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10.0 MONITORING AND FOLLOW-UP PLANS

This Section provides the description of a series of Plans which are to be developed during detailed design of the Project and implemented during Project execution to ensure that commitments made during the EIA process are followed through and either incorporated into Project design elements, or captured in a series of procedures to be followed by construction and operations personnel for the life of the Project.

10.1 Monitoring Programs: Construction and Operational Phases

Monitoring programs will be implemented throughout the construction phase, and following construction, as described in Section 10.0. Monitoring activities will be conducted to ensure that the mitigation measures are in place and effective.

Outcomes of regular monitoring will be reported to interested parties, including applicable regulatory agencies, throughout the construction and operations phase as outlined in Section 10.0. Incidences of non-compliance with prescribed or regulatory standards and limits will be identified and measures to address the situation will be outlined and implemented in consultation with applicable government agencies.

The mitigation measures outlined in Section 9.2 will be implemented through detailed design as well as through an Environmental Management Plan (EMP) to be developed during detailed design that will provide detailed procedures and construction specifications, outlining requirements and activities to be conducted during construction and operation. The details of the EMP are included in Section 9.8 and will provide specific and unique procedures for the construction phase and the operations phase. The EMP will include the following components:

- Environmental Protection Plan;
- Erosion and Sediment Control Plan;
- Dust Control Plan;
- Health and Safety Plan;
- Waste Management Plan;
- Hazardous Materials Management Plan;
- Emergency Response Plan;
- Monitoring Plan[1]; and
- Decommissioning Plan.

Note: A proposed Woodland Caribou Monitoring Plan (WCMP) has been developed as a component of the Project's Monitoring Plan. The WCMP has been developed in consultation with the Eastern Manitoba Woodland Caribou Advisory Committee and Manitoba Conservation, Wildlife Branch.

10.2 Monitoring Plan

Section 8.0 identified potential effects with respect to the physical, biological, socio-economic and cultural environments that may result from construction and operation of the Project with corresponding mitigation measures and residual environmental effects. Section 8.0 also identified where monitoring and follow-up is required to ensure that measures are effectively implemented.

A monitoring program is required to compare pre-project baseline conditions to projected or predicted conditions, and the conditions actually found during the different phases of the project. This will assist in determining the effectiveness of the mitigation measures proposed or applied. The Monitoring Plan (MP) will also serve as a tool in the reporting requirements set out in the permit process and other approvals from different regulatory agencies.

The MP will define the parameters to be measured, methods to be used, sampling location, frequency of measurement, detection limits and definition of thresholds that will signal the need for corrective actions. Additionally, it will provide templates for monitoring reports, which provides information on the progress and results of the mitigation measures.

The role of the proposed monitoring program will be as follows:

- to confirm the predicted environmental effects;
- to enforce compliance with requirements dealing with the environmental construction practices specified for the project; and
- to assess the overall performance and effectiveness of the recommended mitigation measures once implemented.

Once the road is operational, monitoring will be conducted less frequently and focus on the effectiveness of any restored or newly created fisheries habitat, road side drainage facilities, and re-vegetated portions of the ROW. The monitoring plan proposed for the project is primarily applicable to the construction phase. A detailed monitoring plan, identifying monitoring locations, parameters and sampling frequency, will be developed during detailed design of the ASR.

10.2.1 Monitoring Plan - Environmental Site Management

The Monitoring Plan will be the responsibility of ESRA. Construction activities will be monitored as necessary to ensure that contractor(s) and project workforce adhere to the contract provisions and implement applicable mitigation measures. Contractors will be required to be informed and aware of environmental concerns and appropriate measures that are to be implemented and develop construction specific environmental protection plans and procedures as appropriate.

After construction is complete, the construction area will be inspected and any additional rehabilitation measures undertaken. The ROW will be to assessed for re-vegetation and any follow-up measures will be undertaken.

10.2.3 Monitoring Measures

Monitoring for the parameters listed below is based on effects associated with significant residual effects and mitigable effects provided in Section 8. Monitoring for the following is proposed:

- air quality;
- noise;
- vibration;
- water quality;
- soils;
- aquatic environment;
- vegetation and ground cover restoration;
- wildlife (moose, wolf and caribou) ; and
- Socio-economic conditions

Tables 10-1 to 10-9 list the specific proposed monitoring measures to be conducted to confirm the EIS predictions and monitor the effectiveness of the proposed mitigation measures. Monitoring results will support adaptive management of potential environmental effects, providing input for additional mitigation measures, should they become necessary. It should be noted that the monitoring programs will be amended based on requirements set out in Conditions of EIA Approvals, or subsequent licensing and permit authorizations.

Table 10 - 1: Air Quality Monitoring Measures

Parameter	Monitoring Method	Frequency	Responsibility
Airborne particulate during construction	• Visual • observation	• Ongoing during construction activities	*ESRA*
Airborne particulate during operation	• Visual observation	• Periodically during operation to confirm requirements for dust control	*Responsible Manitoba Government Department*

Air quality monitoring locations will be located in proximity to inhabited areas near the ROW and where major quarrying operations are established.

