GENERATIONPGM

May 11, 2022

BY EMAIL (Marathonminereview-examenminemarathon@iaac-aeic.gc.ca)

Impact Assessment Agency of Canada
160 Elgin Street, 22nd Floor
Ottawa, ON K1A 0H3

Attention: Debra Sikora
Panel Chair,
Marathon Palladium Project

Dear Ms. Sikora:

Re: Generation PGM ("GenPGM") Marathon Palladium Project ("Project")
Marathon Palladium Project (Ref. Number 54755) – Undertaking 31 Response

GenPGM hereby submits its response to Undertaking 31 and requests confirmation of the timelines for closing remarks.

Undertaking 31 Background

On March 31, 2022, the Joint Review Panel (the "**Panel**") issued Undertaking 31 to GenPGM, which requires a revised list of commitments, that shows the proposed commitments in relation to the valued ecosystem components ("**VEC**") of the environmental assessment.

During the hearing session on April 1, 2022 (CIAR #1215, PDF 104-107), GenPGM provided its proposed approach for responding to Undertaking 31. GenPGM proposed a hybrid approach to update (1) the Information Request ("**IR**") 3-3 VEC table with any new mitigation measures, details from the IR requests, and/or hearing commitments and (2) update the Chapter 8 Commitment Table to capture the commitments that do not fit into the VEC table.

At that time, GenPGM also committed to engage with the Biigtigong Nishnaabeg First Nation and Pays Plat First Nation regarding the preparation of its response to Undertaking 31 (CIAR #1215, PDF 113-115)

On April 8, 2022 (CIAR #1266), GenPGM's proposed approach to completing Undertaking 31 was accepted by the Panel. The Panel also noted GenPGM's commitment to engage with the Biigtigong Nishnaabeg First Nation and Pays Plat First Nation. GenPGM has completed this Undertaking 31 engagement. GenPGM's engagement with Indigenous communities is ongoing.

Biigtigong Nishnaabeg First Nation – GenPGM Joint Commitments

GenPGM confirms that it has completed its engagement with the Biigtigong Nishnaabeg First Nation regarding the preparation of its response to Undertaking 31. GenPGM and the Biigtigong Nishnaabeg First Nation jointly submit their mutually agreed commitments as an attachment to this letter. The other attachments to this letter were prepared by GenPGM.

Undertaking 31 Submission

GenPGM submits the following three attachments in response to Undertaking 31:

1. An Updated Table of Commitments (Table 8.1), which is an update to the Chapter 8 Commitment Table in the EIS Addendum (CIAR #727, beginning at PDF 7);

2. An Updated Mitigation, Monitoring, and Follow-up Survey (Attachment A), which is an update to the IR 3-3 VEC Table (CIAR #912, beginning at PDF 5); and

3. A joint submission with the Biigtigong Nishnaabeg First Nation showing mutually agreed upon commitments (which have been incorporated into Table 8.1 by GenPGM).

Closing Remarks

Based on the Panel's process clarifications letter dated April 14, 2022 (CIAR #1273), GenPGM understands that the regulatory clock will start on May 12, 2022 the closing remarks session will take place on May 18, 2022, and GenPGM's reply closing remarks will take place on May 19, 2022. GenPGM respectfully requests that the Panel confirm the timelines for closing remarks for the benefit of all participants.

Yours truly,

Generation PGM

<Original signed by>

Jeremy Dart
Environmental Manager
Generation PGM Inc.

Encl.

Table 8.1: Updated Table of Commitments

Commitment	Timing
ENVIRONMENTAL MONITORING AND MANAGEMENT PROGRAM (EMMP)	
GenPGM'S EMMP is intended and will be designed to: • Maintain compliance with applicable performance standards (e.g., limits and requirements imposed or a result of approval of this EIS and subsequent federal and provincial permits and approvals) • Verify the predicted effects and effectiveness of mitigation measures • Reduce risk of potential accidents and malfunctions • Provide a structure for the implementation of an adaptive management strategy • Streamline program and subsequent plans to meet applicable Federal and Provincial regulatory requirements and informed by agreements and through consultation with Indigenous communities and the Town of Marathon	Conceptual EMMP developed through the EIS Addendum will be refined through detailed design and applicable permits and approvals. An EMMP will be in place prior to the commencement of construction. The EMMP will be amended and updated periodically through the life of the Project.

Management Plans will be developed and implemented for:
• Waste and recycling material management – details the segregations, storage and disposal of materials to be in compliance with Regulation 347 under the *Environmental Protection Act*
• Access management – details access protocols for non-employees to travel from the Gate House to the north of the SSA
• Concentrate transfer station (rail load-out facility) management – details operational procedures and mitigations to reduce noise and dust generation under an Environmental Compliance Approval (ECA) or Environmental Activity and Sector Registry (EASR) in accordance with the *Environmental Protection Act, Ontario Regulation 419/05 and Guideline A-7*
• Tailings (process solids) impoundment operations – details operational procedures and mitigations to be employed for the safe storage of Type 2 material under an ECA or EASR in accordance with the *Environmental Protection Act* and the *Ontario Water Resources Act*. The construction of the PSMF Dam will also need to be in accordance with Ontario Regulation 454/96 of the *Lakes and Rivers Improvement Act*
• Materials handling (non-mined materials) – details operational procedures and mitigations for the proper storage of explosives, fuels and other hazardous substances. A Licence for a Factory and Magazine for Explosives will be required in accordance with the *Explosives Act*. A Licence to Operate a Bulk Storage Plant will be required for the storage of fuels in accordance with the *Technical Standards and Safety Act*
• Emergency preparedness and response – details operational procedures and mitigations to be enacted in the event of an emergency
• Erosion prevention and sediment control – details the mitigation measures to be implemented to prevent erosion of disturbed soils and to prevent sediment transport from the site. This plan will be prepared taking guidance from the Ontario Provincial Standard Specifications for Temporary Erosion and Sediment Control Measures (OPSS 805) and guidance from the *Environmental Protection Act* and *Ontario Water Resources Act* - details the operations practices and mitigations to be employed to manage and to prevent the release of sediment
• Fish Habitat Offsetting Strategy and Compensation Plan – details the measures to be employed to provide an offset for the permanent alteration and loss of fish habitat in accordance with the *Fisheries Act* subsection 35(2) and Section 27.1 of the *Metal Mining Effluent Regulations*
• Atmospheric quality management – details the mitigation measures to be implemented to reduce Project-related effects to air quality and noise. An Environmental Compliance Approval (ECA) or Environmental Activity and Sector Registry (EASR) will be obtained in accordance with the *Environmental Protection Act, Ontario Regulation 419/05 and Guideline A-7*, including:
  ○ Air quality management
  ○ Noise management (including noise and vibration)
• Water Management – details the mitigation measures to be implemented to reduce Project related effects to surface and ground water. An Environmental Compliance Approvals (ECA) or Environmental Activity and Sector Registry (EASR) for industrial sewage will be obtained in accordance with the *Ontario Water Resource Act:*
  ○ Surface water management (including quality and quantity)
  ○ Groundwater management
• Acid Rock Drainage / Metal Leaching (ARD/ML) management – details the management and mitigation measures for Type 2 materials. An Environmental Compliance Approval (ECA) or Environmental Activity and Sector Registry (EASR) for industrial sewage will be obtained in accordance with the *Ontario Water Resources Act* Vegetation management (including invasive species) – details the mitigation and approach to removing and managing vegetation. A Forest Resource Licence will be required for removal of trees on Crown land
• Wildlife and Species at Risk management - details the management strategies and mitigations to manage wildlife and species at risk. Vegetation removals will be conducted in accordance with the *Migratory Bird Convention Act* and the Habitat Management Guidelines for Bats of Ontario (MNRF). Bat boxes will be installed in accordance with the Best Management Practices for Bats in British Columbia. A Scientific Collection Permit For Initial Wildlife relocation will be required in accordance with the *Fish and Wildlife Conservation Act*. An Overall Benefit Permit as per Section 17(2)C of the *Engendered Species Act* may be required
• Reclamation and closure - details regarding the mine closure plan will be required in accordance with Ontario Regulation 240/00 of the *Mining Act*
• Soil salvage and storage – details the storage and management strategies for overburden and soil within the mine site. This plan will need to comply with Ontario Regulation 406/19, On-Site and Excess Soil Management
• General construction and operations management – details construction and operations procedures including various mitigation practices to reduce potential Project-related effects
• Spills Prevention and Response Plan - details mitigation measures and response procedures in the event of a spill. This plan should consider Ontario Regulation 675/98
	Conceptual information on these programs is provided in the original EIS (2012), responses to IRs, SIRs, and AIRs, and as updated to reflect project design changes in Chapter 1 (EIS Addendum Vol 1) and Chapter 7 of this EIS Addendum (Vol 2).
	Further, program details to be developed in consultation with applicable regulatory agencies and stakeholders after the EA process either as part of permitting, prior to commencement of Site Preparation and Construction. These management plans will be refined throughout the life of the Project, as necessary, as part of the various follow-up and monitoring programs.

Table 8.1: Updated Table of Commitments

Commitment	Timing
• Occupational health and safety - details the health, safety, security, and environmental practices that are to be followed by employees. Plan will be developed in accordance with the *Occupational Health and Safety Act*.	
Follow-up and monitoring programs will be developed and implemented for: • atmospheric environment (including air quality, noise, and greenhouse gases) • groundwater (including levels and quality) • surface water (including quality and quantity) • sediment and benthos • fish and fish habitat (including mitigation and compensation measures) • soils and terrain (including soil quality and geotechnical stability) • vegetation (including invasive and noxious plants) • wildlife (including wildlife mortality and encounters) • migratory birds (including conformity with the *Migratory Bird Convention Act*) • species at risk (including Woodland Caribou use) • socio-economics (including demography and community services / infrastructure usage) • human health (including connection to the air, surface water and groundwater programs) • country foods (including blueberries, fish, and moose) • archaeological and heritage resources Indigenous land use and rights, Indigenous employment and contracting, country foods, and archaeological resources will be monitored as part of the EMMP by GenPGM and in partnership with Biigtigong Nishnaabeg, the Town of Marathon and other Indigenous groups impacted by the Project. *see updated Monitoring and Follow Up Plan table included as attachment A	Conceptual information on these programs is provided in the original EIS (2012), responses to IRs, SIRs, and AIRs, and in Chapter 7 of this report. Further, program details to be developed in consultation with applicable regulatory agencies and stakeholders after the EA process either as part of permitting, prior to commencement of Site Preparation and Construction or, in the case of socio-economics, in consultation with the Town of Marathon and Biigtigong Nishnaabeg.
INDIGENOUS CONSIDERATIONS	
All commitments made for the Project are proposed to reduce potential adverse environmental and social effects of the Project that could adversely affect Indigenous communities and people. With regard to Indigenous communities potentially affected by the Project, GenPGM will: • Inform the design through consultation with communities, consideration of traditional knowledge/TLRU reports provided by communities and reduced the mine's physical footprint • Inform the design through Biigtigong Nishnaabeg Travel Route Mapping Survey, if available, to reduce conflict between mine design and existing travel routes • Maintain access to the Pic River via Camp 19 Road and to Bamoos Lake via the existing trail through Hare Lake for the duration of the Project • Develop a protocol prior to construction for use of the initial portion of the Camp 19 Road from which there is access to the Pic River and other travel corridors used to access areas for traditional wildlife, fish and plant harvesting • Provide escorted access through the SSA during construction and operations when safety permits, to the extent possible • Develop a communications protocol prior to the construction with Biigtigong Nishnaabeg for reporting of any road mortality of large mammals along the access road • Design and operate the mine and associated infrastructure to reduce environmental effects (including the various measures described in this table) with a focus on water and waterbodies identified by Indigenous communities as VECs, fisheries, and air quality • Provide appropriate accommodation for impacts to traditional land and resource use, prior to restricting access to the SSA • Offer education and training programs, as well as apprenticeships, to build capacity and increase employability and job ready skills to support Indigenous workers and females and offer employment opportunities to Indigenous workers and females, throughout the life of the Project • Work with economic development groups of Indigenous communities to increase contracting opportunities for qualified and cost-competitive bids, throughout the life of the Project • Establish environmental committees with representation from identified Indigenous communities, the Town of Marathon, and other relevant stakeholders. These committees will be used for engagement through the permitting process and throughout the life of the Project. These committees have been established and will continue to operate throughout the life of the Project • Offer training, participation, development, and implementation of environmental monitoring programs for the duration of monitoring activities • Ongoing Indigenous consultation on the results of the mine environmental effects monitoring (EEM) program through the various Environmental Committees, throughout the life of the Project • Engage with Biigtigong Nishnaabeg to support the following proposed Crown accommodation measure "Support and funding of a social service plan and targeted health services plan" (CIAR# 1083, PDF 80) for Biigtigong Nishnaabeg members who are employed through the Project • Engage with Biigtigong Nishnaabeg to identify solutions to the impacts of the Project on community infrastructure and social services to help minimize negative impacts. • Include the soils and terrain, vegetation, wildlife and fish, and fish habitat monitoring programs to monitor the potential impacts of the Project on human health and establish rigorous baselines for metal concentrations in foods and medicines of importance to Biigtigong Nishnaabeg	Throughout mine life, as appropriate

Table 8.1: Updated Table of Commitments

Commitment	Timing
• Develop, in consultation with Biigtigong Nishnaabeg, and other relevant authorities as may be determined by GenPGM and Biigtigong Nishnaabeg from time to time, a follow-up program to verify the accuracy of the effects assessments predictions as they pertain to adverse environmental effects on human health caused by changes in concentrations of contaminants of potential concern in country foods, based on completed baseline testing and additional monitoring • Develop, in consultation with Biigtigong Nishnaabeg, and other relevant authorities as may be determined by GenPGM and Biigtigong Nishnaabeg, a sampling program to assess concentrations of contaminants of potential concern in country foods to monitor for future human health assessments. • Develop and implement, in collaboration with Biigtigong Nishnaabeg, a country foods monitoring program • Implement a Harvester Training Fund to support annual harvests and trapline training programs, • Provide reasonable support to Biigtigong Nishnaabeg to secure a replacement for the community Trapline TR-022 • Develop, in collaboration with Biigtigong Nishnaabeg, a socio-economic management and monitoring plan (SEMMP) to measure and mitigate the socio-economic impacts of the Project on Biigtigong Nishnaabeg • Engage with Biigtigong Nishnaabeg to support the proposed Crown accommodation measure and Crown funding to “Create a bypass road (Gaffhook Lake Access), with access controlled by Biigtigong” (CIAR# 1083, PDF 57) • Engage with Biigtigong Nishnaabeg to determine and implement monitoring and mitigation effects for potential effects to species of high importance to Biigtigong Nishnaabeg • Continue and progress discussions relating to community arrangements and benefit agreements with Biigtigong Nishnaabeg and other identified Indigenous communities Other measures, as appropriate, that may result from ongoing engagement and agreements with Indigenous communities affected by the Project.	
WASTE AND RECYCLING MATERIAL MANAGEMENT PROGRAM (WRMMP)	
GenPGM will develop and implement a WRMMP that will describe the Project’s waste storage and disposal infrastructure, which includes the following components: • Solid non-hazardous waste disposal will be directed to the Town of Marathon Landfill • A material storage area, which allows storage of all recyclable and potentially re-usable items that will ultimately be shipped off site • A special waste storage area to handle certain wastes; for example, waste oil, oil filters, diesel fuel, anti-freeze, solvents, and lubricants (and containers in which they are contained), aerosol containers, hydraulic hoses and batteries prior to shipment off site • Proper on-site management and off-site disposal of food refuse, lubricants, and other waste that may be attractive to wildlife. • A hazardous waste area, which allows for temporary storage of all hazardous waste materials that will ultimately be shipped off site • A sewage system to manage sewage on site This plan will be prepared in accordance with Regulation 347 under the *Environmental Protection Act.* On-site waste facilities will follow standard environmental protection measures; hazardous wastes will be stored in secondary containment, will be constructed to reduce footprint, and drainage will be managed within the PSMF. Procedures and policies for the storage, transport and disposal of waste and recycling materials will be developed as part of the WRMMP. Waste management policies will be developed to meet current waste management legislation.	WRMMP to be developed prior to commencement of Site Preparation and Construction and to be implemented for the life of the Project.
MATERIAL HANDLING (NON-MINED MATERIAL)	
To mitigate the potential for an incident involving hauling concentrate, GenPGM will: • Retain appropriately licensed or trained operators both for long distance transport of concentrate and for on-site haul trucks • Post and monitor speed limits along the site access road and roads within the site • Follow up with contractors/employees on reports of haul trucks travelling at excessive speeds • Equip trucks with soft covers to prevent dusting during transport • Require all trucks to have a means of communicating with the Project site or their dispatch	Throughout mine life as appropriate.
To mitigate the potential of a chemical release during transport, GenPGM will: • Only allow licensed companies to deliver to site • Require third-party contractors to have active service agreements with licensed release response contractors • Require all drivers to have appropriate training, including release response training • Require all trucks to have appropriate communication capabilities • Maintain vehicles and equipment operated by GenPGM that are used to transport chemicals • Post and monitor speed limits on the site access road and on-site roads	Throughout mine life as appropriate.
To mitigate the potential of a fuel release during transport, GenPGM will: • Only contract appropriately licensed companies and drivers to deliver to site • Require third-party contractors to have active service agreements with licensed release response contractors • Require all on-site drivers to be appropriately trained, including release response training • Require all trucks to have appropriate communication capabilities • Maintain vehicles operated by GenPGM	Throughout mine life as appropriate.

Table 8.1: Updated Table of Commitments

Commitment	Timing
• Post and monitor speed limits on the site access road and roads within the site and will follow-up with any reports of excess speed	
To mitigate the potential of a fuel release from on-site storage, the facilities will contain the following design features: • Fuel storage areas (excluding small containers moveable by hand) will be isolated from watercourses, waterbodies and other sensitive environments by a minimum of 100 m • Areas used for day tanks will have been previously cleared to facilitate site development and will be isolated from sensitive features • Fuel storage equipment will comply with applicable legislative requirements • Tanks will have secondary containment and/or will be double-walled with collision protection • The main fuel farm will have lined aprons and collection catchments • Release response equipment will be maintained on site • Operational procedures will be posted at all storage facilities • A high-level alarm will be placed on Project storage tanks (or an equivalent approach will be provided), so that that the operators are made aware of the fill level during filling operations • Automatic shut-off valves and other such equipment will be installed to further reduce the risk of spills during fuel transfer operations Fuel storage will be licensed as a Bulk Storage Plant in accordance with the *Technical Standards and Safety Act*. Details regarding the safe handling and storage of fuels on site, and the measures to be followed in the event of an accidental spill, will be defined in an Emergency Preparedness and Response Plan and Materials Handling Plan.	Throughout mine life as appropriate.
To mitigate the potential of a fuel release during on-site dispensing, GenPGM will: • Provide fuel dispensing equipment that complies with applicable legislative requirements • Require that mobile refueling vehicles are properly maintained and inspected regularly for leaks • Maintain suitable setbacks and appropriate containment between portable dispensing equipment and sensitive environmental features • Design the main fuel dispensing location with compacted gravel or concrete containment pads with drive-on facilities capable of capturing minor releases • Maintain release response equipment on site • Develop operational procedures and training materials • Install automatic shut-off valves to further reduce the risk of spills during fuel transfer operations Details regarding the safe handling and storage of fuels on-site, and the measures to be followed in the event of an accidental spill, will be defined in a Materials Handling Plan (per EMMP) and EPRP.	Throughout mine life as appropriate.
To mitigate the potential of an explosives incident, GenPGM will: • Follow appropriate regulatory requirements, including the installation of chain-link fencing surrounding the explosives facility • If a third-party contractor is employed, they would be licensed to operate the storage facility and/or manufacturing plant, as well as using specifically designed secure storage magazines for blasting accessories • Follow good housekeeping practices • Develop explosives storage, handling, and blasting procedures and train personnel appropriately • Provide suitable protection for above ground fuel tanks used in the explosives manufacturing process in accordance with Subsection 4.3.7 of the National Fire Code of Canada (2015) Explosives handling will be in accordance with the *Explosives Act* and a Licence for a Factory and Magazine for Explosive will be obtained. Details regarding the safe handling and storage of explosives will be defined in procedures.	Throughout mine life as appropriate.
To mitigate the potential of a chemical release within the mine site, GenPGM will: • Construct buildings or structures for chemical storage that include sealed floors and sumps or drains and collection tanks to contain material released to ground • Establish on-site transport routes with consideration of appropriate setbacks from environmentally sensitive features • Store and handle all chemicals as appropriate according to material safety data (MSD) sheet information • Appropriately train (e.g., WHMIS) all personnel handling chemicals Details regarding the safe handling and storage of chemicals on site and the measures to be followed in the event of an accidental spill will be defined in a Materials Handling (non-mined materials) Plan (per the EMMP) and EPRP.	Throughout mine life as appropriate.
EMERGENCY PREPAREDNESS AND RESPONSE PLAN (EPRP)	
GenPGM will develop and implement an EPRP in accordance with appropriate federal and provincial regulations that will include the following elements: • An emergency response policy – a concise policy that highlights the company's commitment to and support for the EPRP • Roles and responsibilities – the identification of those responsible for emergency preparedness and response plan coordination and planning • An emergency identification, prevention and protection process – the EPRP will define resources as necessary to identify potential emergency situations that may arise and document appropriate prevention and protection measures • An emergency notification procedure – a procedure to notify required personnel in the event of an emergency - will be in place	EPRP to be developed in consultation with the Town of Marathon, Biigtigong Nishnaabeg and emergency service providers prior to commencement of Site Preparation and Construction.

Table 8.1: Updated Table of Commitments

Commitment	Timing
• The designation of an emergency management centre – the physical location of the emergency management centre will be identified, and its location and telephone numbers shall be noted • The definition of duties and responsibilities of mine personnel – key emergency personnel will be named as individuals or named as per their job titles and their corresponding duties and responsibilities will be outlined • An evacuation plan – including escape routes and muster areas • A crisis communication plan – the EPRP will outline the means of communication in the event of an emergency or crisis • A training plan – a training plan for all individuals named in the emergency procedures will be developed and implemented so that key personnel will know how to react • A continual improvement plan – the EPRP will be updated periodically according to standard industry practice and/or legal requirements as appropriate Engage with Biigtigong Nishnaabeg and the Town of Marathon to jointly create a coordinated Emergency Response Plan relating to the Project.	
To mitigate the potential of project-related fires, GenPGM will: • Install fire detection and alarm systems, where appropriate • Co-ordinate with local emergency response services • Design fire protection systems consistent with applicable codes and regulations • Equip remote buildings with portable extinguishers • Have a pumper truck on site equipped with a foam generation system • Prepare a fire response plan and conduct regular fire drills Details regarding fire safety, prevention and response will be defined in the EPRP.	Throughout mine life as appropriate.
To mitigate the potential for a process solids slurry or reclaim water pipeline failure, GenPGM will: • Specify that the pipeline design considers appropriate safety factors • Route the pipelines in a manner that allows for access and inspection • Regularly inspect the pipeline • Position pipelines, where possible, to direct a release resulting from a failure into the PSMF or other means of containment • Route pipelines away from sensitive environmental features, where practical • Install emergency catchment features (e.g., berms, ditches and catch basins) to manage the risk of failure that may result in the release of material to a sensitive environmental feature • Install a telemetric flow meter on the pipeline to monitor real-time pipeline flow rates An ECA or EASR for industrial sewage in accordance with the *Environmental Protection Act* and the *Ontario Water Resources Act* will be obtained. Details regarding the measures to be followed in the event of a process solids slurry or reclaim water pipeline failure will be defined in the EPRP.	Throughout mine life as appropriate.
To mitigate the potential release of water from the MRSA Catch basins due to pipeline failure, GenPGM will: • Connect the pump system to the backup power system • Develop a regular maintenance and inspection program for pump equipment • Locate replacement pumps on-site in the event of pump failure An ECA or EASR for industrial sewage in accordance with the *Environmental Protection Act* and the *Ontario Water Resources Act* will be obtained.	Throughout mine life as appropriate.
ACCESS MANAGEMENT	
To provide and manage access to the mine site, GenPGM will: • Construct a new site access road joining the mine to Camp 19 Road • Construct and operate a site guard house (security) and gate near the entrance to the mine site, which will be staffed 24 hours a day, to restrict access to the site. • Maintain access to the Pic River via Camp 19 Road and to Bamoos Lake via the existing trail through Hare Lake • Implement a routine inspection program for Camp 19 Road during construction and periodically over the life of the Project • Develop a procedure for escorted access through the SSA to areas north of the mine site. This procedure will be developed prior to access being restricted to the SSA and will remain in place until operations cease, and the site is considered safe for public access	Throughout mine life as appropriate.
CONCENTRATE TRANSFER STATION (RAIL LOAD-OUT FACILITY) MANAGEMENT	
If the rail load-out option is selected, it will contain the following design features: • A concentrate storage building that is enclosed • Equip trucks with soft covers to prevent dusting during transport • Unload concentrate either by bottom dumping from the bottom of the trailer or as a side tip arrangement directly onto a concrete floor slab. Concentrate will be transferred to rail cars with a dedicated rubber-tired loader that remains within the load-out facility • Drainage capture points to hold spills or overfills at the facility • An appropriate setback distance and engineered controls to meet applicable air and noise criteria	Throughout mine life as appropriate.

