

GENERATION PGM

April 16, 2021

Mrs. Debra Sikora, Panel Chair
Joint Review Panel
Marathon Palladium Project (Ref# 54755)
Impact Assessment Agency of Canada / Government of Canada
160 Elgin St, 22nd Floor, Ottawa, Ontario, K1A 0H3
4108

RE: Generation PGM Submission of EIS Addendum Volume 2

Dear Mrs. Sikora,

Generation PGM Inc. (GenPGM) is pleased to provide Volume 2 of the Environmental Impact Statement (EIS) Addendum for the Marathon Palladium Project (the "Project").

With the EIS Addendum Volume 2 submission, the recently filed Feasibility Study, updated baseline reports and previously submitted EIS Addendum Volume 1, GenPGM has fulfilled the Information Request of January 31, 2014 ([CIAR 680](#)) that paused the Joint Review Panel process for the Project. Specifically outlined in the 2014 Information Request, the following information has been submitted to address the request:

- the description of the Project, including all project components and activities can be found in EIS Addendum Volume 1 ([CIAR 729](#)), and the Feasibility Study ([CIAR 741](#));
- the discussion of the purpose of and need for the Project, is provided in EIS Addendum Volume 1;
- the assessment of effects of the Project on biophysical and socioeconomic environmental, including the effects of any alternatives considered, are detailed in EIS Addendum Volume 2;
- the description of measures that may be required to mitigate the adverse effects are available in EIS Addendum Volume 2; and
- the evaluation of significance of any residual adverse effects are described in EIS Addendum Volume 2.

In February, the Crown and GenPGM mutually received information that highlighted the pre-existing effects in the study area of the Project. GenPGM acknowledges these and are sympathetic to these pre-existing conditions and felt that the information presented was appropriate to include in the EIS Addendum. As such, GenPGM revisited the assessment of cumulative effects and mitigative measures for these effects due to the Project, to ensure they are well defined and separate from those mitigation measures for cumulative effects that are being contemplated by the federal and provincial governments. It is our understanding that the Crown will be working with all Indigenous communities to address existing cumulative effects and, as the proponent, we are committed to mitigating effects as a result of the Project.

GenPGM recognizes that many barriers exist in communities in Northwestern Ontario, such as accessing reliable internet and newer technologies, which has become even more difficult during the pandemic. To assist communities in the review of the Environmental Assessment documents for the Project, we will be mailing USBs preloaded with relevant original and updated EA documentation for the Project to community leadership, committees and third-party reviewers who have indicated interest in the Project.

GenPGM looks forward to ongoing engagement with the JRP and all interested parties as we bring the Project closer to development.

Sincerely,

<Original signed by>

Tabatha R. LeBlanc
Manager of Sustainability
Generation PGM Inc.

Cc: Jamie Levy, CEO Generation PGM
Drew Anwyll, COO Generation PGM



Marathon Palladium Project Environmental Impact Statement Addendum

VOLUME 2 OF 2

Table of Contents, Abbreviations and
Executive Summary

Prepared for:

GENERATIONPGM

Prepared by:



Date: April 2021

Environmental Assessment by Review Panel under CEAA 2012

Reference Number 54755

**Marathon Palladium Project
Environmental Impact Statement
Addendum**

VOLUME 2:

Table of Contents
Abbreviations
Executive Summary

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Panel under CEAA 2012
Reference Number 54755

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Abbreviations – Volume 2

%HA	percent highly annoyed
µg/m ³	Micrograms per cubic metre
µm	Micrometre
AAQC	Ambient Air Quality Criteria
ACB	Air Contaminants Benchmarks
AIP	Agreement in Principle
AIRs	Additional information requests
AOC	Area of Concern
APV	Aquatic Protection Value
ARD/ML	Acid Rock Drainage / Metal Leaching
ATV/UTV	all terrain vehicle / utility task vehicle
BCR	Band Council Resolution
BMA	Bear Management Areas
BMP	Best Management Practice
BN	Biigtigong Nishnaabeg (formerly Pic River First
CAAQS	Nation) Canadian Ambient Air Quality Standards
CAC	criteria air contaminants
CADNA/A	Computer Aided Noise Abatement
CAS	Chemicals Abstracts Services
CBA	Community Benefit Agreement
CCME	Canadian Council of the Ministers of the Environment

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CCP	Caribou Conservation Plan
CEA Act	Former Canadian Environmental Assessment Act
CEAA	Canadian Environmental Assessment Agency
CEAA, 2012	<i>Canadian Environmental Assessment Act, 2012</i>
CEPA	<i>Canadian Environmental Protection Act</i>
CEZ	Cervid Ecological Zone
CFSA	Crown Forest Sustainability Act
CH ₄	Methane
CIAR	Canadian Impact Assessment Registry
CMC	carboxymethyl cellulose
CNWA	<i>Canadian Navigable Waters Act</i>
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CO _{2e}	carbon dioxide equivalents
CoPC	constituent of potential concern
CRA	Commercial, Recreational and Aboriginal
CWB	Community Well-Being
CWFIS	Canadian Wildland Fire Information System
CWQG-FAL	Canadian Water Quality Guidelines for Protection of Freshwater Aquatic Life
dB	decibel
dBa	A-weighted decibels
dBAL	A-weighted sound pressure level of an impulsive sound measured with a sound level meter set to "impulse" response

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DE	diesel exhaust
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
ECA	Environmental compliance approval
ECCC	Environment and Climate Change Canada
EDS	Environmental Design Storm
EEM	Environmental Effects Monitoring
EIS	Environmental Impact Statement
ELC	Ecological Land Classification
EMF	Electromagnetic fields
EMMP	Environmental Monitoring and Management Plan
EMS	Environmental Management System
EPA	<i>Environmental Protection Act</i>
EPRP	Emergency Preparedness and Response Plan
ER	Exposure ratio
ESA	Environmental Site Assessment
ESCP	Erosion and Sediment Control Plan
FHWA	US Federal Highway Administration
FMP	Forest Management Plan
FMU	Forest Management Unit
FMZ	Fisheries Management Zone
FNFNES	First Nations Food, Nutrition and Environmental Study
FRI	Forest Resource Inventory

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FUMP	Follow-up Monitoring and Environmental Management Plans
FWCA	<i>Fish and Wildlife Conservation Act</i>
GCDWQ	Guidelines for Canadian Drinking Water Quality
GDP	Gross Domestic Profit
GenPGM	Generation PGM Inc.
GHD	General Habitat Description
GHG	Greenhouse Gas
GIS	geographic information system
GLC	Ground-level concentration
GLSL	Great Lakes – St. Lawrence
GWP	Global warming potential
ha	Hectares
HADD	harmful alteration, disruption or destruction
HAP	Hazardous Air Pollutants
HC	Health Canada
HDPE	High Density Polyethylene
HHRA	Human Health Risk Assessment
HPGR	High Pressure Grinding Roll
IAA	<i>Impact Assessment Act</i>
IAAC	Impact Assessment Agency of Canada
IDF	Inflow Design Flood
ILCR	Incremental Lifetime Cancer Risk
INAC	Indigenous and Northern Affairs Canada

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IR	Information Request
IUR	inhalation unit risk
JSL	Jurisdictional Screening Level
km	Kilometre
km ² /km	Square Kilometre/ Kilometre
kV	Kilovolt
L _d	Daytime equivalent sound level
L _{dn}	day-night average sound level
LEL	Lowest effect level
L _{eq}	equivalent continuous sound level
LIO	Land information Ontario
LLM	Logarithmic Mean Impulse Sound Level
L _{max}	maximum predicted sound levels
L _{max} dB(A)	Maximum nighttime noise level for sleep disturbance
L _n	Nighttime equivalent sound level
LOS	Level of Service
LRIA	<i>Lakes and Rivers Improvement Act</i>
LRU	land and resource use
LSA	Local Study Area
LSCR	Lake Superior Coast Range
LU 131	Noise Assessment Criteria in Land Use Planning
m	metre
M	Million