Table 10- 2: Noise Monitoring Measures

Parameter	Monitoring Method	Frequency	Responsibility
Noise levels during construction	• observation	• monitor of noise levels. Time of day controls near inhabited areas and construction activities during sensitive calving periods • Monitor construction employee use of ear protection	*ESRA*

Table 10- 3: Vibration Monitoring Measures

Parameter	Monitoring Method	Frequency	Responsibility
Ground and air vibrations at nearest sensitive receptor locations	• Establishing monitoring at nearest receptor locations where local blasting operations raises community/public concerns	• Complaint monitoring, utilizing instrumentation measures, or other means as required	*ESRA/ Construction Contractor*

Soil Monitoring Measures, Water Quality Monitoring, and Aquatic Habitat Monitoring as outlined in Table 10-4, 10-5 and 10-6 will be undertaken in conjunction with the environmental monitoring and supervision of construction activities.

Table 10- 4: Water Quality Monitoring Measures

Parameter	Monitoring Method	Frequency	Responsibility
Surface water quality (pH, DO, turbidity, TSS)	• Grab samples analyzed using field meter or in-field test kits. • Photograph areas affected by any spills or discharges	• As required to identify spill, or discharge of sediment caused by failure of erosion control measures.	*ESRA / Contractor*
Groundwater Quality	• Water well sampling	• As required in relation an environmental site assessment or spill response.	*ESRA/ Contractor*

Table 10- 5: Soil Monitoring Measures

Parameter	Monitoring Method	Frequency	Responsibility
Soil removal and disturbance	• Monitoring and supervision of topsoil/peatland material salvage or disposal	• Continuous	*ESRA/ Contractor*
Soil erosion/sediment	• Field inspection of the effectiveness of erosion & sediment control measures	• Continuous	
	• Inspection of noticeable erosion issues including sediment delivery to watercourses (e.g., washouts, failures of installed protection measures, etc.)	• As required	
Soil contamination	• Inspection and reporting of spills and leaks	• As required	

Table 10- 6: Aquatic Environment Monitoring Measures

Parameter	Monitoring Method	Frequency	Responsibility
Evidence of Active Erosion from slopes, or riparian areas that could affect watercourses or water bodies	• Visual inspection by construction staff and inspectors	• During construction, prior to establishing stabilized site conditions, and following major storm events	*ESRA/ Contractor*
Suspended sediment from deposit or spill of soil, fill or debris into watercourse	• Visual inspection	• During construction, decreasing frequency during follow-up	
Bank stability	• Visual monitoring of bank stability	• During construction, decreasing frequency during follow-up	
Fish stranding, or potential for fish stranding created by working in and around water	• Visual inspection	• During construction in open-water season	

Table 10- 7: Vegetation and Ground Cover Restoration Monitoring Measures

Parameter	Monitoring Method	Frequency	Responsibility
Vegetation	• Monitoring of ROW clearing limits	• Periodic Surveys	*ESRA/ Contractor*
Ground Cover Restoration	• Monitoring of re-vegetation in restored areas, where necessary additional seeding or erosion control measures may be applied.	• As areas are restored	

Table 10- 8: Wildlife Monitoring Measures

Parameter	Monitoring Method	Frequency	Responsibility
Moose: (PR 304 to Bloodvein)	• Moose population and distribution survey • Community surveys to estimate rights-based hunter harvest of moose • Trapper surveys for information on moose and wolf occurrence on traplines	• 2011, 2014, 2017 • Annually	*ESRA with assistance from Manitoba Conservation*
Caribou	• Distribution and population survey with caribou instrumented with GPS collars • Surveys to enumerate caribou group sizes • Remote acquisition of GPS collar data on movements, seasonal use areas, survival • Recover mortalities, enumerate caribou groups • Recruitment survey for data on age/sex ratios, calf recruitment	• Upon commencement of construction • Annually • Two 24-month periods • Monthly • 2 to 3 times per year • Annually	
Wolf	• Distribution and population survey to be flown concurrently with the moose and/or caribou survey to optimize the analysis of wolf-moose-caribou relationship. • Wolf GPS collaring – packs with territories overlapping the road	• Initiated in the winter of 2009/10 to 2014 • GPS collaring to begin the winter of 2009/10	

The proposed caribou monitoring program documented in Appendix 3.2 was developed in consultation with Manitoba Conservation, Wildlife Branch and the Eastern Woodland Caribou Advisory Committee.

Table 10-9: Socio-Economic

Parameter	Monitoring Method	Frequency	Responsibility
Heritage and Archaeological features	• Field assessment of preferred route at key locations	• During detailed design/pre-construction	*ESRA*
	• Field observations with a focus on key locations such as water crossings	• During construction	*ESRA/ Contractor*
Food supply (country foods) and registered trap lines	• Analysis from caribou, moose, and wolf monitoring studies • Analysis of Conservation data files • Trapper and community surveys	• During construction and post construction follow-up as required	*ESRA**
Traffic injuries	• Monitor health and safety reports and MPI data on collision statistics as construction follow-up	• during construction in association with health and safety reporting.	*ESRA**