Valentine Gold Project: Accidents and Malfunctions Prevention and Response Plan

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Abbreviations

AMPRP	Accidents and Malfunctions Prevention and Response Plan
CDA	Canadian Dam Association
CM	Construction Manager
COO	Chief Operating Officer
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
EBMP	Explosives and Blasting Management Plan
ECCC	Environment and Climate Change Canada
EDF	Environmental Design Flood
EIS	Environmental Impact Statement
EOR	Engineer of Record
EPP	Environmental Protection Plan
ERP	Emergency Response Plan
ERT	Emergency Response Team
ERTL	Emergency Response Team Lead
FDP	Final Discharge Point
H&S	Health and Safety
HGO	High Grade Ore
IAAC	Impact Assessment Agency of Canada
IC	Incident Commander
IDF	Inflow Design Flood
km	kilometre
LGO	Low Grade Ore
LOWL	Low Operating Water Level
MAC	Mining Association of Canada
masl	metres above sea level
MDMER	Metal and Diamond Mining Effluent Regulations
MDMER ERP	MDMER Emergency Response Plan for Effluent and Tailings Release

MM	Mine Manager
Mt	million tonnes
NL	Newfoundland and Labrador
NLDECC	Newfoundland and Labrador Department of Environment and Climate Change
NOWL	Normal Operating Water Level
OMS	Operations, Maintenance, and Surveillance
PAG	Potentially Acid Generating
PSSP	Public/Stakeholder Safety Plan
SARA	Species at Risk Act
Sr.SM	Senior Site Manager
TMF	Tailings Management Facility
TRRP	Tailings Release Remediation Plan
tpd	tonnes per day
TSS	Total Suspended Solids
VC	Valued Component
WHSCC	Workplace, Health, Safety, and Compensation Commission

1.0 INTRODUCTION

An Environmental Impact Statement (EIS) for the Valentine Gold Project (the Project) was submitted to the Impact Assessment Agency of Canada (IAAC / the Agency) on September 29, 2020, and to the Environmental Assessment (EA) Division of the Newfoundland and Labrador Department of Environment and Climate Change (NLDECC) on November 30, 2020, by Marathon Gold Corporation (Marathon). The Project was approved with conditions by NLDECC and IAAC, on March 17, 2022 and August 24, 2022, respectively.

This Accidents and Malfunctions Prevention and Response Plan (AMPRP) has been developed and prepared using currently available information. The AMPRP will require updates based on regulator, Indigenous, and stakeholder review and consultation, applicable conditions that may be part of the regulatory approvals, and when further details regarding Project design, sequencing, and methods become available.

1.1 PROJECT OVERVIEW

Marathon is proposing to develop an open pit gold mine near Valentine Lake in central Newfoundland (Figure 1.1). The main components of the proposed Project include two open pits, waste rock piles, crushing and stockpiling areas, conventional milling and processing facilities (the mill), a tailings management facility (TMF), personnel accommodations, and supporting infrastructure including roads, on-site power lines, buildings, and water and effluent management facilities.

The Project is located in a rural region, with a history of mining exploration and development activities and other land and resource uses, including commercial forestry, hydroelectric developments, outfitting, and recreational land use. The mine site is accessed by an existing public access road that extends approximately 88 kilometres (km) south from Millertown to Marathon's existing exploration camp. Marathon will upgrade and maintain the access road from a turnoff approximately 8 km southwest of Millertown to the mine site (i.e., a distance of approximately 76 km).

The Project is comprised of two mining areas (Figure 1.2), the Leprechaun and Marathon deposits. Standard surface mining techniques will be used to mine gold ore from two open pits. Ore material will initially be mined and processed at a nominal rate of 6,850 tonnes per day (tpd), increasing to 10,960 tpd in Year 4. Ore will be processed through the mill, where it will be crushed, milled and processed via floatation and cyanidation to recover gold. High-grade and low-grade ore materials will be stockpiled for mixing and processing later in the mine life. Tailings will be treated in the process plant area to remove cyanide and subsequently deposited in an engineered TMF, where effluent will be monitored for compliance with the *Metal and Diamond Mining Effluent Regulations* (MDMER). Gold will be formed into doré bars and shipped from site to market in secure trucks.

Project construction is expected to take place over a period of approximately 24 months, followed by an estimated mine operation life of 13 years. The Project will operate 24 hours a day, seven days a week on

a 12-hour shift basis. Upon cessation of mining, the operation will be closed, and the site components will be rehabilitated and monitored in accordance with applicable regulations at the time of closure.

Other Project components and activities associated with the primary mining, milling and processing activities include; site and haul road construction and maintenance; waste rock management; electrical power supply and distribution; process and potable water supply and distribution; site-wide stormwater and effluent management including: monitoring, treatment, and discharge; fuel storage and fueling stations; mine and plant workshops and services; administrative office; personnel accommodations and lunchrooms; and security. A power line connected from nearby Newfoundland and Labrador (NL) Hydro's Star Lake Generating Station to the mine site will be required to supply power to the Project and will be constructed and operated by NL Hydro.