Table 8.1: Updated Table of Commitments

Commitment	Timing
To reduce potential noise and vibrations associated with the rail load-out facility, specific mitigation strategies will be implemented such as: • Coupling concentrate rail cars at the rail load-out facility only during the daytime hours of 7:00 am to 7:00 pm • Limiting coupling of concentrate rail cars to allow the rail carrier to complete a pickup • Only couple concentrate rail cars in the zones where compliance with applicable NPC-300 impulsive noise criteria can be met	Throughout mine life as appropriate.
TAILINGS (PROCESS SOLIDS) IMPOUNDMENT OPERATIONS	

To mitigate the potential for unanticipated seepage from the PSMF, GenPGM will:
• Design the upstream surface and bedrock interface of the PSMF to be appropriately lined or sealed to decrease dam permeability, more specifically:
  ○ Install HDPE liner or better technology on upstream face of embankments where designed
  ○ Appropriately anchor liner material to manage seepage between the liner and permeable bedrock
• Clean and inspect bedrock surfaces and treat them with slush grout where required
• Develop a process solids deposition plan and management strategy aimed at maintaining potentially reactive Type 2 material in a saturated state to prevent oxidation
• Monitor seepage during and after operations, pursuant to the Water Monitoring Plan
• Install seepage collection basins and ditches along the downstream toes of dams to intercept seepage water and runoff water from the embankments
• Install groundwater monitoring wells downgradient of the PSMF
An ECA or EASR for industrial sewage in accordance with the *Environmental Protection Act* and the *Ontario Water Resources Act* will be obtained. Details regarding the design of the PSMF, including associated tailings impoundment operations and ARD/ML management, will be defined in the Operations, Maintenance and Surveillance Manual for the PSMF (per the EMMP)
	Throughout mine life as appropriate.

To mitigate the potential of a PSMF slope failure, conservative design criteria and design safeguards have been incorporated into the PSMF including: • A design that meets or exceeds the requirements of the *Lakes and Rivers Improvement Act* and the Canadian Dam Association safety guidelines • Maintain an Engineer of Record for dam construction, raises and operation • Spillway design to allow controlled release of the intensity-duration-frequency (IDF) during all PSMF development stages • Install survey monuments on the crests of the embankments to monitor for potential settlement and/or movement and monitoring phreatic surfaces within the embankments • Reduce free standing water behind dam structures at closure • Complete dam safety inspections at appropriate intervals • Develop and implement an Operations, Maintenance and Surveillance Manual detailing regular monitoring, inspection and reporting requirements and emergency response measures in the event of upset operating conditions • Establish an Independent Tailings Review Board and engage Biigtigong Nishnaabeg in this effort • Sharing the Engineer of Record Dam Breach Assessment with Biigtigong Nishnaabeg Details regarding the design of the PSMF and geotechnical stability will be defined in the design summary report for the PSMF.	Throughout mine life as appropriate.
EROSION AND SEDIMENT CONTROL	

To mitigate adverse effects on erosion and sediment in receiving watercourses, including effects on sediment quality and benthos, GenPGM will:
• Reduce the potential loss of aquatic habitat through mine design by reducing the level of interaction between aquatic habitat features and Project infrastructure
• Comply with water discharge requirements as defined in the Metal and Diamond Mining Effluent Regulations (MDMER) and Environmental Compliance Approval (provincial)
• Employ standard management practices for erosion control such as:
  ○ Isolating disturbed areas with sediment fences, sediment curtains, or similar structures
  ○ Maintaining appropriate work area setbacks from surface water features
  ○ Grading and/or covering surfaces to reduce erosion potential
  ○ Controlling run-off from erosion-sensitive features
  ○ Providing settling ponds or basins in which solids can be collected (i.e., WMP and SWM Pond)
  ○ Promptly stabilize shoreline or banks disturbed by activities associated with the Project to prevent erosion and/or sedimentation, preferably through revegetation with native species appropriate for the site
Details regarding the management of sediment quality and measures to protect benthos will be defined in the Water Management Plan and the Erosion and Sediment Control (ESC) Plan.
	Throughout mine life as appropriate.

To mitigate the potential of an MRSA slope failure and release of mine rock to the Pic River, the MRSA design criteria and safeguards will include: • Slope angles that do not exceed the natural angle of repose and maintain a suitable factor of safety as defined by a professional engineer • Utilization of the natural site topography to support and contain the MRSA • Foundation will consist of bedrock or suitably competent material • Adequate setback from the Pic River	Throughout mine life as appropriate.

Table 8.1: Updated Table of Commitments

Commitment	Timing
Details regarding the design of the MRSA and geotechnical stability will be defined in the design summary report for the MRSA (per the EMMP)	
FISH AND FISH HABITAT	

To mitigate and compensate for adverse effects on fish and fish habitat, GenPGM will:
• Develop and implement an offset plan under Section 35(2) and Section 27.1 of MDMER of the *Fisheries Act* to offset project-related effects to fish and fish habitat and restoration of Streams 2, 3 and 6 after closure. This plan will be developed and accepted by DFO prior to the removal of fish habitat and will contain an implementation schedule.
• Apply culvert design, installation and maintenance that follows and conforms to appropriate DFO and MNRF operational statements, guidance, interim codes of practice, and protocols including:
  ○ Sizing culverts to convey water under high flow conditions
  ○ Maintaining fish passage during low flow conditions
  ○ Embedding the culverts to allow the creation of natural substrates
• Implement PSMF discharge pipeline design that follows and conforms to appropriate DFO and MNDMNRF operational statements, guidance and protocols including but not limited to:
  ○ Scheduling the constructing and decommissioning work to coincide with times of year that reduce risk to resident fish species as necessary (i.e., fisheries timing windows)
  ○ Avoiding where possible or maintaining setbacks and buffers from sensitive features, where necessary
  ○ Isolating access and work areas with temporary sediment control features such as berms and providing for the collection of drainage from disturbed areas
  ○ Restoring disturbed areas as soon as is practical following disturbance
  ○ incorporate an end-of-pipe screen compliant with the DFO guidelines, or a screen design otherwise approved by DFO
• Implement management practices for work around water including:
  ○ Avoiding where possible or maintaining setbacks from sensitive features
  ○ Isolating work areas via temporary berms
  ○ Providing for the collection of drainage from disturbed areas in channels and settling basins
  ○ Restoration of disturbed areas as soon as is practical following disturbance
• Implement management practices for work in water including:
  ○ Avoiding using explosives in or near water. Where this is necessary use the guidelines for the DFO *Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters* (Wright and Hopky 1998) to identify appropriate setback distances to avoid lethal or sub-lethal effects to fish
  ○ Planning in-water work, undertaking or activity to respect timing windows to protect fish, including their eggs, juveniles, spawning adults, the organisms upon which they feed and migrate.
  ○ Where possible conduct instream work during periods of low flow (e.g., summer or winter) to further reduce the risk to fish
  ○ Whenever possible, operate machinery on land above the high-water mark, on ice, or from a floating barge in a manner that limits disturbance to the banks and bed of the waterbody
  ○ Adherence, as applicable, to the Interim Code of Practice for Temporary Cofferdams and Diversion Channels (DFO, 2020)
  ○ Prior to commencement of work, prepare and execute a fish salvage plan in discussion with responsible authorities
• Water takings from local surface waters would incorporate an end-of-pipe screen compliant with the DFO guidelines, or a screen design otherwise approved by DFO
• Limit access to waterbodies and banks to protect riparian vegetation and limit bank erosion
• Allow controlled access to Claw Lake for baitfish collection
• Focus fish monitoring programs on water bodies such as Pic River extending downstream of the Project site to the mouth of Lake Superior, Hare Lake, the outlet of Hare Creek at Port Munro and Stream 6 (Angler Creek) and the outlet at Sturdee Cove that are important VECs to Indigenous communities and work with associated communities to develop and implement the program.
• Incorporate fish tissue sampling into the Country Foods Follow-up and Monitoring program
• Incorporate 2021 and 2022 fish tissue sampling data into relevant monitoring programs
• Offset the flow reduction and impact to fish and fish habitat in Stream6/Angler Creek in the Fisheries Offsetting and Compensation Plan
• Develop and implement a monitoring program with Biigtigong Nishnaabeg for Stream 6/Angler Creek prior to the start of construction to monitor the impact of changes to the watershed, if any, on (a) fish and fish habitat and other aquatic life in Angler Creek/Stream 6, as well as (b) other traditional and cultural uses of Stream 6/Angler Creek by Biigtigong Nishnaabeg
• Engage and provide reasonable support to Biigtigong Nishnaabeg in designing community programs for fish and fish habitat offsetting as part of the Fish and Fish Habitat Offsetting and Compensation Plan
• Support a Biigtigong Nishnaabeg Fish Hatchery program
Details regarding mitigation measures and compensation habitat to offset adverse effects on fish and fish habitat will be defined in the Updated Proposed Fish Habitat Offsetting Strategy and Compensation Plan and will include community-based Projects proposed by BN, PPFN and potentially other communities.
	Throughout mine life as appropriate.

ATMOSPHERIC QUALITY MANAGEMENT	

Table 8.1: Updated Table of Commitments

Commitment	Timing
To mitigate emissions of fugitive dust (TSP, PM_{10}, $PM_{2.5}$), associated metals, and SO_2 emissions, GenPGM will: • Maintain all site roadways in good condition, with regular inspections and timely repairs to reduce silt loading on the roads • Implement standard dust suppression activities such as water sprays, regular road maintenance and posting and monitoring of speed limits • Apply water on roads and construction areas when conditions require and / or apply calcium or magnesium chloride to roads seasonally and when initial application is no longer achieving mitigation • Equip the concentrate handling facility with fugitive emission control technology • Load trucks with concentrate, during operation, in a covered environment • Reduce the amount of beach exposed in Cell 2 of the PSMF and mitigate airborne dust by wetting or chemically stabilizing exposed beach areas with polymers and/or "crusting" agents as is safe and practicable • Maintain water cover on Cell 1 in the PSMF during operations • Locate the primary crusher within an enclosed structure with an appropriate dust collection system • Cover the crushed ore stockpile • Install dust collection on the lime delivery, lime slaking and CMC feed bin systems • Control particulate emissions from the assay lab, assay furnace and cupel furnace with dust collectors • Provide scrubbers on the base metals fume hood and the assay lab AA unit • Reclaim, in a progressive manner as reasonable and practicable, exposed surfaces that are dust sources, especially during decommissioning and closure • Use low sulphur diesel for equipment • Implement a fuel use tracking system to identify anomalies in fuel use • Explore green technologies such as use of bio diesel and Trolley Assist • Use and properly maintain equipment that meets Transport Canada off-road emission requirements • Purchase new mining vehicles and mining equipment that meet US EPA Tier 4 emission standards • Implement an idling policy • Monitor air quality and fugitive dust from the site at sensitive receptors, including crystalline silica, nitrogen (NO_2), $PM_{2.5}$ and PM_{10} and other constituents of potential concern. Monitoring will commence prior to construction • Aggregate crushing systems will include the use of water addition and water sprays to maintain moisture levels to effectively suppress and mitigate the generation of dust • Incorporating design features such as wind breaks to limit fugitive dust emissions • Measure silt content in access and haul roads Details regarding the mitigation and management measures to be implemented to reduce air emissions from mobile and non-mobile equipment will be defined in an Atmospheric Management Plan (per EMMP).	Throughout mine life as appropriate.
To mitigate the potential for effects from noise, GenPGM will: • Purchase vehicles and equipment that meet the applicable noise suppression regulations • Prohibit tailgate slams when dumping materials • Schedule concentrate delivery at times of the day to reduce complaints whenever possible • Design curved portions of rail track at the Rail load-out Facility in a manner to reduce wheel squeal • Implement an overpressure and vibration monitoring program on site upon commencement of blasting operations, assessing and modifying the program as site-specific data becomes available. Mitigation measures include but are not limited to modifying blasting techniques, the use of blast mats, altering charge size and blasting frequencies. This plan will be prepared prior to blasting occurring and will be implemented for the course of blasting activities Details regarding the mitigation and management measures to be implemented to reduce noise emissions from mobile and non-mobile equipment will be defined in an Atmospheric Management Plan (per the EMMP).	Throughout mine life as appropriate.
A formal complaints procedure for nuisance noise will be established for stakeholders and Indigenous peoples during the construction, operation, and decommissioning phases of the Project. A response protocol will also be established so that appropriate follow up occurs.	Procedure to be developed prior to Site Preparation and Construction.
To reduce potential light emissions, specific mitigation strategies will be implemented such as: • Optimization of lighting design to reduce total amount of lighting needed • Using directional lighting • Using shielded fixtures to reduce glare, reduce sideways and upward light leakage, and light pollution • Affixing fixtures on poles or buildings at the lowest possible height	Throughout mine life as appropriate.
SURFACE WATER QUALITY AND QUANTITY	
To mitigate adverse effects on surface water quality, GenPGM will: • Incorporate field test cells into the monitoring programs to inform water management and closure planning. Field test cells will be used once Run of Mine material becomes available • Protect L8 in situ	Throughout mine life as appropriate.

Table 8.1: Updated Table of Commitments

Commitment	Timing
• Plan activities near water such that deleterious materials including, but not limited to, paint, primers, blasting abrasives, rust solvents, degreasers, grout, or other chemicals do not enter the watercourse • Wash, refuel, and service machinery and store fuel and other materials for the machinery in a manner that prevents deleterious substances from entering the water • Implement a Spill Prevention and Response Plan (SPRP). This plan will be prepared prior to site alteration • For operations, develop and implement appropriate operating practices for explosives and blasting operations to reduce nitrogen residuals in mine water • For operations, collection of water associated with the MRSA and management of these waters so that there will not be a routine discharge to the Pic River. Implement treatment measures so that effluent discharge meets applicable regulatory criteria • For operations, monitor constituent concentrations in MRSA catch basins and increase water transfer rates to WMP if concentrations exceed predicted levels • For operations, monitor and report on PGMs within effluent discharge • Maintaining the water management system in place during the closure phase of the Project until such time that water quality is suitable to release to the environment. • During the active closure phase, monitor pit lake quality as the lakes fills • Monitoring and management/treatment as required so that water discharge objectives are achieved as defined in the Environmental Compliance Approval (provincial) and the *Metal and Diamond Mining Effluent Regulations* • Work with the associated communities to develop and implement the program and develop a framework to share the results for the purpose of assessing the performance of the water management system. • During operations, use the water collection system for the Process Solids Management Facility (PSMF) to allow water to move south from the Pit to be managed within the PSMF. • Assess, with Biigtigong Nishnaabeg, technically and economically feasible supplemental flow options for Stream 6/Angler Creek during the operations Phase of the Project. Where economically feasible, GenPGM commits to minimize disruptions to Stream 6/Angler Creek during the operations Phase of the Project. • Develop and implement, in conjunction with Biigtigong Nishnaabeg, a site-wide water management plan that provides an integrated framework to manage water quality that includes provision for water management practices for each of the primary site aspects, as well as areas of the site where there is contact water. The overarching goal of the plan is to maintain care and control of water during all mine phases for the purpose of protecting downstream uses (habitats, aquatic biota, use by people and preservation of Aboriginal rights). GenPGM'S environmental monitoring programs will have specific components related to mercury and phosphorus. • Engage with Biigtigong Nishnaabeg in the design and implementation of the mercury monitoring plan and other site-wide water management plans and programs • Obtain Biigtigong Nishnaabeg's approval of mercury monitoring plans. • Develop and implement, in conjunction with Biigtigong Nishnaabeg, focused monitoring programs on waterbodies such as the Biigtig Zibi (Pic River) extending downstream of the Project site to the mouth of Lake Superior, the outlet of Hare Creek at Port Munro and Stream 6 (Angler Creek) and the outlet at Sturdee Cove that have significance to Indigenous communities. These programs will include the collection of surface water, sediment, benthic invertebrates, and fish tissue samples as well as monitoring for mercury, phosphorus, and other indicators of eutrophication, as well as toxicity testing for mill reagents prior to effluent discharge to receiving water bodies. GenPGM will establish reference areas on the Biigtig Zibi (Pic River) and other areas, upstream of the Project, for use in a comparative analysis of results. GenPGM will engage Biigtigong Nishnaabeg in the design and implementation of the water quality monitoring programs and commits to obtaining Biigtigong Nishnaabeg's approval of its proposed monitoring plans and programs. • At all phases of Life of Mine, to implement best practices to prevent mercury methylation, such as stripping organic soils in advance of flooding an area. • At all phases of Life of Mine, to collect additional up-to-date data to adequately characterize impacts to water quality, water resources and fish and fish habitat, specifically for the Biigtig Zibi (Pic River), and subwatershed 101. GenPGM will also monitor watersheds 102, and 103, which are largely overprinted by MRSA. • At all phases of Life of Mine, to collect and update as necessary, a separate pit lake water quality model for each pit lake which considers various scenarios of rate of pit lake infilling, as well as the how other contact water inputs from the site could affect the pit lake models • At all phases of Life of Mine, to engage with and support Biigtigong Nishnaabeg 's water quality and aquatic monitoring efforts, including the development of adaptive management measures and associated triggers. Details regarding the management of surface water will be defined in the Water Management Plan and the Erosion and Sediment Control Plan.	
To mitigate adverse effects on surface water quantity, GenPGM will: • Appropriately size water management design features (e.g., retention and collection ponds, drainage infrastructure, ditches) to manage water volumes associated with storm and/or flow events • Design the MRSA Catch basin to have storage capacity for the 1:100-year storm event. • Plan to discharge only that water from the site that is considered excess from a management/need point of view (e.g., recycle and re-use water as much as practical) • Diversion of surface water runoff from undisturbed areas away from disturbed areas • Discharge water from the site in a manner that is consistent with the natural hydrograph of the receiving water body • Monitor the quantity of water taken from Hare Lake, Pic River, or other surface water sources, along with flow triggers, as per PTTW requirements • Monitor the quantity of water discharged from the site • Restore natural drainage patterns to the extent possible at the end of the mine life	Throughout mine life as appropriate.

Table 8.1: Updated Table of Commitments

Commitment	Timing
Details regarding the management of surface water, including water balance, intake and discharge, will be defined in the Water Management Plan. This plan will include triggers and thresholds for received waterbodies and reference lakes.	
GROUNDWATER	
To mitigate adverse effects on groundwater quantity and quality, GenPGM will: • Limit construction footprint (i.e., SSA) to the extent possible to reduce the potential for reductions in groundwater recharge and limit the number of watersheds overprinted by the SSA • Use standard management practices throughout the Project, including drainage control and excavation and open pit dewatering • Use standard construction methods, such as seepage cutoff collars, where trenches extend below the water table to mitigate preferential flow paths • Design the MRSA to increase the amount of runoff and reduce the amount of infiltration through the MRSA, thereby reducing the recharge and loading to groundwater • Monitoring locations will be maintained until the location is no longer required. If a monitoring location/station is no longer required but is identified as part of a regulatory approval, it will only be removed from the monitoring program once the required amendments are approved • Monitor groundwater levels and water quality in monitoring wells upgradient, cross-gradient, and downgradient of the MRSA, open pits, and PSMF, and in nearby key surface water features, to monitor for changes in groundwater quality and flow regime due to Project development • Monitor groundwater levels and water quality in background monitoring wells, through the use of nested groundwater monitoring wells that comprise a screen completed in overburden and shallow bedrock to monitor vertical distribution of groundwater level and quality, as applicable • Conduct a water supply well inventory along the stretch of properties along Highway 17 southwest of the SSA to confirm the number of users, well construction and the existing baseline groundwater quality conditions. This survey will be completed prior to site alteration • Develop a communication plan as part of the monitoring program to notify well users in the event of groundwater trigger thresholds being met • Collaborate with Biigtigong Nishnaabeg to identity any groundwater springs on the east site of SSA that are important to the community for consideration as part of the monitoring program • Complete a water well survey within and adjacent to the SSA to confirm the results of the MECP WWR and PTTW database review	Throughout mine life as appropriate.
ACID ROCK DRAINAGE AND METAL LEACHING MANAGEMENT	
To properly manage potential acid-generating mine rock, GenPGM will implement a mine rock segregation program that includes the following: • Developing a detailed mine rock management strategy centering around the distribution of Type 1 (non-PAG) and Type 2 (PAG) materials, including the selection of materials to be used for mine site construction • Storing Type 2 rock in designated areas to allow for effective drainage management • Stockpiling Type 1 rock in the MRSA and only using Type 1 rock for site construction • Maintaining a sulfur content cut-off percentage of 0.18% that distinguishes Type 1 (non-PAG) and Type 2 (PAG) material • Developing a program of ongoing testing that will be carried out during operations to assess the metal leaching and acid-generating potential of mine rock being removed to confirm water quality predictions • Employ high precision GPS and associated technology on loading units to identify ore grades within the deposit to segregate Type 1 and Type 2 mine rock as it is mined from the open pits • Permanent storage of Type 2 rock in a saturated state to prevent ARD after closure Details regarding the management of ARD / ML will be defined in the EMMP. This plan will be developed prior to potential Type 2 material being mined and will remain in place until operations cease, and all materials have been permanently covered.	Throughout mine life as appropriate.
To properly manage Type 1 and Type 2 process solids in the PSMF, GenPGM will: • Sample Type 1 process solids during operations to verify the low sulphur content and confirm material as non-PAG • Separate Type 1 and Type 2 process solids in the Process Plant and manage separately in the PSMF • Permanently store Type 2 material below the water table • Cover Type 2 process solids with a minimum 2 m layer of Type 1 process solids in the PSMF at closure • Run humidity cell tests on Type 1 run-of-mill process solids to confirm water quality predictions • At all phases of Life of Mine, to undertake best efforts to avoid the temporary storage of type 2 waste rock. Where temporary storage is absolutely necessary due to emergency or risk to human health, GenPGM will ensure that type 2 waste rock requiring temporary storage has a storage location with sufficient capacity for the volume of material and that the water management pond has sufficient capacity for the volume of leachate to be collected. Details regarding the management of the PSMF, including associated tailings impoundment operations and ARD / ML management, will be defined in the Operation, Maintenance and Surveillance Manual for the PSMF.	Throughout mine life as appropriate.
VEGETATION MANAGEMENT	
To mitigate adverse effects on vegetation, GenPGM will: • Optimize the location of the site infrastructure (e.g., pit development, aggregate and rock fill supply) and size of the footprint to reduce the potential effects on the environment	Throughout mine life as appropriate.

