture each stage of the project at various locations. The following summarizes the activities which will occur:

1. *Pre-development Activities*
    a. *Determination of baseline conditions for environmental assessment*
2. *Construction Activities*
    a. *Road construction*
    b. *Bridges, river and creek crossings*
3. *Post-construction Activities*
    a. *Road maintenance*
    b. *Traffic*

2.2 Monitoring Objectives

The main objective of the monitoring program is to monitor the effects of the above described activities to provide for adaptive management. The monitoring program will also provide:

- Opportunities to compare wildlife data collected in areas near the ASR versus the natural condition (control areas away from the project). To optimize data collection, control sites will be selected to providebaseline data for future ASR alignments for the planning and assessment of future ASR routes and linkages[1] ;
- Information on the observed effects that ASR development may have on wildlife and illustrate successful mitigation measures that can subsequently be utilized for the planning and licensing of future ASRs;
- Retrospective analysis of existing wildlife data to support the data analysis from the new monitoring information; and,
- Opportunities for community outreach and capacity building.

[1] ***Future ASR projects requiring Environmental Licensing***

Collected monitoring data will be shared with Manitoba Sustainable Development so as to contribute to the existing wildlife databases for ongoing management and conservation of targeted species on the east side of Lake Winnipeg.

2.3 Multi-Jurisdiction Approach

This plan provides a framework for environmental monitoring that is based on the anticipated effects as identified in the environment licensing and assessment process. The types of monitoring and strategic research that are required to address and mitigate the potential effects are identified to allow the application of adaptive management. Various agencies, communities and stakeholders will be involved with various aspects of the monitoring program. These include:

- MI
- Manitoba Sustainable Development
- Eastern Manitoba Woodland Caribou Advisory Committee
- Communities on the east side of Lake Winnipeg
- Others as identified (i.e. trappers, MMF and other stakeholders etc.)

MI:

MI will be the responsible authority in the implementation of the overall wildlife monitoring program. This includes survey design, data collection, data and effects analysis and reporting for the Environment Act License for the project. Data collected will be shared with the various agencies under specific data sharing arrangements. MI will also be communicating with the communities in the study area through a variety of means.

Manitoba Sustainable Development (Wildlife Branch):

- Take a lead role in collar ordering and planning and undertaking wildlife capture work to support the monitoring program.
- Provide technical advice on various components of the monitoring program.
- Identify opportunities for cooperative data collection and sharing that will provide mutual benefit while maintaining the program's environmental monitoring objectives.
- Based on the results of the monitoring program, examine and identify management opportunities outside the scope of MI (i.e. hunting regulations, cooperative management with First Nations, road refuges etc.) that may further mitigate project effects (current and future).
- Receive data collected through MI's monitoring program for incorporation into other provincial wildlife data collection programs.

Manitoba Sustainable Development (Environmental Approvals Branch):

- Manage the Environment Act provisions related to the monitoring program and receive and review project related monitoring reports.

Eastern Manitoba Woodland Caribou Advisory Committee:

- Provide technical advice on various components of the monitoring program.
- Share relevant data of mutual benefit.

3.0 SUMMARY OF EFFECTS

The monitoring and research activities described in this plan relate specifically to the need to mitigate and apply adaptive management to the identified and characterized residual effects described in the Project 4 – All Season Road Connecting Berens River and Poplar River First Nation EIS. The following is a summary of those effects, followed by a short description of the types of monitoring activities that are being proposed. A detailed outline of recommended studies and methods will be developed with input from Manitoba Sustainable Development and provided to regulatory agencies as required.

3.1 Residual Environmental Effects on Woodland Caribou

Boreal caribou are occur within the study area and are listed as Threatened under both the *Manitoba Endangered Species and Ecosystems Act* and the federal *Species At Risk Act* (SARA). Project construction and operation has the potential to negatively affect caribou, primarily within areas of close proximity to the all season road (ASR) and associated facilities (quarries, borrow pits, construction access roads). The key mitigation measure to minimize effects to caribou has been to select an ASR alignment which avoids caribou concentrations as best possible.

The following sections summarize the identified effects and mitigation options described in the EIS. The various project components and strategic linkages are outlined, and a summary of the proposed monitoring is identified. The monitoring techniques described are general in nature, with references to adaptive management and ongoing mitigation as part of the monitoring process.

3.1.1 Loss, Alteration or Fragmentation of Habitat and Temporary Sensory Disturbance from Construction and Operation

Construction will result in clearing of habitat and increased noise and vibration, primarily within close proximity to the ASR ROW and associated temporary work areas. This may affect the use of these areas, and those adjacent to the Project, by caribou Construction will occur in stages along designated sections of the ASR and not along the entire length at any one time. The significance of potential adverse effects of construction and operation activities on caribou was deemed not significant. Mitigation measures to limit disturbance to caribou include, but are not limited to, the selection of the route alignment to avoid caribou concentrations and calving habitat where possible, and suspension of disruptive construction activities during parturition times near known caribou calving areas.

Potential Effect	Project Component/Strategic Link	Monitoring Techniques
Localized and temporary sensory disturbance Loss, alteration or fragmentation of habitat	• Construction • Operation	• Habitat assessment • Tracking/Telemetry of local and regional movement patterns • Assessment of calving success relative to the ASR

3.2 Environmental Effects on Moose

Construction activities, operational activities, and indirect effects associated with improved hunting access have the potential to affect moose in proximity to the ASR. The following section summarizes the identified residual effects and mitigation options described in the EIS.

3.2.1 Loss, Alteration or Fragmentation of Habitat

While the ASR clearing will remove habitat that is suitable for moose, this habitat is widely available in the study area. Habitat for moose is not limiting within the Local Assessment. The loss of habitat has been limited by minimizing disturbance to riparian vegetation and will be offset through decommissioning of the existing winter road. As a result, moose will experience habitat gain through decommissioning and regeneration of temporary access routes and winter roads during the operational phase. The net loss of moose habitat as a result of the project relative to available habitat is deemed not significant.