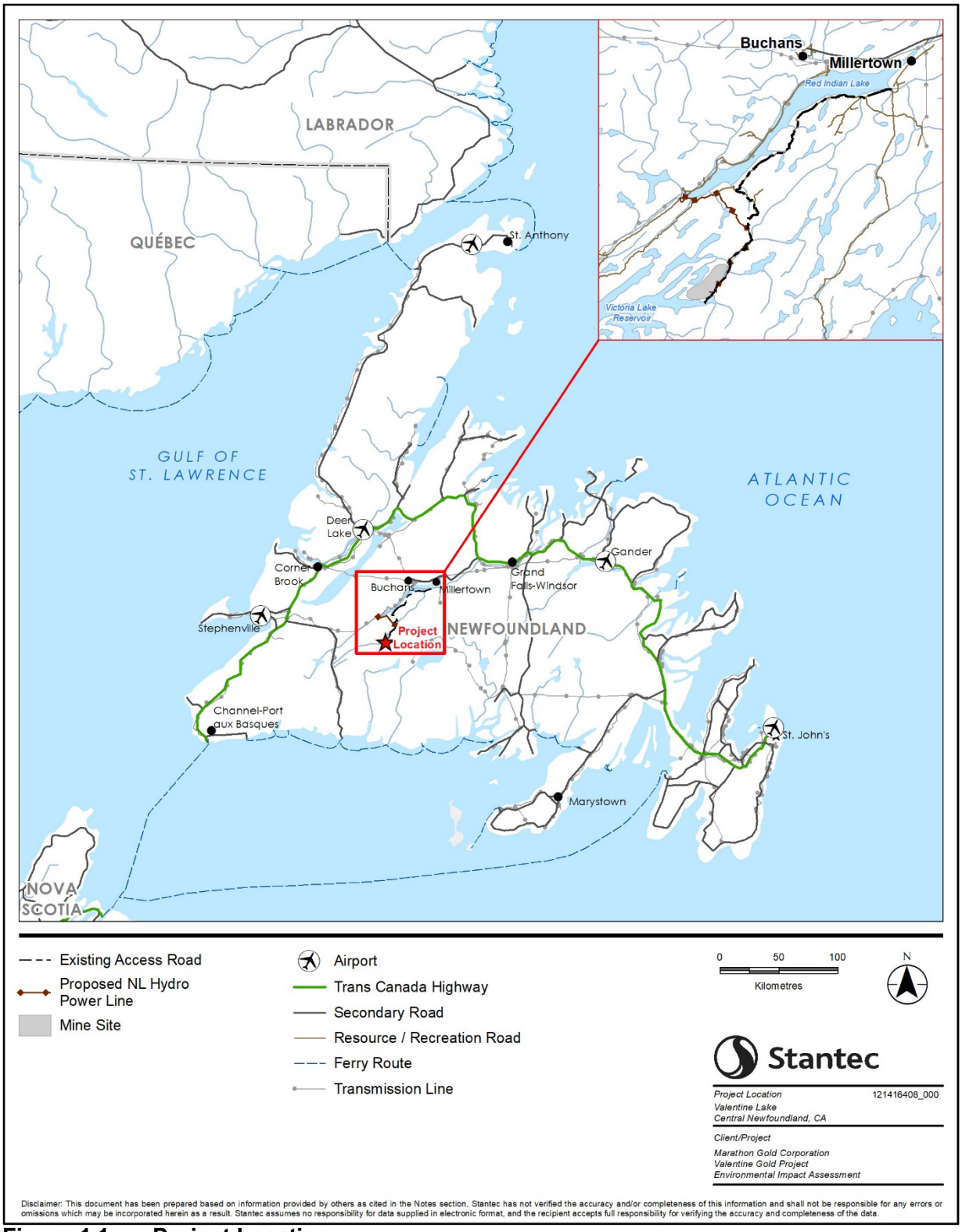

Figure 1.1 Project Location

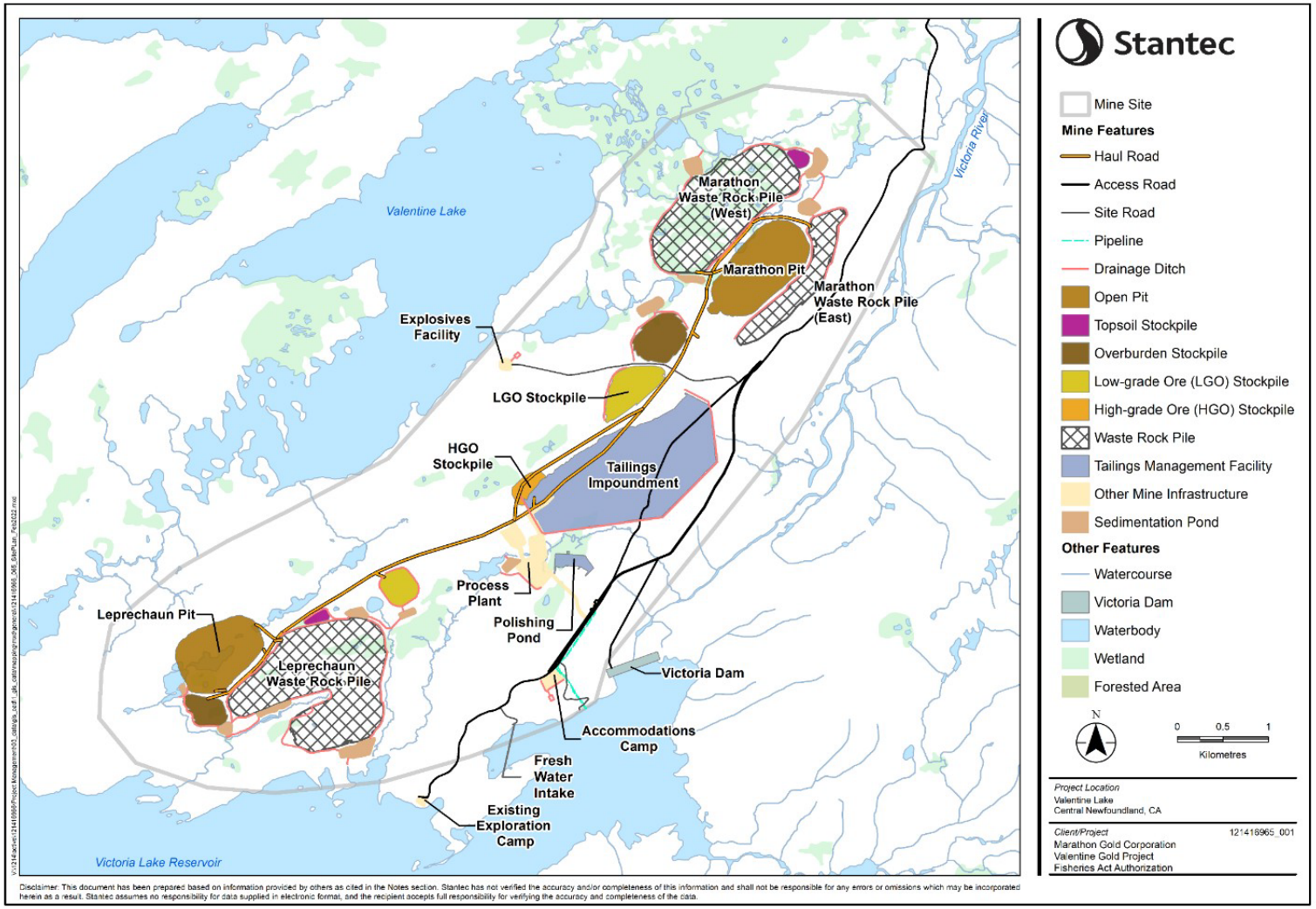

Figure 1.2 Mine Site Layout

1.2 PURPOSE

The purpose of this AMPRP is to:

- Assign roles and responsibilities to Marathon staff.
- Identify potential accidents and malfunctions that may cause adverse environmental effects.
- Outline mitigation measures for potential accidents and malfunctions.
- Provide response measures for each type of accident and malfunction to mitigate any additional adverse environmental effect caused by the accident or malfunction.
- Provide direction for communication requirements following an accident or malfunction.
- Provide direction for reporting requirements following an accident or malfunction.

1.3 ASSESSMENT AND CLASSIFICATION OF ACCIDENTS AND MALFUNCTIONS

1.3.1 ASSESSMENT

Accidents and malfunctions were assessed using the following approach:

- Selection of accidents and malfunctions that could occur during construction, operation, decommissioning, rehabilitation, and closure of the Project and result in potential environmental effects that require assessment.
- Description of the accidental event and malfunction scenarios above and identification of the measures that will be implemented to prevent, reduce, and control adverse environmental effects of each potential accident or malfunction.
- Assessment of the potential residual adverse effects (after design and safety measures and emergency response measures have been applied) on Valued Components (VCs) that would result from each accident or malfunction selected.
- Determination of the significance of residual effects (after design and safety measures and emergency response measures have been applied) of each accident or malfunction.

Marathon understands the importance of preventing accidents and malfunctions, and of planning for them before they occur. Marathon will prevent accidents and malfunctions using the following framework:

- Plan and design adhering to applicable provincial, national, and international codes and standards throughout all phases of the Project.
- Review the individual steps involved in Project construction, operation and decommissioning, rehabilitation and closure activities prior to the start of each phase.
- Analyze each step in the process to verify and update, if needed, the accident and malfunction scenarios identified in this assessment of accidental events.
- Review available best practice documents for each potential accident and malfunction scenario.

- Prepare and maintain on site this Project-specific accidents and malfunctions prevention and response plan, and review the plan on an annual basis, at a minimum.

1.3.2 CLASSIFICATION

Accidents and malfunctions have been classified into three consequence categories: high, medium and low. Consequence categories are defined as follows:

1. High consequence may cause long-term environmental impacts, human fatalities, and/or >$100k in financial damage/loss.
2. Medium consequence may cause medium-term environmental impacts, lost-time injuries, and/or <$100k in financial damage/loss.
3. Low consequence may cause short-term environmental impacts, first aid/medical treatment, and/or <$50k in financial damage/loss.

The accidents and malfunctions consequence summary is presented in Table 1-1.

Table 1-1 Accidents and Malfunctions Consequence Summary

Accident or Malfunction	Consequence	Issues of Concern
TMF Malfunction	High	• Damage to terrestrial/aquatic habitat and life • Damage to downstream human environment • Human fatality
Vehicle Accident	High	• Damage to terrestrial/aquatic habitat and life if a spill occurs • Human fatality
Fuel and Hazardous Materials Spill	Medium	• Damage to terrestrial/aquatic habitat and life • Damage to downstream human environment
Fire/Explosion	Medium	• Damage to terrestrial/aquatic habitat and life if near surface water • Loss of terrestrial habitat if fire is uncontrolled • Potential lost-time injury
Stockpile Slope Failure	Low	• Damage to terrestrial/aquatic habitat and life
Unplanned Release of Contact Water	Low	• Damage to aquatic habitat and life • Damage to downstream human environment

2.0 REGULATORY REQUIREMENTS

The AMPRP addresses:

- IAAC Conditions 10.1, 10.2, 10.3, 10.4, 10.5, and 10.6 which require the development of this plan.

Note that there are additional management and response plans (existing or currently under development) for the Project that overlap with or relate to the AMPRP, including but not limited to:

- Environmental Protection Plan (EPP), including contingency plans for fuel and hazardous materials spills, failure of erosion and sediment control measures and/or dams, and forest fires
- MDMER Emergency Response Plan (effluent and tailings) (MDMER ERP)
- Explosives and Blasting Management Plan (EBMP)
- Health and Safety Emergency Response Plan (H&S ERP)
- Tailings Management Plan
- TMF Operation, Maintenance, and Surveillance Manual (TMF OMS)
- TMF Public/Stakeholder Safety Plan (TMF PSSP)
- Tailings Release Remediation Plan (TRRP)

2.1 LEGISLATION

Federal legislation that applies to accidents and malfunctions includes:

- *Fisheries Act*
- *Species at Risk Act (SARA)*
- *Transportation of Dangerous Goods Act*
- *Explosives Act*
- *Canadian Environmental Protection Act*

Provincial legislation that applies to accidents and malfunctions includes:

- *Environmental Protection Act*
- *Dangerous Goods Transportation Act*
- *Historic Resources Act*
- *Forestry Act*
- *Mineral Act*
- *Occupational Health and Safety Act*

2.2 PERMITS, APPROVALS, AND AUTHORIZATIONS

Potential regulatory permits, approvals, and authorizations that may be required for Project construction and operation are listed in the Valentine Gold Project Construction EPP.