Table 8.1: Updated Table of Commitments

Commitment	Timing

• Transplant rare plants found on site to other local sites prior to disturbance of rare plant areas
• Implement mitigation measures associated with dust creation, as noted under atmospheric quality management above
• Construct a concentrate handling facility within a reduced footprint, and, if possible, within a previously disturbed or developed site
• Implement a number of additional measures to reduce the effect of the transmission line (and access road) such as:
  ○ Leaving vegetated buffer zones around watercourses and other sensitive features
  ○ Leaving lower vegetation in place while harvesting larger trees
  ○ Not grading or stripping within the transmission line corridor to the extent that the mitigation of potential fire hazards allows
  ○ Hand-clearing vegetation at sensitive stream crossings and within erosion control zones to reduce soil disturbance
  ○ Seeding the transmission line corridor and decommissioned roads at closure (consistent with the Closure Plan)
  ○ Stabilizing disturbed soil to assist vegetation regrowth and to control erosion
• Development of the reclamation plan and progressive reclamation commencing as early in the site development process as practicable to provide early re-establishment of vegetation. This plan will be in place prior to construction in accordance with Ontario Regulation 240/00
• Rehabilitation of as much of the mine site as possible to a natural even-aged conifer dominated forest after decommissioning
• Vegetation control measures consistent with provincial standards
• Re-vegetate approximately 275 ha of PSMF and 85 ha of the horizontal portion of the MRSA benches, augmenting with overburden and seed as needed.
• Incorporation of plant species of interest to Indigenous communities during rehabilitation where the use of these species is appropriate and technically feasible
• Removing buildings and covering other disturbed surfaces with overburden as needed, and seed at closure (consistent with the Conceptual Closure Plan)
• Implement specific mitigation measures to prevent establishment of invasive species such as:
  ○ Implementing an invasive species awareness and control program, including requirements for vehicles to enter site in a clean state
  ○ Use manual/mechanical treatment for the removal of invasive species as an alternative to herbicides
  ○ Isolating sensitive areas until adequate native vegetation is established through reclamation
  ○ Maintaining healthy, non-invasive, vegetative cover wherever possible on site
  ○ Managing areas with exposed soil to prevent the establishment of unwanted vegetation in disturbed/high traffic areas
  ○ Evaluating the quality control of reclamation seed mixes so that seed mixes are of high quality
  ○ Progressive reclamation of disturbed lands	

WILDLIFE AND SPECIES AT RISK MANAGEMENT	
To mitigate adverse effects on wildlife during construction, GenPGM will: • avoid, where practical, clearing of vegetation during bird nesting and bat breeding season. If avoidance is not feasible, surveys will be conducted by a qualified biologist in accordance with appropriate regulatory protocols	Throughout mine life as appropriate.
To mitigate adverse effects on wildlife throughout the life of the Project, GenPGM will implement the following general wildlife mitigation measures: • Reclamation plans that aim to restore forest habitat • Posting speed limits on roads to reduce collisions • Sufficiently clear ROW to provide adequate lines of sight to give advance warning of wildlife, particularly on corners • Installing wildlife crossing signs at the beginning of the main access road coming from both directions and at strategic locations, as necessary • Driver training to reduce risk of collision • Plowing practices in winter that provide gaps where mammals can easily exit the road (OMNR 2013) • Recording of wildlife collisions and near misses and developing additional mitigations should a collision hot spot be identified • Decommissioning roads and transmission line by re-establishing vegetation consistent with the Caribou Conservation Plan • Stabilizing disturbed soil to assist vegetation regrowth and to control erosion • Removing animal remains from active mining areas and mine roads to protect raptors and scavengers who might feed on them • Establishment of a wildlife policy and training, including SAR awareness training, to reduce human interaction with wildlife and decrease the potential for habituation, including strict waste management protocols to limit human food sources for wildlife (e.g., bird feeders, waste management practices) • Designing the site infrastructure to reduce the area of the disturbed footprint therefore reducing habitat alteration with special attention paid to sensitive habitats (i.e., water crossings) • Prior to disturbance of amphibian habitat, prepare and execute an amphibian salvage and translocation plan in discussion with responsible authorities • Avoiding direct impacts to identified raptor nesting areas and contacting a qualified avian biologist for direction • Maintaining the embankments of the PSMF to be free of vegetation to limit attraction by waterfowl and/or wildlife • Use of visual and auditory bird deterrents around PSMF, once operational • Using directional lighting • Installing luminescent and/or reflective markers on transmission lines over Canoe Lake where there is greater risk of collision due to the topography and presence of waterbodies • Clearing vegetation within 50 m of the side of building with windows to reduce potential bird abundance and collisions, where practical	Throughout mine life as appropriate.

Table 8.1: Updated Table of Commitments

Commitment	Timing
• Proper handling and disposal of road salt, reagents used in ore processing, or other substances that may be attractive to moose or other mammals craving dietary salt or trace minerals.	
To mitigate adverse effects on nesting birds, GenPGM will implement the following wildlife mitigation measures: • All clearing will be completed in accordance with the *Migratory Bird Convention Act*¸ *Fish and Wildlife Conservation Act* and other applicable guidance thereunder • Where possible, tree and brush clearing will be scheduled outside the bird nesting season • Where tree and brush clearing occur during the migratory bird nesting season, areas that are to be cleared will be surveyed for nest sites, and any identified nests will be marked, and appropriate protections put in place to prevent such trees from being harvested at that time • Conduct surveys for common nighthawk and eastern whip-poor-will, as part of the Wildlife Management Program	Throughout mine life as appropriate.
To mitigate adverse effects on bats and bat habitat, GenPGM will implement the following wildlife mitigation measures: • Avoiding forest clearing during the window May 15 to August 31 to reduce the risk of destruction of bat occupied maternity trees. • If limited clearing must be done during this window, bat maternity surveys using the Significant Wildlife Habitat and Wind Project Protocol would be used to confirm bat presence/absence in any suitable trees (e.g., large diameter chicots) and appropriate protection measures applied • Installation of a minimum of five (5) bat or rocket boxes as an alternate form of maternity roost in LSA • Develop an annual monitoring program to determine occupancy of bat boxes • Suspended construction/operation activities if a bat hibernaculum is discovered until a plan can be put in place with a qualified biologist in consultation with MECP, as part of the Wildlife Management Plan The Best Management Practices for Bats in British Columbia will inform the development of these measures.	Throughout mine life as appropriate.
To decrease potential effects on Woodland Caribou habitat, GenPGM will implement the following on-site mitigation measures: • Reducing the design footprint of the mine and associated infrastructure • Plant and seed access roads and remove watercourse crossings when roads are no longer required, to the extent practical • Suspended construction/operation activities if individual caribou are observed until caribou have left the area and the observation reported to the MNRF • Prohibition of hunting by Project personnel at the Project site to avoid risk of inadvertent caribou mortality due to misidentification or poaching • Prohibition of recreation snowmobile and ATV / UTV use by Project personnel at the Project site • Posting educational signage at the start of the access road to increase awareness of the potential presence of caribou to reduce the potential for collisions, encourage reporting, and reduce accidental hunting mortality. • Pits and trenches that are not geologically important will be backfilled or contoured to a stable angle of repose and, if greater than 3 m deep, will provide at least one sloped ramp as a point of egress for caribou • Non backfilled pits or trenches >3m deep will be fenced unless a means of egress for caribou is provided by a sloped ramp • Disturbed bedrock will be stockpiled on site in a safe and stable manner • Non-merchantable timber and slash will be piled at appropriate locations along trails and roads to reduce predator sight lines and foraging efficiency. Trails will be otherwise left for natural regeneration The development of these measures will be informed by the ECC's Environmental Code of Practice for Metal Mines, the Range Management Policy in Support of Woodland Caribou Conservations and Recovery, and the Recovery Strategy for Woodland Caribou.	Throughout mine life as appropriate.
To benefit off-site Woodland Caribou, GenPGM will implement the following off-site mitigation measures to be developed in consultation with MNDMNRF and Biigtigong Nishnaabeg: • Selection of locations for rehabilitation that will provide connectivity, consider landscapes on a regional scale, and builds off the long-term caribou and forest management plan for the region • Enhanced silviculture (e.g., aerial/ground spray, infill planting, seeding, clearing, tending, slash pile burning, etc.) and road decommissioning, where appropriate • An effectiveness monitoring program that will focus on the success of the silviculture treatments • Conduct an aerial survey of the RSA west of Pukaskwa • Engage in consultation with Biigtigong Nishnaabeg to revise current off-site caribou mitigations to consider the current landscape, and cultural proposals from Biigtigong Nishnaabeg. Details regarding off-site mitigation for Woodland Caribou will be defined in the Updated Caribou Habitat Offset Mitigation Report and will be further developed with MECP and Indigenous communities. The development of these measures will be informed by, the Range Management Policy in Support of Woodland Caribou Conservations and Recovery, and the Recovery Strategy for Woodland Caribou, which will be approved by MECP through an Overall Benefit Agreement. The timing of this agreement will be determined in consultation with MECP.	Throughout mine life as appropriate.

Table 8.1: Updated Table of Commitments

Commitment	Timing
RECLAMATION AND CLOSURE	

The draft Closure Plan includes activities designed so that the mine site is decommissioned and closed in a manner that reduces the potential effects on the social and natural environments and, to the extent possible, returns the site to a land use that is supported by Indigenous peoples, the public, government and wildlife including:
• Restoring the natural drainage patterns as much as possible
• Directing drainage from the pit lake under the MRSA in an underdrain
• Taking reasonable steps to reclaim some disturbed areas of the Project site in a progressive manner, including re-establishment of vegetation conditions supportive of Woodland Caribou, monarch and yellow-banded bumble bees where possible
• Incorporate wildflower seed mix and common milk weed into the re-vegetation plan to provide potential habitat for Monarch butterfly and Yellow-banded bumble bee
• Incorporate wetland habitat into the restoration of the water management pond
• Maintaining overall MRSA slopes of approximately 2.3 horizontal:1 vertical (2.3H:1V), with minor re-contouring of the overall slopes at closure
• Contouring slopes of the PSMF at closure, reducing standing water on PSMF, establishing a vegetative cover, decommissioning, and dismantling management and process solids slurry pipeline systems, ongoing monitoring to confirm suitable water quality, overflow at closure preferred to Stream 6
• Decommissioning roads to the extent possible while maintaining access to the site for necessary closure and long-term land uses
• Use of overburden on horizontal surfaces of the MRSA to promote revegetation as a proactive reclamation strategy, when necessary
• Use of non-merchantable coarse woody debris from site clearing in rehabilitation efforts
• Removing and/or covering concrete foundations with overburden to support revegetation
• Rehabilitating the general mine site area through a process of scarification of heavily compacted areas, regrading, applying overburden cover as needed, and revegetation
• Incorporate species of interest to Indigenous communities in reclamation activities
• Monitoring during closure will include:
  ○ Monitoring to verify success of reclamation and confirm on-site water quality has stabilized and there are no long-term geochemistry concerns
  ○ Monitoring pit water quality prior to pit overflow to determine if mitigation is required and monitoring water discharged from the pits to surface water for a suitable time period after overflow
• Details regarding decommissioning and closure of the mine site following completion of operations will be provided in a Closure Plan in accordance with O. Reg 240/00 and filed with the Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNRF) prior to the start of construction. Identified Indigenous groups will be invited to participate in the preparation of the closure plan through information sharing and direct participation in selection of long-term reclamations projects.
• Engaging Biigtigong Nishnaabeg in end land use planning for the Project site and will ensure the site is designed to support habitats and species of interest to Biigtigong Nishnaabeg.
• Obtain Biigtigong Nishnaabeg's consent to the closure plan as expressed in a Band Council Resolution
• On an ongoing basis, to review feasible closure plan alternatives with Biigtigong Nishnaabeg
	Closure Plan to be developed prior to Site Preparation and Construction.

To monitor the long-term groundwater level and quality in PSMF Cell 2a during closure of the PSMF, GenPGM will implement the following: • Installation of groundwater monitoring wells and vibrating wire piezometer in the process solids contained in Cell 2A at the start of the closure phase • Groundwater level data will be compared to predicted levels to confirm that Cell 2A is performing as designed. Importantly, it will be confirmed that the Type 2 (PAG) process solids contained in Cell 2A continue to remain in a saturated state to prevent the generation of acid drainage • Groundwater quality data will be collected (from within the PSMF) to verify water quality predictions for Cell 2A and to evaluate the effectiveness of the mitigation measures implemented for the Type 2 process solids In the event the groundwater monitoring program identifies an issue with the performance of Cell 2A, the following contingency measures could be implemented to maintain the groundwater table at the required level: • Closure spillway invert elevations could be increased to retain additional water in the Cell 2A pond during the spring freshet resulting in increased net infiltration into the process solids • An engineered cover could be placed over a portion of Cell 2A to reduce surface evaporation and increase infiltration into the process solids Details regarding the monitoring program for PSMF Cell 2A, including the triggers for implementation of contingency measures, will be provided as part of the Water Management Plan.	During active closure.

Table 8.1: Updated Table of Commitments

Commitment	Timing
SOIL SALVAGE AND STORAGE	
To manage soil on site during site preparation and construction, and to provide available soils for decommissioning and closure of the site, GenPGM will: • Provide results of 2021 soil sampling to the Panel and use results to inform the design of the access road and management plan for the storage of excess materials • Limit the construction footprint to the extent possible to minimize the need for soil/overburden excavation. • Strip topsoil to the extent possible to be stockpiled in the same area as the overburden and subsequently used following construction during mine life for progressive reclamation and closure to restore disturbed areas • Ensure that soil/overburden stockpiles that are created to facilitate development of the site have appropriate slopes, and maintaining the piles to prevent erosion and slide hazard • Limiting potential erosion of disturbed areas and / or soil stockpiles by implementing appropriate erosion and sediment control measures (i.e., seeding) to stabilize these areas Details regarding the soil monitoring and management, including monitoring for constituents of potential concern, will be provided as part of the Soil and Terrain Monitoring Program.	
SOCIO-ECONOMIC CONDITIONS	
To mitigate potential socio-economic effects, GenPGM will: • Provide adequate housing to accommodate the workforce during the site preparation and construction phase through a temporary construction camp, to be operated by a third party • Provide adequate housing to accommodate the workforce during operation through an Accommodations Complex with a minimum of 180 rooms, to be operated by a third party • Establish and enforce a code of conduct for workers housed in the Accommodations Complex and work with the third-party developer of the temporary construction camp to establish and enforce a similar code of conduct. The code of conduct will be established prior to the commencement of site construction • Facilitate rotational work arrangements which allow some employees to return to distant housing during operations • Work proactively with municipal authorities to co-ordinate planning, development or upgrades of infrastructure, as necessary • During decommissioning, implementing strategies to help transition the workforce • Work with economic development groups to increase contracting opportunities for local businesses throughout the life of the Project • Work with regional institutions to implement employment and training programs, including the development of a program focusing on underrepresented populations • Establishing measures to encourage and recruit employees from the existing populations in local communities • Providing opportunities for training to facilitate employment by residents of the LSA and RSA and supporting initiatives to train local youth and members of Indigenous groups • Work with economic development groups to increase contracting opportunities for local businesses • Providing Project employees with health services (physical, mental and social health), including Employee Assistance Programs (EAP) and on-site emergency service infrastructure, including fire-fighting equipment. GenPGM will co-ordinate its EPRP with the Town of Marathon emergency services department • Develop, in collaboration with Biigtigong Nishnaabeg, a mandatory, cultural competency training for all mine workers that will include content on Residential Schools, the Truth and Reconciliation Commission, Missing and Murdered Indigenous Women and Girls, and Indigenous rights, including Biigtigong Nishnaabeg's asserted exclusive Aboriginal title rights. • Develop and implement, in collaboration with Biigtigong Nishnaabeg, workplace policies and procedures to address and minimize risks associated with related sexual harassment, violence, harassment and discrimination. Providing support to fund key community services or organizations and provide fitness and recreational programs for workers within the existing facilities. • GenPGM will engage with the Town of Marathon and provincial Crown lands permit holders to address potential disturbance to or access restrictions to municipal and Crown land areas • Signage will be installed around the SSA to alert the public and land users of the presence of the Project and its facilities. Signage will be installed during construction • Hunting / fishing / harvesting of wildlife will be strictly prohibited on the site. Workers will not be permitted to hunt / fish / harvest and will not be permitted to bring firearms or angling gear to site • Implement a Harvester Training Fund to support trapline training programs • To the extent possible, clearing and wood utilization will follow the requirements contained in the Forest Management Plan. This may include a commercial market for the harvested wood from the Project site or may be used for firewood for the general public. Un-merchantable wood, as defined by the *Crown Forest Sustainability Act*, may be left scattered throughout the harvested area to serve as coarse woody debris. • Project activities, locations, and timing will continue to be communicated to Indigenous communities, affected land and resource users, environmental non-government organizations, the provincial government, and local authorities throughout the life of the Project • Desired land and resource end-uses will be considered in the preparation of the Rehabilitation and Closure Plan	Throughout mine life as appropriate.

Table 8.1: Updated Table of Commitments

Commitment	Timing
To mitigate potential traffic effects, GenPGM will implement the following mitigation measures: • Bussing of employees and shift changes in consultation with the Town of Marathon • Scheduling concentrate delivery to the rail load-out facility (if this option is used) in consultation with the Town of Marathon • Scheduling shift changes and truck movements to avoid peak traffic hours and school bus pick-up and drop-off times. • Regular communications with the Town of Marathon, MTO, and OPP representatives to monitor and mitigate traffic effects • Implementing a Traffic Management Plan, which will include encouraging car-pooling and providing bus transport to and from the Project site and requiring all Project drivers and employees to observe speed limits and take safety precautions. This plan will be developed prior to construction.	Throughout mine life as appropriate.
ARCHAEOLOGY AND CULTURAL HERITAGE	
To mitigate potential effects on physical and cultural heritage resources, GenPGM will: • Complete an additional area of Stage 2 archaeological assessment in 2021, prior to construction, if the final alignment of the discharge pipeline remains in close proximity to the area of high archaeological potential on Hare Lake, however avoidance of this area is the preferred mitigation measure. Any archaeological work would be completed in accordance with the MHSTCI's *Standards and Guidelines for Consultant Archaeologists.* • Invite local Indigenous communities to participate in archaeological field work programs (i.e., as field monitors) and to review and inform the assessment of any findings resulting from this work • Train all employees engaged in activities that have the potential to unearth heritage or cultural features • Immediately suspend all work in the vicinity of the discovery in the instance that built heritage and cultural heritage landscape features are identified and contact the MHSTCI and Indigenous peoples • Immediately suspend all work in the vicinity of the discovery in the instance that human remains are identified and notifying the OPP, or local police and also notifying Indigenous representatives, the MHSTCI • Notify stakeholders and local Indigenous peoples as part of its routine response to the identification of built heritage and cultural heritage landscape features Details regarding measures to protect archaeological resources and to identify the procedures to be followed where archaeological resources are identified or in the unlikely event that human remains are encountered during construction will be defined in the General Construction and Operations Management plan (per EMMP).	Throughout mine life as appropriate.
OCCUPATIONAL HEALTH AND SAFETY	
Occupational health and safety to be implemented and followed in accordance with all applicable legislation and regulations (see Section 7.4 of this EIS Addendum [Vol 2]) • As part of the General Construction and Operations Management Program, develop a procedure for recording operation health and safety incidences and near misses and the identification of potential hazards	Throughout mine life as appropriate.

ATTACHMENT A: UPDATED MITIGATION, MONITORING AND FOLLOW-UP SUMMARY

GENERATIONPGM

Attachment A: Updated Mitigation, Monitoring and Follow-up Summary

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
ATMOSPHERIC ENVIRONMENT						
Change in air quality – Emissions of CoPCs will increase as a result of Project-related activities						
• Equipment to meet applicable emissions standards and to be maintained regularly • Use of low sulphur diesel for equipment • Use of dust suppression techniques • Implementation of dust collection system and baghouses	• Maintenance of equipment improves efficiency and reduces emissions • Use of low sulphur diesel reduces emissions • Managing dust through active and passive controls reduces potential for fugitive dust emissions • Dust collection system and baghouses reduce dust released to the atmosphere, including PM	The air quality modelling predicts a scenario where 79 of the 83 CoPCs examined will meet applicable AAQC during either the construction or operations phase. With mitigation, four (4) exceedances are predicted: • Benzo(a)pyrene (B(a)P) is predicted to increase during construction and operations as a result of vehicle emissions along Peninsula Road. However, the Project is considered to be a negligible contributor to these levels as only 3.8% (Construction) and 3.2% (operation) of the total modeled B(a)P concentrations is estimated to be from the Project. • Crystalline silica exceedances are predicted during construction and operations. These exceedances are limited in geographic extent (1.8% of the LSA during construction) (0.8% of the LSA during	Atmospheric Environment Follow-up and Monitoring Program • Measurement of ambient levels of particulates, criteria air contaminants, and other parameters of potential concern at identified air quality monitoring locations. • Air quality samples will be collected through high-volume samples of ambient air at locations identified through the effects assessment. • Sampling will occur periodically during the Project lifespan using standard protocols, including updated baseline, construction, operation and closure phases of the Project. • Ambient air quality measurements of nitrogen (NH4 and NO3), crystalline silica, benzene and other relevant contaminants of potential concern will be collected to inform the Follow-up and Monitoring Program • Silt content of haul roads will be measured during construction. • The Atmospheric Environment Follow-up and Monitoring Plan will be developed in consultation with agencies (MECP and Health Canada) and Indigenous communities.	Results from this testing will be compared to the appropriate federal and provincial ambient air criteria and to the predictions in the EIS Addendum. Additional mitigation will be employed in the event that the Project results in measured levels being greater than these criteria.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Site specific dust suppression measures at the rail-load out facility • Use of alternative / additional dust suppressants • Focused dust suppression at mine entrance or other areas where increased dustfall levels are experienced • Improvement/ procurement of vehicles as new technology becomes technically and economically viable	Atmospheric Quality Management Plan Atmospheric Environment Follow-Up and Monitoring Plan General Construction and Operations Management Plan

[1] Details regarding mitigation measures will be developed and confirmed as part of the relevant management plan listed. Details regarding the listed follow-up and monitoring plans, including adaptive management thresholds and triggers, will be confirmed prior to implementation.