Potential Effect	Project Component/Strategic Link	Monitoring Techniques
Loss of habitat	• Construction • Operation	• Habitat assessment • Aerial and/or roadside surveys

3.2.2 Temporary Sensory Disturbance

Disturbance resulting from construction and operational activities, including traffic, may alter use of areas by moose. However, restricting construction activities to the project footprint, and seasonal timing of activities to limit disturbance during parturition times for moose are anticipated to limit disturbance caused by the Project. With mitigation and monitoring measures, the residual effects of blasting on moose were deemed not significant.

Potential Effect	Project Component/Strategic Link	Monitoring Techniques
Disturbance and displacement	• Construction • Operation	• Aerial and/or roadside surveys

3.3 Environmental Effects on Furbearers

Disturbance during construction may alter habitat use by furbearer species. However, once the disturbance has ceased, most species are expected to return to the area. Regional species distributions are not anticipated to change.

Mitigation measures include, but are not limited to, clearing the ROW only during the winter months and limiting construction activities to the project footprint to avoid disruption of dens. With the application of mitigation measures, the net loss of wildlife habitat as a result of the project, relative to available habitat, is deemed not significant. Similarly, with mitigation, the residual effects of temporary sensory disturbance were determined to be not significant.

3.3.1 Loss, Alteration or Fragmentation of Habitat and Temporary Sensory Disturbance

Though ASR clearing will remove habitat, habitat is not limiting and widely available in the study area. Relative to available habitat, the net loss of furbearer habitat as a result of the project for instance, is deemed low and not significant. Further, the loss of habitat will be partially compensated for by re-growth and decommissioning of the existing winter road.

Potential Effect	Project Component/Strategic Link	Monitoring Techniques
Loss, alteration or fragmentation of habitat and temporary sensory disturbance	• Construction • Operation	• Aerial and/or roadside surveys • Trail camera studies • Trapper participation program to monitor fur harvest over time

3.4 Summary of Monitoring

Potential Effect	Project Component/ Strategic Link	Monitoring Techniques
Caribou – Construction and Operation Disturbance Displacement and disturbance and affecting calving habitat	• Construction • Operation	• Habitat assessment • Tracking/Telemetry of local and regional movement patterns • Assessment of calving success relative to the ASR
Moose – Loss, Alteration or Fragmentation of Habitat Loss of habitat	• Construction • Operation	• Habitat assessment • Aerial and/or roadside surveys
Moose – Temporary Sensory Disturbance Disturbance and displacement	• Construction • Operation	• Aerial and/or roadside surveys
Furbearers - Loss, alteration or fragmentation of habitat and temporary sensory disturbance Loss of habitat Disturbance and displacement	• Construction • Operation	• Aerial and/or roadside surveys • Trail camera studies • Trapper participation program to monitor fur harvest over time

4.0 KEY/MAIN ELEMENTS REQUIRING STUDY

Elements that will be studied will link to specific effects as described above. The following are the main elements that will be studied.

- Review Base Line Conditions using current information and data available from Manitoba Sustainable Development.
- Boreal caribou movement and use of areas near the ASR, including summer and winter use.
- Boreal caribou recruitment near and away from ASR.
- Caribou calf survival – as it relates to potential effects of the Project.
- Mortality of moose, caribou and other species resulting Project related effects.
- Avoidance of habitat due to construction (caribou, moose, and furbearers).
- Use of habitats near ASR (caribou, moose and furbearers).
- Loss of habitat.
- Monitor the presence of invasive species through incidental observations or detection of sign.

6.0 ASSESSMENT OF MONITORING ACTIVITIES

Monitoring activities will be phased-in as the project progresses. Assessment and analysis of monitoring information will be conducted and reported on as required. Monitoring methods can be modified as studies progress if required.

7.0 EVALUATION AND CRITICAL REVIEW

MI and the various project consultants will participate in various inter-agency reviews relative to the development, implementation and reporting on all the various components described in this monitoring plan. Such results will be reported on an annual basis. It is also expected that others including the Eastern Region Caribou Advisory Committees, communities First Nations, environmental organizations, and the public will be provided information summaries from these studies.

1.0 AQUATIC MONITORING OVERVIEW

Monitoring will be conducted during the construction phase to ensure that environmental protection and mitigation measures are performing as intended. Post construction monitoring also will be conducted at both the new crossing sites and offsetting sites as required by DFO to determine if mitigation measures remain effective and that compensation sites are performing as expected.

1.1 CONSTRUCTION MONITORING

1.1.1 Turbidity Monitoring

The primary potential impact of in-stream construction activities is sediment re-suspension and erosion in relation to disturbance to the streambed and stream bank, and alterations to channel hydraulics. Site inspections will be conducted to monitor for potential effects. The primary indicator for these impacts is total suspended solids (TSS), with turbidity serving as a surrogate for rapid on-site monitoring.

A turbidity monitoring program will be undertaken at each site where in-stream construction is occurring. The objective of turbidity monitoring program will be to document the increases in turbidity/TSS during in-stream construction activities. The program will be designed in relation to the proposed in-stream work and will be adaptive. It is anticipated that the specific details of the program will be developed upon review of initial monitoring data and stream conditions (e.g., discharge).

Digital photographs will be collected prior to, during, and following in-stream construction activities to document site conditions. The frequency of monitoring will be adapted to reflect the duration and nature of in-stream activities, and will target collection of data during both periods of peak TSS levels as well as more typical conditions. Where water quality *in situ* instrumentation is being implemented, a relationship between TSS and turbidity will be developed to facilitate the use of *in situ* measurements of turbidity to estimate TSS concentrations. Depending on site conditions, turbidity loggers may be deployed in the streams during construction to assist in data collection (e.g., at locations that are not readily accessible). Should turbidity data indicate that Manitoba Water Quality Standards, Objectives, and Guidelines (MWQSOGs) for the protection of aquatic life are being exceeded, corrective actions will be undertaken.