3.0 ROLES AND RESPONSIBILITIES

3.1 KEY PERSONNEL

The Marathon organization structure related to responding to accidents and malfunctions is depicted in Figure 3.1, with roles and responsibilities described below in Table 3-1. The organization structure and associated roles and responsibilities are under review by Marathon until construction begins and information in this section is subject to change until mining operations commence.

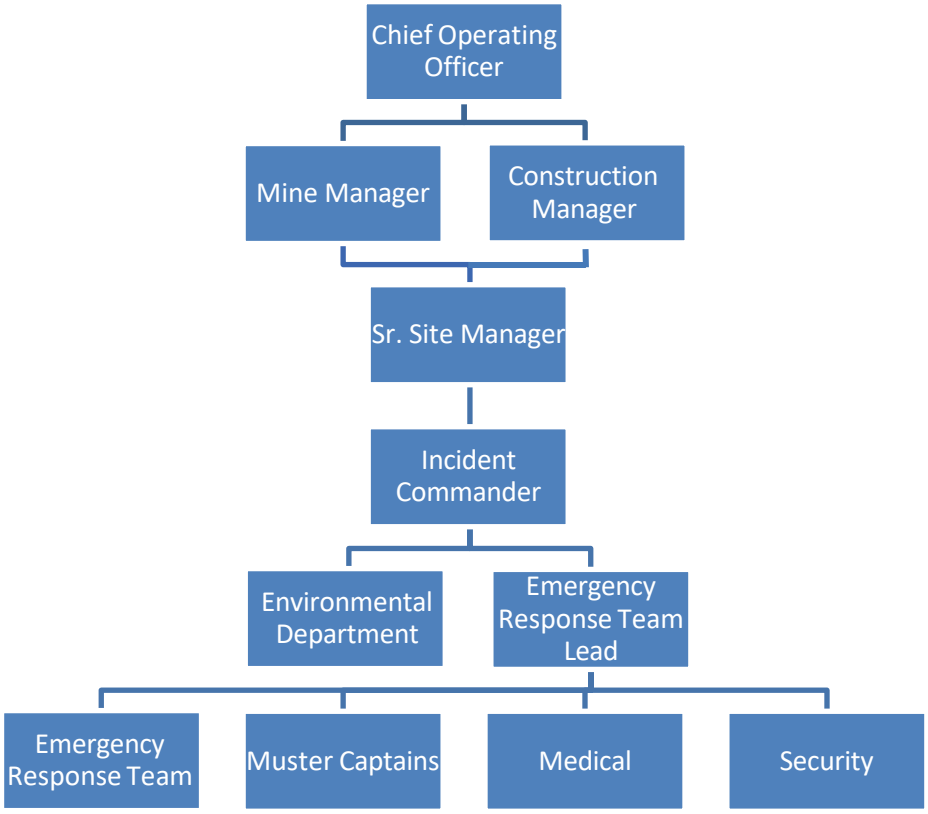

Figure 3.1 Marathon Emergency Response Authority

Table 3-1 Marathon Roles and Responsibilities

Title	Responsibilities
Chief Operating Officer (COO)	• Responsible to ensure the resources and support required are in place for successful implementation of the AMPRP.
Mine Manager (MM)	• Overall responsibility for the operation of the Project. • Oversight of on-site environmental monitoring and compliance relating to operating activities.
Construction Manager (CM)	• Overall responsibility for the construction of the Project. • Oversight of on-site environmental monitoring and compliance relating to construction activities.
Senior Site Manager (Sr.SM)	• Report to the MM or CM. • Provides oversight for all operations and construction of the Project. • Oversight of on-site environmental monitoring and compliance relating to Project activities.
Incident Commander (IC)	• Leads the response. • Responsible for ensuring the AMPRP is followed. • Coordinates with the Environmental Department to inspect the accident or malfunction scene and if follow-up environmental monitoring is required. • Coordinates response measures with the ERTL.
Environmental Department	• Responsible for determining if any adverse environmental effects are occurring. • Provides environmental direction during accidents and malfunction response activities. • External reporting of environmental conditions on behalf of Marathon.
Emergency Response Team Lead (ERTL)	• Responsible for the overall coordination and support for the accidents and malfunctions response. • Provides direction to the ERT, Muster Captains, Medical, and Security.
Emergency Response Team (ERT)	• Trained in responding to accidents and malfunctions. • Respond to all accidents and malfunctions under the direct supervision of the ERTL.
Muster Captains	• Designated individuals appointed by the ERTL to direct occupants/evacuees to muster points.
Medical	• Responsible for responding to accidents and malfunctions where medical attention is required, reporting to the ERTL.
Security	• Responsible for providing access to/from accident and malfunction sites, reporting to the ERTL. • Can act as temporary IC/ERTL if personnel are limited.
All Marathon Personnel	• Review and become familiar with the AMPRP. • Adhere to and implement mitigations noted in the AMPRP. • Immediately report accidents or malfunctions to a supervisor.

3.3 COMPETENCY AND TRAINING

Marathon personnel must understand accidents and malfunction response procedures for the Project and become familiar with their role in a response situation. Employee competency is necessary to ensure that response measures are consistent with expectations. Job observations and written tests are some of the methods that may be used to confirm competency. Employees will receive on the job training outlining measures to respond to accidents and malfunctions at the Project, and competency will be considered during performance reviews.

Employees will be required to sign a form indicating that they have reviewed and understand their role and responsibilities regarding this AMPRP.

All workers will receive an orientation from an immediate supervisor or designated trainer prior to the start of any new activity and thereafter on an as-needed basis.

4.0 POTENTIAL ACCIDENTS AND MALFUNCTIONS

Presented below are descriptions, and mitigation and response measures for accidents and malfunctions that were assessed for environmental effects in the EIS submitted by Marathon. Potential accidents or malfunctions that were not assessed in the EIS include: Open Pit Slope Failure; Sewage Treatment Plant Failure; Over Blasting; and Watercourse Crossing Failure. These scenarios were not assessed due to the low risk of residual adverse effects on VCs. For additional details on these potential accidents or malfunctions, please refer to the Project EIS.

4.1 TAILINGS MANAGEMENT FACILITY MALFUNCTION

Tailings will be managed for the first nine years of operation in the TMF. After Year 9 of operation, tailings will be pumped via pipeline to the exhausted Leprechaun open pit until the cessation of milling operation. The TMF will be designed to store 30 million tonnes (Mt) of tailings and constructed from mine waste rock and locally sourced borrow materials.

A water treatment plant and polishing pond will allow for the treatment and discharge of the excess water to Victoria Lake Reservoir. The polishing pond has been relocated away from the toe of the TMF dam, and closer to the plant site, which improves tailings water management components and eliminates the potential for a cascade failure in the event of a tailings dam breach.

4.1.1 DESCRIPTION OF SCENARIO

Historically, there have been several failure mechanisms that have resulted in dam breaks, including earthquakes, landslides, overtopping, internal erosion or piping, foundation failure, and slope failures (Golder 2020a; Stantec 2020).

- The most common causes of recorded dam failures include piping and overtopping failures (ICOLD 1995 in Golder 2020a; Stantec 2020).
- Piping, the internal erosion of the embankment material due to the flow of water, can develop as a result of construction and design issues as well as over time due to burrowing animals, decaying root systems below the pond reservoir level, or cracking caused by deformation. Piping manifests in the form of concentrated seepage and erosion of the dam fill, which can cause a collapse of the dam crest (Golder 2020a; Stantec 2020).
- Dam overtopping, when the inflow to the pond exceeds its storage and discharge capacities and therefore a rise of water level higher than the dam crest, has the potential to result in rapid down cutting as the dam fill is eroded by the flowing water.
- Piping and overtopping, if not identified and corrected, may lead to a rapid breach of the dam section through progressive erosion of the fill materials and an uncontrolled release of the impounded water (Golder 2020a; Stantec 2020).

4.1.2 PREVENTION MEASURES

Preventative measures have been taken in the design and operation stages of the Project to prevent, reduce and control potential accidents and malfunctions related to the TMF. The dams required for the tailings impoundment will be designed, constructed, operated, and closed in accordance with the Canadian Dam Association (CDA) and Mining Association of Canada (MAC) guidelines, Global Industry Standards on Tailings Management, as well as applicable provincial requirements. They will be inspected, maintained, and repaired in accordance with the NL *Water Resources Act.*

The design of the TMF has been carried out to meet or exceed the minimum allowable factors of safety under static and pseudo-static loading conditions recommended in the current CDA *Dam Safety Guidelines*. The proposed TMF includes a tailings dam and polishing pond dam that incorporate current regulatory requirements into the design, including the CDA (2013) design standards. Design of the tailings dam crest and invert elevation of associated spillways are determined by considering the Inflow Design Flood (IDF), the Environmental Design Flood (EDF), the Normal Operating Water Level (NOWL), the Low Operating Water Level (LOWL), and freeboard.