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
		operation) and are predicted to be in areas where human presence is infrequent. • Exceedances of the 24-hour and annual average nickel levels are predicted at the rail load out facility. However, these exceedances are expected to be addressed through the implementation of additional mitigation in the design of the facility.				
<u>Change in dustfall</u> – Project-related activities will result in an increase in dustfall						
• Use of dust suppression techniques • Implementation of dust collection system and baghouses	• Managing dust through active and passive controls reduces potential for fugitive dust emissions. • Dust collection system and baghouses reduces dust released to the atmosphere, including PM.	The air quality modelling predicts an exceedance of the monthly dustfall criterion (25%) close to the mine entrance at the modelled property boundary, within a limited geographic extent. However, predicted dustfall levels are below the criterion at special receptors.	<u>Atmospheric Environment Follow-up and Monitoring Program</u> • Fugitive dust will be collected using dustfall jars; locations will be determined based on a number of factors including locations of maximum predicted dustfall levels, proximity to residential or sensitive land use areas, MECP siting criteria for ambient dustfall monitors, etc. and will be reviewed and approved by the MECP. These locations will take into consideration the areas representative of the Braun's Holly fern. • Sampling will occur at appropriate intervals throughout the life of the Project (monthly during construction and operation, reduced frequency thereafter). • Total dustfall mass per unit area and total metal levels will be measured.	Results will be reported as total dustfall mass per unit area, which will be compared with predictions in the EIS Addendum, and to applicable regulatory criteria. Additional mitigation will be employed in the event that the Project results in measured levels being greater than these criteria and those predicted in the EIS Addendum.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Use of alternative / additional dust suppressants • Focused dust suppression at mine entrance or other areas where increased dustfall levels are experienced	Atmospheric Quality Management Plan Atmospheric Environment Follow-up and Monitoring Plan General Construction and Operations Management Plan

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
			• The Atmospheric Environment Follow-up and Monitoring Plan will be developed in consultation with regulatory agencies and Indigenous communities.			
Change in ambient light levels – Project-related activities will result in a localized change in ambient light levels						
• Optimization of lighting design (including mounting lights as low as possible) • Use of directional lighting	• The location and design of project lighting will be refined to balance safety with reductions in light effects. • Limiting and directing lighting to specific work areas reduces overall lighting requirements across the site, thereby reducing the amount of light requiring mitigation.	The Project is expected to contribute to an increase in ambient light levels through sky glow (brightening of the sky). This increase is considered to be of low magnitude as nearby sensitive receptors already experience periodic elevated light levels associated with highway traffic, airport operations, and lighting at businesses and residences. Sensitive receptors along Highway 17 and Hare Lake will be screened from the SSA by existing vegetation and terrain changes. Light will generally be restricted to the developed area of the site where wildlife activity will be low.	• No monitoring is proposed for light.	In the event of complaints regarding light trespass or glare, GenPGM would review the source of the complaint and implement mitigation, if necessary, to address the complaint.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Adjustments to light shielding and direction	N/A
Change in GHG levels - GHG emissions are associated with the Project						
• Mine design optimization • Employ energy efficient equipment • Proactive site reclamation • Management of fuel use • CO_2 capture	• Optimizations to the mine design reduces travel times for equipment and materials, reducing emissions • The use of energy efficient equipment improves efficiency and reduces emissions • Proactive site reclamation provides opportunities for carbon sequestration by vegetation	Project construction is predicted to result in a total CO_2e emissions range from 212.5 to 231.1 kt annually, while total CO_2e emissions during operations are predicted to range from 45.7 to 86.9 kt annually. These predicted levels result in incremental contributions to Ontario's and Canada's total annual GHG emissions (based on 2018 data).	Atmospheric Environment Follow-up and Monitoring Program, GHG monitoring will include: • Monitoring of GHG emissions as a component of fuel consumption to confirm GHG emission predictions. • Measurement of ambient levels of particulates, criteria air contaminants, and other parameters of potential concern at identified air quality monitoring locations. • Air quality samples will be collected through high-volume samples of ambient air at	Results from this testing will be compared to the appropriate federal and provincial ambient air criteria and to the predictions in the EIS Addendum. Additional mitigation will be employed in the event that the Project results in measured levels being greater than the predictions within the EIS Addendum and regulatory criteria.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Improvement / procurement of vehicles as new technology becomes technically and economically viable • Additional screening of the Project site to sensitive receptors	Atmospheric Quality Management Plan Atmospheric Environment Follow-up and Monitoring Plan General Construction and Operations Management Plan

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
	• Management and monitoring of fuel consumption allows for the identification and management of anomalies in usage and is a component of confirming GHG emissions predictions		locations identified during the development of the Follow-up and Monitoring Program. • Sampling will occur periodically during the Project lifespan using standard protocols. • GHG reporting will be provided to the ECCC in accordance with the *CEPA* (1999).			
ACOUSTIC ENVIRONMENT						
<u>Change in noise levels</u> - Project-related activities will result in an increase in local noise levels						
• Purchase of vehicles and equipment that meet applicable noise suppression regulations • Schedule concentrate delivery to reduce complaints, whenever possible • Implement an overpressure and vibration monitoring program on-site • Only permit coupling at the Rail Load-Out Facility • Prohibit tailgate slams when dumping material	• The use of equipment with proper noise suppression reduces noise generated during Project related activities • Scheduling concentrate delivery during daytime hours, while avoiding high traffic times will reduce potential noise complaints • The implementation of monitoring creates a feedback loop, upon which operating practices can be adjusted as needed • Coupling is less noise-intrusive than shunting • Prohibiting tailgate slams reduces noise generated during Project-related activities	Noise modelling predicts steady-state noise levels during the worst-case construction and operations scenarios (i.e. all significant noise sources operating at the same time) to be in compliance with the applicable MECP criteria at representative noise-sensitive receptors. Predicted Project traffic levels were predicted to be less than 5 dB over baseline levels, which are below the sound level thresholds provided by MECP and MTO. The setback analysis for air blast results indicate that a 575 m setback is needed. Noise-sensitive receptors within the 120 dB contour for construction blasting will also be monitored. These receptors include North Lake Hare Cottage, Laughing Moose Eatery Restaurant and Residence, Peninsula Inn and May's Gifts. No noise-sensitive receptors were within the	<u>Atmospheric Follow-up and Monitoring Program</u> • Measurement of ambient noise levels, overpressure, and vibrations at identified sensitive receptor, locations, during various mining activities including, but not limited to, near surface blasting activities during site preparation and early operation. • The location of monitoring stations will be determined based on a number of factors, including locations of maximum predicted noise levels, proximity to residential or sensitive land use areas, MECP siting criteria for noise monitors, etc. and will be reviewed and approved by the MECP. • A log of public concerns raised over nuisance noise levels. • The Follow-up and Monitoring Program will be developed in consultation with regulatory agencies and Indigenous communities.	Results from this testing will be compared to the noise levels predicted in the EIS Addendum and to applicable regulations. Additional monitoring may be employed when the public raises a nuisance noise concern. Additional mitigation will be employed if it is determined that ambient noise levels exceed the applicable regulatory criteria.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Review of night time activities • Improve/procure vehicles and equipment to have increased noise suppression • Review of blasting plans in response to monitoring level recordings at sensitive report locations that exceed applicable criteria.	Atmospheric Quality Management Plan General Construction and Operations Management Plan Atmospheric Environment Follow-Up and Monitoring Plan

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
		120 dB contour for operations blasting.				
Change in vibration – Project-related blasting will increase vibration levels						
• Implement an overpressure and vibration monitoring program on-site	• The implementation of monitoring creates a feedback loop upon which operating practices can be adjusted as needed	The setback analysis for ground vibration results indicate that a 68 m setback is needed. A vibration monitoring of 10 mm/s ground vibration setback was set to identify sensitive receptors requiring monitoring. No receptors were identified within this setback.	Atmospheric Environment Follow-Up and Monitoring Program Measurement of ambient noise levels, overpressure, and vibrations at identified sensitive receptor locations during various mining activities including, but not limited to, near surface blasting activities during site preparation and early operation. The location of monitoring stations will be determined based on a number of factors including locations of maximum predicted noise levels, proximity to residential or sensitive land use areas, MECP siting criteria for noise monitors, etc. and will be reviewed and approved by the MECP. • A log of public concerns raised over nuisance noise levels. • The Follow-up and Monitoring Program will be developed in consultation with regulatory agencies and Indigenous communities.	Results from this testing will be compared to the noise levels predicted in the EIS Addendum and to applicable regulations. Additional monitoring may be employed when the public raises a nuisance noise concern. Additional mitigation will be employed if it is determined that ambient noise levels exceed the applicable regulatory criteria.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Modifying blasting techniques including, but not limited to, changing frequency of blasts with smaller charges, decreasing powder factor, using electric detonation. using air decking, timing of blasts, and coordination of blast patterns toward a partially open face • Use of blasting mats	Atmospheric Quality Management Plan General Construction and Operations Management Plan Atmospheric Environment Follow-Up and Monitoring Plan
WATER QUALITY AND QUANTITY						
Change in groundwater quantity – Project-related activities will result in the lowering of water table levels during operations and closure due to pit dewatering and final lake pit elevations, as well as localized groundwater mounding in relation to the Process Solids Management Facility (PSMF) and Mine Rock Storage Area (MRSA)						
• Limit construction footprint (i.e., SSA) to the extent possible to reduce the potential for reductions in groundwater recharge and limit the number of watersheds overprinted by the SSA • Use standard management and	• Limiting the footprint of disturbance reduces the potential for reductions in groundwater recharge and limits the number of watersheds overprinted by the SSA • A seepage collection system can be used	Groundwater modelling predicts that pit dewatering during the operation phase will lower the water table by up to 0.5 m in overburden and shallow bedrock over an area of approximately 900 m to the north, east, and south, and 500 m to the west of the open pits. Local mounding of the water table is predicted to	Groundwater Follow-Up and Monitoring Program • Measurement of groundwater levels to document changes in level and flow in response to dewatering. • Monitoring groundwater quantity and quality at the receiving environment. A water well survey will be completed within and adjacent to the SSA to confirm the	Results from this monitoring will be compared to those established through the various approvals (e.g. ECA and PTTW). Additional mitigation will be employed if it is determined that the Project results in water quantity levels that exceed criteria set out in the Project approvals process.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Review of water management plan to consider monitored changes in groundwater levels.	Groundwater Follow-Up and Monitoring Plan Water Management Plan

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
construction practices throughout the Project • Install contact water and seepage collection ditches around the perimeter of the MRSA and ore stockpile to mitigate the migration of seepage • Consider accelerating open pit filling at closure to return groundwater levels to post-closure steady-state conditions in a shorter timeframe • Completion of a water well survey within and adjacent to the SSA to confirm the presence of nearby water supply wells	to direct contact water to the PSMF for treatment prior to release to the environment • Shortening pit filling times reduces the duration of drawdown effects on groundwater levels • Water sample survey results provide baseline data that can be used during monitoring and to inform management strategies	increase by up to 10 m within the MRSA as a result of the pile size and magnitude of change in hydraulic conductivity of the MRSA vs. the underlying hydrostratigraphic unit. Groundwater flow and discharge into surface water features will decrease in some watersheds and increase in others. Generally, the groundwater discharge rates for each watershed represent a small component of total flow for the given watershed. Changes to surface water bodies are further discussed in the change in surface water quantity section, below.	results of the MECP water well record (WWR) and permit to take water (PTTW) database review. The existing monitoring well network will be reviewed and enhanced as necessary to ensure appropriate up-, down-, and cross-gradient coverage of key mine infrastructure (e.g. open pit, MRSA, PSMF, water management pond (WMP)). • Water levels, flow (i.e. pumped volumes), and water quality will be measured at regular intervals. • The program will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities.			
<u>Change in groundwater quality</u> – Concentration of select constituents in groundwater will increase as a result of Project-related activities						
• Limit construction footprint (i.e., SSA) to the extent possible to reduce the potential for reductions in groundwater recharge and limit the number of watersheds overprinted by the SSA. • Use standard management and construction practices throughout the Project • Design of the MRSA to increase the amount of runoff and reduce the amount of infiltration through the MRSA, thereby reducing the recharge and loading to groundwater. • Install contact water and seepage collection	• Limiting the footprint of disturbance reduces the number of watersheds overprinted by the SSA and the potential for groundwater interactions with contact water • Reducing the amount of infiltration and installing a seepage collection system reduces the interaction potential between contact water and the surrounding environment • Shortening pit filling times reduces the duration of drawdown	<u>Operation:</u> Groundwater recharge from the MRSA during operation is predicted to exceed the ODWQS and/or GCDWQ for nitrate, nitrite, aluminum, and arsenic, and the APVs for copper, selenium, and vanadium. The concentration of aluminum in background groundwater quality exceeds the ODWQS and GCDWQ operational guidelines. The groundwater recharge from the MRSA is predicted to be below the MDMER. Groundwater recharge from the MRSA is predicted to discharge primarily to the open pits (78%) with the remainder of discharge to	<u>Groundwater Follow-Up and Monitoring Program</u> • Measurement of groundwater levels to document changes in level and flow in response to dewatering. • Monitoring groundwater quantity and quality at upgradient, downgradient, and cross gradient of the MRSA, PSMF, and open pit in addition to groundwater monitoring wells located along the predicted flow paths of seepage from these mine features. • A water well survey will be completed within and adjacent to the SSA to confirm the results of the MECP water well record (WWR) and permit to take water (PTTW) database review. The existing monitoring	Results from this monitoring will be compared to those established through the various approvals (e.g. ECA and PTTW). Additional mitigation will be employed if it is determined that the Project results in water quality levels that exceed criteria set out in the Project approvals process.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Review of water management plan to consider monitored changes in groundwater levels.	Groundwater Follow-Up and Monitoring Plan Water Management Plan

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
ditches around the perimeter of the MRSA and ore stockpile to mitigate the migration of seepage. • Implement progressive rehabilitation (placement of vegetated soil cover) to reduce infiltration into the MRSA and PSMF, thereby reducing the amount of water and loading to groundwater, resulting in improvements to groundwater quality. • Consider accelerating open pit filling at closure to return groundwater levels to post-closure steady-state conditions in a shorter timeframe. • Complete a water well survey within and adjacent to the SSA to confirm the presence of nearby water supply wells.	effects on groundwater levels • Water sample survey results provide baseline data that can be used during monitoring and to inform management strategies	subwatershed 101 (17%) and 102 (5%). Groundwater recharge from the ore stockpile during operation is predicted to be less than the ODWQS and/or GCDWQ and exceed the APV for copper. The groundwater recharge from the ore stockpile is predicted to be below the MDMER. Groundwater recharge from beneath the ore stockpile is captured by the dewatering associated with the Central and South pits where it will be pumped to Collection Pond 1 prior to being transferred to the WMP for use as process water or treated, if required, and discharged to Hare Lake. Groundwater recharge from the PSMF during operation is predicted to be less than the ODWQS, GCDWQ, and APVs. The groundwater recharge from the PSMF is predicted to be below the MDMER. Groundwater recharge from beneath the PSMF discharges primarily to subwatershed 106 (68%) with the remainder of discharge to subwatershed 105 (32%). Groundwater recharge from the WMP during operation is predicted to exceed the ODWQS and/or GCDWQ for nitrate, nitrite, aluminum, and arsenic and the APVs for copper, selenium, and vanadium. The concentration of aluminum in background groundwater quality exceeds the	well network will be reviewed and enhanced as necessary to ensure appropriate up-, down-, and cross-gradient coverage of key mine infrastructure (e.g. open pit, MRSA, PSMF, water management pond (WMP)). • Water levels, flow (i.e. pumped volumes), and water quality (general chemistry and select dissolved metals) will be measured at regular intervals. • The plan will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities.			

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
		ODWQS and GCDWQ operational guidelines. The groundwater recharge from the WMP is predicted to be below the MDMER. Groundwater recharge from beneath the WMP discharges to subwatershed 101, a tributary of the Pic River. Closure: Groundwater recharge from the MRSA during closure is predicted to exceed the ODWQS and/or GCDWQ for nitrate, nitrite, aluminum, and arsenic and the APVs for copper, selenium, and vanadium, which is consistent with seepage quality during operation. The concentration of aluminum in background groundwater quality exceeds the ODWQS and GCDWQ operational guidelines. The groundwater recharge from the MRSA is predicted to be below the MDMER. Groundwater recharge from beneath the MRSA discharges primarily to the subwatershed 101 (62%), a tributary of Pic River. The remainder of groundwater recharge from beneath the MRSA discharges to the North and Central Pits (25%) and subwatershed 102 (13%). Groundwater recharge from the PSMF during closure is predicted to be less than the ODWQS, GCDWQ, and APVs, consistent with seepage quality during operation. The groundwater recharge from the PSMF is				

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
		predicted to be below the MDMER. Groundwater recharge from beneath the PSMF discharges primarily to subwatershed 106 (70%) with the remainder of discharge to subwatershed105 (30%). Groundwater recharge from the WMP during closure is predicted to exceed the ODWQS and/or GCDWQ for nitrate, nitrite, aluminum, and arsenic and the APVs for copper, selenium, and vanadium. The concentration of aluminum in background groundwater quality exceeds the ODWQS and GCDWQ operational guidelines. The groundwater recharge from the WMP is predicted to be below the MDMER. Groundwater recharge from beneath the WMP discharges to subwatershed 101, a tributary of the Pic River. The WMP will be decommissioned in closure, once water quality meets criteria for discharge to the environment.				
<u>Change in surface water quantity</u> – Through the development of Project infrastructure, including the water management system, removal of several watercourses and the contributing drainage areas for subwatersheds within the Local Study Area (LSA) will occur						
• Limit and stage construction footprint (SSA) to the extent practicable • Maintain existing drainage patterns with the use of culverts • Inspect culverts periodically. Remove accumulated material and debris upstream and downstream of the	• Limiting the footprint of disturbance reduces the potential for changes to surface water flow regimes and limits the number of watersheds overprinted by the SSA • Maintaining drainage and flow patterns reduces the change in baseline flow	<u>Construction:</u> • During construction subwatersheds 101, 102, 103, and 106 are expected to have MAFs decrease from baseline conditions by more than 10% (-33%, -98%, -96%, and -36%, respectively):	<u>Surface Water Follow-Up and Monitoring Program</u> • Measurement of water quantity will be conducted at point source discharge locations (e.g. PSMF and MRSA discharge points) and receiving water bodies, such as L8 and L12 and those identified in Table 1 in the response to IR 5-7, including Hare Creek,	Results of monitoring will be compared to the values used in the EIS Addendum, and to applicable regulatory criteria or objectives, and as set out through the approvals process (e.g. ECA). A trigger threshold of Q100 will be applied for flow increase and a threshold of three consecutive months where MMF is 10% less than the predicted MMF for flow reduction.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Review of water management plan to consider monitored changes in surface water levels. • Use the system to attenuate peak discharges and augment baseflows to the environment through use of Project water storage features (i.e.,	Surface Water Follow-Up and Monitoring Plan Water Management Plan

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
culverts to prevent erosion, flooding, habitat damage, property damage, and mobilization of sediment • Maintain access roads by periodically regrading and ditching to improve water flow, reduce erosion, and manage vegetation growth • Attenuate peak discharges and augment baseflows to the environment through use of Project water storage features (i.e., catch basins, collection ponds, SWM ponds) • Collection of runoff and groundwater seepage from the open pits and run-of-mine stockpile within Collection Pond 1 • Excess water pumped from Collection Pond 1 to the WMP for treatment and discharge to Hare Lake • Recycling of contact water for use as process water • Construction and use of existing subwatershed boundaries to divert fresh water away from Project components • Assessment of the downstream watercourse in subwatershed 103 and 112 to implement erosion control measures to reduce the potential for scour and	characteristics within subwatersheds • Proper maintenance of infrastructure allows for operation as designed to better mimic flow conditions • Collecting of run-off and seepage for treatment prior to discharge allows for collection system reduces the interaction of contact water and the surrounding environment, while mimicking flow characteristics • Collecting baseline data and monitoring downstream receivers allows for monitoring and to inform management strategies	– In subwatershed 101, six months of the year during construction do not maintain environmental flows but flows are expected to recover to less than the 10% threshold for MAF during closure and post-closure. – Subwatershed 102 is expected to undergo permanent changes commencing at construction and extending to post-closure. When the pits overflow and subwatershed 102 discharges to the Pic River, the permanent reductions in catchment area result in permanent reductions in flow with MMFs below environmental flows – Subwatershed 103 is predicted to have MMFs that do not maintain environmental flows during construction, with recovery expected above environmental flows once the open pit fills and contributes to the subwatershed MAF during post-closure. – In subwatershed 106, during winter	Hare Lake, and Angler Creek (Stream 6). • Records will include water level, flow gauging, depth and flow profiling. • Monitoring will occur at various times of the year, consistent with ECA and MDMER requirements. All applicable parameters will be monitored at facility commissioning to establish and confirm emissions. • The plan will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities	Additional mitigation will be employed if it is determined that the Project results in water quantity levels that exceed these criteria.	catch basins, collection ponds, SWM ponds) • Monitor receiving watercourses and implement site specific erosion control measures, as needed	

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
erosion to occur, as needed		and sometimes during summer, lower flow periods extending from construction to the time in post-closure where the PSMF commences discharge to subwatershed 106, MMFs do not maintain environmental flows. However, when the PSMF commences discharge to subwatershed 106, flows will recover, and flow change will be less than the 10% MAF screening threshold • Subwatersheds 104, 105, 107, 108, and 109 are expected to have a change in MAF of less than 5% (-1%, -2%, -1%, -4%, and 2%, respectively) due to minor watershed loss from mine components but do not trigger further assessment as they remain below the 10% threshold. <u>Operations:</u> • Changes to contributing subwatersheds during operation is expected to be consistent with the subwatershed areas during construction. Dewatering of the				

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		open pits is expected to lower the groundwater levels and reduce groundwater contribution to surface water within the vicinity of the open pits. Dewatering of the open pits is anticipated to increase the maximum discharge rate for the average-year return period to Hare Lake during operation to 0.092 m3/s. The increased discharge rates are expected to increase Hare Lake water levels during operation by 1.16 cm compared to baseline conditions, an increase of 4%, considered to be insignificant. • Subwatersheds 101, 102, 103, and 106 are expected to have MAFs decrease from baseline conditions by more than 10% (-22%, -97%, -95%, and -33%, respectively) and trigger further assessment: – In subwatershed 101, two months of the year during operation do not maintain environmental flows but flows are expected to recover to less than the 10% threshold for				

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		MAF during closure and post-closure. – Subwatershed 102 is expected to undergo permanent changes commencing in construction and extending to post-closure. – Subwatershed 103 is predicted to have MMFs that do not maintain environmental flows during operation, with recovery expected above environmental flows once the open pits fill and contributes to the subwatershed flows during post-closure. – In subwatershed 106, during winter lower flow periods extending to post-closure when the PSMF commences discharge to subwatershed 106, MMFs do not maintain environmental flows. However, when the PSMF commences discharge to subwatershed 106, flows will recover and be less than the 10% MAF screening threshold. • Subwatersheds (105 and 112) are expected to have an				

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		increase in MAF greater than 10% (12% and 53%, respectively), triggering additional assessment for Q100 flood flows. The analysis of flood flows resulted in subwatersheds 105 and 112 having a maximum flood flow increase of -1% and 1% compared to baseline flood flow estimates as the discharge to Hare Lake in subwatershed 105 and the change in groundwater contribution to subwatershed 112 during flood flow conditions are minor compared to the overall flow. The increase in MAF for subwatershed 105 is expected to recover during closure and post-closure conditions when the discharge to Hare Lake discontinues. The groundwater change triggering the increase in MAF to subwatershed 112 is expected to be non-reversible due to the mounding from the filled pit lake. • Subwatersheds 104, 107, 108, 109, 110, 111, 113, 114, 115, 116, and 117 are expected to have a change in MAF of				

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
		less than 10% (4%, -1%, -7%, 4%, 4%, 5%, 4%, 3%, 1%, 1%, and 3%, respectively) due to minor baseflow changes from groundwater contribution and/or subwatershed loss from Project components. • The resulting change in the Pic River MAF from Project activities is expected to be negligible (-0.15% - construction) (-0.13% - operation) due to the small percentage of Pic River watershed affected by the Project. <u>Closure:</u> • During the closure phases, the removal of Project infrastructure and rehabilitation of disturbed areas will recover some of the contributing subwatershed area changes seen during construction and operation. Contact water associated with the ore stockpile, open pits, and MRSA will continue to be sent to the open pits to accelerate pit filling and will not contribute to applicable subwatershed MAFs. During closure two scenarios were				

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		assessed for subwatersheds 102 and 103: MRSA catch basins discharge to subwatersheds 102 and 103, respectively, if effluent discharge quality met effluent criteria during Year 6 of closure, or continued MRSA discharge to the open pits if effluent criteria was not met. If subwatershed 102 and 103 meet discharge criteria and the catch basin walls are breached to allow discharge to the environment, the MAF is expected to be reduced from baseline conditions by 66% and 73%, respectively. If subwatershed 102 and 103 do not meet discharge criteria and continue to get pumped to the open pits, the MAF is expected to be reduced from baseline conditions by 98% and 95%, respectively. Subwatershed 102 is expected to undergo permanent changes commencing in construction and extending to post-closure, with MMFs not maintaining environmental flows during both closure				

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		scenarios. Subwatershed 103 is predicted to have MMFs that do not maintain environmental flows during both scenarios of closure, with recovery of the MAF not exceeding the 10% trigger threshold once the open pits fill and contributes to the subwatershed. • Two scenarios were assessed for subwatershed 106: PSMF discharge to subwatershed 106 if effluent discharge quality met effluent criteria during Year 6 of closure, or continued PSMF discharge to the open pits if effluent criteria was not met. The closure concept for the PSMF covers Type 1 process solids and submergence of Type 2 process solids. Runoff from the surface of the PSMF will be routed to internal constructed wetlands prior to release. When discharge from the PSMF to subwatershed 106 proceeds, the change to the MAF for subwatershed 106 is anticipated to be a 4% reduction and does not trigger further assessment. If				