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m/s	metre per second
M2W Line	Terrace Bay-Manitouwadge transmission line
m ³ /ha/year	cubic metre/ hectares/year
MAF	Mean Annual Flow
MAFA	Moose Aquatic Feeding Area
masl	Metres Above Sea Level
MBCA	<i>Migratory Birds Convention Act</i>
MDMER	Metal and Diamond Mining Effluent Regulations
MECP	Ontario Ministry of Environment, Conservation and Parks
MENDM	Ontario Ministry of Energy, Northern Development and Mines
MFN	Michipicoten First Nation
MHSTCI	Ministry of Heritage, Sport, Tourism and Culture Industries
ml	Metal leaching
MLTSD	Ontario Ministry of Labour, Training and Skills Development
mm	Millimetre
MMER	Metal Mining Effluent Regulations
MMF	Means Monthly Flow
Mn	Manganese
MNO	Superior North Shore Métis Council: Métis Nation of Ontario
MNR	Ministry of Natural Resources
MNRF	Ministry of Natural Resources and Forestry
MOE Blasting	MECP Blast Analysis Method
MoU	Memorandum of Understanding

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MRSA	Mine Rock Storage Area
MTO	Ministry of Transportation
MW	Megawatt
MWh	megawatt hour
N/A	Not Applicable
N ₂ O	Nitrous oxide
NAAQO	National Ambient Air Quality Objectives
NAPS	National Air Pollution Surveillance
NFMC	Nawiinginokiima Forest Management Corporation
NFPA	National Fire Protection Association
NHIC	Natural Heritage Information Centre
Ni	Nickel
NMHC	Non-methane hydrocarbon
NO ₂	Nitrogen dioxide
non-PAG	non-potentially acid generating
NO _x	Nitrogen Oxides
NPC 104	Adjustments for Intermittency and Tonality
NPC 119	Blasting
NPC 205	Sound Level Limits for Stationary Sources in Class 1 & 2 Areas
NPC 300	Stationary and Transportation Source – Approval and Planning
NPRI	National Pollutant Release Inventory
NRCan	Natural Resources Canada
NSRs	noise sensitive receptors

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O. Reg.	Ontario Regulation
O ₃	ozone
OB	overburden
OCIP	Jackfish Métis: Ontario Coalition of Indigenous Peoples
OCTAA	Ontario College of Trades and Apprenticeship Act
ODWQS	Ontario Drinking Water Quality Standards
OHS	Occupational Health and Safety
OHSA	Occupational Health and Safety Act
OHSP	Occupational Health and Safety Plan
OMNRF	Ontario Ministry of Natural Resources and Forestry
OPSS	Ontario Provincial Standard Specifications
ORNAMENT	Ontario Road Noise Analysis Method for Environment and Transportation
OWRA	<i>Ontario Water Resources Act</i>
Panel	Joint Review Panel
PAG	Potentially Acid Generating
PAHs	polycyclic aromatic hydrocarbons
PCB	Polychlorinated Biphenyls
PDAC	Prospectors & Developers Association of Canada
PEDC	Pawgwasheeng Economic Development Corporation
PEL	probable effect level
PIL	Project Inclusion List
PM	Particulate matter
PM ₁₀	Particulate Matter (with a diameter of 10 microns or less)

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PM _{2.5}	Particulate Matter (with a diameter of 2.5 microns or less)
PMFN	Pic Moberg First Nation/Netmizaaggamig Nishnaabeg
PMP	Probable Maximum Precipitation
PNP	Pukaskwa National Park
POI	point of impingement
PORs	Points of Reception
PPFN	Pays Plat First Nation/Pawgwasheeng First Nation
ppm	parts per million
PPV	peak particle velocity
PSMF	Process Solids Management Facility
PTTW	Permit to Take Water
PWQO	Ontario Provincial Water Quality Objectives
ROC	Record of Consultation
ROM	Run of Mill
ROW	Right-of-Way
RSA	Regional Study Area
RSMIN	Red Sky Métis Independent Nation
SAR	Species at Risk
SARA	<i>Species at Risk Act</i>
SEL	Strongest effect level
SID	Supporting Information Document
SIR	Supplemental Information Request
SLs	Screening Levels

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SME	Site Mixed Emulsion
SO ₂	Sulphur Dioxide
SRNV	Simulated Range of Natural Variation
SSA	Site Study Area
SWM	Stormwater Management
tCO ₂ e	tonnes of carbon dioxide equivalent
TEK	Traditional Ecological Knowledge
TEL	threshold effect level
TK	traditional knowledge
TLRU	Traditional land and resource use
TLU	Traditional Land Use
TNM	Traffic Noise Model
TOC	Total Organic Carbon
TRV	toxicity reference value
TSP	Total Suspended particulate
TSS	total suspended solids
U	Uranium
um	micrometers
UNFCCC	United Nations Framework Convention on Climate Change
URTs	Upper Risk Thresholds
USEPA	United States Environmental Protection Agency
UV	Ultra violet
VEC	Valued Ecosystem Component

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VOCs	volatile organic compounds
WHMIS	Workplace Hazardous Materials Information System
WHO	World Health Organization
WHS	Worker Health and Safety
WMP	water management pond
WMU	wildlife management unit
WNS	White-nose syndrome
WQO	water quality objective
WRMMP	Waste and Recycling Material Management Program
WSC	Water Survey of Canada
WTP	Water Treatment Plant
WWR	Water well record
$\mu\text{g}/\text{m}^3$	milligram per cubic meter

EXECUTIVE SUMMARY

Generation PGM Inc. (GenPGM) proposes to develop the Marathon Palladium Project (the “Project”), which is a platinum group metals (PGM) and copper (Cu) mine and milling operation near the Town of Marathon, Ontario. The Project is being assessed in accordance with the *Canadian Environmental Assessment Act* (CEAA, 2012) and Ontario’s *Environmental Assessment Act* (EA Act) through a Joint Review Panel (the Panel) pursuant to the *Canada-Ontario Agreement on Environmental Assessment Cooperation* (2004).

The Joint Review Panel process was put on hold by Stillwater Canada Inc. (the original Proponent of the Project) and ultimately postponed in 2014. Since 2014, the Project has been acquired by GenPGM and the Panel review process to assess the potential effects of the Project has resumed. In 2020, GenPGM indicated their intention to restart the environmental assessment process. On January 7, 2021, GenPGM submitted Volume 1 of the Environmental Impact Statement (EIS) Addendum to the original EIS (2012) to the Joint Review Panel (the Panel). This report has been prepared as Volume 2 of the EIS Addendum and is to be read in conjunction with EIS Addendum Volume 1. The complete EIS Addendum (Volumes 1 and 2) confirms and updates the original assessment of environmental effects for the Project.

Volume 1 of the EIS Addendum (see Canadian Impact Assessment Registry ([CIAR](#)) [#727](#)) covered:

- The Project and Proponent (purpose, components and study boundaries)
- The Environmental setting (including updates to baseline conditions)
- An assessment of alternatives (including alternatives to and alternative means)
- The Scope of the EIS Addendum (including relevant ‘changes’ that have occurred since the completion of the original EIS (2012), identification of valued ecosystem components (VECs), and spatial and temporal boundaries)

Since submission of Volume 1 of the EIS Addendum, the Terms of Reference was signed (See [CIAR #717](#) and [#731](#)). The Panel also invited several Indigenous communities to participate in the environmental assessment process.

ENGAGEMENT AND CONSULTATION

GenPGM recognizes the importance of consultation and engagement as an integral aspect of the Project. In the context of this EIS Addendum, ‘consultation’ refers to two-way communication to share information and viewpoints, understand comments and interests, and address or resolve issues during the planning phase of the Project.

GenPGM and its predecessors have completed active consultation with Indigenous communities and Project stakeholders (i.e., agencies, members of the public, other interested parties) since 2004. Engagement with these groups over the last 17 years has influenced Project design, built trust, enhanced

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Project understanding, and informed the assessment of potential environmental effects. Community participation has also informed the Project design through the integration of traditional knowledge (TK) to better understand traditional land and resource uses (TLRU) and to identify components of the environment of importance to the identified Indigenous Groups, which have been incorporated into the Valued Ecosystem Components (VECs) for the Project.

Traditional and local knowledge accessible to GenPGM and the Project Team was considered in keeping with appropriate ethical standards and without breaching obligations of confidentiality.

GenPGM understands that consultation on the Project is an iterative and ongoing process. To ensure that ample consultation opportunities on the Project were offered, GenPGM focused consultation with relevant stakeholders, government agencies and Indigenous communities on key environmental assessment milestones.