1.1.2 Site/Sediment and Erosion Monitoring

Site inspections will be conducted on an on-going basis during construction to ensure site specific sediment and erosion control measures and generic mitigation measures are being

implemented and are effective. If necessary, work will be stopped such that corrective actions can be undertaken immediately. Site/Sediment and Erosion Control measures including monitoring are further described Environmental Protection Procedure 16: Erosion and Sediment Control and Part B General Requirements: GR130.15 Working Within or Near Fish Bearing Waters.

1.1.3 Cofferdam Dewatering Monitoring

Dewatering of coffer dams can result in water with excessively high TSS monitored via changes in turbidity (e.g., at culvert placements) or pH values (at pier placements due to contact with concrete). Water pumped from coffer dams that will re-enter a natural waterbody will be monitoring to determine if it meets MWQSOGs. Should monitoring results indicate that guidelines are exceeded, appropriate mitigation measures will be implemented to treat the water before it re-enters the watercourse.

1.2 POST CONSTRUCTION MONITORING

1.2.1 Site / Sediment and Erosion Monitoring

Site inspections will be conducted one month after construction activities and annually thereafter for a period of up to two years as required to ensure site specific sediment and erosion control measures and generic mitigation measures remain effective. If necessary, corrective action will be initiated immediately after site inspections. If warranted, the frequency of site inspections would be increased. Site/Sediment and Erosion Control measures including monitoring are further described in Environmental Protection Procedure 16: Erosion and Sediment Control and Part B General Requirements: GR130.15 Working Within or Near Fish Bearing Waters.

1.2.3 Fish Passage

The Okeyakkoteinewin Creek was identified as having fish access from Lake Winnipeg and therefore the culvert crossing structure at this location is being designed to provide for fish passage. Where bridges are provided it is assumed that the project will have no effect on the ability of fish to swim upstream. Fish passage monitoring will be conducted at the fish-bearing culvert crossing to ensure design specifications were adequate.

Fish passage monitoring at the fish-bearing culvert crossing will be conducted during the spring following construction and under two additional flow scenarios post project (i.e., low, moderate and high flow years will be sampled). Should it be determined that crossings are blocking fish movements, mitigation options to re-establish fish movement upstream will be explored.

1.2.4 Offsetting Monitoring

Habitat offsetting sites, if required, will be monitored according to Fisheries Act Authorizations to ensure that the physical integrity of the site has been maintained and that the offsetting project is performing as intended. The nature of monitoring will depend on the type of offsetting provided but may include biological sampling and/or physical measurements. Biological sampling may include gillnetting, larval drift netting, seining, electrofishing, ponar grabs, egg mats, etc. Physical measurements may include water velocities, depths, substrates and channel conditions.

If a habitat offsetting project is not performing as intended, potential modifications to the structure will be reviewed and, if warranted, implemented. Monitoring of offsetting sites will also include pre construction monitoring. Habitat offsetting project monitoring programs will be described in detail in Habitat Offsetting Plans. These plans will be developed with input from Department of Fisheries and Oceans, will be based on Fisheries Act Authorizations received for the Project 4 crossings and submitted to DFO for approval where required. Monitoring reports will also be submitted to Department of Fisheries and Oceans and Manitoba Conservation and Water Stewardship for their review and records.

Annex 21

ENVIRONMENTAL PROTECTION PROCEDURES 19

BORROW PIT DECOMMISSIONING

December 2015

Procedure name: Reference number
Borrow Pit Decommissioning EP19

1.0 Description

.1 The excavation of a borrow pit shall be undertaken in areas outlined by the Contractor, Contract Administrator or by the East Side Road Authority (ESRA), and consist of the excavating of material, other than Solid Rock.

.2 The decommissioning of borrow pits shall include the removal or disposal of all site debris, appropriate sloping of borrow pit sides, removal of site access, and promoting of natural re-establishment of vegetation. The Contractor is responsible for ensuring compliance with all contract specifications, environmental legislation, permits and authorizations.

2.0 Purpose

.1 The purpose of this procedure is to ensure that borrow pit decommissioning operations are conducted in accordance with applicable environmental legislation, regulations, guidelines, permits and contracts.

3.0 Legislation and Supporting Documents

- ESRA Contracts and Associated Documents
- Applicable Manitoba Conservation Work Permits
- The Manitoba Conservation Brush Disposal Guidebook – March 2005
- The Manitoba Stream Crossing Guidelines for the Protection of Fish Habitat – May 1996
- Environmental Protection Guidelines - Appendix 7.1 of PR 304 to Berens River All-Season Road Environmental Impact Assessment – August 2009
- Fisheries Act (R.S., 1985, c. F-14)
- The Manitoba Conservation Forest Management Guidelines for Terrestrial Buffers – 2010-2015
- Manitoba Infrastructure and Transportation Standard Construction Specifications for Grading – January 2008

4.0 Procedures

4.1 Clearing and Grubbing

.1 Where clearing and grubbing is required, it shall be completed prior to excavation of the borrow pit.

.2 Clearing and grubbing shall be limited to the site and associated access routes.

.3 Clearing and grubbing shall only be undertaken between September, 1 of any year and April, 1 of the following year.

.4 All clearing and grubbing operations shall occur in accordance with the Clearing and Grubbing Environmental Protection Procedure (EP1).

4.2 Brush Disposal

.1 Disposal of cleared trees and brush must be done as directed or approved by the Contract Administrator. Disposal may involve burning, compacting, burying, windrowing and compacting, limbing and chipping.

.2 All cleared vegetation and debris that is to be burned shall be piled and compacted in windrows. Windrows shall be compacted to lie as close to the ground as possible (maximum height of 0.6 of a meter) and shall be no closer than 1 meter to the bush line. Burn piles shall be located a minimum of 15 meters from other wood and brush piles and standing timber.