The overall design objective of the TMF is to protect the regional groundwater and surface water resources during both mine operation and long term (post-closure), achieve safe and efficient tailings storage and effluent management during operation, and achieve effective rehabilitation upon mine closure. The design of the TMF has considered the following:

- Reducing potential adverse effects to fish and fish habitat and risks to the surrounding environment and the Victoria Lake Reservoir and Dam, in the event of a dam failure.
- Permanent, secure and total confinement of tailings materials within the engineered TMF.
- Control, collection, and removal of effluent from the tailings during operation for recycling as process water to the maximum practical extent.
- The inclusion of monitoring features for the facility to demonstrate that facility performance goals are achieved, and design criteria and assumptions are met.
- Staged development of the TMF over the life of the Project to defer capital cost and allow for efficient use of rock materials from open pit development as construction materials for the TMF.
- Conservatively sizing the emergency spillway based on the probable maximum precipitation of 450 mm for Buchans meteorological station (ID 8400698).

A water treatment plant and polishing pond will allow for the treatment and discharge of the excess water to Victoria Lake Reservoir. Treatment and discharge will occur for eight months a year during operation (avoiding discharges during winter months). The TMF has been sized to store the excess water during the non-discharge period, including appropriate design precipitation events.

As outlined in the CDA *Dam Safety Guidelines*, dam surveillance is a critical component of dam safety for all phases of the life of most dams. Dam surveillance will start with construction, utilizing a comprehensive construction monitoring plan, including inspections by the Engineer of Record (EOR). Once constructed,

pre-operational inspections will be completed by Marathon, the EOR, and if feasible, the engineer who will conduct the annual inspections and Dam Safety Reviews.

Prior to operation, emergency preparedness and response plans (e.g., MDMER ERP, TMF OMS, and Tailings Management Plan) will be developed to provide a comprehensive plan for operation, inspection, and emergency response using the best practices outlined by the CDA and MAC. From a dam safety perspective, the TMF OMS manual will prescribe the type, frequency, and intensity of dam inspections to be completed, including daily observational inspections, weekly and monthly formal inspections completed by trained staff, and third-party annual inspections and Dam Safety Reviews (for Project TMF dams, required every five years based on “very high” dam classification). The Project Rehabilitation and Closure Plan and Financial Assurance will contain provisions for post-closure monitoring and maintenance of Project dams for 100 years, in the event that Marathon defaults on the Project at any time.

Dam monitoring and surveillance instrumentation will provide a record of key TMF dam performance data, including TMF water levels and flows, internal dam and downstream groundwater levels, groundwater quality upstream (natural) and downstream of the TMF, and settlement or movement of the dam itself.

The detailed engineering design (for construction) will be submitted to the Water Resources Management Division, NLDECC to obtain the necessary approvals (permits) for construction and operation of the TMF dams. Pre-operational plans (e.g., MDMER ERP, TMF OMS, and Tailings Management Plan) will also be submitted to the appropriate regulators for review. The TMF OMS will include a reporting plan and structure to provide dam safety information (inspection reports, monitoring data) to regulators and NL Hydro.

CDA requires that a TMF PSSP be developed which will identify the notifications procedures, warnings, and alarms to be implemented in the event of a catastrophic failure. Furthermore, under MDMER, there is a requirement for a tailings / effluent emergency response plan which will outline how a failure would be managed. The TMF will be monitored throughout the life of the facility to demonstrate performance goals are achieved and design criteria and assumptions are met.

4.1.3 RESPONSE MEASURES

If a TMF accident or malfunction occurs, the response measures outlined in Table 4-1 should be followed without delay.

Table 4-1 Response Measures for TMF Failure

Role	Response
First on scene	• Stop work in the area and notify MM/CM/Sr.SM by radio.
MM/CM/Sr.SM	• Coordinate with IC and ERTL to stop/shut down pumping of tailings to the TMF • Coordinate TMF repair to prevent recurring failure. • Initiate the H&S ERP, MDMER ERP, TRRP, and TMF OMS with the ERTL and IC.

	• Initiate remedial action with the ERTL and IC such as deploying earthworks equipment to reduce further damage to the dam and stabilize escaped tailings to the extent feasible.
IC	• Assess the TMF failure scene and determine if there are any injured personnel. ○ In the event of trapped personnel, medical responders trained in Advanced First Aid will also respond with appropriate medical equipment and supplies based on the number of potential injuries (see H&S ERP). • Initiate the H&S ERP, MDMER ERP, and TMF OMS with the ERTL and MM/CM/Sr.SM. • Initiate remedial action with the ERTL and MM/CM/Sr.SM such as deploying earthworks equipment to reduce further damage to the dam and stabilize escaped tailings to the extent feasible, establishing additional containment as needed around the inundation area. • Conduct visual inspection, if safe, to determine if any erosion or scouring is occurring or if any VCs are being affected by the TMF failure. • Mitigate further potential accidents or malfunctions by organizing for silt fencing and berms to be installed to contain tailings and/or effluent to protect VCs as necessary. • Engage with NL Hydro regarding mutual emergency notification and response procedures. • Report on the TMF failure post-incident to debrief regulators, stakeholders and Indigenous groups in collaboration with Environmental Department as per the TMF PSSP. • Participate in the planning, management, and execution of remedial measures to restore affected areas.
ERTL	• Initiate the H&S ERP, MDMER ERP, and TMF OMS with the IC and MM/CM/Sr.SM. • Initiate remedial action with the IC and MM/CM/Sr.SM such as deploying earthworks equipment to reduce further damage to the dam and stabilize escaped tailings to the extent feasible, establishing additional containment as needed around the inundation area. • Conduct visual inspection, if safe, to determine if any erosion or scouring is occurring or if any VCs are being affected by the TMF failure. • Mitigate further potential accidents or malfunctions by organizing for silt fencing and berms to be installed to protect VCs as necessary.
ERT	• Respond to any injured personnel. • Deploy earthworks equipment to reduce further damage to the dam and stabilize escaped tailings to the extent feasible. • Establish additional containment as needed around the inundation area. • Deploy turbidity curtains and/or other similar mitigation within affected watercourses.
Environmental Department	• Conduct inspection to determine if nearby waterbodies are being affected. • Communicate a reportable tailings release that may enter a waterbody frequented by fish, to the **Environmental Emergencies 24-Hour Report Line (709-772-2083 / 1-800-563-9089)**. • Notify appropriate regulators, stakeholders (see Section 5.0), the public and Indigenous groups (see Indigenous Communication Plan, Appendix A) of adverse environmental effects, as applicable. • Consult with Fisheries and Oceans Canada (DFO) and Environment and

	Climate Change Canada (ECCC) for requirements under the *Fisheries Act* and MDMER to determine the length and frequency of water quality monitoring and if fish tissue sampling is required. • Refer to MDMER ERP, TMF OMS, EPP, and environmental effects monitoring programs. • Report on the TMF failure post-incident to debrief regulators, stakeholders and Indigenous groups in collaboration with IC as per the TMF PSSP.

4.2 STOCKPILE SLOPE FAILURE

There will be five types of stockpiles required for the Project including: topsoil, overburden, low grade ore (LGO), high grade ore (HGO), and waste rock (Table 4-2).

Table 4-2 Stockpile Details

Stockpile Type	Capacity (Mt)			ARD / ML Potential
	Marathon	Leprechaun	Processing Plant	
Topsoil	0.250	0.200	-	Low
Overburden	7.5	3.1	-	Low
LGO	4.3	8.0	-	Low (Leprechaun) / PAG[1] (Marathon)
HGO	-	-	3.0	PAG
Waste Rock	145	136	-	PAG
[1]PAG=potentially acid generating				

There are designated topsoil and overburden (i.e., glacial till excavated as the open pits are expanded) stockpiles for the open pits. There are no designated overburden and topsoil stockpiles for other areas of the mine site; however, most of these materials will be windrowed along road corridors and along the edges of areas, like the mill pads. Marathon will also use the 'future footprint' of mine components, such as the waste rock piles and TMF, and around the pit, to store topsoil and overburden temporarily for progressive rehabilitation. This will be further defined as part of a materials balance completed as part of the Rehabilitation and Closure Plan, as well as for site development to reduce material movement and reduce the size of the various stockpiles.