Consultation was conducted with Indigenous communities, government agencies, and other stakeholders throughout the EA process. Specific communities or organizations consulted included the following:

Indigenous Communities	Government	Other
Animbiigoo Zaagi'igan Anishinaabek (Lake Nipigon)	Ontario Ministry of Natural Resources and Forestry (MNRF)	Town of Marathon
Biinjitiwaabik Zaaging Anishinaabek (Rocky Bay FN)	Ontario Ministry of the Environment, Conservation and Parks (MECP)	Marathon Economic Development Corporation
Bingwi Neyaashi Anishinaabek (Sandpoint FN)	Ontario Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI)	Marathon Chamber of Commerce
Fort William First Nation	Ontario Ministry of Energy, Northern Development, and Mines (MENDM)	Manitouwadge Town Council
Long Lake #58 First Nation	Ontario Ministry of Labour, Training, and Skills Development (MLTSD)	Public
Kiashke Zaaging Anishinaabek (Gull Bay FN)	Ontario Ministry of Transportation (MTO)	Pawgwasheeng Economic Development Corporation (PEDC)
Red Rock Band	Environment and Climate Change Canada (ECCC)	
Whitesand First Nation	Fisheries and Oceans Canada (DFO)	
Ginoogaming First Nation	Natural Resources Canada (NRCan)	
Jackfish Métis – OCIP	Health Canada (HC)	
Michipicoten First Nation	Impact Assessment Agency of Canada (IAAC)	
Superior North Shore Métis – MNO	Indigenous and Northern Affairs Canada (INAC)	
Red Sky Métis Independent Nation – RSMIN	Transport Canada (TC)	
Biigtigong Nishnaabeg (Pic River First Nation)	Federal Economic Development Agency for Southern Ontario	

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Indigenous Communities	Government	Other
Pays Plat First Nation	Indigenous Services Canada	
Pic Moberg First Nation	Infrastructure Canada	
	Public Health Agency of Canada	
	Women and Gender Equality Canada	
	Employment and Social Development Canada	
	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	

Consultation completed with Indigenous communities consisted of some or all of the following activities:

- Sharing of technical reports, work plans and invitations to participate in field programs
- Drop-in sessions at Band Offices
- Virtual Information sessions
- Establishment of committees for regular communication and information sharing
- Government-led discussion forums

Concerns raised by Indigenous communities included potential impacts to water resources, air quality, noise, TLRU, trapping, fishing, country foods and medicinal/cultural plants, closure and reclamation concepts, accidents and malfunctions, and wildlife. Particular concerns were raised regarding impacts to the Pic River, Lake Superior, SAR such as caribou, as well as socio-economic impacts.

Consultation completed with government agencies consisted of the following activities:

- Participation in Government-led discussion forums
- Meetings with Government agencies on specific topics
- Proponent-led workshops presenting technical updates on the Project

Consultation and outreach completed with the public and other Non-Government Organizations (NGOs) consisted of the following:

- Development and maintenance of a Project website
- Social Media presence and updates
- In-person drop-in Public Information Sessions at GenPGM Offices in Marathon
- Town of Marathon Community Information Board
- Virtual Public Information Session for the Town of Marathon
- Presentation to the Town of Manitowadge Council
- Weekly plain language updates in local print publications

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Concerns raised by Government and NGOs were associated with effects on the project related to climate change, accidents and malfunctions, socio-economic impacts, traffic, water quality, and wildlife.

Consultation and engagement activities will continue throughout the EA process, permitting and project implementation.

EFFECTS ASSESSMENT

An update to the effects assessment has been prepared to verify the conclusions of the original EIS (2012), to update baseline information, and to take into account the refinements to the Project description and changes to regulations, guidelines, policies, and regulatory thresholds. To update the assessment, existing information relating to the original EIS (2012) was reviewed, including the EIS, Information Requests (IRs), Additional Information Requests (AIRs) and Supplemental Information Requests (SIRs).

To support the update of the effects assessments, a series of stand-alone effects assessment reports were prepared for various VECs (under separate cover). These have been included in Appendix D of this EIS Addendum (Vol 2).

The Project components (updated in EIS Addendum [Vol 1]) were used to predict and evaluate potential changes to the environment and the likely effects on identified VECs. The VECs assessed included the following:

- Atmospheric Environment, including air quality, greenhouse gas and light
- Acoustic Environment, including blasting and vibration
- Water Quality and Quantity, including surface water and groundwater
- Fish and Fish Habitat
- Terrain and Soils
- Vegetation
- Wildlife
- Species at Risk
- Socio-economics, including economics, community infrastructure and services, and land and resource use
- Human Health, including air quality, water quality, country foods and noise
- Physical and Cultural Heritage Resources
- Indigenous Considerations

As described in Volume 1 of the EIS Addendum, the following Project phases were assessed:

- Phase I: Site Preparation and Construction
- Phase II: Operations

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- Phase III: Decommissioning and Closure/Post-Closure

A summary of findings for each VEC is provided below.

Air Quality

Emissions of constituents of potential concern (CoPCs) were evaluated for activities through Phase I and II of the Project including emissions from the operation of vehicles and heavy equipment, drilling and blasting, heating equipment, earthworks, diesel generators, emission control equipment (e.g. baghouses, scrubbers), and fugitive emissions from stockpiles, road dust, and the process solids management facility (PSMF). Emission rates were calculated using emission factors or manufacturer's equipment specifications and modelled using AERMOD modelling software. The decommissioning and closure phase (Phase III) was not modelled since emissions from that phase were considered to be lower than emissions during the construction phase.

Mitigation measures proposed and included in the evaluation of air emissions included the use of dust suppressants (e.g., water) on roads and stockpiles, maintenance of vehicles to increase fuel efficiency, use of pollution control equipment (e.g. baghouses, scrubbers), and purchase of vehicles to meet Tier 4 emission standards.

Residual effects for the Project alone scenario predicted exceedances of applicable provincial or federal criteria for benzo(a)pyrene and crystalline silica during Phase I and for benzo(a)pyrene, crystalline silica, nickel, and dustfall during Phase II. These exceedances were determined to be limited in geographic or temporal extent or related to existing conditions with minimal contribution from the Project. Exceedances for benzo(a)pyrene and nickel are associated with the proposed rail loadout facility and crystalline silica and dustfall exceedances were associated with the property boundary. Residual effects for the cumulative effect scenario (Project + Background) predicted exceedances of applicable criteria for benzene, benzo(a)pyrene, and nickel at the rail loadout facility and for dustfall and nitrogen dioxide at the property boundary (no background data for silica was available and, therefore, the cumulative effect could not be assessed). The significance of the residual effect was predicted to be not significant as the effects were of limited geographic extent, of low to medium duration, infrequent (for NO₂), and reversible. Furthermore, the detailed design of the rail load out facility will incorporate appropriate engineering design and mitigations measures in order to meet applicable provincial criteria at the property boundary.

Greenhouse Gases

Greenhouse gas emissions for the project were calculated using the estimated fuel consumption quantities and emission rates for CO₂, CH₄, and N₂O from the 2019 Requirements, converted to CO₂e, using the 100-year global warming potential for each parameter presented in the 2019 Requirements. Annual GHG emissions from blasting were estimated using quantities of explosive and blasting schedules for construction and operations provided by GenPGM using a CO₂ emission factor presented in the original EIS (2012).

Mitigation measures proposed to avoid or reduce Project-related effects on GHG emissions included optimizing the mine design by centralizing infrastructure and improving haul truck routes to reduce travel distances; using energy-efficient equipment where practical; maximizing the recovery of marketable wood

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products during vegetative clearing and revegetating quickly with plants native to the region through progressive rehabilitation activities; management of fuel use by proper vehicle maintenance, reducing idling times, optimizing vehicle movements, fuel use tracking, exploring the use of biodiesel and Trolley Assist; and, exploring the possibility of CO₂ capture in construction concrete and processed solids streams.

Total CO₂e emissions were predicted to range from 5.9 to 24.3 kt annually during construction, resulting in an incremental contribution of Project construction to Ontario's and Canada's total annual GHG emissions (based on 2018 data) of 0.01% and 0.003%, respectively (not considering the loss of carbon storage due to clearing which was considered negligible). Total CO₂e emissions were predicted to average 61.6 kt/yr, ranging from 33.1 to 81.9 kt annually during operations, resulting in an incremental contribution of Project CO₂e emissions to Ontario's and Canada's total annual GHG emissions (based on 2018 data) of 0.05% and 0.01%, respectively.