.3 Merchantable wood that is identified by the Contract Administrator shall be stockpiled outside and immediately adjacent to the clearing limits. Stockpile sites shall be located within existing clearings or areas of non-merchantable timber. Stockpile sites shall not be located within 100 meters of a waterbody. Unless otherwise specified, all stockpiled material shall be removed from Crown land by April 30 following the date of issuance.

.4 The burning of debris piles is not permitted in the spring or early summer to avoid disturbing small wildlife species which may have young in the piles or may have prepared nesting sites. The best and preferred option for wildlife is burning in the fall or winter.

.5 No burning of debris piles shall occur on deep organic soils. Piles shall be a minimum of 15 meters away from standing timber and the high water mark of any waterbody.

.6 Slash shall be piled in a manner that allows for clean, efficient burning of all material. Avoid mixing soil into the slash.

.7 The Contractor shall obtain a burning permit for open fires between April 1 and November 15. Burning between November 16 and March 31 does not require a burning permit; however, the supervising officer shall be advised prior to any burning. All fires shall be completely extinguished by March 31

.8 Ensure safety precautions are taken to keep the fire under control. Burn piles shall be monitored, to ensure that subsequent fire hazards

are not present. Upon completion of the burn, burn piles shall be completely extinguished.

.9 All occurrences of fire spreading beyond the debris piles shall be reported to the Contract Administrator and the Natural Resources District Supervisor.

.10 All brush disposal operations shall occur in accordance with the Clearing and Grubbing Environmental Protection Procedure (EP1).

4.3 Borrow Pit Sloping

.1 The borrow pit excavation shall be conducted as uniformly as possible to the depths and within the limits outlined by contract specifications, environmental legislation, permits and authorizations.

.2 Upon excavation completion, stockpiled stripping shall be placed uniformly over the slopes and bottom of the borrow pit.

.3 Side slopes shall maintain a slope of 4:1, unless otherwise permitted or directed.

.4 Upon completion of the borrow pit excavation, the Contactor shall cap, level and trim the borrow pit prior to decommissioning the area. If burying woody debris, the area shall be capped with ½ metre of clay. Stockpiled topsoil shall be spread to promote natural re-establishment of vegetation.

4.4 Access Road Removal

.1 The temporary access road to the borrow pit, and any equipment brought onto site, shall be removed or blocked as soon as possible following completion of the work or when it is no longer required.

.2 Following the removal of the temporary access road, the site shall be restored as per section 4.3.4.

4.5 Re-Vegetation

.1 Borrow pits will be left in a manner which promotes natural re-vegetation of the site.

.1 In cases where seeding is required, and when conditions permit, it shall commence immediately upon completion of capping and trimming operations. When conditions do not permit immediate seeding, ESRA will endeavor to ensure seeding is completed within the next growing season.

.2 Seeding operations shall not be carried out under adverse conditions of high winds, or ground covered with snow, ice, or standing water.

Annex 22

ENVIRONMENTAL PROTECTION PROCEDURES 23

TEMPORARY SITE DECOMMISSIONING

July 2016

Procedure name: Temporary Site Decommissioning

Reference number EP23

1.0 Description

.1 Upon the completion of work, all temporary sites shall be decommissioned. The decommissioning shall include the removal or disposal of all site debris, appropriate sloping and regrading of the area, removal of site access, and the promotion of natural re-establishment of vegetation.

.3 The Contractor is responsible for ensuring compliance with all contract specifications, environmental legislation, permits and authorizations.

2.0 Purpose

.1 The purpose of this procedure is to ensure that temporary site decommissioning operations are conducted in accordance with applicable environmental legislation, regulations, guidelines, permits and contracts.

3.0 Legislation and Supporting Documents

- ESRA Contracts and Associated Documents
- Applicable Manitoba Conservation Work Permits
- The Manitoba Stream Crossing Guidelines for the Protection of Fish Habitat – May 1996
- Fisheries Act (R.S., 1985, c. F-14)
- The Manitoba Conservation Forest Management Guidelines for Terrestrial Buffers – 2010-2015
- The Manitoba Conservation Brush Disposal Guidebook – March 2005
- Manitoba Infrastructure and Transportation Standard Construction Specifications for Grading – January 2008

4.0 Procedures

4.1 Site Decommissioning

.1 All temporary structures and equipment must be removed from the temporary site.

.2 All granular material shall be stripped and removed from the temporary site.

.3 The area will be leveled to natural or pre-existing grade and slope prior to decommissioning the area. Stockpiled topsoil and other organic matter that had been removed from the site shall be spread to promote natural re-establishment of vegetation.

4.2 Access Road Removal

.1 Access roads and any equipment brought onto site shall be removed or blocked as soon as possible following completion of the work, or when no longer required.

.2 Access roads will be obstructed and blocked using, rocks, gates, timbers or other barriers to impede access.

4.3 Re-Vegetation

.1 Temporary site locations will be left in a manner which promotes natural re-vegetation of the site.

.1 In cases where seeding is required, and when conditions permit, it shall commence immediately upon completion of grading, capping and trimming operations. When conditions do not permit immediate seeding, ESRA will endeavor to ensure seeding is completed within the next growing season.

.2 Seeding operations shall not be carried out under adverse conditions of high winds, or ground covered with snow, ice, or standing water.

Annex 23

ENVIRONMENTAL PROTECTION PROCEDURES 22

WINTER ROAD CLOSURE AND RECLAMATION PLAN

August 2016

1.0 Description

.1 With construction of all-season roads, existing winter roads will be closed, in segments or in whole, and left to regenerate naturally.

.2 Decommissioning of the winter road shall include the removal of site access, removal of culverts, installation of erosion and sediment control (if required) and the promotion of natural re-establishment of vegetation. The Contractor is responsible for ensuring compliance with all contract specifications, environmental legislation, permits and authorizations.