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		discharge from the PSMF continues to be pumped to the open pit, the change in MAF for subwatershed 106, is expected to be maintained at a -33% reduction from operation. MMFs assessed for the -33% reduction in MAF indicated MMFs were not expected to maintain the environmental flows during closure, however recovery was expected during post-closure. • One subwatershed (112) is expected to have an increase in MAF of 58%, triggering additional assessment for Q100 flood flows. The analysis of flood flows resulted in subwatershed 112 having a maximum flood flow increase of 1% compared to baseline flood flow estimates as the change in groundwater contribution to subwatershed 112 during flood flow conditions are minor compared to the overall flow. • Subwatersheds 101, 104, 105, 107, 108, 109, 110, 111, 113, 114, 115, 116, and 117 are expected to have a change in				

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
		MAF of less than 10% (8%, 5%, -1%, -1%, -8%, 5%, 5%, 6%, 5%, 4%, 1%, 1%, and 4%, respectively) due to minor baseflow changes from groundwater contribution and/or subwatershed loss from mine components. Further assessment was not completed as the thirteen subwatersheds remain below the 10% change in baseline MAF threshold. • During post-closure, the pit lake will have been filled and water will overflow from the north pit lake under the MRSA within subwatershed 103, where it will be discharged to the existing stream within subwatershed 103. The resulting change in natural subwatershed area due to the redirection of water from the south and central pits previously associated with subwatershed 102 increases the subwatershed area in 103. The resulting change in MAF is expected to be an increase of 74%, triggering additional assessment for flood flows (Q100) which				

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		estimated an 88% increase compared to baseline Q100 conditions • During post-closure, the PSMF will discharge to subwatershed 106. The MAF for subwatershed 106 is anticipated to be consistent with the discharge scenario during closure, of a 4% reduction from baseline flows. • Consistent with closure, subwatershed 112 is expected to have an increase in MAF of 58%, triggering additional assessment for Q100 flood flows. (see above)				
<u>Change in water quality</u> – Incremental change in concentrations of constituents relative to baseline conditions						
• Develop and implement a site-wide water management plan that provides an integrated framework to manage water quality that includes provision for water management practices for each of the primary site aspects, as well as areas of the site where there is contact water. This plan will have specific components related to mercury and phosphorus. • Develop and implement a mine waste management plan that	• Collecting, management and treatment of site water reduces the interaction of contact water and the surrounding environment • The proper management of Type 2 reduces potential for acid generation • Proper management and storage of explosives reduces the potential for nitrogen to enter water • Collecting baseline data and monitoring receivers allows for	<u>Construction:</u> • The primary potential water quality change associated with the construction phase of the Project is the mobilization of suspended material into natural surface water features as the result of land clearing activities. Waters (e.g., runoff) associated with areas under development will be collected and either stored within management infrastructure (e.g.,	<u>Surface Water Follow-Up and Monitoring Program</u> • Measurement of water quality will be conducted at point source discharge locations (e.g. PSMF, SWM pond, and MRSA discharge points) and within the open pits (during active closure). • Water quality will also be measured in surface water receiving environments (e.g. Hare Lake, Stream 6 [post closure], Pic River) consistent with ECA and metal and diamond mining effluent regulations (MDMER) requirements. Additional sampling will be completed at	Results of monitoring will be compared to the values used in the EIS Addendum, and to applicable regulatory criteria or objectives, and as set out through the approvals process (e.g. ECA). Specific triggers will also be established for mercury. Additional mitigation will be employed if it is determined that the Project results in water quality levels that exceed these criteria. During closure, pit lake water quality monitoring will be used as a trigger for discharge to the natural environment.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Reviewing the water management plan to consider monitored changes in surface water levels. Employ active means (e.g., filtering), if required to achieve low TSS levels in discharge, in addition to passive means such as settling and clarification in the WMP to manage TSS in the effluent stream to low levels, including in situ water treatment if necessary • Employ passive treatment technology such as permeable reactive barriers	Surface Water Follow-Up and Monitoring Plan Water Management Plan Acid Rock Drainage/ Metal Leaching Management Plan

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
is keeping with the principals of the mine waste management strategy that has been presented in the original EIS based on the geochemical characterization on the mine waste materials. • Incorporate field test cells into the monitoring programs to inform water management and closure planning • For operations, develop and implement appropriate operating practices for explosives and blasting operations to reduce nitrogen residuals in mine water • For operations, collect surface water drainage associated with the MRSA and manage these waters so that there will not be a routine discharge to the Pic River • For operations, monitor constituent concentrations in MRSA catchbasins and increase water transfer rates to the WMP, as necessary • For operations, monitor and report on PGMs within effluent discharge • Maintain the water management system in place during the closure phase of the Project until such time that water quality is suitable to release to the environment	monitoring and to inform management strategies	PSMF water management ponds) or potentially released into natural surface water features once it is safe to do so – that is, suspended solids levels in the water would be at acceptable levels. No downstream effects to local surface waters are expected. <u>Operations:</u> • During operations, the primary potential water quality effect from the project is the discharge of excess water from the site water management system to Hare Lake. Based on the mine waste testing programs completed to date, phosphorus, as well as total suspended solids (TSS), have been identified as potential management needs. This testing indicates that low levels of metals/metalloids will be generated but, overall, they are not expected to represent a potential risk to water quality in the receiving environment. • With respect to phosphorus, it is noted that a phosphorus (phosphate) based reagent is planned to	waterbodies of interest near the SSA (e.g. Hare Creek, Stream 1, subwatershed 101, 102 and 103). Proposed monitoring locations are illustrated on Figure 1 in Attachment A of IR5-3. • Records will include water quality sampling for a full suite of constituents including metals (total and dissolved)(e.g. mercury/ methyl mercury, PGMs), anions (including sulphate), nutrients (phosphorus, nitrogen), organic carbon, alkalinity, hardness, pH, alkalinity, conductivity, temperature, dissolved oxygen. • Toxicological monitoring will be completed through fish tissue sampling. • Monitoring will occur at various times of the year, consistent with ECA and MDMER requirements. All applicable parameters will be monitored at facility commissioning to establish and confirm emissions. • The plan will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities.		• Should developed areas with potential to affect water quality be identified, they will be isolated and specific water and sediment control management practices would be implemented to ensure that any water released to natural surface water drainages would be suitable for release and that water quality in these natural surface water drainages would be protected • Prepare effluent treatment strategies specific to water quality levels identified through monitoring.	

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• Monitor and manage effluent, including contingency for effluent treatment as may be required, so that water discharge objectives are achieved as defined in applicable provincial and federal regulatory instruments • Develop and implement focused monitoring programs on waterbodies such as the Pic River extending downstream of the SSA to the mouth of Lake Superior, Hare Lake, the outlet of Hare Creek at Port Munro and Stream 6 (Angler Creek) and the outlet at Sturdee Cove that have significance to Indigenous communities • Work with the associated communities to develop and implement the program and develop a framework to share the results for the purpose of assessing the performance of the water management system.		be used in the floatation circuit. Conservatively, it can be assumed that this phosphorus will remain in the dissolved form within the process water stream. In this case, the dissolved phosphorus would be at levels at end of pipe that could result in phosphorus concentrations that are greater than background and exceeding relevant receiver water quality objectives, without appropriate management. Therefore, there is potential for nutrient enrichment (increased primary productivity) in Hare Lake if not mitigated. <u>Closure:</u> • During the closure phase, once contact and process water quality has stabilized the water management system will be decommissioned. At this time natural surface water drainage will be restored. It is noted that the predictions provided for the post-closure phase, though conservative in nature, are provided for planning purposes. GenPGM will not release water				

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		to the environment from its care and control until such time as monitoring data demonstrate it is safe to do so.				
Change in Sediment Quality -Accumulation of constituents in sediments						
• Reduce the level of interaction between aquatic habitat features and Project infrastructure • Comply with water discharge requirements as defined in the Metal and Diamond Mining Effluent Regulations (MDMER) and Environmental Compliance Approval (provincial) • Employ standard management practices for erosion control such as: – Isolating disturbed areas with sediment fences or similar structures – Maintaining appropriate work area setbacks from surface water features – Grading and/or covering surfaces to reduce erosion potential – Controlling runoff from erosion-sensitive features – Providing settling ponds or basins in which solids can be collected (i.e., WMP and SWM Pond)	• Limiting interaction between aquatic habitat features and Project infrastructure reduces the potential for cross-contamination of sediment • Employing best management practices and complying with the MDMER and ECA criteria reduces potential for discharge water to reduce sediment quality	During construction and operations, the primary potential sediment quality effect from the Project is the discharge of excess water from the water management system to Hare Lake. It is noted that discharge is not anticipated during the construction phase. There continues to be some risk of transport of solids to watercourses or water bodies through erosion of disturbed areas, though the risk is low and the potential effects are readily mitigatable. The discharge to Hare Lake has the potential to change the concentrations of water quality constituents from background, and in turn this could affect sediment quality. Predictions of sediment quality note incremental increases seen in sediment constituent concentrations in Hare Lake are generally within the background variability seen for individual constituents in Hare Lake based on baseline data and therefore are essentially indistinguishable from existing constituent levels. The exceptions to this pattern are molybdenum	<u>Sediment and Benthos Follow-Up and Monitoring Program</u> • Sampling of fish communities, including sediments, and benthic communities at receiving watercourses (i.e. Hare Lake and Pic River) will be conducted in accordance with Environment Canada and Climate Change (ECCC) Environmental Effects Monitoring (EEM) program. Additionally, subwatershed 101, 102 and 103 will be monitored. • Pre-operational surveys will be conducted at Hare Lake and Pic River to further characterize baseline conditions and ongoing sampling will be completed in accordance with ECCC's EEM program guidelines, MDMER requirements throughout the operation of the mine, and in accordance with the closure plan. • The plan will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities.	Results of monitoring will be compared to the values used in the EIS Addendum, and to applicable regulatory criteria or objectives, and as set out through the approvals process (e.g. ECA). Additional mitigation will be employed if it is determined that the Project results in sediment quality levels that exceed these criteria.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Reviewing the water management plan to consider monitored changes in surface water levels. Employ active means (e.g., filtering), if required to achieve low TSS levels in discharge, in addition to passive means such as settling and clarification in the WMP to manage TSS in the effluent stream to low levels. • Should developed areas with potential to effect water quality be identified, they will be isolated and specific water and sediment control management practices would be implemented to ensure that any water released to natural surface water drainages would be suitable for release and that water quality in these natural surface water drainages would be protected • Prepare effluent treatment strategies specific to water and sediment quality levels identified through monitoring.	Fish and Fish Habitat Follow-Up and Monitoring Plan Sediment and Benthos Follow-Up and Monitoring Plan Fish and Fish Habitat Follow-Up and Monitoring Plan Soils and Terrain Follow-Up and Monitoring Plan Erosion and Sediment Control Management Plan Water Management Plan Soil Salvage and Storage Management Plan

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		and vanadium. For molybdenum, the LEL and SEL are 13.8 mg/kg and 1,239 mg/kg, respectively. For vanadium, the LEL and SEL are 35.2 mg/kg and 160 mg/kg, respectively. The maximum predicted molybdenum level in Hare Lake is about half the LEL, and therefore no effects on aquatic biota would be expected. For vanadium, the average and maximum predicted concentrations are 39.6 mg/kg and 49.6 mg/kg, respectively. The maximum predicted vanadium concentration is greater than the LEL but well below the SEL.				
FISH AND FISH HABITAT						
<u>Lethal effects to fish</u> – The loss of approximately 9.22 ha of fish-bearing habitat may result in mortality to fish						
• Fish habitat/ HADD offsetting • Avoid waterbodies of importance to local land users and Indigenous communities, to extent practical • Avoid use of explosives near water and, when near water, comply with DFO Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters • Planning in-water work to respect applicable fish timing windows • Conduct in-water works during low flow periods • Prepare and executive a fish salvage plan prior to in-water works • Design intake and discharge infrastructure	• An offset for loss of fish habitat provides mitigation for the death to fish and the loss of their habitat • Proper management of explosives reduces the introduction of nitrogen into water • Planning in-water activities to occur outside of the fish breeding timing windows reduces potential effects to fish while spawning and in their juvenile life stage • Conducting salvage activities allows for the relocation of fish • Designing Project infrastructure to restrict the passage of fish reduces the potential	The Project related lethal effects to fish associated with overprinting of 9.22 ha of existing fish habitat that may result in death to fish, which will require Authorization under Section 34.4(2) of the Fisheries Act. Blasting is proposed to occur beyond the estimated setback thresholds and lethal effects to fish as a result of these activities are not expected.	<u>General Construction and Operations Management Plan</u> • Confirm Project footprint is consistent with SSA • Monitor access road and Camp 19 Road for potential stability issues <u>Fish and Fish Habitat Follow-Up and Monitoring Program</u> • Sampling of fish communities, including tissue sampling, sediments, and benthic communities at receiving watercourse (i.e. Hare Lake and Pic River) will be conducted in accordance with Environment Canada and Climate Change (ECCC) Environmental Effects Monitoring (EEM) program. Pre-operational surveys will be conducted at Hare Lake and	Results of sampling and monitoring will be compared to assess for lethal effects to fish beyond what was predicted within the EIS Addendum and fish habitat compensation plan. Additional mitigation will be employed if it is determined that the Project results in lethal effects to fish beyond what was predicted through the EIS Addendum and compensation plan.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Review and modification of the Fish and Fish Habitat Offsetting Plan Update • Identification of additional offsetting measures	Fish and Fish Habitat Follow-Up and Monitoring Plan Fish Habitat Offsetting Strategy and Compensation Plan General Construction and Operations Management Plan (compliance monitoring) Erosion and Sediment Control Management Plan

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
to prevent entrainment or impingement of fish • Implement an Erosion and Sediment Control Plan	for fish to enter into the water management infrastructure (i.e. the MRSA catch basins or PSMF) • Proper Erosion and Sediment Control measures reduce the potential for sediment to enter waterbodies		Pic River to further characterize baseline conditions and ongoing sampling will be completed in accordance with ECCC's EEM program guidelines, MDMER requirements throughout the operation of the mine, and in accordance with the closure plan. • Monitoring programs specific to fish habitat compensation measures implemented will be developed. The scope and nature of the programs will depend on scope and nature of the compensation provided and will be communicated as part of the Fish Habitat Compensation Plan. Compensation related monitoring would be implemented following completion of the individual compensation-related works. • The plan will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities.			Water Management Plan
<u>Change resulting in direct physical harmful alteration, disruption or destruction (HADD)</u> – Loss of approximately 15.07 ha of aquatic habitat, with an offset of approximately 9.22 ha, resulting in a net loss of 6 ha						
• HADD offsetting • Mine design optimization • Avoid waterbodies of importance to local land users and Indigenous communities, to extent practical • Avoidance of more sensitive habitats to the extent practicable • Design infrastructure including pipeline crossings and outfalls, and road crossings using best management practices	• An offset for HADD provides mitigation for the death to fish and the loss of their habitat • Avoidance of waterbodies of significance (i.e. Bamoos Lake) reduces the effect of the Project on local land users • Avoidance of sensitive fish habitat preserves these areas for continued use by fish • Designing infrastructure to provide passage for	The Project will result in the loss of approximately 9.22 ha of habitat frequented by fish. The total amount of required offset associated with the HADD, as a result of the development (and subsequent operation) of the site, has been estimated to be 9.22 ha. Of this, approximately 2.5 ha are specific to indirect impacts to fish habitat due to flow reduction in Stream 6 (106) subwatershed. The direct (or footprint) effects	<u>General Construction and Operations Management</u> • Confirm Project footprint is consistent with SSA <u>Fish and Fish Habitat Follow-Up and Monitoring Program</u> • Sampling of fish communities, including tissue sampling, sediments, and benthic communities at receiving watercourse (i.e. Hare Lake and Pic River) will be conducted in accordance with Environment Canada and Climate Change (ECCC)	Results of sampling and monitoring will be compared to assess for lethal effects to fish beyond what was predicted within the EIS Addendum and fish habitat compensation plan. Additional mitigation will be employed if it is determined that the Project results in lethal effects to fish beyond what was predicted through the EIS Addendum and compensation plan.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Review and modification of the Fish and Fish Habitat Offsetting Plan Update • Identification of additional offsetting measures	Fish and Fish Habitat Follow-Up and Monitoring Plan Fish Habitat Offsetting Strategy and Compensation Plan General Construction and Operations Management (compliance monitoring)

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
to minimize disturbance to the existing watercourses • Adherence, as applicable, to the Interim Code of Practice for fish protection screens, cofferdams, diversion channels, and temporary stream crossings	fish prevents the creation of barriers to fish passage	include several small waterbodies and associated connecting channels that will be within the footprint of mine-related infrastructure (open pits, MRSA, PSMF) in the SSA. The primary fish bearing subwatersheds that will be overprinted are 101, 102, 103 and 106. No direct impacts are expected with respect to the Pic River. Construction / implementation of offsetting measures are likely to occur during the phased approach of closure when the PSMF will be reclaimed, and surface water features will be created to restore the natural drainage patterns in Stream 6 (106 subwatershed).	Environmental Effects Monitoring (EEM) program. Pre-operational surveys will be conducted at Hare Lake and Pic River to further characterize baseline conditions and ongoing sampling will be completed in accordance with ECCC's EEM program guidelines, MDMER requirements throughout the operation of the mine, and in accordance with the closure plan. • Monitoring programs specific to fish habitat compensation measures implemented will be developed. The scope and nature of the programs will depend on scope and nature of the compensation provided and will be communicated as part of the Fish Habitat Compensation Plan. Compensation-related monitoring would be implemented following completion of the individual compensation-related works. • The plan will be in place for all Project phases and will be developed in consultation with DFO, regulatory agencies, and Indigenous communities			
<u>Change in water quantity (as it relates to fish)</u> – Indirect HADD due to redirection of water from upper portions of subwatersheds in the Site Study Area (SSA), specifically in subwatersheds 101 and 106. Flows in these subwatersheds are anticipated to return to normal post-closure.						
• Design, install and maintain culverts in accordance with DFO and MNR operational statements, guidelines and protocols *See also Change in Water Quantity in Water	• Designing infrastructure to provide passage for fish prevents the creation of barriers to fish passage	• As a result of overprinting portions of subwatersheds in the SSA there is a loss and redirection of water from the upper portions of these systems, resulting in a reduction in the flow at more downstream reaches of the	See change in water quantity	See change in water quantity	See change in water quantity	See change in water quantity

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
		tributaries. Subwatershed specific changes in water quantity are discussed in detail above. • The flow in subwatersheds 102 and 103 will essentially be lost due to their overprinting by the open pit and mine rock stockpile footprints. Flows in Stream 6 will be reduced during the construction and operation phases by 36% and will also constitute an indirect HADD. • Stream 1 (subwatershed 101) flows will be diminished for the operational life of the mine but will be returned to a similar MAF (+8%) following closure and report to the Pic River. • Following the acceptability of water quality in the rehabilitated PSMF, discharge from the PSMF will be directed to the environment. The total contributing watershed area will be increased to 10.15 km^2, leaving a reduction of 4% in MAF from the baseline in Stream 6, during post-closure.				
Change in water quality (as it relates to effects to fish) – Incremental change in concentrations of constituents relative to baseline conditions						

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
• Avoid waterbodies of importance to local land users and Indigenous communities, to extent practical • Plan activities near water such that deleterious materials do not enter watercourse • Implement a Spill Prevention and Response Plan (SPRP) • Whenever possible, operate machinery on land above the high-water mark, on ice, or from a floating barge in a manner that limits disturbance to the banks and bed of the waterbody • Limit access to waterbodies and banks to protect riparian vegetation and limit bank erosion • Promptly stabilize shoreline or banks disturbed by activities associated with the Project to prevent erosion and/or sedimentation • Implementation of an Erosion and Sediment Control Plan (ESCP) • Follow the DFO interim code of practice for temporary stream crossing, culvert maintenance and the waste rock management plan. • Implement Follow-up Monitoring and Environmental Management Plans.	• Avoidance of waterbodies of significance (i.e. Bamoos Lake) reduces the effect of the Project on local land users • Avoidance of sensitive fish habitat preserves these areas for continued use by fish • Proper design and construction practices prevent the release of sediment and deleterious substances to fish habitat • Designing infrastructure to provide passage for fish prevents the creation of barriers to fish passage	See change in water quality	See change in water quality	See change in water quality	See change in water quality	See change in water quality

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
*See also Lethal Effects to fish, Change in Water Quality in Water VEC, and soils VEC.						
Change in benthic invertebrate communities – Direct loss and indirect impairment of benthic communities through the loss of habitat (e.g. HADD), and indirect loss due to changes in water quantity, changes to concentrations of constituents in sediments						
• Implementation of an Erosion and Sediment Control Plan (ESCP) • Maintaining appropriate work area setbacks from surface water features • Avoid use of explosives near water and, when near water, comply with DFO Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters • Controlling run-off from erosion-sensitive features • Providing settling ponds or basins in which solids can be collected *See also Lethal Effects to fish and HADD.	• Employing ESC measures and providing setbacks reduces potential for release of sediment to adjacent waterbodies • Proper management and storage of explosives reduces the potential for overpressure effects to fish and the potential release of nitrogen to water	• Direct and indirect impacts to the benthic invertebrate community will be realized through overprinting and changes in flows due to the development of the Project, which are discussed in detail above. These impacts will require offset under the *Fisheries Act* and *MDMER*. • The predicted incremental increases in constituent sediment levels are on average essentially indistinguishable from existing constituent levels. Following the cessation of mining operations, the discharge to Hare Lake will cease. It would be expected at this time that since water quality will return to background levels a new water-sediment equilibrium will be reached over time that sees sediment recovery to pre-discharge conditions. This change is also expected to normalize any changes to benthic	Fish and Fish Habitat Monitoring Program • Sampling of fish communities, including tissue sampling, sediments, and benthic communities at receiving watercourse (i.e. Hare Lake and Pic River) will be conducted in accordance with Environment Canada and Climate Change (ECCC) Environmental Effects Monitoring (EEM) program. Pre-operational surveys will be conducted at Hare Lake and Pic River to further characterize baseline conditions and ongoing sampling will be completed in accordance with ECCC's EEM program guidelines, MDMER requirements throughout the operation of the mine, and in accordance with the closure plan. • A program consistent with EEM will be developed to monitor metal levels in fish tissues in response to concerns that metal tissue levels will be affected by discharge from mine releases. Specifically, the program will focus on recreational, food fish and /or fish collected as part of an indigenous fisheries. Interested stakeholders, including the public, Indigenous peoples and the government will be consulted when designing the program. • The plan will be in place for all Project phases and will be	Results of sampling and monitoring will be compared to assess effects to benthic invertebrate communities beyond what was predicted within the EIS Addendum and fish habitat compensation plan. Additional mitigation will be employed if it is determined that the Project results in effects to benthic invertebrate communities beyond what was predicted through the EIS Addendum and compensation plan.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Review and modification of the water management plan to consider monitored changes in surface water levels. • Prepare effluent treatment strategies specific to water quality levels identified through monitoring.	Fish and Fish Habitat Monitoring Program General Construction and Operations Management (compliance monitoring) Erosion and Sediment Control Management Plan Atmospheric Quality Management Plan (Overpressure and Vibration management)