Overall, with mitigation and environmental protection measures to be implemented, residual effects on GHG emissions are predicted to be not significant since the magnitude of the residual effect is low, the geographical extent is high (GHGs are a global phenomenon), the duration and frequency are medium, reversibility is high, and the ecological/societal value is high because of the overall importance upon which society places on GHGs and, by extension, climate change.

Light

Potential Project-related effects associated with ambient light were qualitatively assessed by analyzing sight lines from the Site Study Area (SSA) to potential nearby receptors (i.e., the Town of Marathon, developments along Highway 17, and cottages on Hare Lake) to determine light trespass (brightening of adjacent areas). Topography, vegetation cover, and distance from the SSA were considered when determining potential for ambient light to affect these receptors. Other land uses near the receptors were also considered when determining the potential effect of ambient light.

Mitigation measures proposed to avoid or reduce Project-related effects on ambient light include optimization of lighting design to reduce the total amount of lighting needed, the use of directional lighting fixtures outfitted with shields to minimize sideways and upward light leakage, and mounting of light fixtures as low as possible.

Given the Project location within an undeveloped area, the Project is expected to contribute to an increase in ambient light levels through sky glow (brightening of the sky). The ambient light from the SSA will not be visible from the Town of Marathon as there is no direct line of sight, and the effect of Project-related light on the cottages on Hare Lake and properties along Highway 17 will be negligible due to screening by existing vegetation and terrain changes. The properties along Highway 17 already experience some periodic elevated light levels associated with highway traffic, airport operations and lighting at businesses located along the highway.

Considering the above, residual Project effects associated with light are predicted to be not significant. This characterization is primarily in recognition of the low magnitude and geographic extent of the residual effect.

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Noise

Noise emissions will be generated by most Project activities such as drilling; blasting; heavy mobile equipment/machinery; emergency diesel generators; material handling; pollution control equipment; building exhaust fans; material handling; and, vehicle, haul truck and rail traffic. While noise emissions will be generated during each phase of mine life, emissions during Phase III (decommissioning and post-closure) will be similar to, or less than, those during site preparation and construction and operation and were not further assessed.

Predictive noise modelling was completed to estimate Project noise emissions for construction and operation considering the worst-case years with respect to noise. Year 1 of construction and Year 2 of operations were predicted to represent the worst-case with respect to noise. Noise modelling was completed using the latest version of the commercially available CADNA/A software incorporating the ISO 9613-2 algorithm for outdoor sound propagation. The US Federal Highway Administration (FHWA) Traffic Noise Model (TNM) version 2.5, incorporated into CADNA/A, was used to predict traffic noise along the Project access road, Highway 17 and within the Town of Marathon. Blasting was assessed based on potential structural damage to buildings and analyzed following the MECP Blast Analysis Method (MOE Blasting), as it was considered most consistent with the NPC 119 guideline and is an approved blasting methodology developed by MECP. Community annoyance and sleep disturbance related to noise were evaluated in accordance with the Health Canada Noise Guideline (2017).

Mitigation measures considered as part of the acoustical assessment consisted of purchasing vehicles and equipment that meet applicable noise suppression regulations; scheduling concentrate delivery at times of the day to reduce complaints whenever possible; and implementing an overpressure and vibration monitoring program on-site upon commencement of blasting operations.

The sound levels (i.e., L_{max}, L_{eq} 16-hour, L_d, L_e, L_n and L_{dn}) and subsequent analysis (i.e., air blast setback distances and %HA) at representative NSRs from Project construction and operation activities are predicted to be below the applicable provincial and federal criteria.

With the implementation of mitigation and environmental protection measures, residual environmental effects on a change in noise levels and ground vibration during the construction, operation and decommissioning phases of the Project are predicted to be not significant. Monitoring for blasting noise during Project construction is recommended as some NSRs fell along the boundary of the setback distance. For Project operation, no NSRs were identified within the air blast setback distance.

Water Quality/Quantity and Sediment

The assessment of water quality and quantity evaluated changes to groundwater quality, groundwater quantity, surface water quality, surface water quantity, and sediment quality as a result of the Project. The following scenarios were evaluated:

- Groundwater quantity: Project activities will result in changes in groundwater recharge and changes in groundwater levels and flow. A decrease in groundwater levels may result in loss of yield to dug or drilled wells, reducing their ability to meet water supply requirements. As a pathway to surface water and wetlands, a decrease in groundwater levels and changes in the

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natural groundwater flow could affect discharge to nearby surface water bodies and water levels within wetlands.

- Groundwater quality: Changes in groundwater levels and flow direction and change in recharge or infiltration from the Project activities may alter groundwater quality in dug or drilled wells, reducing their ability to meet water supply requirements without treatment. As a pathway to surface water and wetlands, recharge or infiltration from Project activities may result in changes to groundwater quality discharging to surface water.
- Surface water quantity: Project activities will result in changes to local hydrology. A reduction or increase in flows and/or water levels may result due to elimination or redirection of subwatershed area and through Project water management (e.g. Project water use and effluent discharge).
- Surface water quality: Introduction of constituents, as a result of the Project, into receiving waterbodies and watercourses that are of a magnitude to negatively affect aquatic biota and non-aquatic biota associated with those waters and/or potential water uses in the study area.
- Sediment quality: Introduction of constituents into the sediments of water bodies and watercourses that are of a magnitude to negatively affect aquatic biota, non-aquatic biota, or other potential uses of those waterbodies.

Mitigation measures proposed and evaluated included the following, as applicable:

- limit and stage construction footprint (i.e., SSA) to the extent possible, including minimizing interaction between aquatic habitat features and Project infrastructure,
- use standard construction, management, and maintenance practices throughout all phases for drainage control, excavation, open pit dewatering, culverts, roads, and excavation,
- 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,
- design the MRSA to increase the amount of runoff and reduce the amount of infiltration, thereby reducing the recharge and loading to groundwater,
- install contact water and seepage collection 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 and improvements to groundwater quality,
- develop and implement a site-wide water management plan to manage water quality, maintain existing drainage patterns with the use of culverts, manage peak discharges and augment baseflows using Project water storage features (e.g. catch basins, collection ponds, etc.), recycle contact water for process water use, and divert non-contact water away from Project components,

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- 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,
- 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 that have significance to Indigenous communities

Residual effects identified for water quantity/quality and sediment include permanent lowering of the groundwater table as a consequence of dewatering the open pits; an increase in concentration of constituents in both groundwater and surface water relative to background conditions; the change in contributing subwatershed area due to the construction of Project infrastructure and resulting water management, as well as Project-related effluent discharge; and, transport of solids to watercourses or water bodies through erosion of disturbed areas and changes in concentrations of constituents relative to background. All of these residual effects are consistent with the residual effects identified in the original EIS (2012). Based on the magnitude and/or nature of the residual effects, a determination of not significant was made for each of these categories.

Fish

An evaluation of the effects on fish as a result of the Project was completed and considered fish mortality / death of fish by means other than fishing; change resulting in direct physical harmful alteration, disruption, or destruction of fish habitat; change in water quantity (flow); change in water quality; and change to benthic invertebrate communities.

Mitigation measures proposed for fish and fish habitat include the following:

- implementing fish habitat offsetting works as required under the *Fisheries Act* to offset losses of aquatic habitat and, by extension, benthic invertebrate communities,
- avoiding waterbodies considered important to Indigenous communities and local land users or those that are more sensitive to the extent possible,
- avoiding the use of explosives in or near water or, where necessary, establishing appropriate setback distances for use of explosives near waterbodies in accordance with DFO Guidelines to avoid lethal or sub-lethal effects to fish,
- planning in-water work, undertakings or activities to respect timing windows to protect fish, including their eggs, juveniles, spawning adults, and the organisms upon which they feed and migrate,
- preparing a fish salvage plan to relocate fish prior to in-water work, as appropriate,
- designing Project infrastructure to reduce the disturbance footprint, limit the areal extent of disturbance to creeks and specific subwatersheds, conform to appropriate DFO and MNR guidance, and plan activities occurring near water to prevent the release of deleterious materials into watercourses,

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- implementing a Spill Prevention and Response Plan and an Erosion and Sediment Control Plan for the site, as well as Follow-up Monitoring and Environmental Management Plans on waterbodies such as 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.