2.0 Purpose

.1 The purpose of this procedure is to ensure that the decommissioning and reclamation of the winter road is conducted in accordance with applicable environmental legislation, regulations, guidelines, permits and contracts.

3.0 Legislation and Supporting Documents

- ESRA Contracts and Associated Documents, specifically GR130.15 EP6 – Working In or Within Water, and EP11 – Culvert Maintenance and Replacement
- Applicable Manitoba Conservation Work Permits
- The Manitoba Stream Crossing Guidelines for the Protection of Fish Habitat – May 1996
- Fisheries Act (R.S., 1985, c. F-14)
- The Manitoba Conservation Forest Management Guidelines for Terrestrial Buffers – 2010-2015
- The Manitoba Conservation Brush Disposal Guidebook – March 2005
- Joro Consultants. (2015). Various Wildlife Photographs Provided by Joro Consultants from Research and Field Studies. Prepared for Manitoba Floodway and East Side Road Authority.

4.0 Procedures

4.1 Access Removal

.1 As winter roads are decommissioned, access will be obstructed and blocked using, rocks, gates, timbers or other barriers to impede access.

.2 Temporary access roads intersecting winter roads shall be decommissioned or blocked as soon as possible following completion of the work or when no longer required.

.3 Effective erosion and sediment control measures shall be installed where required.

4.2 Culvert Removal

.1 Material and debris removal shall be timed to prevent disruption to sensitive fish life stages by adhering to DFO's Regional Timing Windows to prevent disruption of fish and wildlife habitat. The contractor shall not undertake construction activities in fish bearing waters or potentially fish bearing waters between April 1 and June 30 of any year, or during periods of high stream flow.

.2 Machinery shall arrive at site in a clean condition and shall be operated on land (from outside of the water) and in a manner that minimizes disturbance to the bed and banks of the watercourse.

.3 Operate machinery, if required, from the top of bank.

.4 Isolate your work area, if required, from all flowing water in a manner that does not cut off flow to downstream portions of the stream at the time during removal.

.5 If dewatering of the site is required, a Fisheries Biologist holding all necessary permits required by fisheries agencies to collect and transport fish, should be on hand to make the final decision regarding the need for a water quality monitoring and fish salvage program. If fish salvage is necessary, recovered fish must be relocated to a safe area outside of the influence of the worksite and transport containers must not be overloaded with fish.

.6 Remove any old structures to a suitable upland disposal site, away from the riparian area and floodplain to avoid waste material from re-entering the watercourse.

.7 The bed and banks of the watercourse shall be restored to preexisting conditions following a disturbance.

.8 A site visit shall be conducted prior to the commencement of in-water construction activities to determine the site-specific environmental protection measures that may be required (i.e., worksite isolation methods, site restoration considerations, erosion and sediment control materials required, etc.).

.9 Cofferdams and other structures (diversions) shall be installed to separate the dewatered worksite from flowing water. Materials that are used to build these dams shall not be taken from below the high water mark (1 in 2 year high water level). Cofferdams shall be designed to accommodate any expected high flows during the construction period.

.10 Downstream flows shall be maintained at all times. If isolated sites are required, flows shall be detoured around the sites, and original

flows through the site shall be restored as soon as work is completed.

.11 A fish salvage operation shall be conducted prior to dewatering of isolated sites.

.12 Utilize culvert removal techniques that result in the least amount of impacts to the watercourse and riparian area.

.13 The contractor shall avoid using frozen backfill.

.14 Avoid culvert removal during wet and rainy periods

.15 Slopes shall be contoured to an appropriate steepness to minimize erosion; erosion controls shall be installed as soon as possible, and maintained until complete re-vegetation of the disturbed area(s) is achieved.

.16 Soils shall be graded in the direction away from the watercourse and never into the stream itself.

.17 All brush disposal operations shall occur in accordance with the Clearing and Grubbing Environmental Protection Procedure (EP1).

4.3 Re-Vegetation

.1 Winter roads will be left in a manner which promotes natural re-vegetation of the site.

.2 Vegetation recovery for vascular plants is expected within 5 years, followed by longer periods of success for tree species.

Annex 24

Table - Distances from Project Construction Components to Receptor Sites

	Project Component	Receptor	Distance
ASR	ASR	nearest dwelling on Poplar River FN Reserve	530m
	ASR	nearest dwelling on Berens River FN Reserve	1.4 km
	ASR	Poplar River FN Reserve boundary	*
	ASR	Berens River FN Reserve boundary	500m
	ASR	Poplar River	600m
Potential Quarry Location	Potential Quarry Location	nearest dwelling on Poplar River FN Reserve	2.3 km
	Potential Quarry Location	nearest dwelling on Berens River FN Reserve	6.6 km
	Potential Quarry Location	Poplar River FN Reserve boundary	1.5 km
	Potential Quarry Location	Berens River FN Reserve boundary	5.0 km
	Potential Quarry Location	nearest cabin	6.0 km
	Potential Quarry Location (Q4, Q11, Q12, Q14, Q15, Q16, Q22, Q31)	nearest waterbody/watercourse	300m
	Potential Quarry Location	nearest heritage site	150m
Crossing	Crossing Site (P4-x22)	cabin	2.7 km
	Crossing Site (P4-x30)	Many Bays Lake	3.3 km

*ASR terminates at Poplar River FN southern boundary as per Section 1.2 *Project Overview* of the EIS

Annex 25

Table 12.1: Potential Accidents and Malfunctions, Mitigation Measures, and Evaluation of Environmental Risk