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
		invertebrate communities.	developed in consultation with regulatory agencies and Indigenous communities.			
TERRAIN AND SOILS						
Change in soil and overburden quantity – Soil disturbance as a result of site preparation and construction including the potential for soil loss due to erosion						
• Mine design optimization • Committing to stockpiling soil and overburden materials for later use in site rehabilitation activities. • Ensuring that soil/overburden stockpiles that are created to facilitate development of the site have appropriate slopes, and maintaining the piles to prevent erosion and slide hazard. • Limiting potential erosion of disturbed areas and / or soil stockpiles by implementing appropriate erosion and sediment control measures (i.e., seeding) to stabilize these areas • Implement Follow-up Monitoring and Environmental Management Plans.	• Optimizations to the mine design reduces areas of disturbance • Stockpiling and stabilizing of overburden for re-use on site reduces/eliminates that amount of imported soil required for reclamation • Stabilizing soils and employing ESC measures reduces potential for release of sediment to the adjacent environment	Changes in soil quantity may be associated with each project phase but are principally associated with construction, and to a lesser extent operations. During construction, topsoil and overburden will be removed to clear and excavate the Project site (SSA). It is estimated that approximately 2.0 M m^3 of soil and overburden will be excavated and stockpiled to facilitate site development. This material will be relocated to a single stockpile south of the MRSA. An additional 674,000 m^3 will be excavated and placed in several small stockpiles along the western margin of the PSMF. Once created, the soil and overburden stockpiles have the potential to present a slide hazard due to erosion.	Soil and Terrain Follow-Up and Monitoring Program • Evaluation of man-made structures for geotechnical stability will be conducted regularly during various Project phases. • As-built evaluations will be completed by qualified engineers as development occurs to ensure adherence to design. PSMF dam inspections will occur regularly and into the closure phase. • A soils salvage and storage management plan will be developed to identify the suitability of materials stockpiled during stripping for reclamation purposes. The plan will include a strategy for storage of these materials.	Additional mitigation measures including maintenance activities and design improvements/ modifications will be undertaken upon completion of as-built evaluations at the discretion of the qualified engineer.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • A review of soil stockpiling techniques and erosion protection measures to mitigate any unforeseen scenarios	Soil and Terrain Follow-Up and Monitoring Plan General Construction and Operations Management (compliance monitoring) Erosion and Sediment Control Management Plan Soil Salvage and Storage Management Plan Reclamation and Closure Plan
Change in soil quality – Potential incremental increase in soil constituent concentrations as a result of Project-related fugitive air emissions						
• Limiting fugitive dust emissions on the PSMF and MRSA by incorporating design features such as wind breaks. • Limiting fugitive emissions by watering	• Managing dust through active and passive controls reduces potential for fugitive dust emissions that could contaminate soils	Changes in soil quality may be associated with each Project phase, but are principally associated with construction and operations as the likelihood and rates of fugitive air emissions are greater during these	Atmospheric Environment Follow-Up and Monitoring Program • Soil sampling will be conducted at identified air quality monitoring locations (see Figure 5 of Appendix D1 of the EIS Addendum). Samples will be analyzed for metals to	Results of sampling will be compared to the appropriate federal and provincial metal deposition criteria and to the predictions in the EIS Addendum. Additional mitigation will be employed in the event that the Project results in measured	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Use of alternative / additional dust suppressants on soil stockpiles	Soil and Terrain Follow-Up and Monitoring Plan General Construction and Operations Management

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
construction areas in development, as well as roads and throughways used by mobile equipment and trucks. • Limiting fugitive dust emissions by progressively rehabilitating disturbed areas of the project site as quickly as is practical. • Implement Follow-up Monitoring and Environmental Management Plans.		periods. The results of the air quality modelling predict low levels of fugitive emissions below applicable criteria. In keeping with those predictions, no quantitative predictions of changes in soil quality were considered warranted since, as indicated, there is no expectation that constituents associated with fugitive emissions would accumulate in soils in the study area.	provide a direct measure of metals deposition. The plan will be in place for all Project phases. • The plan will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities. <u>Soil and Terrain Follow-up and Monitoring Program</u> • A soils salvage and storage plan will be developed to identify the suitability of materials stockpiled during stripping for reclamation purposes. The plan will include a strategy for storage of these materials. • The plan will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities	levels being greater than these criteria.		(compliance monitoring) Erosion and Sediment Control Management Plan Atmospheric Environment Monitoring Program
VEGETATION						
<u>Change in forest cover</u> - Direct loss of approximately 1,081 ha of forest and potential indirect change or impairment of approximately 842 ha of forest cover						
• Mine design optimization • Implement standard construction best practices to reduce interactions with vegetation • For Transmission corridor: – No grading or stripping – Vegetated buffer zones (slope-dependent) will be left between the line and sensitive habitats – Lower vegetation and brush will be left in place	• Optimizations to the mine design reduces areas of disturbance • Proper vegetation management practices reduce the amount of vegetation removed or damaged • Progressive reclamation allows for vegetation to become self-sustainable sooner • Management of invasive species improves ability for native species to succeed	• Project site development and construction will result in the long-term loss of approximately 1,081 ha of forest. • Forest communities in affected areas of the SSA are not predicted to return to original forest conditions. Forest regrowth will occur after closure in areas where soils and topography are suitable for tree growth.	<u>General Construction and Operations Management</u> • Confirm Project footprint is consistent with SSA. <u>Vegetation Follow-Up and Monitoring Program</u> • Surveillance monitoring will occur around the SSA to identify the presence, colonization and encroachment of invasive and noxious plants within and around disturbed areas of the Project site. • The plan will be in place for all Project phases and will be developed in consultation with	Any clearing that may occur outside the SSA would necessitate restoration. Should monitoring identify the presence, colonization and or encroachment of invasive or noxious plants within or around disturbed areas of the Project site they will be removed.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Review and refinement of the Closure Plan • A review of the invasive species awareness and control program	General Construction and Operations Management (compliance monitoring) Vegetation Follow-Up and Monitoring Program

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
– Disturbed soil will be stabilized to assist vegetation regrowth and to control erosion – Hand-clearing of vegetation will be used at sensitive stream crossings and within erosion control zones to reduce soil disturbance • Progressively rehabilitating disturbed areas of the Project site as quickly as is practical with seed and non-invasive vegetation • Implement invasive species awareness and control program *See also Change in Air Quality and Dustfall		• After mitigation, negligible effects on vegetation are expected due to dustfall. Effects from dust deposition due to construction, operation and active closure activities will be localized to 30 m from the SSA. Other edge effects will likely vary with local topography, aspect, and other factors, and will be broadly comparable to those experienced in clear-cuts associated with commercial forestry in the Pic FMU or along forest access roads. • Areas within the SSA and LSA may be affected by the spread of invasive species by new roads, construction equipment and vehicles or imported fill. Vegetation communities within 30 m of the SSA will be most susceptible to the introduction of invasive and non-native species.	regulatory agencies and Indigenous communities.			
<u>Change in non-forest cover</u> – Direct loss or indirect impairment of approximately 38 ha of non-forested wetlands, non-forested upland communities and sparsely vegetated open water habitat						
*See Change in forest cover		The Project is predicted to result in the loss of 21.4 ha of open wetlands and an additional 9.8 ha of sparsely vegetated open water habitat within the SSA. An additional 6.8 ha of non-forested upland will also be removed. 6.0 ha of	<u>General Construction and Operations Management</u> • Confirm Project footprint is consistent with SSA.	Any clearing that may occur outside the SSA would necessitate restoration. Should monitoring identify the presence, colonization and or encroachment of invasive or noxious plants within or around	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Review and refinement of the Closure Plan	General Construction and Operations Management (compliance monitoring) Vegetation Follow-Up and

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
		wetland would potentially have indirect effects from groundwater increase, mainly near the PMSF and approximately 1.0 ha could be affected by predicted groundwater drawdown, primarily near the pit and MRSA.		disturbed areas of the Project site they will be removed.	• A review of the invasive species awareness and control program	Monitoring Program
<u>Change to regionally and provincially rare plant species</u> – Transplantation of two occurrences of provincially rare algae pondweed and regionally rare Oakes pondweed. Transplant of one occurrence of provincially rare alpine woodsia.						
• Transfer reproductive structures of rare plant species within the SSA to suitable locations *See also Change in forest cover	• Transplanting rare plant species provides an opportunity for the species to continue to grow and reproduce	The Project will permanently remove the habitat for one occurrence of the provincially rare alga pondweed and two adjacent occurrences of the regionally rare Oakes' pondweed. This loss can be partially mitigated by transplanting individuals to receptor lakes in the adjacent landscape, with an estimated moderate to high degree of success. One occurrence of the provincially rare alpine woodsia will also be permanently removed. Transplanting the affected cliff ferns to other suitable habitat outside the LSA is anticipated to have moderate potential for mitigating this loss.	<u>Vegetation Follow-Up and Monitoring Program</u> • Transplanted Pondweed will be monitored at least once during the first season following transplanting, and attempts will be made to visit them during the optimal season to detect flowering. • Transplanted ferns (i.e. alpine woodsia) will be monitored at least twice during the summer after transplanting and watered if necessary. Survivorship monitoring will be conducted the following two years. • Documentation on the success of transplant methods will be provided to MNDMNRF as the information will be helpful in other similar situations in the future • The plan will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities	In the event that other regionally or provincially rare plant species are identified through detailed design or vegetation monitoring additional protection or transplant measures will be explored.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • The development of a plan to protect the species and its habitat • If protection is not feasible develop a relocation/transplant strategy.	Vegetation Follow-Up and Monitoring Program
<u>Change to plant species of interest to Indigenous Communities -</u> Removal of habitat that supports plant and fungus species of interest to Indigenous communities from the SSA						
*See Change in forest cover		The removal of habitat that supports plant and fungus species of interest to Indigenous communities from the SSA is not anticipated to affect the viability of populations of these species in the LSA and RSA. Given that these	See changes in forest cover	See changes in forest cover	See changes in forest cover	Vegetation Follow-Up and Monitoring Plan

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
		plant and fungus species of interest are relatively common in the RSA and are predicted to maintain viable populations in areas that will be accessible throughout the life of the Project, the magnitude of the residual effect is rated as low.				
WILDLIFE						
<u>Change to wildlife habitat quantity</u> – Displacement (temporary or permanent) of furbearers from the SSA						
• Mine design optimization • Implement standard construction best practices to reduce interactions with vegetation • Progressively rehabilitating disturbed areas of the Project site as quickly as is practical with seed and non-invasive vegetation • Implement waste control measures • Implement a policy and training program for wildlife interactions and practices to reduce wildlife potential in SSA (e.g. no feeding) *See also Change in Air Quality and Dustfall, Changes to Ambient Light, Change in Noise, Change in Forest and Non-forest Cover, Change in Water Quantity (Surface and Groundwater)	• Optimizations to the mine design reduces areas of disturbance • Proper vegetation management practices reduce the amount of vegetation removed or damaged, thus reducing the amount of habitat removed • Progressive reclamation allows for vegetation to become self-sustainable sooner, which helps habitat re-establish • Proper waste management and worker training can decrease the attraction of wildlife to the SSA	The removal of forest cover and associated vegetation for Project development has the greatest potential interaction with wildlife. Indirect loss of wildlife habitat is expected to occur as a result of sensory disturbance. During the closure phase, potential impairment from fugitive dustfall, sensory disturbance, and edge effects will lessen as the site activity decreases and progressive rehabilitation activities occur. <u>Furbearers</u> – most furbearers will be displaced from the SSA. Some species that are more tolerant of human disturbance may become accustomed to human activity and move back to the periphery of the site. Less tolerant species may be completely displaced during construction and operations. These species may return post-closure.	<u>General Construction and Operations Management</u> • Confirm Project footprint is consistent with SSA.	Any clearing that may occur outside the SSA would necessitate restoration.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Review and refinement of the Closure Plan • A review of the invasive species management plan (part of the General Construction and Operations Management plan)	General Construction and Operations Management (compliance monitoring) Wildlife Follow-Up and Monitoring Plan

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
		Black Bear – Clearing of the Project footprint will result in the loss of habitat for black bear, at least during operations. Bears can become habituated to anthropogenic activities and it is expected that bears displaced by the Project will remain in the local landscape and may use some of the margins of the cleared SSA footprint that do not have intensive industrial activities. At closure, revegetation efforts will likely create open habitats that may be a source of forage for bears. Moose – One or two moose are projected to be impacted by habitat loss in the SSA and, given their mobility, it is expected they will be displaced rather than killed by the forest clearing. Site rehabilitation may recover some lost habitat for moose after closure, such as shrubby browse along the transmission line corridor. Birds - The clearing of the SSA is predicted to result in the temporary loss of habitat for about 8,700 forest birds. The overall impact of loss of forest habitat on the bird populations is uncertain because breeding habitat is likely not limiting for at least some species (e.g., species limited by wintering habitat or other mortality factors) and displaced birds may be				

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
		able to occupy vacant territories nearby.				
Change in wildlife habitat quality – Potential effects from elevated sound, vibration, light, smells, dustfall, as well as possible changes as a result of invasive species, groundwater and surface hydrology, or edge effects						
• Mine design optimization • Implement waste control measures • Implement a policy and training program for wildlife interactions and practices to reduce wildlife potential in SSA (e.g. no feeding) *See also Change in Air Quality and Dustfall, Changes to Ambient Light, Change in Noise, Change in Forest and Non-forest Cover, Change in Water Quantity (Surface and Groundwater)	• Optimizations to the mine design reduces areas of disturbance • Proper vegetation management practices reduce the amount of vegetation removed or damaged, thus reducing the amount of habitat affected • Progressive reclamation allows for vegetation to become self-sustainable sooner, which helps habitat re-establish • Proper waste management and worker training can decrease the attraction of wildlife to the SSA	Edge effects – The amount of dust generated, if properly mitigated, is anticipated to have a negligible effect on wildlife habitat. Other edge effects will likely vary with local topography, aspect, and other factors, and will be broadly comparable to those experienced in clear-cuts associated with commercial forestry on the Pic FMU or along forest access roads. Substantial edge effects from subsidized nest predators are not anticipated Invasive Plant Species – Wildlife habitat within 30 m of the SSA will be most susceptible to the introduction of invasive and non-native plant species. Ground and Surface Water –Effects on wildlife habitat from predicted changes in groundwater and surface water hydrology are expected to manifest slowly as they are reflected in altered successional pathways of the overstory trees. Forested areas within the LSA with raised or lowered groundwater or surface water may see a slow replacement in overstory tree species. However, many of the predominant boreal tree species (e.g., black spruce,	Wildlife Follow-Up and Monitoring Program • Recording of wildlife fatalities or interactions conducted through a self-reporting program to be followed by all on-site personnel. • Monitoring of PSMF for use by waterfowl. • The plan will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities. General Construction and Operations Management • Prior to tree clearing, surveys of the area will be conducted for migratory birds.	Should monitoring identify repeated and consistent wildlife interactions a site specific and species wildlife deterrent or other mitigation measures will be explored.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Wildlife deterrents, fencing, or screening specific to monitoring results • A review of the invasive species awareness and control program • Application of non-reflective films or other window treatments to reduce bird strikes	Wildlife Follow-Up and Monitoring Plan General Construction and Operations Management (compliance monitoring)

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
		balsam fir) in the LSA have rather broad tolerance with respect to soil moisture regime. Understory effects are predicted to be more pronounced but may be difficult to differentiate from natural variation and ecological processes associated with succession and will be of much lower magnitude than observed with natural disturbance (e.g., wildfire, forest pest and disease outbreaks, windthrow). <u>Noise Vibration and Light</u> - Some wildlife species may exhibit habitat avoidance of the SSA and affected LSA because of noise, artificial lights, and vibrations. Predicted sound levels at the perimeter of the SSA are anticipated to range from 45 to 60 dBA. Sensory disturbance will be more pronounced during operation, with approximately 444 ha within the LSA expected to experience noise levels up to 50 dBA. Most of the affected area is within 500 m of the SSA, primarily along the southern periphery of the Project footprint and some to the northwest of the proposed pit and processing facility. The response to noise and vibration by wildlife will vary depending on the species.				
<u>Change in wildlife survival</u> – Potential increase in collisions with Project vehicles and other infrastructure						

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
• Where possible, forest clearing will be conducted to avoid bat-occupied maternity trees and bird nests in accordance with provincial and federal guidelines. When clearing must occur outside of prescribed windows, surveys and protection measures will be employed • Clear ROWs to provide adequate lines of sight to give advanced warning of wildlife, particularly on corners. Regular brushing of roadsides to maintain sight lines • Post speed limits and wildlife crossing signs • Driver training to reduce risk of collision • Removal of roadkill to reduce the risk to scavenging birds and mammals • Plowing practices that provide gaps where mammals can easily exit the road • Using directional lighting to reduce potential disorientation and collision with windows by migratory birds • Install Luminescent and/or reflective markers on transmission lines over Canoe Lake • Clear vegetation within 50 m of building windows to reduce	• Avoiding nesting seasons reduces the risk of conducting removals of vegetation with an active nest present • Brushing and clearing of ROWs and lower speed limits provide wildlife and vehicle/equipment operators with an increased line of sight to avoid collisions • Removal of roadkill reduces the attraction of wildlife to active work areas	Mortality of furbearers and larger mammals is expected to be negligible during clearing. An increase in mortality of species that use roadways more frequently for foraging or travel is anticipated but will be restricted to the SSA. Residual effects to birds are expected to be negligible and will not affect forest bird populations in the RSA provided proper mitigation is employed.	<u>Wildlife Follow-Up and Monitoring Program</u> • Recording of wildlife fatalities or interactions conducted through a self-reporting program to be followed by all on-site personnel. • The plan will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities • General Construction and Operations Management Prior to tree clearing, surveys of the area will be conducted for migratory birds.	Should monitoring identify repeated and consistent wildlife interactions resulting in fatality, a site-specific wildlife deterrent or other mitigation measures will be explored.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Wildlife deterrents, fencing, or screening specific to monitoring results • Identify wildlife-vehicle collision hot spots • Draining of roadside salt ponds to reduce potential attraction of animals	Wildlife Follow-Up and Monitoring Plan General Construction and Operations Management (compliance monitoring)

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
potential bird abundance and strikes. • If monitoring indicates elevated window strikes at the Project site (e.g., >50 bird deaths/year), additional mitigation measures will be employed as necessary (e.g., non-reflective films on problematic windows). • Implement a policy and training program for wildlife interactions and practices to reduce wildlife potential in SSA (e.g. no feeding)						
<u>Change in wildlife habitat fragmentation & movement</u> – Potential effects from habitat clearing, collisions with Project vehicles and infrastructure, and waste-related interactions						
• Mine design optimization • Progressively rehabilitating disturbed areas of the Project site as quickly as is practical with seed and non-invasive vegetation	• Optimizations to the mine design reduces areas of disturbance • Progressive reclamation allows for vegetation to become self-sustainable sooner, which helps re-establish connectivity	Forest clearing in the SSA will have little effect on fragmentation at the RSA level, either for Ecodistrict 3W-5 or the Pic FMU, with the texture of mature and old forest similar between the current state and the site if the Project goes ahead. Mature and old forest is much more abundant in the RSA. Proposed roads and transmission lines will contribute to forest fragmentation and may adversely affect forest-interior bird species. Conversely, edge adapted birds may benefit from the habitat alteration.	<u>Wildlife Follow-Up and Monitoring Program</u> • Recording of wildlife fatalities or interactions conducted through a self-reporting program to be followed by all on-site personnel. • The plan will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities. • General Construction and Operations Management Prior to tree clearing, surveys of the area will be conducted for migratory birds.	Should monitoring identify repeated and consistent wildlife interactions, a site- specific and species wildlife deterrent or other mitigation measures will be explored.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Wildlife deterrents, fencing, or screening specific to monitoring results and to direct species around the active portions of the site.	Wildlife Follow-Up and Monitoring Plan General Construction and Operations Management
<u>Change to wildlife of interest to Indigenous communities</u> – Residual changes to wildlife habitat quantity and quality, wildlife survival, and wildlife habitat fragmentation and movement also apply to changes to wildlife of interest to Indigenous communities						
*See Change to Wildlife Habitat Quantity, Quality, Fragmentation and Wildlife Survival.		The residual effects described above also include wildlife species of interest to Indigenous communities. Residual	<u>Wildlife Monitoring Program</u> • Recording of wildlife fatalities or interactions conducted through a self-reporting	Should monitoring identify repeated and consistent wildlife interactions, a site specific and species wildlife deterrent or other	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include:	Wildlife Follow-Up and Monitoring Plan

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		changes to wildlife habitat quantity and quality, wildlife survival, and wildlife habitat fragmentation and movement also apply to changes to wildlife of interest to Indigenous communities.	program to be followed by all on-site personnel. • Prior to tree clearing, surveys of the area will be conducted for migratory birds. • Develop a communication protocol with Biigtigong Nishnaabeg for reporting the mortality of large mammals along the site access road and in the vicinity of the SSA. • The plan will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities.	mitigation measures will be explored.	• Wildlife deterrents, fencing, or screening specific to monitoring results and to direct species around the active portions of the site. • A review of the invasive species awareness and control program	General Construction and Operations Management
SPECIES AT RISK						
<u>Change to woodland caribou or their habitat</u> - loss of approximately 107 ha of potential caribou winter habitat in the SSA (albeit only 2.9 ha are currently undisturbed) and an additional 45 ha of disturbed habitat in the LSA.						
• Suspended construction/operational activities if individual caribou are observed until caribou have left the area and the observation reported to the MNDMNRF • Prohibit hunting by the Proponent's employees and subcontractors on Project site • Provide SAR awareness training for all construction and operations employees, agents, and contractors so that they can recognize woodland caribou and are aware of the proper procedures to follow if caribou are observed • Plow escape routes through snowbanks every 1 km • Prohibit recreational snowmobile and	• Suspension of activities, prohibiting hunting and recreational vehicles reduces the potential interaction with caribou • Providing staff training increases capacity for SAR to be identified and procedures to be followed should species be observed • The use of plow escape routes and pit egress design prevents caribou from being trapped • The use of timber and slash piles decreases predator sight lines, reducing contact with caribou • Progressive reclamation of the site returns the area to caribou habitat	• Updated analyses of modelled caribou habitat indicate there are approximately 106 ha of caribou winter habitat (41 ha preferred, 65 ha usable) and 732 ha of caribou refuge habitat (221 ha preferred, 511 ha used) approximately within the SSA. However, it is noted almost all (97.3%) of the winter habitat and refuge habitat in the SSA is already considered disturbed by MNDMNRF's and Environment Canada's disturbance model. As such, the additional disturbance from the Project would have a negligible effect on overall range	<u>Wildlife Follow-Up and Monitoring Program</u> • Recording of wildlife (including woodland caribou) fatalities or interactions conducted through a self-reporting program to be followed by all on-site personnel. • The plan will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities. Species at Risk Follow-up and Monitoring Program • Additional Woodland Caribou specific monitoring will be developed in conjunction with MNDMNRF and ECCC. This plan will include details regarding monitoring of any off-site mitigation, as necessary. • The plan will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities.	Should monitoring identify repeated and consistent wildlife interactions, a site specific and species wildlife deterrent or other mitigation measures will be explored Any clearing that may occur outside the SSA would necessitate restoration.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Wildlife deterrents, fencing, or screening specific to monitoring results and to direct species around the active • Review and refinement of the Caribou Offsetting Plan • Review and refinement of the Closure Plan	Wildlife Follow-up and Monitoring Plan Species at Risk Follow-up and Monitoring Plan General Construction and Operations Management (compliance monitoring)

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ATV/UTV use at the Project site • Post and maintain education signage on potential presence of caribou • Where possible, Pits and trenches will be backfilled or contoured to a stable angle of repose and, if greater than 3 m deep, will provide at least one sloped ramp as a point of egress for caribou. Where egress is not feasible, the area will be fenced • Disturbed bedrock will be stockpiled on site in a safe and stable manner • Non-merchantable timber and slash will be piled at appropriate locations along trails and roads to reduce predator sight lines and foraging efficiency. Trails will be otherwise left for natural regeneration • Other disturbed areas will be stabilized and revegetated using native seed mixes or natural regeneration as appropriate • Where possible, habitat that was disturbed by mineral exploration activities (including roads and landings) will be rehabilitated and restored in a progressive manner. • To reduce potential increase in forage for alternate prey which		disturbance levels at the RSA level. • With appropriate mitigation, no adverse effects on woodland caribou survival are anticipated from the Project given the lack of documented historical or current use of the SSA by woodland caribou and the very low numbers of woodland caribou estimated to remain in the mainland LSCR. • The SSA is approximately 6 km in width and has the potential to be at least a partial barrier to movement by caribou, particularly during the anticipated 2-year site development phase and 13-year mine operating life. This potential risk will be reduced at closure with partial site rehabilitation.	<u>General Construction and Operations Management</u> • Confirm Project footprint is consistent with SSA.			