The residual effects on fish and fish habitat are consistent with those identified in the original EIS (2012); however, the modernization of the Fisheries Act and inclusion of Act-consistent indicators for the fish and fish habitat VEC results in a different pathway of effects assessment.

Residual effects on fish are anticipated either as a result of the overprinting of 9.22 ha of existing fish habitat, requiring Authorization under Section 34.4(2) of the *Fisheries Act*, or through a reduction in flow. Residual effects on water quality during construction result from the mobilization of suspended material in the natural surface water features due to land clearing, excavation, and material movement and can be mitigated through erosion and sediment control methods including soil stabilization practices. 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 between April and November. Water quality within 150 m or less of the discharge point to Hare Lake is expected to meet applicable criteria and, therefore, will be protective of fish and fish habitat. During closure, site water will be directed toward and controlled via the water management pond to the open pit complex for a period of time until water quality stabilizes and natural surface water drainages are restored. Residual effects due to blasting are not anticipated.

Following the implementation of offsetting and further conditions under a Fisheries Act authorization (including fish salvage) and adherence to minimum setback distances to mitigate effects of blasting to fish, residual effect to fish as a result of fish mortality will be not significant. With the proposed mitigation and environmental protection measures, the residual effects of a change in water quality on fish and fish habitat will be not significant. With the proposed mitigation and environmental protection measures (i.e., appropriate site water management prior to effluent discharge), water and sediment quality will remain below criteria for the protection of aquatic biota and therefore not constitute a significant residual effect. The determination of no significant residual effect is consistent with the original EIS (2012).

Soil

Two potential effects on the soil and overburden VEC were identified: “change to soil and overburden” and “change to soil quality”. Changes to soil and overburden refers to the potential loss of soil and overburden (quantity) through the development of mine-related infrastructure through excavation and stockpiling activities (approximately 4.9 million tonnes) which may be subjected to erosion and sliding, such that the quantity of material stockpiled would be reduced, leaving less material available for rehabilitation purposes. Changes in soil quality refers to the potential change in concentrations of soil constituents that could result primarily from project-related air emissions, principally fugitive dust emissions. Such an effect is relevant to consider since changes to soil quality may affect soil productivity.

Mitigation measures proposed to be implemented include limiting the construction footprint (i.e., SSA) to the extent possible to minimize the need for soil/overburden excavation, stockpiling soil and overburden materials for later use in site rehabilitation activities, ensuring appropriate slopes for soil/overburden

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stockpiles to prevent erosion and slide hazards, limiting fugitive dust emissions from the PSMF and MRSA using windbreaks or other mitigative measures, watering stockpiles and/or dirt roads, and progressively rehabilitating disturbed areas as quickly as practical.

No significant residual adverse effects of the Project on the Soil and Terrain VEC are predicted. That is, no change in soil quantity and/or quality that will result in a reduction in soil capability, which cannot be offset through mitigation or compensation measures, is expected. The residual adverse environmental effects on terrain and soils are predicted to be not significant. This finding is consistent with the original EIS (2012).

Vegetation

The potential environmental effects on vegetation as a result of the project were evaluated based on the following: change in forest cover, change in non-forest cover (e.g., thicket swamp, shore fen/meadow marsh, and rock barrens), change to regionally or provincially rare plant species, and change to plants of interest to Indigenous communities.

The primary mechanism for change in vegetation communities is the removal of vegetation during site preparation and construction activities. It is conservatively assumed that all vegetation in the SSA will be removed or substantially altered. Most of the clearing will occur during the site preparation phase, while recognizing this may somewhat overestimate the impacts on vegetation during early stages of the Project. No additional vegetation communities will be removed during operation. However, it is predicted that limited vegetation regrowth or regeneration in the SSA will occur, and progressive rehabilitation of select areas will commence. In the absence of mitigation, indirect effects such as fugitive dust deposition and other edge effects (i.e., increased sunlight, wind, and evapotranspiration) will continue, as will impacts from invasive and other non-native species. Vegetation communities within 30 m of the SSA may be indirectly affected by dust deposition from operation activities. Dust during operation is anticipated to result from traffic movement on unpaved roads; handling and transferring of extracted ore, waste rock and overburden, ore stockpile, storage areas of waste rock and overburden, the open pits; and ore processing (crushing, grinding, refining). As with site development and construction, effects on vegetation communities within 30 m of Project components are associated with the introduction of exotic or invasive species by vehicles or imported fill.

Mitigation measures proposed to address potential effects on vegetation include limiting grading or stripping activities within the transmission corridor; leaving vegetated buffer zones (slope-dependent) between transmission lines and sensitive habitats (e.g., watercourses, waterbodies); incorporating previously-disturbed areas into the project footprint; using stockpiled soil and overburden for reclamation activities and re-seeding with non-invasive (and native, where practicable) plant species; and isolating sensitive areas until native vegetation is established through reclamation activities. Mitigation for provincially or regionally rare plant species consists of transplanting at suitable receiver sites.

Project residual effects include the long-term loss of approximately 1,081 ha of forest in the SSA (consisting of forest ecosites that are common and widespread in the regional study area [RSA]) and potential indirect effects on 842 ha in the adjacent local study area (LSA); permanent alteration of soil and site conditions for much of the SSA; permanent changes in the substrate from relatively deep mineral and

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organic soils to shallow soils and exposed rock within the SSA after closure; direct loss of non-forested wetlands within the SSA, accounting for 21.4 ha of open wetlands and an additional 9.8 ha of sparsely vegetated open water habitat; and the loss of approximately 6.8 ha of non-forested upland plant communities through development of the LSA.

With remediation at closure, at least some of these losses will be mitigated over time. Residual effects from invasive species, dustfall and other edge effects, and indirect effects from predicted changes to groundwater and surface water hydrology are not predicted to result in the loss or permanent impairment of forest communities. The predicted effects were determined to be not significant, primarily due to the limited area affected, the changes being within natural variation, and/or the prevalence of communities within the area. This finding is consistent with the original EIS (2012).

Wildlife

Potential environmental effects as a result of the Project were evaluated for the following: changes in wildlife habitat quantity, changes in wildlife habitat quality, changes in wildlife survival, changes in wildlife habitat fragmentation and movement patterns, and changes to wildlife of interest to Indigenous peoples.

Examples of mitigation measures proposed for wildlife include optimizing the location of Project components to reduce environmental impact including area of vegetation clearing; incorporating existing disturbed areas into the SSA to accommodate Project components; using standard construction best practices during site preparation and construction to reduce potential negative interactions with vegetation; progressively rehabilitating, as early as possible, some of the area lost during mine operation, including the access road and transmission line, and returning it to a vegetated state; using reflective markers on transmission lines over Canoe Lake; and using directional lighting.

Predicted residual effects include displacement of furbearer species (e.g. Canada lynx, fisher, American marten, etc.), loss of actual and potential habitat for beavers, martens, moose, black bears, forest-dependent birds; and displacement of gray wolves. Limited impacts were assessed for shorebirds, wetland birds, and waterfowl due to the limited quantities observed within the SSA. Residual effects in wildlife habitat quality could include the impacts of dustfall deposition, spread of invasive species, increases or decreases in groundwater levels or changes to hydrology, and sensory disturbance from noise and vibration. For wildlife survival, the primary effect mechanisms are wildlife collisions with vehicles and wildlife collisions with Project infrastructure. Forest clearing for the Project will fragment wildlife habitat along the boundary of the SSA. Although habitat fragmentation will reduce local connectivity within the LSA and SSA during the life of the Project, the fragmentation will not substantially alter the broad-scale landscape connectivity in the RSA.

The residual effects of the Project arise from the loss of approximately 1,116 ha of wildlife habitat in the SSA. With remediation at closure, at least some of this loss will be mitigated. As with the original EIS (2012), the residual environmental effect of a change in wildlife habitat quantity is predicted to be not significant because the decrease in wildlife habitat is not expected to threaten the long-term viability of wildlife in the RSA. Wildlife habitat is abundant and widespread in the RSA and the Project-associated loss is well within the range of annual disturbance considered sustainable in boreal ecosystems.