Potential Accident or Malfunction	Preventative / Contingency Mitigation Measures	Probability of Occurrence[a]	Potential Environmental Effects	Emergency Response Procedure[b]	Evaluation of Potential Environmental Risk[c]
Accidental release of hazardous substances	▪ Adherence to provincial regulations and guidelines regarding hazardous substance storage, use and handling. ▪ Adherence to ESRA's Environmental Protection Specifications (GR130s). ▪ Adherence to ESRA's Workplace Safety and Health Specifications (GR140s).	Low[d]	▪ Adverse effects on fish and fish habitat due to introduction of deleterious substances into waterbodies (e.g., leaked fuel and oil). ▪ Adverse effects on wildlife (including migratory birds) and wildlife habitat due to introduction of deleterious substances into aquatic and terrestrial habitats (e.g., leaked fuel and oil).	▪ Application of Environmental Protection Specification GR130.1*0 Spills and Remediation and Emergency Response* (Appendix 5-4 of the EIS). ▪ Application of contractor's Environmental Emergency Plan for Spill Response and Remediation as found in: o EPP2 *Petroleum Storage (*Appendix 5-3 *Environmental Protection Procedures* of EIS*)* and o GR130.3. 2.1 *Submittals GR130.10.5 Spills and Remediation and Emergency Response,* (Appendix 5-4 *GR130s Environmental Protection Specifications* of EIS).	Low
Fire or explosion	▪ Adherence to federal regulations for the storage of explosives. ▪ Adherence to provincial Code of Practice and legislative regulations / requirements for the use of explosives. ▪ Adherence to ESRA's Workplace Safety and Health Specifications (GR140s). ▪ Blasting contractor(s) will be certified. ▪ Presence and maintenance of on-site fire suppression equipment.	Low	▪ Potential mortality of wildlife and /or disturbance of wildlife (including migratory birds). ▪ Destruction of wildlife habitat.	▪ Application of Environmental Protection Specification GR130.20 *Wildfires* (Appendix 5-4 of the EIS). ▪ Application of contractor's Evacuation and Emergency Preparedness Plan in the Event of a Wildfire as found in o EPP4 *Wildfires* (Appendix 5-3 *Environmental Protection Procedures* of EIS*)*. ▪ Application of Environmental Protection Specification GR130.13 *Planned and Unplanned Shutdowns*, as required (Appendix 5-4 of EIS). ▪ Application of contractor's Materials Management Plan in the event of an Unplanned Shutdown, as required as found in: o GR130. 3.2.6 *Submittals,* and GR130.13 *Planned and Unplanned Shutdowns* (Appendix 5-4 *GR130s Environmental Protection Specification* of EIS)	Low
Vehicle collisions	▪ Provide warning signage, speed control, flag	Low	▪ Wildlife mortality due to collisions.	▪ Application of Environmental	Low

	persons near work areas along all-season road, as required. ▪ Adherence to provincial highway safety regulations and codes. ▪ Adherence to ESRA's Workplace Safety and Health Specifications (GR140s). ▪ Posting of appropriate speed limit, crossing and wildlife warning signage. ▪ Incorporation of standard safe road design configurations and construction methods in the detailed all-season road design.		▪ Adverse effects on fish and fish habitat due to introduction of deleterious substances into waterbodies (e.g. leaked fuel and oil). ▪ Adverse effects on wildlife (including migratory birds) and wildlife habitat due to introduction of deleterious substances into aquatic and terrestrial habitats (e.g. leaked fuel and oil).	Protection Specification GR130.10 *Spills and Remediation and Emergency Response and* GR130. 3.2.1 *Submittals* (Appendix 5-4 of the EIS). ▪ Application of contractor's Environmental Emergency Plan for Spill Response and Remediation as found in: o EPP2 *Petroleum Storage*, Appendix 5-3 *Environmental Protection Procedures* of EIS*).*	
Accidental Encroachments	▪ Identification of sensitive sites through baseline environmental studies (vegetation, wildlife, aquatics, heritage resources, traditional knowledge) and avoidance through design ▪ Careful layout and clear demarcation of limits of temporary and permanent working areas will be made ▪ Establish clearly identify buffers to support protection of sensitive areas ▪ Reclamation of encroachment areas	Low	▪ Adverse effects on sensitive fish and fish habitat due to encroachment of equipment and or construction staff. ▪ Adverse effects on sensitive wildlife (including migratory birds) and wildlife habitat due to encroachment of equipment and or construction staff. ▪ Adverse effects on cultural heritage sites due to encroachment of equipment and or construction staff	▪ Creation and application of buffers as found in: o EPP1 *Clearing and Grubbing*, EPP6 *Working Within or Near Fish Bearing Waterways*, EPP7 *Stream Crossings*, EPP20 *Quarry Site Selection and Requirements*, EPP21 *Site Selection - Temporary Works* (Appendix 5-3 *Environmental Protection Procedures* of EIS*).* ▪ Application of Environmental Protection Specifications GR130.15.1 *Working Within or Near Water*, and GR130.17.1 *Clearing and Grubbing* (Appendix 5-4 of the EIS). ▪ Application of mitigation measures recommended by historic resource consultant as found in: o EP13 *Heritage Resources* (Appendix 5-3 *Environmental Protection Procedures* of EIS*).*	Low

Note: a Probability of accident or malfunction after application of preventative / contingency mitigation measures;

b Refer to **Chapter 5** (Environmental Protection and Sustainable Development), **Appendix 5-4** for ESRA's Environmental Protection Specifications and required emergency response plans

c Risk level considering both preventative measures and application of emergency response measures. Low: negligible negative effect, unlikely to occur, Medium: moderate negative effect could reasonably expected to occur; High: large negative effect, will occur

d. low likelihood of significant release(i.e. reportable hydrocarbon spill over 100L) after mitigation measures.