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could subsequently attract predators, the use of non-native, invasive, and/or high productivity plant species for erosion control will be avoided. For example, use of clovers (Trifolium spp.) which are palatable to bears, will be avoided *See also Change to Wildlife Habitat Quantity, Quality, Fragmentation and Wildlife Survival.						
<u>Change to little brown myotis / northern brown myotis or their habitat</u> - loss of approximately 1,000 ha of possible bat foraging and day roost habitat in the SSA, as well as the loss of an estimated 39 ha of potential bat maternity roost habitat.						
• Avoid clearing of trees in the SSA during the maternity period (i.e., May 15th through August 31). If limited clearing must be done during this window, bat maternity surveys using the current MECP protocol would be used, and appropriate protection measures applied. • Install 5 bat boxes and / or bat rocket boxes outside of the LSA *See also Change to Wildlife Habitat Quantity, Quality, Fragmentation and Wildlife Survival.	• Avoiding breeding seasons reduces the risk of conducting removals of vegetation with active roosts • Bat boxes and rocket boxes provide roosting opportunities for bats	• The loss of approximately 1,000 ha of possible bat habitat and 39 ha of potential bat maternity roost habitat will result in a residual effect to myotis. However, given the abundance of habitat and the proposed mitigation to partially replace habitat, this effect is predicted to be not significant. • During clearing, proper mitigation (e.g. time restrictions on clearing or the completion surveys) will reduce potential effects.	<u>General Construction and Operations Management</u> • Confirm Project footprint is consistent with SSA. <u>Wildlife Follow-up and Monitoring Program</u> • Recording of bat use of installed bat boxes and bat rocket boxes. • Prior to tree clearing, surveys of the area will be conducted for SAR bats. • Additional monitoring specific to SAR bats may be developed through discussions with MNDMNRF and ECCC. • The plan will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities.	Any clearing that may occur outside the SSA would necessitate restoration.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • If use of maternity roost trees by myotis is confirmed, mitigation will be applied following MNDMNRF's AOC prescription for bat maternity roosts that has been developed for the Pic Forest (i.e., Project RSA).	General Construction and Operations Management (compliance monitoring) Species at Risk Follow-up and Monitoring Plan Wildlife Follow-up and Monitoring Plan
<u>Change to Canada warbler or their habitat</u> – loss of approximately 1071 ha of potential Canadian warbler habitat and potential sensory disturbance of an additional 444 ha within the LSA						
• stockpiling of non-merchantable coarse woody debris during site clearing for use	• Non-merchantable coarse woody debris can be used for the creation of Canada warbler habitat	• The development of the Project results in the potential direct loss of habitat. Modelling estimates that a total of 92	<u>General Construction and Operations Management</u> • Confirm Project footprint is consistent with SSA.	Any clearing that may occur outside the SSA would necessitate restoration.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include:	General Construction and Operations Management

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during future rehabilitation efforts *See also Change to Wildlife Habitat Quantity, Quality, Fragmentation and Wildlife Survival		Canada warblers breeding in the SSA could be potentially displaced by clearing of the SSA • Approximately 326 ha of ecosites that are modelled as preferred Canada warbler habitat within the LSA (outside the SSA) could potentially be affected by noise during operations of greater than 50 dB.			• Review and refinement of the Closure Plan	(compliance monitoring) Species at Risk Follow-up and Monitoring Plan
<u>Change to rusty blackbird or their habitat</u> – loss of approximately 17.7 ha of potential rusty blackbird habitat						
*See Change to Wildlife Habitat Quantity, Quality, Fragmentation and Wildlife Survival.		• There are nine small waterbodies (between 0.5 ha and 5.0 ha in size) in the SSA and a total of 17.7 ha of aquatic habitat when smaller ponds are included that may be suitable to this species. • Potential effects from collisions with Project infrastructure or vehicles, sensory disturbance, or indirect effects from the Project are expected to be minimal for rusty blackbird given their infrequent use of the LSA and habitat preference for riparian conifer forests.	<u>General Construction and Operations Management</u> • Confirm Project footprint is consistent with SSA. <u>Wildlife Follow-up and Monitoring Program</u> • Recording of wildlife fatalities or interactions conducted through a self-reporting program to be followed by all on-site personnel. • Prior to tree clearing, surveys of the area will be conducted for migratory birds. • Additional monitoring specific to rusty blackbird may be developed through discussions with MNDMNRF and ECCC. • The plan will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities.	Any clearing that may occur outside the SSA would necessitate restoration. Should monitoring identify repeated and consistent wildlife interactions, a site specific and species wildlife deterrent or other mitigation measures will be explored	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Review and refinement of the Closure Plan • Wildlife deterrents, fencing, or screening specific to monitoring results and to direct species around the active portions of the site.	General Construction and Operations Management (compliance monitoring) Wildlife Follow-Up and Monitoring Plan Species at Risk Follow-up and Monitoring Plan
<u>Change to common nighthawk or their habitat</u> – loss of approximately 48 ha of potential common nighthawk habitat						
• *See Change to Wildlife Habitat Quantity, Quality, Fragmentation and Wildlife Survival.		Within the SSA, there are only about 6 ha of non-treed upland ecosite and 42 ha of treed conifer Ecosite	<u>General Construction and Operations Management</u>	Any clearing that may occur outside the SSA would necessitate restoration.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with	General Construction and Operations Management

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
		B012 that is potentially suitable, where there is sufficient unmapped rock barren area intermixed with jack pine and black spruce forest. There has been no observed use of these habitats and they represent less than 0.1% of the potentially suitable habitat for these species within the RSA, not including cutovers, burns, and anthropogenic features such as transmission line rights-of-way.	• Confirm Project footprint is consistent with SSA.		pertinent agencies and stakeholders. Alternatives may include: • Review and refinement of the Closure Plan	(compliance monitoring) Species at Risk Follow-up and Monitoring Plan
<u>Change to eastern whip-poor-will or their habitat</u> - loss of approximately 48 ha of potential whip-poor-will habitat						
• Conduct nightjar surveys on site in the event that whip-poor-will colonize the site during operations • *See Change to Wildlife Habitat Quantity, Quality, Fragmentation and Wildlife Survival.	Surveys would confirm the potential presence of nightjar within the mine site to identify occupied nesting locations to avoid during active nest season	Within the SSA, there are only about 6 ha of non-treed upland ecosite and 42 ha of treed conifer Ecosite B012 that is potentially suitable, where there is sufficient unmapped rock barren area intermixed with jack pine and black spruce forest. There has been no observed use of these habitats and they represent less than 0.1% of the potentially suitable habitat for these species within the RSA, not including cutovers, burns, and anthropogenic features such as transmission line rights-of-way.	<u>General Construction and Operations Management</u> • Confirm Project footprint is consistent with SSA. <u>Species at Risk Follow-up and Monitoring Plan</u> • Nightjar surveys to follow standard survey protocols. • The plan will be in place for operations and will be developed in consultation with regulatory agencies and Indigenous communities.	Any clearing that may occur outside the SSA would necessitate restoration.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Review and refinement of the Closure Plan	General Construction and Operations Management (compliance monitoring) Species at Risk Follow-up and Monitoring Plan
<u>Change to yellow-banded bumble bee or their habitat</u> – loss of approximately 1,116 ha of potential, yellow-banded bumble bee habitat						
• Inclusion of selected wildflower species in the seed mixes to provide additional nectar sources throughout the growing season *See also Change to Wildlife Habitat Quantity, Quality,	• Seed mixes that contain wildflower species help establish habitat for yellow-banded bumble bee	Given the broad habitat requirements for this species and abundant potential habitat in the RSA, this habitat loss is not expected to affect regional populations. There is the potential mortality of a few individuals, if actually	<u>General Construction and Operations Management</u> • Confirm Project footprint is consistent with SSA.	Any clearing that may occur outside the SSA would necessitate restoration.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Review and refinement of the Closure Plan	General Construction and Operations Management (compliance monitoring)

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Fragmentation and Wildlife Survival.		nesting in the SSA, during site clearing and development. There is also a minor risk of mortality from vehicle collisions, although this can largely be mitigated				Species at Risk Follow-up and Monitoring Plan Reclamation and Closure Plan
Change to monarch or their habitat – loss of approximately 1,116 ha of potential monarch habitat						
• Inclusion of selected wildflower species in the seed mixes to provide additional nectar sources throughout the growing season *See also Change to Wildlife Habitat Quantity, Quality, Fragmentation and Wildlife Survival.	• Seed mixes that contain wildflower species help establish habitat for monarch	The LSA sees irregular use by adult monarchs, with none observed during 2007-2010 fieldwork but numerous adults (15+) observed on July 7-8, 2020. In some areas, the monarch is vulnerable to mortality from vehicle collisions, particularly throughout its summer range. Given the infrequent use of the LSA by monarchs, the relatively low traffic speeds and volumes (especially compared to Highway 17 immediately to the south), and generally north-south alignment of the road, this risk is expected to be low and can be mitigated.	General Construction and Operations Management • Confirm Project footprint is consistent with SSA.	Any clearing that may occur outside the SSA would necessitate restoration.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Review and refinement of the Closure Plan	General Construction and Operations Management (compliance monitoring) Species at Risk Follow-up and Monitoring Plan
Change to lake sturgeon or their habitat – Indirect loss of habitat as a result of changes to surface water quality						
• Maintain existing drainage patterns as is possible so as not to alter natural hydrological patterns, while ensuring water quality is not adversely affected. • Avoiding the use of explosives within setback areas as determined by the DFO Guidelines for the Use of Explosives in or Near	• Maintaining drainage and flow patterns reduces the change in baseline flow characteristics within subwatersheds • Proper management and storage of explosives reduces the potential for overpressure effects to fish and the potential release of nitrogen to water	No residual effects were identified as it relates to changes in water quantity (e.g. the change in flow to the Pic River will be negligible), water quality (e.g. modelled constituent concentrations in the Pic River will be below water quality benchmarks that are protective of aquatic life, including all life stages of Lake Sturgeon) or the use of explosives (e.g. estimate setbacks of approximately	Surface Water Follow-up and Monitoring Program • Water quality will be measured in surface water receiving environments (e.g. Hare Lake, Stream 6 [post closure], Pic River) consistent with ECA and metal and diamond mining effluent regulations (MDMER) requirements. • Records will include water quality sampling. • Monitoring will occur at various times of the year, consistent with ECA and MDMER	Results of monitoring will be compared to the values used in the EIS Addendum, and to applicable regulatory criteria or objectives, and as set out through the approvals process (e.g. ECA). Additional mitigation will be employed if it is determined that the Project results in water quality levels that exceed these criteria.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Reviewing the water management plan to consider monitored changes in surface water levels.	Fish and Fish Habitat Follow-up and Monitoring Plan Surface Water Follow-up and Monitoring Plan

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Canadian Fisheries Waters. • Implement the site waste management, water management and erosion and sediment control strategies and ensure the measures associated with these strategies are maintained as applicable throughout the duration of the Project. *See also changes to fish and fish habitat	• Proper design and construction practices prevent the release of sediment and deleterious substances to fish habitat	one kilometer was deemed sufficient).	requirements. All applicable parameters will be monitored at facility commissioning to establish and confirm emissions. • The plan will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities. <u>Fish and Fish Habitat Monitoring Program</u> • Sampling of fish communities, including tissue sampling, sediments, and benthic communities at receiving watercourse (i.e. Hare Lake and Pic River) will be conducted in accordance with Environment Canada and Climate Change (ECCC) Environmental Effects Monitoring (EEM) program. Pre-operational surveys will be conducted at Hare Lake and Pic River to further characterize baseline conditions and ongoing sampling will be completed in accordance with ECCC's EEM program guidelines, MDMER requirements throughout the operation of the mine, and in accordance with the closure plan. • Monitoring programs specific to fish habitat compensation measures implemented will be developed. The scope and nature of the programs will depend on scope and nature of the compensation provided and will be communicated as part of the Fish Habitat Compensation Plan. Compensation-related monitoring would be			

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			implemented following completion of the individual compensation-related works. • Additional monitoring specific to lake sturgeon may be developed through discussions with MNDMNRF and ECCC. • The plan will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities.			
SOCIO-ECONOMIC ENVIRONMENT						
<u>Change in employment and income</u> – loss of employment and Project-related income when project transitions from operations to closure						
• Establishing measures to encourage and recruit employees from the existing populations in local communities • Providing opportunities for training to facilitate employment by residents of the LSA and RSA and supporting initiatives to train local youth and members of Indigenous groups • During decommissioning, implementing strategies to help transition the workforce • Working with existing institutions and employment and training providers such as Lakehead University, Confederation College, and local high schools • Identifying opportunities for job readiness programs that include practical hands on training and soft skills	• Recruitment of employees from the existing population provides economic benefits to the community while not increasing Project demand on infrastructure and services • Developing and implementing training programs focused on the local population creates a larger locally based employment base • Developing strategies for the workforce during closure provides a transition for employees	GenPGM currently estimates that Project construction will involve a workforce ranging from 430 to 550 persons over the 18-to-24-month construction period, with a peak workforce of 800 to 1,000 persons. During operations, the project will generate an average of 419 full-time-equivalents of employment per year, over which an average of 375 persons will be directly employed by the Project. As the Project transitions into decommissioning and closure/post-closure, the workforce will be ramped down, resulting in a loss of employment within local communities. This eventual loss of employment, however, will be anticipated and communicated to Project workers. The skills, experience, and qualifications that workers gained while employed on the Project will help offset the loss of employment, as these improved qualifications will aid with	<u>Socio-economic Follow-up and Monitoring Program</u> • A conceptual program has been reviewed with both the Town of Marathon and BN (per SIR#7) (CIAR #587). The monitoring program will include monitoring of indicators for demography (population, employment), housing, education, community infrastructure, community services, health services, emergency services, traffic / transportation, employment and income, business development, cultural and Indigenous considerations. • Indicators, duration, frequency and other components of the program will be established through on-going consultation.	On-going discussions with municipal and indigenous communities.	N/A	Socio-economic Follow-up and Monitoring Program

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such as computer skills, literacy and math • Developing programs focused on underrepresented populations (e.g. Indigenous peoples or females) within the mining sector		securing employment on future projects within the LSA, RSA or other parts of Ontario.				
Change in economic and business development – reduction/loss of revenue and opportunities once the Project transitions from operations to closure						
• Work with economic development groups to increase contracting opportunities for local businesses	• Use of local businesses for contracting opportunities provides economic benefits to the community	The Project will generate opportunities for local and regional businesses to supply goods and services both to the Project directly or indirectly due to the presence of workers and contractors in the local area and region. Economic activity associated with the Project will bolster the economy of the RSA by injecting new capital into the region thereby reducing dependence of local businesses on existing mining and natural resources operations.	Socio-economic Follow-up and Monitoring Program • A conceptual program has been reviewed with both the Town of Marathon and BN (per SIR#7) (CIAR #587). The monitoring program will include monitoring of indicators for demography (population, employment), housing, education, community infrastructure, community services, health services, emergency services, traffic / transportation, employment and income, business development, cultural and Indigenous considerations. • Indicators, duration, frequency and other components of the program will be established through on-going consultation.	N/A	N/A	Socio-economic Follow-up and Monitoring Plan
Change in accommodations – Increase in demand for housing and short-term accommodations (estimate of 240 persons for short-term accommodations), including BN members who may choose to move back to the community						
• Implementation of a worker housing strategy, which entails the use of an Accommodations Complex in or near Marathon during construction and operation • Implementing rotational work arrangements. • Establishing measures to encourage and	• The use of an accommodation complex reduces Project-related demand on local housing supply • Rotational work arrangements reduce the number of people within the accommodation complex at a given time	• It is predicted that Project construction will require a peak workforce of approximately 870 and an average of 360 workers to be onsite per day. An existing work camp will be used to house the construction workforce.	Socio-economic Follow-up and Monitoring Program • A conceptual program has been reviewed with both the Town of Marathon and BN (per SIR#7) (CIAR #587). The monitoring program will include monitoring of indicators for demography (population, employment), housing, and cultural and Indigenous considerations.	Should monitoring identify a shortage in accommodations as a result of the Project, additional mitigation will be provided.	Mitigation will include the provision of temporary or permanent housing for transient members of the workforce and will be determined based on availability when such a shortage is identified. Alternatives may include: • The expansion of the modular Accommodation Complex • The use of other work camps within the RSA	Socio-economic Follow-up and Monitoring Plan

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recruit employees from the existing populations in local communities. • Providing opportunities for training to facilitate employment by residents of the LSA and RSA and supporting initiatives to train local youth and members of Indigenous groups.	• Recruitment of employees from the existing population provides economic benefits to the community while not increasing Project demand on infrastructure and services	• The Project operations workforce is predicted to average 430, working a one week on/one week off rotation, therefore, 212 workers per rotation, with roughly half working day shift and half working night shift and these workers do not share rooms. These workers can be housed within the Accommodation Complex (capacity of 180 rooms).	• Indicators, duration, frequency and other components of the program will be established through on-going consultation.			
<u>Change in community infrastructure use</u> – Potential increased demand on infrastructure and community services as a result of Project-related population growth.						
• Mandatory cultural sensitivity training for all Project employees. • Engaging with municipal authorities and BN to coordinate planning of infrastructure development or upgrades that may be needed to ensure that they do not negatively affect the local communities. • Providing support to fund key community services or organizations and provide fitness and recreational programs for workers within the existing facilities. • Providing Project employees with health services (physical, mental and social health), including Employee Assistance	• Cultural sensitivity training outlines GenPGM'S code of conduct and expectations, policies and practices to prevent discrimination, harassment and other forms of misconduct. • Coordination and planning with infrastructure/ services providers improves the ability to respond to capacity demands as a result of the Project • Providing health services to employees reduces demand on existing services and promotes employee wellbeing • Coordinating emergency response preparedness coordination provides a pre-determined plan and associated	Changes in demand for community services and infrastructure are largely based on population growth – therefore, the extent to which workers choose to relocate to local communities during Project construction and operation will influence the extent to which demand for community services will change. Rotational workers in the LSA and RSA during construction and operation will also require access to certain types of services, although, given the short-term nature of a temporary workforce engaged on a rotational basis, and the fact that some services will be available at the Accommodations Complex, it is not expected that construction phase workers will make substantial use of local community services.	<u>Socio-economic Follow-up and Monitoring Program</u> • A conceptual program has been reviewed with both the Town of Marathon and BN (per SIR#7) (CIAR #587). The monitoring program will include monitoring of indicators for demography (population, employment), housing, education, community infrastructure, community services, health services, emergency services, traffic / transportation, employment and income, business development, cultural and Indigenous considerations. • Indicators, duration, frequency and other components of the program will be established through on-going consultation.	Should monitoring identify capacity issues with community infrastructure as a result of the Projects demand on infrastructure (excluding permanent resident use), additional mitigation will be discussed with the community service provider (e.g., Town of Marathon, BN).	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Working with municipalities and other infrastructure and service providers to forecast potential demands that require an increase in service capacity	Socio-economic Follow-up and Monitoring Plan

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
Programs (EAP) and on-site emergency service infrastructure, including fire-fighting equipment. • GenPGM will co-ordinate its Emergency Preparedness and Response Plan (EPRP) with the Town of Marathon emergency services department and BN. • Implementing a Waste Management Plan. • Commitment to on-going monitoring of socio-economic effects on the BN community.	resource needs in the case of an emergency • Implementing a Waste Management Plan will reduce the amount of waste generated through diversion to recycling • Follow-up and monitoring provides a response mechanism to monitor and track potential Project-related effects to surrounding communities					
<u>Change in transportation infrastructure</u> - Project-related activities and transportation of workers will place increased demands on local transportation infrastructure.						
• Implementing a Traffic Management Plan, which will include encouraging car-pooling and providing bus transport to and from the Project site and requiring all Project drivers and employees to observe speed limits and take safety precautions. • Scheduling shift changes and truck movements to avoid peak traffic hours and school bus pick-up and drop-off times.	• The implementation of a traffic management plan will promote the reduction of vehicle trips to and from the site and promote scheduling of deliveries outside of peak traffic times	The Project is expected to contribute to an increase in road traffic volume (90 passenger vehicles entering the site for each day shift and 60 passenger vehicles for the night shifts; up to 40 tractor trailer truckloads per day of concentrate product; and six tractor trailer loads of supplies) in the vicinity of the Project site. Through upgrades to the Highway 17 and Peninsula Road intersection, it is predicted that infrastructure will operate as anticipated.	<u>Socio-economic Follow-up and Monitoring Program</u> • A conceptual program has been reviewed with both the Town of Marathon and BN (per SIR#7) (CIAR #587). The monitoring program will include monitoring of indicators for demography (population, employment) and traffic / transportation. • Indicators, duration, frequency and other components of the program will be established through on-going consultation.	Should monitoring identify a Project-related demand increase on transportation infrastructure that exceeds these facilities capacities, additional mitigation will be discussed with the pertinent party (e.g. MTO or Town of Marathon).	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Working with municipalities and MTO to monitor traffic volumes	Socio-economic Follow—up and Monitoring Plan General Construction and Operations Management Plan (compliance monitoring)
<u>Change in land and resource use</u> - loss of, or restricted access to, the SSA, sensory disturbances (i.e., noise and dust) from Project activities, and the reduction in overall user experience from the Project presence						
• GenPGM will engage with the Town of Marathon and provincial Crown lands permit holders to address potential disturbance to or access restrictions to	• Engaging with the Town and Crown land permit holders enables alternative access arrangements to be made, including access around the site and escorted access	• For safety and security reasons, resource and recreational activities will be restricted near Project activities (within the SSA). GenPGM will engage	<u>General Construction and Operations Management</u> • Confirm Project footprint is consistent with SSA. <u>Atmospheric Environment Follow-up and Monitoring Program</u>	Any clearing that may occur outside the SSA would necessitate restoration. *See changes in air quality and changes in noise level	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Review and refinement of the Closure Plan	Atmospheric Environment Follow-up and Monitoring Plan Access Management Plan

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
municipal and Crown land areas • Develop limited access protocol that includes a provision for guided escorted access through the SSA. • Harvester Training Fund. An endowment fund where interest supports annual harvester and trapline training programs. • Signage will be installed around the SSA to alert the public and land users of the presence of the Project and its facilities. • Hunting / fishing / harvesting of wildlife will be strictly prohibited on the site. Workers will not be permitted to hunt / fish / harvest and will not be permitted to bring firearms or angling gear to site. • Project activities, locations, and timing will continue to be communicated to Indigenous groups, affected land and resource users, environmental non-government organizations, the provincial government, and local authorities throughout the life of the Project. • Desired land and resource end-uses will be considered in the preparation of the Closure Plan.	through the site when permitted • The establishment of a Harvester and Training Fund, as part of CBAs, provides alternative means for training and support for the loss of access to Trap Lines • Prohibiting access and restricting workers from hunting/fishing/ harvesting reduces safety incidence and the potential for ingestion of CoPCs • Notifying land users of potential obtrusive Project activities can reduce potential for such interactions • Collaboration and engagement of land users, including BN, in the development of the end land use plan promotes the restoration of the SSA to a desirable state	with local resource users (hunters, outfitters, trappers, fishers) regarding the overlap of the Project with hunting, trapping, and fishing areas in the SSA. • The Project is likely to result in sensory disturbances which can affect the overall experience of resource users (i.e., hunters, trappers, outfitters, and fishers) within the SSA and LSA, as the remoteness is a large part of the draw and appeal of these activities	• Nuisance sensory effects (e.g. noise and odor) will be monitored in accordance with changes in air quality and noise levels.		*See changes in air quality and changes in noise level	General Construction and Operations Management (compliance monitoring)
<u>Change in land and resource use</u> - removal of forest land from the commercial forest area could affect the determination of annual allowable cut (AAC) levels.						