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Species at Risk (SAR)

An evaluation of the potential environmental effects of the Project on SAR was completed and assessed the potential for changes to various SAR or their habitat, including woodland caribou, little brown myotis, northern myotis, Canada warbler or their habitat, rusty blackbird, olive-sided flycatcher, yellow-banded bumble bee, bald eagle, peregrine falcon, common nighthawk, eastern whip-poor-will, monarch, and lake sturgeon.

Examples of proposed mitigation measures for SAR include suspending construction activities if caribou are observed during construction activities and MNRF are advised of the sighting; banning hunting within the SSA; conducting SAR awareness training; using directional lighting; progressive rehabilitation as soon as possible; using native seed mixes during rehabilitation activities; provision of bat boxes and rocket boxes as partial replacement for loss of potential roost trees within the SSA; and, ensuring proper waste disposal practices are followed to minimize scavenging, accidental poisoning, and bird strikes. Off-site mitigation for caribou elsewhere within the Lake Superior Coastal Range for caribou is also proposed.

Residual effects for the Project arise from the loss of 107 ha of potential caribou winter habitat within the SSA (only 2.9 ha of which are undisturbed); approximately 1,000 ha of possible bat foraging and day roost habitat in the SSA during the development and operation of the mine, as well as the loss of an estimated 39 ha of potential bat maternity roost habitat. With the proposed mitigation measures, the residual effects were determined to be not significant.

Socio-economic

An evaluation of the potential effects of the Project on the socio-economic environment was completed and evaluated the potential impacts on economy and employment, infrastructure and services, and land and resource use. Changes in the economy and employment will occur as a result of Project expenditures and hiring and retention of workers. Changes to infrastructure and services will occur as labour requirements may cause an increase in the local population resulting in additional demands on infrastructure and services, including housing / accommodations, health and emergency services and infrastructure, utilities, as well as education, recreation, and transportation services and infrastructure. Most Project activities during construction are anticipated to result in a change in land and resource use through disturbances (noise, dust, visual) to the viability of, restricted access to, or loss of areas used for resource activity and/or by recreational users.

Mitigation measures proposed for the socio-economic environment VEC include providing training opportunities to facilitate employment by residents within the LSA and RSA, including training of local youth and Indigenous groups; implementation of workforce transition strategies during decommissioning; use of an accommodations complex during construction and operation; engaging with municipal authorities to coordinate planning of infrastructure development or upgrades; providing funding support to key community services or organizations for fitness and recreational programs for workers; establishment of a Harvester Training Fund to support annual harvester and trapline training programs; and restricting of hunting, fishing, and harvesting of wildlife on the site.

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Both positive (employment, labour income, GDP and government revenue impacts, and business contracting potential) and adverse effects (loss of these positive benefits when the project transitions from operations to closure) are anticipated with respect to impacts on economy and employment. With the implementation of mitigation and management measures, residual adverse effects on economy and employment are predicted to be not significant, consistent with the original EIS (2012).

With the application of mitigation and enhancement measures, including the use of an Accommodations Complex and Project-specific management plans, some adverse effects on infrastructure and services are expected to occur during construction, operation, and decommissioning in the LSA and RSA. While the Town of Marathon and other nearby communities may be able to support modest growth, other community members living off-Reserve return for Project employment and chose to live within the community instead of within the Accommodations Complex provided. However, in recognition of the predicted effect, GenPGM and Biigtigong Nishnaabeg (BN) have recently executed an Agreement in Principle (AIP) in February 2021 that outlines the framework for a community benefit agreement that mitigates these adverse residual effects and provide an overall benefit to BN. The residual adverse effect of the Project on infrastructure and services is predicted to be not significant because it will not result in an exceedance of available capacity of infrastructure and services, or a substantial decrease in their quality, on a persistent and ongoing basis, which cannot be mitigated with current or anticipated programs, policies, or proposed mitigation measures. This prediction is consistent with the original EIS (2012).

With the implementation of mitigation, residual adverse effects on land and resources use are predicted to be low in magnitude (i.e., a small, measurable change in land and resource use capacity, although activities can take place at or near current levels). The overall area of the SSA (1,116.4 ha) is relatively small compared to alternate lands available for land and resource use activities. Noise and dust effects to nearby users are predicted to be below regulatory thresholds. Desired land and resource end-uses will be considered in the preparation of the Closure Plan. Furthermore, the Project is located in an area with a history of similar resource use activities. With mitigation and enhancement measures, the residual environmental effects on land and resource use are predicted to be not significant.

Human Health

Key components of the biophysical environment were identified for evaluating human health impacts, including changes to air quality, water quality, country foods, noise and electromagnetic fields. This included an evaluation of exposure via inhalation of constituents in air originating from Project air emissions, exposure via ingestion of constituents in drinking water originating from Project water emissions, exposure via ingestion of constituents in country foods originating from Project air and water emissions, inhalation of air quality affected by Project air emissions, consumption of drinking water and quality of recreational water affected by Project releases to water, consumption of country foods affected by Project air and water releases, and community annoyance and sleep disturbance resulting from unwanted sound from Project activities.

There is fundamentally no change in the assessment of electromagnetic fields (EMFs) for the updated Project design compared to the assessment in the original EIS (2012) and, therefore, no further assessment was completed in the EIS Addendum for EMFs. The EMFs from the proposed 2.2 km 115 kV

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overhead transmission line for the Project are not expected to adversely affect the health of people who visit or reside near the Project site. Power lines emit extremely low frequency EMFs (below 300 Hertz). The closest receptor to the proposed power line for the Project is a cottage on Hare Lake, and it is approximately 2 to 3 km from the proposed power line.

Mitigation measures have been incorporated into the project design with respect to air emissions and water discharges such as the use of pollution control equipment (e.g. baghouses, scrubbers, etc.), application of amendments on stockpiles and gravel-surfaced roads, effluent treatment, recycling of contact water through the mill, minimization of the project footprint, and diversion of non-contact water around operational areas.

Residual effects are anticipated in terms of exceedances of applicable provincial or federal air quality criteria for benzene, benzo(a)pyrene, crystalline silica, nickel, nitrogen dioxide, and diesel exhaust. With mitigation and environmental protection measures implemented, residual effects on human health from changes in air quality are not expected to be significant during any phase of mine life. For the CoPCs predicted to exceed relevant air quality criteria, either the Project contribution is small, the predicted residual effects are infrequent at potentially susceptible receptors, or the geographic extent is restricted to within the property boundary or immediate surroundings.

Discharges to surface water during all mine phases are not expected to increase constituent concentrations in surface water in excess of water quality benchmarks; therefore, no adverse effects on human health are expected during any phase of the Project. No adverse effects on human health are expected from groundwater affected by Project-related changes to groundwater quality because no existing or foreseeable groundwater users are located in the areas where groundwater quality is predicted to exceed provincial and/or federal drinking water standards. The conclusion that water quality will not adversely affect human health is consistent with the conclusion in the original EIS (2012) that the Project will have limited effects on the aquatic environment.

With respect to country foods, there are minimal predicted Project-related effects on CoPC concentrations in the environment that would result in changes to CoPC concentrations in country foods in the LSA and RSA where country foods are likely to be harvested. Therefore, adverse effects on human health from country foods consumption are not expected from Project-related air and water emissions. This is consistent with the conclusion in the original EIS (2012).

Archaeology and Built and Cultural Heritage

Consistent with the original EIS (2012), two potential effects on physical and cultural heritage resources have been considered, including “change to archaeological resources” and “change to built and cultural heritage resources”. Change to archaeological resources is defined as the potential removal or alteration of archaeological sites or resources and change to built and cultural heritage resources is defined as the potential removal or alteration of historic sites, structures or landscapes.

Mitigation measures employed to avoid disturbance to archaeological resources include completion of a Stage 2 archaeological assessment prior to construction if the final alignment of the discharge pipeline

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remains in close proximity to the area of high archaeological potential identified on Hare Lake or avoidance of this area altogether.

Effects on archaeological resources will be avoided since the archaeological assessment programs have been (or will be) conducted in the SSA prior to ground disturbance activities, as required. An archaeological and heritage resource follow-up and monitoring program will form part of the Project Environmental Monitoring and Management Plan (EMMP) outlining the responsive action and process of documentation regarding the unexpected discovery of additional archaeological resources.