Low-grade ore not immediately destined for the processing plant will be stockpiled for future processing, either for potential blending with higher grade ore, or towards the end of the mine life. There will be a LGO stockpile adjacent to each pit and a HGO stockpile near the processing plant. Approximately 50% of the LGO from Marathon is conservatively classified as a potentially acid generating (PAG) material and, therefore, LGO stockpile effluent has been segregated from other component flow streams in the design, to facilitate collection and further treatment, if required. In LGO from both deposits, concentration of metals in neutral leachates from humidity cells are substantially below MDMER discharge limits. Based on the static testing, approximately 11% and 56% of samples are classified as PAG material from Leprechaun and Marathon HGOs, respectively. The drainage from the HGO stockpile flows to the TMF

and any potential acidity will be neutralized in the pond or in the mill during pH adjustment required for gold recovery by cyanide. No exceedances of the MDMER limits are observed in leachates from ore samples.

There will be two waste rock piles, one located southeast of the Leprechaun pit (136 Mt) and the other northwest of the Marathon pit (145 Mt). The geological block model indicates that less than 0.5% of Leprechaun waste rock may be PAG. Approximately 14% of Marathon waste rock is estimated to be PAG based on the testing completed to date. To achieve neutralization, PAG and non-PAG rock will be blended, and PAG waste will be placed on non-PAG rock and encapsulated with non-PAG rock (e.g., no PAG rock deposited within 10 m of final waste rock pile base/shell). As a result, overall drainage from waste rock is not expected to be acidic. Concentration in leachates from waste rock humidity cells are two to three orders of magnitude below MDMER discharge limits (to be confirmed with further testing).

4.2.1 DESCRIPTION OF SCENARIO

Failure or slumping of materials in stockpiles / waste rock piles slopes would result in the release of waste rock, ore, or soils outside the storage areas and increase the footprint of the stockpile. Should a failure occur, solid material from the stockpile areas could enter adjacent areas to the stockpile, which may include lakes and streams.

While overburden, LGO and HGO stockpiles may result in slumping, these stockpiles are temporary and in the event of a failure, released material will be re-instated in a timely manner. Adverse effects are therefore not anticipated as a result of overburden, LGO and HGO stockpile failure. This scenario is therefore focused on the failure or slumping of materials from the waste rock pile.

4.2.2 PREVENTION MEASURES

Preventative measures have been taken in the design and operation stages of the Project to prevent, reduce, and control potential accidents and malfunctions related to stockpile slopes. The following prevention measures will be implemented in the design or operating stage of the Project:

- Waste rock piles will be benched and constructed to an overall slope of 3H:1V to promote long-term stability.
- Waste rock piles will be constructed according to design requirements for closure (i.e., long-term slope stability factors of safety) and assume a final closure slope angle of 30°.
    - The waste rock piles will be constructed in single lifts with a 35° face angle and a 6.1 m safety bench.
- Waste rock piles will be progressively rehabilitated (e.g., placement of soil cover and vegetation over waste rock piles) as benches or sections are completed (ongoing over life of Project).
- Waste rock piles will be constructed from the ground up using slopes and benches of 10 m height.
    - When a bench is finished in one area, the horizontal bench and slope will be covered with overburden / organics (anticipated 0.3 m in total thickness) and revegetated.

- Displacement monitoring / surveys will be undertaken to identify potential instability and early movements.
- Geotechnical and hydrogeological investigations will support the design, including appropriate geotechnical design parameters/factor of safety, and proper construction.

4.2.3 RESPONSE MEASURES

If stockpile slope failure occurs, the response measures outlined in Table 4-3 should be followed without delay.

Table 4-3 Response Measures for Stockpile Slope Failures

Role	Response
First on scene	• Stop work in the area of the stockpile slope failure and notify MM/CM/Sr.SM by radio.
MM/CM/Sr.SM	• Initiate the H&S ERP and MDMER ERP with the ERTL and IC if required. • Coordinate slope repair by recontouring material to prevent additional and/or recurring failure.
IC	• Assess the slope failure scene and determine if there are any injured personnel. ○ In the event of trapped personnel, medical responders trained in Advanced First Aid will also respond with appropriate medical equipment and supplies based on the number of potential injuries. • Initiate the H&S ERP and MDMER ERP with the ERTL and MM/CM/Sr.SM if required. • Conduct visual inspection, if safe, to determine if any erosion or scouring is occurring or if any VCs are being affected by the slope failure. • Mitigate further potential accidents or malfunctions by organizing for silt fencing and berms to be installed to protect VCs as necessary. • Report on the stockpile slope failure post-incident to debrief regulators, stakeholders and Indigenous groups in collaboration with Environmental Department.
ERTL	• Initiate the H&S ERP and MDMER ERP with the IC and MM/CM/Sr.SM if required. • Conduct visual inspection, if safe, to determine if any erosion or scouring is occurring or if any VCs are being affected by the slope failure. • Mitigate further potential accidents or malfunctions by organizing for silt fencing and berms to be installed to protect VCs as necessary.
ERT	• Respond to any injured personnel. • Install silt fence and berms to protect VCs if necessary.
Environmental Department	• Conduct inspection to determine if nearby waterbodies are being affected. • Communicate a release that may enter a waterbody frequented by fish, to the **Environmental Emergencies 24-Hour Report Line (709-772-2083 / 1-800-563-9089)**. • Notify appropriate regulators, stakeholders (see Section 5.0), the public and Indigenous groups (see Indigenous Communication Plan, Appendix A) of adverse environmental effects, as applicable. • Consult with DFO and ECCC for requirements under the *Fisheries Act* and

	MDMER to determine the length and frequency of water quality monitoring and if fish tissue sampling is required. • Refer to MDMER ERP, EPP, and environmental effects monitoring programs. • Report on the stockpile slope failure post-incident to debrief regulators and stakeholders in collaboration with IC.

4.3 FUEL AND HAZARDOUS MATERIALS SPILL

Fuel and hazardous materials (reagents) will be required throughout the life of the Project. Reagents are chemicals used to separate the desired material (i.e., the target metal) from the unwanted material (i.e., tailings) and include quicklime, sodium cyanide, frother, promoter, flocculant, hydrochloric acid, copper sulphate pentahydrate, sodium metabisulphite, sodium hydroxide, activated carbon, and smelting fluxes.

4.3.1 DESCRIPTION OF SCENARIO

A spill of fuel and/or hazardous material could occur due to factors such as equipment or vehicle malfunction, human error, or severe weather. Potential spill mechanisms include:

- Equipment leakage / failure: Relatively small spills of fuel may occur during construction or operation through refueling or leaks from machinery including the potential for hydraulic hose leaks from construction equipment. The volume of material from these spills is usually less than a few litres. These spills are typically highly localized and readily cleaned up by on-site crews using standard equipment and materials
- Storage tank leak or rupture: A spill from a storage tank could occur as a result of structural failure of the tank or an accidental impact to a tank from a vehicle, for example. Failure of the fuel storage and fueling stations would result in the release of petroleum-based pollutants
- Spill from vehicles on-site: An on-site vehicle accident could result in an unplanned release of fuel or hazardous materials used by the Project, on site roads or haul roads within the Project Area. In general, this scenario is considered less of a concern than a vehicle accident along the access road. Given drainage collection around the mine site, free product would possibly be directed towards the TMF, where it could be collected and cleaned up. Additionally, there is less chance for a spill on site to interact with wildlife or resource users due to the relatively low level of wildlife activity expected in the immediate areas of work and the restricted public access of the mine site (i.e., requirement to maintain a safety zone for blasting)
- Spill from vehicles along the access road: A worst-case scenario would be considered a large spill of fuel or hazardous material resulting from vehicle accidents or malfunctions during any phase of the Project. Fuels, reagents, and combustibles used for the Project will be transported to the site via the access road; therefore, there is a risk of an accident / collision, resulting in a spill of these transported materials. Spills may also occur if a vehicle malfunctions, or if non-transport vehicles collide, leading to the release of fluids or lubricants from these vehicles onto the ground. A spill, as a result of a

vehicle accident or malfunction, has the potential to affect surface water resources if the spill occurs near a waterbody either on site or along the access road

Spills have the potential to affect land or water within the mine site or outside of the mine site if not remediated in a timely manner. Adverse environmental effects can result from an accidental release of hazardous liquids due to their ability to flow in an uncontrolled manner and seep into porous material, and the toxicity of some liquids to plants and wildlife. There is also potential for air emissions of volatile components from a fuel spill. However, adverse effects will be generally localized, rapidly dispersed, and not of high enough concentrations to affect wildlife, which tend to avoid a spill and cleanup activities.