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
• Site clearing and disturbed areas will be limited to the extent practicable and only as required to accommodate the Project. • To the extent possible, clearing and wood utilization will follow the requirements contained in the Forest Management Plan. This may include a commercial market for the harvested wood from the Project site or may be used for firewood for the general public. Un-merchantable wood, as defined by the *Crown Forest Sustainability Act*, may be left scattered throughout the harvested area to serve as coarse woody debris.	• Limiting disturbed areas provides more areas around the SSA that can continue to be used for land and resource use • Conducting clearing and wood utilization in accordance with Forest Management Plan aligns clearing activities with those used to manage the broader Forest Management Unit, while the storage of un-merchantable wood allows for re-use on site for reclamation and habitat mitigation	Timber harvest on site will be staged over a four-year period, commencing with site preparation and construction and continuing as needed during the initial two years of operation as project infrastructure is expanded. The adverse effect on AAC will be a continuous event because the affected productive forest land will remain deforested for the duration of the Project. However, no harvest areas in the SSA were identified in the current forest management plan. Additionally, the Summary of the Proposed Long-Term Management Direction for the Pic Forest Management Plan (2021) outlines potential harvest areas until 2029 and no such areas were identified within the SSA.	<u>General Construction and Operations Management</u> • Confirm Project footprint is consistent with SSA.	Any clearing that may occur outside the SSA would necessitate restoration.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Review and refinement of the Closure Plan	General Construction and Operations Management (compliance monitoring) Reclamation and Closure Plan
HUMAN HEALTH						
<u>Change in Human Health exposure to air</u> – Incremental changes in air quality are predicted and therefore an incremental risk is perceived though no specific Human Health risks are expected						
*See Change in Air Quality and Dustfall		Air quality parameters that exceeded a short-term screening value included nickel, nitrogen dioxide (NO2), benzo(a)pyrene and crystalline silica. Air quality parameters that exceeded a long-term screening value included benzene, benzo(a)pyrene, and nickel.	<u>Atmospheric Environment Follow-up and Monitoring Program</u> • Contaminants of potential concern (CoPC) for air and water (surface and ground) will be monitored as part of the respective monitoring programs. *See changes in air quality for more details	*See changes in air quality for more details	*See changes in air quality for more details	Atmospheric Environment Follow-up and Monitoring Plan Atmospheric Quality Management Plan
<u>Change in Human Health exposure to noise</u> – Incremental changes in noise are predicted and therefore an incremental risk is perceived though no specific HH risks are expected						
*See Change in Noise Levels and ground vibrations		Noise modelling predicted the Percent Highly Annoyed (%HA) to be	<u>Atmospheric Environment Follow-up and Monitoring Program</u>	*See changes in noise levels for more details	*See changes in noise levels for more details	Atmospheric Environment

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
		insignificant, with the closest noise-sensitive receptor having a predicted change of 2.4%HA, where less than 6.5%HA is not expected to impact on community annoyance. The maximum predicted noise levels within the SSA were also below the noise-induced sleep disturbance criteria threshold recommended by the WHO and Health Canada.	• Measurement of ambient noise levels will be completed during various phases of the Project. *See changes in noise levels for more details			Monitoring Program Atmospheric Quality Management Plan
<u>Change in Human Health exposure to water</u> – Incremental changes in water quality are predicted and therefore an incremental risk is perceived though no specific HH risks are expected						
• For safety reasons, public access to the SSA will be prohibited during the construction, operations and decommissioning phases of the Project. *See Change in Surface Water and Ground Water Quality	• Prohibiting access reduces potential for safety incidence or exposure	Constituent concentrations in surface water are not predicted to exceed water quality benchmarks protective of human health. Therefore, no adverse effects on human health are expected from Project-related changes to surface water quality in Hare Lake for people using water in Hare Lake for drinking water and recreational purposes.	<u>Groundwater Follow-up and Monitoring Program</u> • Monitoring of groundwater quality levels at receiving environment. • The plan will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities. <u>Surface Water Follow-up and Monitoring Program</u> • Monitoring of water quality at point source discharge locations (e.g. PSMF and MRSA discharge points). • The plan will be in place for all Project phases and will be developed in consultation with regulatory agencies and Indigenous communities. *See change to groundwater quality and change to surface water quality for more details	*See change to groundwater quality and change to surface water quality for more details	*See change to groundwater quality and change to surface water quality for more details	Groundwater Follow-up and Monitoring Plan Surface Water Follow-up and Monitoring Plan General Construction and Operations Management (compliance monitoring)
<u>Change in Human Health exposure to country foods</u> – Incremental changes in country foods are predicted and therefore an incremental risk is perceived though no specific HH risks are expected						
• For safety reasons, public access to the SSA will be prohibited during the construction, operations and	• Prohibiting access and restricting workers from hunting/fishing/ harvesting reduces safety incidence and	Project-related air and water emissions are not expected to cause CoPCs to accumulate in country	<u>Country Food Follow-up and Monitoring Program</u> • A conceptual plan for monitoring country foods for CoPCs and exposure	If increases in concentrations of COPCs in environmental media are observed to result in a Project related increased risk to human health, additional	Additional mitigation measures will be developed specific to the risk factors and in coordination with country food harvesters	Country Food Follow-up and Monitoring Plan

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
decommissioning phases of the Project. • Implement a country food monitoring program *See Change in Air Quality, Surface Water and Ground Water	the potential for ingestion of CoPCs • Development and implementation of a Country Foods Monitoring program in collaboration with BN establishes a monitoring and response mechanism to determine the accuracy of predictions to address potential concerns	foods to levels of concern for human health.	pathways during the pre-operational and operational phases of the proposed Project has been prepared. • Sampling of country food will be conducted to set a baseline, once during construction, and every three years during operation. • A minimum of five (5) samples will be collected for each of blueberries, moose tissues and fish at each sampling location during a sampling campaign. • The Country Foods Monitoring Program will be developed in coordination with Indigenous communities, including the identification of sampling locations with local hunters and harvesters.	mitigation measures may be proposed.		
PHYSICAL AND CULTURAL HERITAGE						
Change in Archaeological Resources - Potential removal or alteration of archaeological sites or resources						
• Completion of a Stage 2 archaeological assessment for the Hare Lake discharge pipeline, including infrastructure footprint, access road and temporary work areas associated, • If any archaeological resources are documented, the MHSTCI's Standards and Guidelines for Consultant Archaeologists will be followed in order to address follow-up Stage 3 archaeological assessment and, if required, Stage 4 archaeological mitigation	• Completion of appropriate archaeological assessment will identify the presence of archaeological resource / site potentially affected by the project, in accordance with MHSTCI standards for consulting archaeologists, and appropriate avoidance and mitigation measures to be followed should resources be found • Chance find protocols allow for the identification of undocumented artifacts that may be disturbed during construction	No archaeological resources have been identified that would be affected by the Project; therefore, no residual effects are anticipated If archaeological sites are identified, avoidance of archaeological sites and completion of appropriate archaeological investigations avoids the unauthorized disturbance or destruction of part or all of a cultural heritage resource Protocols to protect archaeological resources will be implemented in the event of a chance find	<u>General Construction and Operations Management</u> • Chance find protocol to be developed outlining the responsive action and process of documentation of the unexpected discovery of additional archaeological resources. • Protocol will include communication strategy for Indigenous communities.	In the event that a cultural artifact is discovered, work in the area will cease until the appropriate mitigation has been employed	Mitigation to be determined in collaboration with appropriate regulatory agency (MHSTCI) and Indigenous communities	General Construction and Operations Management

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
• Results of archaeological assessments to be provided to Indigenous communities • Implementation of a chance finds protocol	• Disseminate information through providing archaeological reports to Indigenous communities					
INDIGENOUS CONSIDERATIONS						
Change to harvesting – loss of area for hunting and harvesting of fish, plants and materials						
• Harvester Training Fund. An endowment fund where interest supports annual harvester and trapline training programs. • Signage will be installed around the SSA to alert the public and land users of the presence of the Project and its facilities. • Engage with Indigenous communities and develop a limited access protocol that includes a provision for guided escorted access through the SSA. • Hunting / fishing / harvesting of wildlife will be strictly prohibited on the site. Workers will not be permitted to hunt / fish / harvest and will not be permitted to bring firearms or angling gear to site. • Project activities, locations, and timing will continue to be communicated to Indigenous groups, affected land and resource users, environmental non-government	• The establishment of a Harvester and Training Fund, as part of CBAs, provides alternative means for training and support for the loss of access to Trap Lines • Prohibiting access and restricting hunting/fishing/ harvesting reduces safety incidence and the potential for ingestion of CoPCs • Developing an access protocol allows for escorted access through the site, when safety permits • Notifying land users of potential obtrusive Project activities can reduce potential for such interactions • Development and implementation of a Country Foods Monitoring program, in collaboration with BN, establishes a monitoring and response mechanism to determine the accuracy of predictions to address potential concerns. • Incorporating TEK/TLRU knowledge	For safety and security reasons, resource and recreational activities will be restricted near Project activities. GenPGM will engage with local resource users regarding the overlap of the Project with hunting, trapping, and fishing areas in the SSA. The Project is likely to result in sensory disturbances which can affect the overall experience of resource users (i.e., hunters, trappers, outfitters, and fishers) within the SSA and LSA, as the remoteness is a large part of the draw and appeal of these activities	<u>General Construction and Operations Management</u> • Confirm Project footprint is consistent with SSA. <u>Atmospheric Environment Follow-up and Monitoring Program</u> • Nuisance sensory effects (e.g. noise and odor) will be monitored in accordance with change in air quality and noise levels. <u>Country Food Follow-up and Monitoring Program</u> • A conceptual plan for monitoring country foods for CoPCs and exposure pathways during the pre-operational and operational phases of the proposed Project has been prepared (per IR21.1) (CIAR #461), (AIR 16) (CIAR #659), and IR6-33 (CIAR #950). • Sampling of county food will be conducted to set a baseline, once during construction, and every three years during operation. • A minimum of five (5) samples will be collected for each blueberries, moose tissues and fish at each sampling location during a sampling campaign. • The Country Foods Monitoring Program will be developed in	Any clearing that may occur outside the SSA would necessitate restoration. *See changes in air quality and changes in noise level	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Review and refinement of the Closure Plan *See changes in air quality and changes in noise level	General Construction and Operations Management (compliance monitoring) Atmospheric Environment Follow-up and Monitoring Plan Country Food Follow-up and Monitoring Plan Access Management Plan Reclamation and Closure Plan

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
organizations, the provincial government, and local authorities throughout the life of the Project. • Incorporate new TEK/TLRU information provided into detailed design and to inform the development follow-up and monitoring programs • Desired land and resource end-uses will be considered in the preparation of the Closure Plan.	into the various Follow-up and Monitoring programs provides direct land use experience to be incorporated into the plans as it relates to baseline information and the development of triggers and thresholds in order to monitor potential effects to land and resource use activities • Collaboration and engagement of land users, including BN, in the development of the end land use plan promotes the restoration of the SSA to a desirable state		coordination with Indigenous communities, including the identification of sampling locations with local hunters and harvesters.			
<u>Change of access to BN Community Trapline</u> – loss of 1116 ha of trapline area and altered access to remaining area						
• Engage with Indigenous communities and develop a limited access protocol for guided escorted access through the SSA. • Develop a protocol for use of the initial portion of the Camp 19 Road from which there is access to the Pic River and other travel corridors used to access areas for traditional wildlife, fish and plant harvesting. • Compensation for the loss of access, economic benefits of trapping, and use of a portion of BN Community Trapline within the SSA	• Developing an access protocol allows for escorted access through the site, when safety permits • Allowing for continued access of Camp 19 Road provides access to the Pic River • Providing compensation for the loss of access to the BN trapline provides alternative means through training and support for the loss of access to Trap Lines • Implementing management and follow-up and monitoring programs outline the proposed mitigation techniques to be employed, as well as the trigger, thresholds and feedback methods	• For safety and security reasons, resource and recreational activities will be restricted near Project activities. GenPGM will engage with local resource users regarding the overlap of the Project with hunting, trapping, and fishing areas in the SSA. • The Project is likely to result in sensory disturbances which can affect the overall experience of resource users (i.e., hunters, trappers, outfitters, and fishers) within the SSA and LSA, as the remoteness is a large part of the draw and	<u>General Construction and Operations Management</u> • Confirm Project footprint is consistent with SSA. <u>Atmospheric Environment Monitoring Program</u> • Nuisance sensory effects (e.g., noise and odor) will be monitored in accordance with changes in air quality and noise levels.	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Review and refinement of the Closure Plan *See changes in air quality and changes in noise level	Additional mitigation measures will be determined based on the scenario and will be developed in collaboration with pertinent agencies and stakeholders. Alternatives may include: • Review and refinement of the Closure Plan • Identifying and establishing alternate access to areas of the community trapline • Additional contribution to the Harvester Training Fund *See changes in air quality and changes in noise level	Atmospheric Environment Follow-up and Monitoring Plan Country Food Follow-up and Monitoring Plan Access Management Plan Reclamation and Closure Plan General Construction and Operations Management (compliance monitoring)

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
• Where practicable, design site and place buildings situated in topographically low areas, blended with surrounding height of land and vegetative buffers with forested areas to break lines of sight to reduce visibility of site infrastructure from viewpoints in LSA • Incorporate BN's Travel Route Mapping Survey (2019) information into Project design and mitigation measures, to extent practical. • Consult with Indigenous peoples and in particular BN to discuss the concepts developed for closure and seek further information, opinion, and guidance. • Harvester Training Fund. An endowment fund where interest supports annual harvester and trapline training programs. • Implement Follow-up Monitoring and Environmental Management Plans on that have significance to Indigenous communities. *See Change to Wildlife, Fish, Vegetation, and Land and Resource Uses	to track and further refine mitigations.	appeal of these activities				
<u>Changes to Indigenous Health</u> – including change to drinking water and country foods						

Mitigation Measures	Purpose of Mitigation	Residual Effect	Description of type of Monitoring including Location, Frequency Duration, Source/ Parameters	Trigger for Additional Mitigation (i.e., Observed Effect Requiring Further Mitigation)	What additional mitigation measures are technically and economically feasible for adaptive management?	Applicable Environmental Management Plan or other Plans[1]
• *See changes to HH exposure for water and country food		*See changes to HH exposure for water and country food	*See changes to HH exposure for water and country food	*See changes to HH exposure for water and country food	*See changes to HH exposure for water and country food	*See changes to HH exposure for water and country food

BIIGTIGONG NISHNAABEG

GENERATIONPGM

Biigtigong Nishnaabeg First Nation – Generation PGM Commitments May 11, 2022

Undertaking 31 Commitments

Closure Plan

The Closure Plan is a mandatory legal requirement before the project proceeds. It must be approved by the Ontario Ministry of Energy, Northern Development, Mines, Natural Resources and Forestry in accordance with O. Reg 240/00. GenPGM commits to obtain Biigtigong Nishnaabeg's consent with respect to its final Closure Plan.

Specific Undertakings:

1. GenPGM commits to obtain Biigtigong Nishnaabeg's consent to the closure plan as expressed in a Band Council Resolution.

2. GenPGM commits, on an ongoing basis, to review feasible closure plan alternatives with Biigtigong Nishnaabeg.

Discharge from Pit

Specific Undertakings:

1. During operations, GenPGM commits to use the water collection system for the Process Solids Management Facility (PSMF) to allow water to move south from the Pit to be managed within the PSMF.

Maintenance of Stream 6 (Angler Creek) System

GenPGM recognizes that flow reduction to Stream 6/Angler Creek would occur upon the construction of the PSMF, and flow reduction would be offset through the Fisheries Offsetting and Compensation Plan, however traditional and cultural use of Stream 6/Angler Creek by Biigtigong Nishnaabeg could be impacted during the operations Phase of the Project.

Specific Undertakings:

1. GenPGM commits to assess, with Biigtigong Nishnaabeg technically and economically feasible supplemental flow options for Stream 6/Angler Creek during the operations Phase of the Project. Where economically feasible, GenPGM commits to minimize disruptions to Stream 6/Angler Creek during the operations Phase of the Project.

2. GenPGM commits to offsetting the flow reduction and impact to fish and fish habitat in Stream 6/Angler Creek in the Fisheries Offsetting and Compensation Plan.

3. GenPGM commits to developing and implementing a monitoring program with Biigtigong Nishnaabeg for Stream 6/Angler Creek prior to the start of construction to monitor the impact of changes to the watershed, if any, on (a) fish and fish habitat and other aquatic life in Angler Creek/Stream 6, as well as (b) other traditional and cultural uses of Stream 6/Angler Creek by Biigtigong Nishnaabeg.

Water Quality Monitoring Plans and Programs

Specific Undertakings:

1. GenPGM commits to develop and implement, in conjunction with Biigtigong Nishnaabeg, a site-wide water management plan that provides an integrated framework to manage water quality that includes provision for water management practices for each of the primary site aspects, as well as areas of the site where there is contact water. The overarching goal of the plan is to maintain care and control of water during all mine phases for the purpose of protecting downstream uses (habitats, aquatic biota, use by people and preservation of Aboriginal rights). GenPGM's environmental monitoring programs will have specific components related to mercury and phosphorus.

2. GenPGM will engage with Biigtigong Nishnaabeg in the design and implementation of the mercury monitoring plan and other site-wide water management plans and programs.

3. GenPGM commits to obtaining Biigtigong Nishnaabeg's approval of mercury monitoring plans.

4. GenPGM commits to develop and implement, in conjunction with Biigtigong Nishnaabeg, focused monitoring programs on waterbodies such as the Biigtig Zibi (Pic River) extending downstream of the Project site to the mouth of Lake Superior, the outlet of Hare Creek at Port Munro and Stream 6 (Angler Creek) and the outlet at Sturdee Cove that have significance to Indigenous communities. These programs will include the collection of surface water, sediment, benthic invertebrates, and fish tissue samples as well as monitoring for mercury, phosphorus, and other indicators of eutrophication, as well as toxicity testing for mill reagents prior to effluent discharge to receiving water bodies. GenPGM will establish reference areas on the Biigtig Zibi (Pic River) and other areas, upstream of the Project, for use in a comparative analysis of results. GenPGM will engage Biigtigong Nishnaabeg in the design and implementation of the water quality monitoring programs and commits to obtaining Biigtigong Nishnaabeg's approval of its proposed monitoring plans and programs.

5. GenPGM commits, at all phases of Life of Mine, to implement best practices to prevent mercury methylation, such as stripping organic soils in advance of flooding an area.

6. GenPGM commits, at all phases of Life of Mine, to collect additional up-to-date data to adequately characterize impacts to water quality, water resources and fish and fish habitat, specifically for the Biigtig Zibi (Pic River), and sub watershed 101. GenPGM will also monitor watersheds 102, and 103, which are largely overprinted by MRSA.

7. GenPGM commits, at all phases of Life of Mine, to collect and update as necessary, a separate pit lake water quality model for each pit lake which considers various scenarios of rate of pit lake infilling, as well as the how other contact water inputs from the site could affect the pit lake models.

8. GenPGM commits, at all phases of Life of Mine, to undertake best efforts to avoid the temporary storage of type 2 waste rock. Where temporary storage is absolutely necessary due to emergency or risk to human health, GenPGM will ensure that type 2 waste rock requiring temporary storage has a storage location with sufficient capacity for the volume of material and that the water management pond has sufficient capacity for the volume of leachate to be collected.

9. GenPGM commits, at all phases of Life of Mine, to engage with and support Biigtigong Nishnaabeg 's water quality and aquatic monitoring efforts, including the development of adaptive management measures and associated triggers.

Fish and Fish Habitat Compensation and Offsetting

Specific Undertakings:

10. GenPGM commits to engage and provide reasonable support to Biigtigong Nishnaabeg in designing community programs for fish and fish habitat offsetting as part of the Fish and Fish Habitat Offsetting and Compensation Plan and commits to supporting a Biigtigong Nishnaabeg Fish Hatchery program.

Accidents and Malfunctions

Specific Undertakings:

1. GenPGM commits to establish an Independent Tailings Review Board and engage Biigtigong Nishnaabeg in this effort.

2. GenPGM commits to sharing the Engineer of Record Dam Breach Assessment with Biigtigong Nishnaabeg.

End Land Use Planning

Specific Undertakings:

1. GenPGM commits to engage Biigtigong Nishnaabeg in end land use planning for the Project site and will ensure the site is designed to support habitats and species of interest to Biigtigong Nishnaabeg.

Socio-Economic Impacts

Specific Undertakings:

1. GenPGM commits to develop, in collaboration with Biigtigong Nishnaabeg, a socio-economic management and monitoring plan (SEMMP) to measure and mitigate the socio-economic impacts of the Project on Biigtigong Nishnaabeg.

Traplines and Access to Territory

Specific Undertakings:

1. GenPGM commits to provide reasonable support to Biigtigong Nishnaabeg to secure a replacement for the community Trapline TR-022.

2. GenPGM commits to engage with Biigtigong Nishnaabeg to support the proposed Crown accommodation measure and Crown funding to "Create a bypass road (Gaffhook Lake Access), with access controlled by Biigtigong" (CIAR# 1083, PDF 57).

Moose, Caribou and Other Species of Importance

Specific Undertakings:

1. GenPGM commits to engage with Biigtigong Nishnaabeg to determine and implement monitoring and mitigation effects for potential effects to species of high importance to Biigtigong Nishnaabeg.

2. GenPGM commits to engage in consultation with Biigtigong Nishnaabeg to revise current off-site caribou mitigations to consider the current landscape, and cultural proposals from Biigtigong Nishnaabeg.

Social Services, Safety and Health

Specific Undertakings:

1. GenPGM commits to engage with Biigtigong Nishnaabeg to support the following proposed Crown accommodation measure "Support and funding of a social service plan and targeted health services plan" (CIAR# 1083, PDF 80) for Biigtigong Nishnaabeg members who are employed through the Project.

2. GenPGM commits to engage with Biigtigong Nishnaabeg to identify solutions to the impacts of the Project on community infrastructure and social services to help minimize negative impacts.

3. GenPGM commits to develop, in collaboration with Biigtigong Nishnaabeg, a mandatory, cultural competency training for all mine workers that will include content on Residential Schools, the Truth and Reconciliation Commission, Missing and Murdered Indigenous Women and Girls, and Indigenous rights, including Biigtigong Nishnaabeg's asserted exclusive Aboriginal title rights.

4. GenPGM commits to develop and implement, in collaboration with Biigtigong Nishnaabeg, workplace policies and procedures to address and minimize risks associated with related sexual harassment, violence, harassment and discrimination.

5. GenPGM commits to engage with Biigtigong Nishnaabeg and the Town of Marathon to jointly create a coordinated Emergency Response Plan relating to the Project.

6. GenPGM commits to develop, in consultation with Biigtigong Nishnaabeg, and other relevant authorities as may be determined by GenPGM and Biigtigong Nishnaabeg, a sampling program to assess concentrations of contaminants of potential concern in country foods to monitor for future human health assessments.

7. GenPGM commits to develop, in consultation with Biigtigong Nishnaabeg, and other relevant authorities as may be determined by GenPGM and Biigtigong Nishnaabeg from time to time, a follow-up program to verify the accuracy of the effects assessments predictions as they pertain to adverse environmental effects on human health caused by changes in concentrations of contaminants of potential concern in country foods, based on completed baseline testing and additional monitoring.

8. GenPGM commits to, in collaboration with Biigtigong Nishnaabeg, develop and implement country foods monitoring program.

9. GenPGM commits to include the soils and terrain, vegetation, wildlife and fish, and fish habitat monitoring programs to monitor the potential impacts of the Project on human health and establish rigorous baselines for metal concentrations in foods and medicines of importance to Biigtigong Nishnaabeg.