Annex 26

Table of Accidents and Malfunctions – Release of Hazardous Materials

Hazardous Material	Maximum Probable Quantity	Storage or Transport	Mechanism of Release	Form of material released	Mitigation Measures	Effects assessment (as stated in Chapter 12)
Waste oil	20 L or 250L tanks	manufacture's container, transported in accordance with regulatory requirements	Breach of storage or loss during transfer Accident during transport	Liquid	Federal *Transportation of Dangerous Goods Act* Federal *Transportation of Dangerous Goods Regulations* Federal *The National Fire Code of Canada* Provincial *Dangerous Goods Handling and Transportation Act* Provincial *The Environment Act* Provincial *The Workplace Safety and Health Act* Provincial *Storage and Handling of Petroleum Products and Allied Products Regulation* Applicable Manitoba Conservation Work Permits GR130.9 Materials Handling, Storage and Disposal GR130.9.1 General GR130.9.2 Handles and Storage of Wastes GR130.9.2.1 Domestic Solid, Demolition, and Construction Waste GR130.9.2.4 Dangerous Goods/Hazardous Waste Handling and Disposal GR130.9.2.5 Petroleum Handling and Storage GR130.10 Spills and Remediation and Emergency Response GR130.15 Working Within or Near Water GR130.15.1 General EPP2 – Petroleum Storage EPP3 – Spill Response EPP5 – Materials Handling and Storage EPP6.4.13, EPP6.5.14, and EPP6.5.15 - Working Within or Near Fish Bearing Waters	Low
Lubricating oil	1L, 5L or 20 L	manufacture's container	Breach of storage or loss during transfer Accident during transport	Liquid	Federal *Transportation of Dangerous Goods Act* Federal *Transportation of Dangerous Goods Regulations* Federal *The National Fire Code of Canada* Provincial *Dangerous Goods Handling and Transportation Act* Provincial *The Environment Act* Provincial *The Workplace Safety and Health Act* Provincial *Storage and Handling of Petroleum Products and Allied Products Regulation* Applicable Manitoba Conservation Work Permits GR130.9 Materials Handling, Storage and Disposal GR130.9.1 General GR130.9.2 Handles and Storage of Wastes GR130.9.2.1 Domestic Solid, Demolition, and Construction Waste GR130.9.2.4 Dangerous Goods/Hazardous Waste Handling and Disposal GR130.9.2.5 Petroleum Handling and Storage GR130.10 Spills and Remediation and Emergency Response GR130.15 Working Within or Near Water GR130.15.1 General EPP2 – Petroleum Storage EPP3 – Spill Response EPP5 – Materials Handling and Storage EPP6.4.13, EPP6.5.14, and EPP6.5.15 - Working Within or Near Fish Bearing Waters	Low
Hydraulic fluid	5L - 20 L	manufacture's container	Breach of storage or loss during transfer Accident during transport	Liquid	Federal *Transportation of Dangerous Goods Act* Federal *Transportation of Dangerous Goods Regulations* Federal *The National Fire Code of Canada* Provincial *Dangerous Goods Handling and Transportation Act* Provincial *The Environment Act* Provincial *The Workplace Safety and Health Act* Provincial *Storage and Handling of Petroleum Products and Allied Products Regulation* Applicable Manitoba Conservation Work Permits GR130.9 Materials Handling, Storage and Disposal	Low

					GR130.9.1 General GR130.9.2 Handles and Storage of Wastes GR130.9.2.1 Domestic Solid, Demolition, and Construction Waste GR130.9.2.4 Dangerous Goods/Hazardous Waste Handling and Disposal GR130.9.2.5 Petroleum Handling and Storage GR130.10 Spills and Remediation and Emergency Response GR130.15 Working Within or Near Water GR130.15.1 General EPP2 – Petroleum Storage EPP3 – Spill Response EPP5 – Materials Handling and Storage EPP6.4.13, EPP6.5.14, and EPP6.5.15 - Working Within or Near Fish Bearing Waters	
Diesel	Fuel storage tank 5000 to	certified tanks and delivery transport	Breach of storage or loss during transfer Accident during transport	Liquid	Federal *Transportation of Dangerous Goods Act* Federal *Transportation of Dangerous Goods Regulations* Federal *The National Fire Code of Canada* Federal *Highway Tanks and Portable Tanks for the Transportation of Dangerous Goods* Provincial *Dangerous Goods Handling and Transportation Act* Provincial *The Environment Act* Provincial *The Workplace Safety and Health Act* Provincial *Storage and Handling of Petroleum Products and Allied Products Regulation* Applicable Manitoba Conservation Work Permits GR130.9 Materials Handling, Storage and Disposal GR130.9.1 General GR130.9.2 Handles and Storage of Wastes GR130.9.2.1 Domestic Solid, Demolition, and Construction Waste GR130.9.2.4 Dangerous Goods/Hazardous Waste Handling and Disposal GR130.9.2.5 Petroleum Handling and Storage GR130.10 Spills and Remediation and Emergency Response EPP2 – Petroleum Storage EPP3 – Spill Response EPP5 – Materials Handling and Storage	Low
Diesel – slip tank	Fuel storage tank 250L – 750L	certified tanks and delivery transport		Liquid	Federal *Transportation of Dangerous Goods Act* Federal *Transportation of Dangerous Goods Regulations* Federal *The National Fire Code of Canada* Federal *Highway Tanks and Portable Tanks for the Transportation of Dangerous Goods* Provincial *Dangerous Goods Handling and Transportation Act* Provincial *The Environment Act* Provincial *The Workplace Safety and Health Act* Provincial *Storage and Handling of Petroleum Products and Allied Products Regulation* Applicable Manitoba Conservation Work Permits GR130.9 Materials Handling, Storage and Disposal GR130.9.1 General GR130.9.2 Handles and Storage of Wastes GR130.9.2.1 Domestic Solid, Demolition, and Construction Waste GR130.9.2.4 Dangerous Goods/Hazardous Waste Handling and Disposal GR130.9.2.5 Petroleum Handling and Storage GR130.10 Spills and Remediation and Emergency Response GR130.15 Working Within or Near Water GR130.15.1 General EPP2 – Petroleum Storage EPP3 – Spill Response EPP5 – Materials Handling and Storage EPP6.4.13, EPP6.5.14, and EPP6.5.15 - Working Within or Near Fish Bearing Waters	Low
Gas	~10,000L	certified tanks and delivery transport		Liquid	Federal *Transportation of Dangerous Goods Act* Federal *Transportation of Dangerous Goods Regulations* Federal *The National Fire Code of Canada*	Low