4.3.2 PREVENTION MEASURES

Preventative measures have been taken in the design and operation stages of the Project to prevent, reduce, and control potential accidents and malfunctions related to fuel and hazardous material spills. The following prevention measures will be implemented:

- Fuel will be obtained from a licensed contractor who will be required to comply with federal and provincial regulations.
- Designing the Project in accordance with the International Cyanide Management Code for the Manufacture, Transport, and Use of Cyanide in the Production of Gold.
- Regular vehicle and equipment inspections and maintenance will be conducted.
- The use of biodegradable hydraulic fluid in compatible machinery will be considered.
- Reagent preparation and storage facilities will be located within containment areas designed to accommodate more than the contents of the largest tank.
- Storage tanks will be equipped with level indicators, instrumentation, and alarms to prevent spills.
- Appropriate ventilation fire and safety protection, eyewash stations, and Safety Data Sheet stations will be located throughout the facilities.
- Sumps and sump pumps will be installed for spillage control.
- Temporary storage and fueling locations and procedures will conform to applicable regulatory criteria.
- Areas in which chemicals are used or stored shall have spill containment systems constructed with impermeable floors, walls, dykes, or curbs as applicable. These areas will:
    - Have no discharge to environment.
    - Have effective secondary containment capacity of at least 110% of the chemical storage tank capacity, in the case of a single storage container.
    - When there is more than one storage container, the spill containment system will be able to retain no less than 110% of the capacity of the largest container or 100% of the capacity of the largest container plus 10% of the aggregate capacity of all additional containers, whichever is greater.
    - Be kept clear of material that may compromise the containment capacity.
    - Include a floor drain system provided that the floor drains, and the place or device to which they drain is configured in such a manner that the required effective secondary containment capacity is maintained.
    - Be visually inspected annually for their liquid-containing integrity, with repairs made as required.

  - Be inspected by a means other than visual inspection for their liquid-containing integrity, with repairs made as required.
- Transportation measures will be implemented to reduce the potential for a vehicle accident which include:
  - Transportation of hazardous materials will be conducted in compliance with the federal *Transportation of Dangerous Goods Act* and the provincial *Dangerous Goods Transportation Act*.
  - Haul roads, site roads and the access road will be maintained in good condition. This will include periodically re-topping, regrading, and ditching to improve water flow, reduce erosion, and by managing vegetation growth.
  - Vehicles will use existing roads / trails while operating at the mine site.
  - Project vehicles will be required to comply with posted speed limits on the access road, site roads and haul roads. Speed limits will be set in accordance with provincial regulations and industry standards (e.g., for haul roads), as well as safety / environmental concerns (wildlife).
  - Marathon will develop and implement a Traffic Management Plan to manage transportation of workers and materials to site, product leaving site, the number of vehicles accessing the site, and to reduce traffic delays.
  - Appropriate Project personnel will be trained in fuel handling, equipment maintenance, and fire prevention and response measures.
  - Fuels and lubricants used during construction and operation will be stored according to regulated containment methods in designated areas. Refueling, servicing and equipment and waste storage will not take place within 30 m of watercourses to reduce the likelihood that deleterious substances will enter watercourses. Spill kits will be maintained at numerous locations on-site during construction and operation.
  - Marathon will regularly inspect and monitor Project infrastructure and equipment and take required action to maintain, repair and upgrade infrastructure / equipment as needed.

4.3.3 RESPONSE MEASURES

If a fuel or hazardous material spill occurs, the following response measures listed in Table 4-4 should be followed. In reaching decisions on containment and clean-up procedures, the following criteria will be applied, drawn from Section 6 of the EPP:

- Minimize danger to workers and public.
- Protect water supplies.
- Minimize pollution of watercourses.
- Minimize area affected by spill.
- Minimize the degree of disturbance to the area and watercourses during clean-up.

Table 4-4 Response Measures for Fuel and Hazardous Materials Spills

Role	Response
First on scene	• Ensure the area is safe for entry and the spilled fuel or hazardous material does not pose an immediate threat to health and safety of responder(s). • Check for hazards (flammable material, noxious fumes, cause of spill) and leave the area. • Verbally report the spill immediately to the MM/CM/Sr.SM, with details including spill location, type of fuel or hazardous material (if known), approximate volume, and terrain condition at the spill site. ○ As soon as possible following verbal reporting, the Spill Reporting Information Form (Appendix B) is to be completed and submitted to Environmental Department. • Make a reasonable attempt to immediately stop the leakage and contain the flow, if safe to do so. • Take digital photographs of the spill at the earliest opportunity.

MM/CM/Sr.SM	• Initiate the H&S ERP, MDMER ERP (if required) and applicable contingency plans in the EPP with the ERTL and IC.
	• In consultation with the IC, ERTL, ERT, and regulating authorities:
	  ○ Assess site conditions, ensure that the source of the spill has been isolated and stemmed, and determine the appropriate cleanup procedure in consideration of potential environmental effects of various cleanup procedures.
	  ○ Deploy on-site staff to mobilize pumps and empty 215-L drums or other appropriate storage containers to the spill site.
	  ○ Deploy on-site staff to build containment dykes and commence pumping contaminant into drums.
	  ○ Take all necessary precautions to avoid the incident in the future, including thorough identification of immediate and root causes and corrective actions, communicating these to personnel/contractors as applicable, and following through corrective actions to closure.
	• Coordinate containment and clean-up of the spill using spill kits and appropriate absorbent material, prevent spill from entering nearby waterbodies.
	• Redirect spill response equipment and supplies to the spill area, if necessary.

IC	• Initiate the H&S ERP, MDMER ERP (if required) and applicable contingency plans in the EPP with the ERTL and MM/CM/Sr.SM.
	• In consultation with the MM/CM/Sr.SM, ERTL, ERT, and regulating authorities:
	  ○ Assess site conditions, ensure that the source of the spill has been isolated and stemmed, and determine the appropriate cleanup procedure in consideration of potential environmental effects of various cleanup procedures.
	  ○ Deploy on-site staff to mobilize pumps and empty 215-L drums or other appropriate storage containers to the spill site.
	  ○ Deploy on-site staff to build containment dykes and commence pumping contaminant into drums.
	  ○ Take all necessary precautions to avoid the incident in the future, including thorough identification of immediate and root causes and corrective actions, communicating these to personnel/contractors as applicable, and following through corrective actions to closure.

	• Report on the fuel or hazardous materials spill post-incident to debrief regulators, stakeholders and Indigenous groups in collaboration with the Environmental Department.

ERTL	• Initiate the H&S ERP, MDMER ERP (if required) and applicable contingency plans in the EPP with the MM/CM/Sr.SM and IC.
	• In consultation with the IC, MM/CM/Sr.SM, ERT, and regulating authorities:
	  ○ Assess site conditions, ensure that the source of the spill has been isolated and stemmed, and determine the appropriate cleanup procedure in consideration of potential environmental effects of various cleanup procedures.
	  ○ Deploy on-site staff to mobilize pumps and empty 215-L drums or other appropriate storage containers to the spill site.
	  ○ Deploy on-site staff to build containment dykes and commence pumping contaminant into drums.
	  ○ Take all necessary precautions to avoid the incident in the future, including thorough identification of immediate and root causes and corrective actions, communicating these to personnel/contractors as applicable, and following through corrective actions to closure.

ERT	• In consultation with the IC, MM/CM/Sr.SM, ERT, and regulating authorities:
	  ○ Assess site conditions, ensure that the source of the spill has been isolated and stemmed, and determine the appropriate cleanup procedure in consideration of potential environmental effects of various cleanup procedures.
	  ○ Mobilize pumps and empty 215-L drums or other appropriate storage containers to the spill site.
	  ○ Build containment dykes and commence pumping contaminant into drums
	  ○ Apply absorbent as necessary.
	  ○ Dispose of all contaminated debris, soil, cleaning materials, and absorbent by placing in an ISO-approved container for shipment and disposal offsite in a licensed disposal facility.
	  ○ Take all necessary precautions to avoid the incident in the future, including thorough identification of immediate and root causes and corrective actions, communicating these to personnel/contractors as applicable, and following through corrective actions to closure.

Environmental Department	• Conduct inspection to determine if nearby waterbodies are being affected. • Communicate a reportable spill on land, or any spill regardless of size that may enter a waterbody frequented by fish, to the **Environmental Emergencies 24-Hour Report Line (709-772-2083 / 1-800-563-9089)**. • Coordinate to test soils for hydrocarbon in the vicinity of a spill to determine the requirement for further excavation. • Notify appropriate regulators, stakeholders (see Section 5.0), the public and Indigenous groups (see Indigenous Communication Plan, Appendix A) of adverse environmental effects, as applicable. • Consult with DFO and ECCC for requirements under the *Fisheries Act* and MDMER to determine the length and frequency of water quality monitoring and if fish tissue sampling is required. • Refer to MDMER ERP, applicable contingency plans in the EPP, and environmental effects monitoring programs.

	• Report on the fuel or hazardous materials spill post-incident to debrief regulators and stakeholders in collaboration with IC.