To date, no archaeological resources have been identified that would be affected by the Project. Therefore, no residual adverse effect on archaeological resources is anticipated. Following implementation of the proposed mitigation measures, effects on archaeological resources will be reduced, having carried out archaeological assessment programs in areas of archaeological potential prior to ground disturbance activities in these areas during the construction phase. Furthermore, protocols to protect archaeological resources will be implemented in the event of a chance find.

As there are no potential interactions between Project and built or cultural heritage resources, no residual adverse environmental effects were identified or predicted. The significance of residual effects was not assessed as no residual effects were identified. This prediction is the same as that of the original EIS (2012).

Indigenous Considerations

Three First Nations communities and three Métis communities from the original EIS (2012) continue to express direct interest in the Project based on asserted Indigenous rights and traditional and/or current land uses and have participated in the Project since the commencement of the EA in 2010, as follows:

- Biigtigong Nishnaabeg (BN) (formerly Pic River First Nation)
- Pays Plat First Nation/Pawgwasheeng First Nation (PPFN)
- Pic Moberg First Nation (also referred to as Netmizaaggamig Nishnaabeg) (PMFN)
- Red Sky Métis Independent Nation (RSMIN)
- Superior North Shore Métis Council: Métis Nation of Ontario (MNO)
- Jackfish Métis: Ontario Coalition of Indigenous Peoples (OCIP)

BN asserts exclusive title to a territory in which the Project site is located. An application seeking a court declaration to this effect was initiated in Ontario Superior Court in 2004. The Robinson-Superior Treaty confers hunting and fishing rights on its signatories. BN, PPFN and the RSMIN assert these treaty rights based on lands within a traditional area that includes the Project site.

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In January 2021, IAAC stated that an additional ten Indigenous communities would be notified of the Project. As of February 2021, GenPGM has included the following additional ten communities in Project notifications:

- Michipicoten First Nation
- Long Lake #58 First Nation
- Ginoogaming First Nation
- Animbiigoo Zaagi'igan Anishinaabek (Lake Nipigon FN)
- Bingwi Neyaashi Anishinaabek (Sandpoint First Nation)
- Biinjitiwaabik Zaaging Anishinaabek (Rocky Bay First Nation)
- Red Rock Indian Band
- Fort William First Nation
- Kiashke Zaaging Anishinaabek First Nation
- Whitesand First Nation

At the time of writing this report, Michipicoten First Nation has indicated interest in the Project and Ginoogaming First Nation stated they would be sending in comments. A meeting was held with Michipicoten First Nations in February 2021 to discuss topics of interest to the community, such as water quality predictions for effluent discharge (phosphorus), understanding potential changes to Lake Superior and species at risk, in particular caribou.

Comments and feedback received throughout the consultation process pertaining to Indigenous considerations (beyond those listed previously for each VEC) included topics such as access to the SSA during operations; how existing TLRU activities may be affected by the Project; communication of sites of ecological, cultural, social and/or economic importance (specifically Pic River, Stream 6/Angler Creek, and Lake Superior); timber harvesting and its effect on fur bearers, birds, and other wildlife; and requests for inclusion of community members in environmental monitoring programs. In addition, SAR, water quality, air quality, fish and wildlife (specifically caribou and moose) were among common areas of interest to most or all communities.

Comments and feedback received from Indigenous communities have been considered and incorporated throughout the assessment of effects on Indigenous consideration, and in the relevant VEC assessments, either in the form of providing further information, incorporation as specific components of the assessment (i.e., VECs), consideration to inform project design, identification of specific mitigation measures or consideration for future follow-up programs.

Potential effects as a result of Project-related activities are generally limited to the SSA, with some indirect effects extending to the LSA, and would occur from the site preparation and construction phase to the time at which it is deemed safe for the general public to access the site following decommissioning. Effects related to First Nation and Métis country food gathering and use of the BN community trapline could extend into the closure phase for a somewhat longer period as the reclamation process takes hold

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and plant and animal communities re-distribute themselves in the landscape. Residual effects on Indigenous considerations were evaluated under three main categories:

- Changes to traditional land and resource use, including wildlife harvesting (with a focus on the BN trapline), traditional fish harvesting, traditional plant and material harvesting and access and travel routes
- Changes to Indigenous heritage and archaeological resources
- Changes to Indigenous health, including as a result of drinking water and country foods\

The residual effects of the Project arise from the loss of approximately 1,116 ha of wildlife habitat and corresponding vegetation in the SSA. Some of this loss will be mitigated with remediation at closure. The residual environmental effect of a change in wildlife habitat quantity is predicted not to threaten the long-term viability of wildlife in the RSA as wildlife habitat is abundant in the RSA and the Project-associated loss is well within the range of annual disturbance considered sustainable in boreal ecosystems. Similarly, the residual effect of a change in wildlife habitat quality is not expected to threaten the long-term viability of wildlife. Impacts to the BN Community Trapline will occur as a result of the location of the trapline relative to the deposit and supporting infrastructure; however, with mitigation and reclamation, these adverse effects are considered to be temporary and reversible. Any loss of fish habitat will be compensated through the implementation of fish habitat offsetting in consultation with DFO and other interested parties. With implementation of the mitigation measures proposed, the residual adverse effects of the Project on traditional land and resource uses by Indigenous communities are predicted to be not significant.

To date, physical Indigenous heritage or archaeological resources have not been identified within the SSA. As such, no residual adverse effects on these resources are anticipated. Culturally important heritage sites have been identified by BN associated with the Community Trapline and harvesting of wildlife and vegetation within the LSA, as discussed above. With the implementation of mitigation measures, residual adverse effects of the Project on Indigenous cultural heritage and archaeological resources are determined to be not significant.

No groundwater users are known within the area where groundwater quality will be influenced by Project components. Therefore, changes in groundwater quality are not expected to adversely affect human health via use of groundwater as drinking water. Residual effects on surface water are limited to changes in water quality relative to background that do not exceed human health benchmarks during any phase of the Project. Therefore, changes in surface water quality are not expected to adversely affect human health via use of surface water as drinking or recreational water. As changes to water quality were not identified as an adverse effect on human health and did not differ substantially from background at locations where subsistence harvesters may harvest country foods, no CoPCs from Project-related water emissions were identified as being likely to accumulate in country foods at levels of concern to human health. Similarly, no significant adverse effects on human health are expected from Project-related changes in the quality of country foods during any phase of the Project. With mitigation and environmental protection measures, changes to air and water quality are not expected to have a significant adverse effect on human health via country food consumption because air and water quality are not predicted to differ substantially from background conditions at locations where subsistence

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harvesters may harvest country foods. As a result, the residual effects are considered to be not significant, consistent with the findings of the original EIS (2012).

Accidents and Malfunctions

Accident and malfunction scenarios that could occur during the various phases of the Project with the potential to adversely affect the environment were considered. Through the integration of precautionary safety protocols, measures and response planning, the potential for environmental effects on VECs as a result of an accident or malfunction are considered to be not significant. When assessing potential accidents and malfunctions, the following was considered:

- their nature, mechanism and magnitude
- their probability (high, medium, low, remote)
- their consequence(s)
- mitigation (i.e., design, management, safeguards, capabilities, resources and equipment available to safely respond to a scenario)
- contingency and emergency response procedures

Effects of the environment on the Project, including climate change, extreme weather, forest fires and seismic activity, were considered with respect to Project design and implementation. Project design, mitigation measures, and response procedures through the Environmental Management System (EMS) will help mitigate some of the effects of the environment. Project sensitivities to climate change can be addressed through mine and remediation design (e.g. adjust plantings for climate conditions at time of closure). Project design considerations included provisions for extreme weather (e.g. design of process solids management facility (PSMF) to Environmental Design Storm (EDS) standards, incorporating wave run up, etc.). As a result, potential effects of the environment on the Project are considered to be not significant.

As the Project is not likely to result in significant adverse effects, renewable resources are not anticipated to be significantly affected by the Project. The affected ecosystems are anticipated to be able to respond to internal and external changes and, as such, the capacity for renewable resources is not anticipated to be significantly affected as a result of the Project.

Cumulative Effects

The update to the cumulative effects assessment identifies and assesses Project residual adverse environmental effects that are likely to interact cumulatively with residual adverse environmental effects from other physical activities (past, present, and reasonably foreseeable). The significance of any Project-related cumulative effects and the Project's contribution to cumulative effects is also assessed. With the exception of archaeological and built and cultural heritage resources, for which no residual adverse effects were predicted, all VECs were carried forward to the cumulative effects assessment.