					Federal *Highway Tanks and Portable Tanks for the Transportation of Dangerous Goods* Provincial *Dangerous Goods Handling and Transportation Act* Provincial *The Environment Act* Provincial *The Workplace Safety and Health Act* Provincial *Storage and Handling of Petroleum Products and Allied Products Regulation* Applicable Manitoba Conservation Work Permits GR130.9 Materials Handling, Storage and Disposal GR130.9.1 General GR130.9.2 Handles and Storage of Wastes GR130.9.2.1 Domestic Solid, Demolition, and Construction Waste GR130.9.2.4 Dangerous Goods/Hazardous Waste Handling and Disposal GR130.9.2.5 Petroleum Handling and Storage GR130.10 Spills and Remediation and Emergency Response EPP2 – Petroleum Storage EPP3 – Spill Response EPP5 – Materials Handling and Storage	
Gas – slip tank	250L – 750L	certified tanks and delivery transport		Liquid	Federal *Transportation of Dangerous Goods Act* Federal *Transportation of Dangerous Goods Regulations* Federal *The National Fire Code of Canada* Federal *Highway Tanks and Portable Tanks for the Transportation of Dangerous Goods* Provincial *Dangerous Goods Handling and Transportation Act* Provincial *The Environment Act* Provincial *The Workplace Safety and Health Act* Provincial *Storage and Handling of Petroleum Products and Allied Products Regulation* Applicable Manitoba Conservation Work Permits GR130.9 Materials Handling, Storage and Disposal GR130.9.1 General GR130.9.2 Handles and Storage of Wastes GR130.9.2.1 Domestic Solid, Demolition, and Construction Waste GR130.9.2.4 Dangerous Goods/Hazardous Waste Handling and Disposal GR130.9.2.5 Petroleum Handling and Storage GR130.10 Spills and Remediation and Emergency Response GR130.15 Working Within or Near Water GR130.15.1 General EPP2 – Petroleum Storage EPP3 – Spill Response EPP5 – Materials Handling and Storage EPP6.4.13, EPP6.5.14, and EPP6.5.15 - Working Within or Near Fish Bearing Waters	Low
Herbicides	4L	manufacture's container		Liquid	Federal *Transportation of Dangerous Goods Act* Federal *Transportation of Dangerous Goods Regulations* Provincial *The Environment Act* Provincial *Dangerous Goods Handling and Transportation Act* Provincial *Pest Control Products Act* *Manitoba Regulation 94/88* respecting *Pesticides* GR130.5 Record Keeping GR130.9.2.4 Dangerous Goods/Hazardous Waste Handling and Disposal GR130.16 Erosion and Sediment Control EPP3 – Spill Response EPP5 – Materials Handling and Storage EPP6 – Working Within or Near Fish Bearing Waterways	Low
Explosives – ammonium nitrate	Storage quantities varies 15,000 KG to 30,000kg	Storage magazine	Licenced federally or provincially	Solid - Minute quantities of blast residue - nitrates	Federal *Transportation of Dangerous Goods Act* Federal *Transportation of Dangerous Goods Regulations* Federal *The National Fire Code of Canada* Federal *Explosives Act* Federal *Explosives Regulations* Federal *Explosives Resources*	Low

					Provincial *Mines and Minerals Act* Provincial *The Operation of Mines Regulation* Provincial *The Quarry Minerals Regulation* Provincial *Dangerous Goods Handling and Transportation Act* Provincial *The Environment Act* Provincial *The Workplace Safety and Health Act* Blaster certified by *Workplace Safety and Health, Mines Branch, Province of Manitoba* A magazine licence (F060-01) must be obtained from *Explosives Regulatory Division, Natural Resources Canada*	
	On site transfer - small quantities <1,000kg	Transport – truck (meeting Transport Canada standards	Misfire during use	Solid - Minute quantities of blast residue - nitrates	Federal *Transportation of Dangerous Goods Act* Federal *Transportation of Dangerous Goods Regulations* Federal *The National Fire Code of Canada* Federal *Explosives Act* Federal *Explosives Regulations* Federal *Explosives Resources* Provincial *Mines and Minerals Act* Provincial *The Operation of Mines Regulation* Provincial *The Quarry Minerals Regulation* Provincial *Dangerous Goods Handling and Transportation Act* Provincial *The Environment Act* Provincial *The Workplace Safety and Health Act* Blaster certified by *Workplace Safety and Health, Mines Branch, Province of Manitoba* A magazine licence (F060-01) must be obtained from *Explosives Regulatory Division, Natural Resources Canada*	Low
	On site transport to project <1,000kg	Transport – transportation meeting Transport Canada standards	Misfire during use	Solid - Minute quantities of blast residue - nitrates	Federal *Transportation of Dangerous Goods Act* Federal *Transportation of Dangerous Goods Regulations* Federal *The National Fire Code of Canada* Federal *Explosives Act* Federal *Explosives Regulations* Federal *Explosives Resources* Provincial *Mines and Minerals Act* Provincial *The Operation of Mines Regulation* Provincial *The Quarry Minerals Regulation* Provincial *Dangerous Goods Handling and Transportation Act* Provincial *The Environment Act* Provincial *The Workplace Safety and Health Act* Blaster certified by *Workplace Safety and Health, Mines Branch, Province of Manitoba* A magazine licence (F060-01) must be obtained from *Explosives Regulatory Division, Natural Resources Canada*	Low