4.4 UNPLANNED RELEASE OF CONTACT WATER

Contact water is any runoff, groundwater or process water that has come into direct contact with mine rock, tailings, or terrain where mine workings and infrastructure occur. Contact water will be collected and managed through a variety of drainage ditches, pipes and sump pits constructed around Project infrastructure and directed to either the TMF or sedimentation ponds. Water collected in the sumps and/or small ponds and during open pit dewatering will be pumped to sedimentation ponds located at each site. Contact water will be held and/or treated as required to meet MDMER requirements prior to being discharged directly to the environment at identified Final Discharge Points (FDPs). The mine site is divided into the three water management complexes, each with independent functioning:

- Marathon complex: ditches and ponds will discharge to tributaries of Valentine Lake (30% of discharges) or the Victoria River (70% of discharges).
- Process plant and TMF complex: excess runoff is routed through a water treatment plant and polishing pond prior to discharge via a pipeline to Victoria Lake Reservoir. Runoff from the process plant yard and adjacent stockpiles to be treated through the same process.
- Leprechaun complex: runoff to be collected in drainage ditches and directed to sedimentation ponds and discharged directly to Victoria Lake Reservoir or its tributaries.

4.4.1 DESCRIPTION OF SCENARIO

Malfunction of the catchment sumps, ditches and channels, and sedimentation ponds could lead to the unplanned release of contact water into the receiving environment. There is also potential for accidental seepage wherever contact water is stored. Seepage water associated with the TMF will be collected and pumped back to the TMF; however, excess seepage could result from a damaged TMF dam liner (due to improper construction or installation, or damage during operation), which could overwhelm the downstream sumps and cause uncontrolled discharge to the environment. Accidental discharge from the collection or seepage of mining effluent has the potential to cause changes to groundwater, surface water and sediment quality, as well as indirect or direct effects on fish (e.g., toxicity, bioaccumulation, avoidance of area, alteration of planktonic and benthic communities).

4.4.2 PREVENTION MEASURES

Preventative measures have been taken in the design and operation stages of the Project to prevent, reduce, and control potential accidents and malfunctions related to unplanned release of contact water. The following prevention measures will be implemented:

- The Water Management Plan will be followed to support and guide the construction, operation, and closure of the Project.
- Reduce water inventory through perimeter berms, separation of groundwater and surface water flows, and promote overland flow of non-contact runoff.
- Effectively control potential high precipitation events and provide water management design that produces effluent achieving regulatory effluent criteria.
- Reduce FDPs through grading of ditches and construction of diversion channels to combine discharge points to collective effluent discharge points and or sedimentation ponds.
- Maintain flow to fish-bearing streams and wetlands/bogs by maintaining pre-development catchments.
- Reduce water management costs during operation through gravity drainage, where feasible, thus reducing pump requirements.
- Water management across the site will be implemented and operated as follows:
    - Diversion of non-contact water where feasible. Channels and berms will be constructed around the crest of the open pits and up-hill of waste rock piles and other developed areas to divert natural precipitation and surface runoff away to natural water drainage areas and away from contact with the mining operation, where feasible.
    - Precipitation and groundwater entering the open pits will be managed in-pit via sloped pit floors and catchment sumps, as required. Catchment sumps are the first opportunity to reduce sedimentation and chemistry impacts (e.g., residual ammonia). Appropriately sized sumps with screened intakes and hydrocarbon absorption booms will be employed in-pit. Water collected in these in-pit sumps will be pumped to the crest of the pit and discharged into an engineered sedimentation pond.
    - Sedimentation ponds are appropriately sized for retention and removal (by gravity) of suspended solids (sediment), such that discharge is expected to comply with the applicable regulatory requirements including the MDMER pursuant to the *Fisheries Act*.
    - Precipitation runoff from waste rock piles and other developed areas of the site will be collected via ditches and channels and directed to downstream sedimentation ponds similar to those to be constructed for management of water from the open pits.
    - Sedimentation ponds will be constructed in-ground, and/or using earthen berms and till, or synthetic liners, where required, for water retention.
    - Sedimentation ponds have been sited based on topography and geotechnical conditions. Where feasible, water collected in pit, or in the sedimentation ponds will be used for other purposes on site rather than discharged to the environment.
- Water management infrastructure will be designed to:
    - Include a 15 m setback from fish-bearing waterbodies.
    - Consider climate change associated precipitation events and associated flow.
    - Maintain flow to fish-bearing waterbodies where feasible, draining mine site components to pre-development catchment areas, where practical.
- Contact runoff from the stockpiles will be managed by perimeter ditches and treated for sediment prior to release to the environment.

- Sedimentation pond embankments will be designed to reduce seepage and be constructed out of locally sourced, low permeability glacial till.
- Erosion protection will be provided through riprap lining of the embankment and spillway, and a scour pad at the toe of slope of spillways. A geotextile or granular soil filter layer will be placed between materials to reduce the opportunity for piping. The design of the sedimentation ponds will account for climate change, ice thickness during winter, inactive storage to promote settling, operating water levels, and freeboard requirements.
- Sedimentation ponds are designed to store runoff from the Project for storm events up to the 1:100-year return period, and emergency spillways to accommodate 1:200-year return period flow.
- Surface water and groundwater quantity and quality monitoring programs will be implemented to confirm compliance with regulatory requirements, support predictions of effects of the Project on water quality, identify changes in drainage patterns and surface water flow, and determine if additional mitigation measures are required.

4.4.3 RESPONSE MEASURES

If an unplanned release of contact water occurs, the response measures outlined in Table 4-5 should be followed.

Table 4-5 Response Measures for Unplanned Releases of Contact Water.

Role	Response
First on scene	• Identify the location of the contact water release. • Verbally report the release immediately to the MM/CM/Sr.SM, with details including release location, approximate volume, and terrain condition at the release site.
MM/CM/Sr.SM	• Initiate the H&S ERP and MDMER ERP with the IC and ERTL. • Coordinate with the IC and ERTL deployment of water control and silt fencing to stop the source of the release, if practical. • Coordinate pumping of contact water back into the collection system, if possible. This may require the installation of additional pumps should the volume of pump-back water exceed predicted rates in the TMF seepage collection ditches.
IC	• Initiate the H&S ERP and MDMER ERP with the MM/CM/Sr.SM and ERTL. • Coordinate with ERTL and MM/CM/Sr.SM the deployment of water control and silt fencing to stop the source of the release, if practical. • Report on the unplanned release of contact water post-incident to debrief Regulators, stakeholders and Indigenous groups in collaboration with Environmental Department
ERTL	• Initiate the H&S ERP and MDMER ERP with the MM/CM/Sr.SM and IC. • Coordinate with IC and MM/CM/Sr.SM the deployment of water control and silt

	fencing to stop the source of the release, if practical.
ERT	• Deploy water control and silt fencing to stop the source of the release. • Pump contact water back into the collection system, if possible. • Install additional pumps should the volume of pump-back water exceed predicted rates in the TMF seepage collection ditches.
Environmental Department	• Communicate a contact water release that may enter a waterbody frequented by fish to the **Environmental Emergencies 24-Hour Report Line (709-772-2083 / 1-800-563-9089).** • Notify appropriate regulators, stakeholders (see Section 5.0), the public and Indigenous groups (see Indigenous Communication Plan, Appendix A) of adverse environmental effects, as applicable. • Consult with DFO and ECCC for requirements under the *Fisheries Act* and MDMER to determine the length and frequency of water quality monitoring and if fish tissue sampling is required. • Refer to MDMER ERP, EPP, and environmental effects monitoring programs. • Report on the unplanned release of contact water post-incident to debrief regulators, stakeholders and Indigenous groups in collaboration with IC.

4.5 FIRE/EXPLOSION

Accidental events associated with Project activities such as equipment malfunction, human error or uncontrolled explosions could result in a fire related directly to Project infrastructure and facilities, or within the Project Area as a forest fire.

4.5.1 DESCRIPTION OF SCENARIO

The potential for fire or explosion exists from Project activities including, although not limited to, vehicle or equipment accidents or malfunctions, uncontrolled explosions, smelter or kiln malfunctions, electrical accidents, welding activities, kitchen fires, or human carelessness. The scenario(s) for this accident includes a fire or explosion within the processing facility or, a fire and/or explosion resulting from a fuel spill that could spread outside of the Project Area, as well as a fire arising from an off-site (i.e., along the access road) vehicle accident. A fire and/or explosion in a processing facility may occur due to the failure / malfunctioning of technology or equipment. Fuel transfer activities during construction and operation may also result in fire and/or explosion. In the event of fire or explosions, fuel could potentially spill onto land and nearby waterbodies, see Section 4.3 for response measures.