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An updated to the Project Inclusion List (PIL) was completed to identify past, present, and certain and reasonably foreseeable future projects and activities that may interact cumulatively with the proposed Project. In consideration of projects / activities identified in the PIL, cumulative residual effects were predicted for:

- atmospheric environment (change in GHGs)
- fish and fish habitat (change in fish habitat, change in fish mortality)
- vegetation (change in forest cover, change in non-forest cover)
- wildlife (change in habitat – direct and indirect, change in wildlife movement / passage, change in wildlife mortality)
- SAR (change in habitat - direct, change in habitat – sensory disturbance, change in mortality)
- socio-economic (economy and employment, infrastructure and community services, land and resource use)
- Indigenous considerations (traditional land and resource use, Indigenous heritage, Indigenous health)

In each case, the cumulative residual effects on these VECs have been identified as not significant and likely to occur with or without the implementation of the Project, where the contribution of the Project to any cumulative effects was considered to be negligible.

For GHGs, any projects / activities that are associated with GHG emissions, however minor the source, contribute to overall emissions of GHGs that are associated with the RSA, as well as nationally and globally. In this broad context, any source of GHG emissions that represent an incremental increase in emissions could affect Canada's ability to meet its commitments with respect to climate change.

As it concerns fish and fish habitat, the cumulative residual effects that have been identified (change in habitat, change in mortality) may be associated with other projects / activities that have been identified in the PIL. As such, they add cumulatively to the Project residual effects and, in this context, the cumulative residual effect that has been identified is likely to occur with or without the implementation of the Project.

For vegetation, since the cumulative residual effects that have been identified all primarily relate to loss and / or disturbance of forest cover and non-forest cover vegetation types, any projects / activities that are associated with similar types of effects (i.e., land clearing and land disturbance) add cumulatively to habitat loss / disturbance in the RSAs. In this context, the cumulative residual effect that has been identified is likely to occur with or without the implementation of the Project.

With respect to wildlife, the cumulative residual effects that have been identified (change in habitat – direct and indirect, change in wildlife movement / passage, change in wildlife mortality) may be associated with other projects / activities that have been identified in the PIL. As such, they add cumulatively to the Project residual effects and, in this context, the cumulative residual effect that has been identified is likely to occur with or without the implementation of the Project.

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As it concerns SAR, the cumulative residual effects that have been identified (change in habitat – direct and indirect or sensory disturbance, change in movement / passage, change in mortality) may be associated with other projects / activities that have been identified in the PIL. As such, they add cumulatively to the Project residual effects and, in this context, the cumulative residual effect that has been identified is likely to occur with or without the implementation of the Project.

For socio-economic conditions, the Project is viewed as a benefit to the economy of the area and is anticipated to increase employment for a population that is in decline due to an absence of employment opportunities. The positive benefits of the Project would not occur without the Project. Cumulative residual effects that have been identified (change in infrastructure and community services, change in land and resource use) may be associated with other projects / activities that have been identified in the PIL. As such, they add cumulatively to the Project residual effects and, in this context, the cumulative residual effect that has been identified is likely to occur with or without the implementation of the Project. However, the contribution of the Project to this determination is considered negligible.

As expressed by BN to GenPGM, BN is of the position that significant cumulative effects have occurred as a result of the past and present projects and activities within their traditional territory. However, it should be acknowledged that such effects will have occurred and are likely to occur independent of the Project (i.e., whether or not the Project proceeds). BN have identified additional mitigation measures that they propose are required from the federal and provincial governments to address existing conditions and historical effects on Indigenous communities. As such, in this context, the cumulative residual effect that has been identified is likely to occur with or without the implementation of the Project. However, the contribution of the Project to this determination is considered negligible.

ENVIRONMENTAL MANAGEMENT

An updated EMS was developed to manage and monitor liabilities and occupational hazards throughout the life of the Project in accordance with applicable federal and provincial requirements, as well as GenPGM's corporate policies. This system focuses on ensuring compliance with applicable environmental regulatory requirements by establishing roles and responsibilities, outlining requirements for training, describing standard practices and procedures, and setting up a system for periodic review and continuous improvement. The EMS comprises three components:

- Waste and Recycling Material Management Program (WRMMP): Intended to manage the non-hazardous and hazardous waste generated on the Project site
- Emergency Preparedness and Response Plan (EPRP): Intended to establish procedures and provide clear direction in case of an on-site emergency, including the identification of responsibilities of parties
- Environmental Monitoring and Management Plans (EMMP): Sets the practices and procedures that will be implemented to reduce potential adverse environmental effects of the Project and the corresponding follow-up and monitoring programs to test predictions made in the original EIS (2012) and the EIS Addendum and to demonstrate compliance with applicable permit and licence standards

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GenPGM will refine and further develop these programs should the Project progress to design and permitting, construction and operation. The Adaptive Management Framework will be followed as a means of formally evaluating and improving the Project design and operation.

A decommissioning and closure plan that reduces potential impacts of the Project, to the extent possible, and returns the site to a state that is usable by Indigenous peoples and the public will be implemented in accordance with O. Reg. 240/00.

GenPGM will implement follow-up and monitoring programs to verify the accuracy of the predicted effects and effectiveness of proposed mitigation measures. The goal of these programs will be to ensure proper measures and controls are in place to reduce the potential for environmental degradation and to provide clear emergency response procedures and plans.

PROJECT COMMITMENTS

GenPGM prepared an updated Table of Commitments (EIS Addendum, Volume 2, Chapter 8.0) to be carried out should the Project be approved and developed. These commitments pertain to the implementation of mitigation measures, contingency planning, monitoring, and reclamation/ rehabilitation of the site upon closure.

The commitments made include the preparation of various management plans under the EMMP as follows:

- Waste and recycling material management
- Access management
- Concentrate transfer station management
- PSMF operations
- Materials handling (non-mined materials)
- Emergency preparedness and response
- Erosion prevention and sediment control
- Fish Habitat Offsetting Strategy and Compensation Plan
- Atmospheric quality management, including air
- Water Management (surface water quality, surface water quantity, groundwater)
- Acid Rock Drainage / Metal Leaching (ARD/ML) management
- Vegetation management (including invasive species)
- Wildlife and Species at Risk management
- Reclamation and closure
- Soil salvage and storage

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- General construction and operations management
- Spills Prevention and Response Plan
- Occupational health and safety

Follow-up monitoring programs are proposed for various media to confirm predictions made in the original EIS (2012) and the EIS Addendum. Specific monitoring programs have been proposed 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

Monitoring of Indigenous land use and rights, Indigenous employment and contracting, country foods, and archaeological resources will be completed under the EMMP by GenPGM in partnership with BN, the Town of Marathon, and other Indigenous groups impacted by the Project.

SUMMARY

Effects of the environment on the Project continue to be predicted to be not significant, consistent with the original EIS (2012), due to the low likelihood of occurrence and incorporation of appropriate mitigation measures into the design, construction, operation and decommissioning of the Project. The potential residual environmental effects of accidents and malfunctions also continue to be considered unlikely and not significant.

Cumulative environmental effects of the Project in combination with other past, present or reasonably foreseeable future projects or activities were also assessed. The assessment of cumulative effects was updated as part of this EIS Addendum to reflect any residual effects from the Project that may interact cumulatively in combination with other projects or activities that have been or will be carried out in the

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RSA. Project management and mitigation measures will be applied as part of the Project, such that the potential environmental effects of the Project in combination with other projects or activities that have been or will be carried out are not significant.

An appropriate follow-up program has been developed to verify the predictions of the original EIS (2012) and EIS Addendum and to verify the effectiveness of mitigation. Additional follow-up and monitoring activities have been proposed, where appropriate. As well, monitoring measures have been developed to measure compliance with regulatory requirements, and to assist in the identification of adaptive management measures as necessary to avoid or minimize potentially significant adverse environmental effects in the unlikely event they occurred.

Overall, the EIS Addendum confirmed the findings of the original EIS (2012), concluding that with the implementation of appropriate mitigation and environmental protection measures, the residual environmental effects of the Project, including cumulative effects and the effects of the environment on the Project, during all phases of the Project are considered not significant.