4.5.2 PREVENTION MEASURES

Preventative measures have been taken in the design and operation stages of the Project to prevent, reduce, and control potential accidents and malfunctions related to fire or explosions. The following prevention measures will be implemented:

- An Explosives and Blasting Management Plan will be prepared for the safe use and storage of explosives prior to the use of explosives at Project sites.
- Facilities will have a fire suppression system in accordance with the structure's function and in accordance with regulatory requirements, including NL *Occupational Health and Safety Act* and *Occupational Health and Safety Regulations*.
- Fire water will be used with an underground ring main network around the facilities, supplied by the bottom section of the raw water tank.
- All buildings will have hose cabinets and handheld fire extinguishers.
- Electrical and control rooms will be equipped with dry-type fire extinguishers.
- Automatic sprinkler systems will be installed in ancillary buildings.
- Appropriate fire suppression systems will be provided for reagents according to their SDS.
- All mine water trucks will be fitted with firefighting equipment and foam injection tanks.
- Explosives and accessories will be transported to the open pits as needed.
- Buffers will be provided, as required, between infrastructure and equipment.
- Equipment will be maintained and in good working order.
- Employees will be trained in fuel handling, fire prevention, and emergency response measures.
- A 150 m by 150 m explosives storage and mixing area will be constructed for mine operation
    - Consist of bulk ammonium nitrate storage, bulk emulsion storage, an explosives magazine, storage for explosive and blasting accessories (e.g., detonators, boosters, detonating cords), bulk transfer facilities, garage for mobile equipment, and trailers for personnel.
    - Will meet or exceed government regulations including required separation distances as regulated by Explosives Regulatory Division of Natural Resources Canada.

4.5.3 RESPONSE MEASURES

If a fire and/or explosion occurs, the following response measures outlined in Table 4-6 should be followed without delay.

Table 4-6 Response Measures for Fire/Explosions

Role	Response
First on scene	• Immediately report the incident by announcing "EMERGENCY, EMERGENCY, EMERGENCY" over the radio. • Take immediate steps to contain or extinguish the fire if safe to do so. • Leave the area if the fire continues to burn. • Ensure the area is safe for entry and the fire does not pose an immediate threat to health and safety of responder(s).
MM/CM/Sr.SM	• Initiate H&S ERP with IC. • Refer to Table 4-3 for response measures in the case of a fuel or hazardous materials spill caused by fire or explosion.
IC	• Initiate H&S ERP with MM/CM/Sr.SM • Report fires immediately to:

	○ The Environmental Department. ○ NLDFFA's 24-hour Forest Fire Emergency Line (1-800-898-4528); providing the name and phone number of the reporter, time of detection of the fire, size of the fire, location of the fire. • Notify firefighters of unaccounted personnel. • Report on the fire or explosion post-incident to debrief regulators and stakeholders.
Environmental Department	• Refer to Table 4-3 for response measures in the case of a fuel or hazardous materials spill caused by a fire or explosion. • Notify appropriate regulators, stakeholders (see Section 5.0), the public and Indigenous groups (see Indigenous Communication Plan, Appendix A) of adverse environmental effects, as applicable.
Muster Captains	• Conduct head counts and notify the IC if any personnel are not accounted for.
Site Personnel	• Proceed to nearest/safe muster point without delay for a head count and wait for further instructions from the IC.

4.6 VEHICLE ACCIDENT

The mine site is accessible via an 88 km gravel access road from Millertown. The first 8 km are owned, operated, and maintained by the province. The next 80 km of class D gravel road will be upgraded (where required) to a Class A standard 7.3 m-wide driving surface and will include ditching on both sides and cross drainage by culverts. There is a 20 m-wide buffer on either side of the existing access road included in the Project Area to accommodate upgrading activities (where required) and will provide better visibility.

4.6.1 DESCRIPTION OF SCENARIO

Vehicle accidents, including single vehicle accidents, could result in the release of hydrocarbons, sodium cyanide, or ammonium nitrate to the environment, see Section 4.3 for response measures. Accidental collisions from the operation of Project vehicles or heavy equipment could also result in human mortality or injury. A vehicle accident could also result in a fuel or hazardous materials spill (Section 4.3) and fire or explosion (Section 4.5).

4.6.2 PREVENTION MEASURES

Preventative measures have been taken in the design and operation stages of the Project to prevent, reduce, and control potential accidents and malfunctions related to vehicle accidents. The following prevention measures will be implemented:

- Marathon will develop and implement a Traffic Management Plan to manage transportation of workers and materials to site, product leaving site, the number of vehicles accessing the site, and to reduce traffic delays.

- Haul roads, site roads and the access road will be maintained in good condition. This will include periodically regrading and ditching to improve water flow, reduce erosion and by managing vegetation growth.
- Project vehicles will be required to comply with posted speed limits on the access road, site roads and haul roads. Speed limits will be set in accordance with road conditions, and provincial regulations and industry standards (e.g., for haul roads).
- Marathon will implement traffic control measures, which may include gating approaches, placing large boulder and/or gated fencing to restrict public access to the mine site.
- Project vehicles will be driven by trained and competent drivers who will use approved routes.
- Project vehicles will be manually inspected on a regular schedule to confirm serviceability.
- Driving safety will be a part of the employee orientation program.
- Workers will be bussed from nearby communities to the mine site for shifts to reduce effects of traffic on the access road, which will also reduce potential for a vehicle collision.

4.6.3 RESPONSE MEASURES

If a vehicle accident occurs, the response measures outlined in Table 4-7 should be followed.

Table 4-7 Response Measures for Vehicle Accidents.

Role	Response
First on scene	• Immediately report the accident via radio to the MM/CM/Sr.SM on site, providing a detailed description of the scene including the condition of the occupant(s), the exact location of the accident, and the number/type of vehicle(s) involved. • Approach the vehicle if safe to do so and isolate the vehicle by turning off the ignition. • Care for the injured as circumstances allow, providing First Aid if trained to do so. Do not move injured occupant(s). • Update the IC on the condition of the occupant(s). • Continue to monitor the scene until help arrives.
MM/CM/Sr.SM	• Initiate H&S ERP with IC and ERTL. • Refer to Table 4-3 for response measures in the case of a fuel or hazardous materials spill caused by a vehicle accident.
IC	• Initiate H&S ERP with MM/CM/Sr.SM and ERTL. • Respond to the accident scene with appropriate equipment. In the event of injured or trapped occupant(s), medical responders trained in Advanced First Aid will also respond with appropriate medical equipment and supplies based on the number of potential injured. • Assess the accident scene and ensure it is safe to conduct emergency operations. ○ If it is determined that outside resources (e.g., ambulance, police) are required, communicate the requirement to the MM/CM/Sr.SM. • Assess any threat to the environment that has resulted from the accident and ensure that appropriate measures are taken to mitigate them. • Ensure that the scene is cordoned off and preserved for investigation purposes.

	• Notify appropriate regulators, stakeholders (see Section 5.0), the public and Indigenous groups (see Indigenous Communication Plan, Appendix A) of adverse environmental effects, as applicable. • Notify appropriate regulators, as applicable. • Report on the vehicle accident post-incident to debrief regulators and stakeholders.
ERTL	• Initiate H&S ERP with MM/CM/Sr.SM and IC. • Respond to the accident scene with appropriate equipment. In the event of injured or trapped occupant(s), medical responders trained in Advanced First Aid will also respond with appropriate medical equipment and supplies based on the number of potential injured. • Assess the accident scene and ensure it is safe to conduct emergency operations. • Assess any threat to the environment that has resulted from the accident and ensure that appropriate measures are taken to mitigate them.
ERT	• Respond to the accident scene with appropriate equipment as per H&S ERP. In the event of injured or trapped occupant(s), medical responders trained in Advanced First Aid will also respond with appropriate medical equipment and supplies based on the number of potential injured. • Assess the accident scene and ensure it is safe to conduct emergency operations. • Remove the occupant(s) from the vehicle(s) and transport them to the camp center for further care.
Environmental Department	• Refer to Table 4-3 for response measures in the case of a fuel or hazardous materials spill caused by a vehicle accident. • Notify appropriate regulators, stakeholders (see Section 5.0), the public and Indigenous groups (see Indigenous Communication Plan, Appendix A) of adverse environmental effects, as applicable.
Medical	• Remove the occupant(s) from the vehicle(s) and transport them to the camp center for further care. • As a precaution, prepare and equip a vehicle for patient transport if necessary.

5.0 COMMUNICATIONS AND REPORTING REQUIREMENTS

In the event of any accident or malfunction, Marathon will meet the following communication and reporting requirements of the IAAC conditions:

1. Refer to the Communications Plan in Appendix A for communication requirements with Indigenous groups.
2. Other stakeholders such as communities will be notified in accordance with Marathon's internal procedures.
3. Notify relevant authorities with responsibilities related to emergency response (including environmental emergencies) in accordance with applicable legislative and regulatory requirements, and as outlined in Project environmental emergency response plans.
4. Notify IAAC no later than 24 hours following the accident or malfunction with specific information including:
    - The date and time when and location where the accident or malfunction occurred within the Designated Project area.
    - A summary description of the accident or malfunction.
    - A list of any substance potentially released into the environment as a result of the accident or malfunction.
5. Report to IAAC no later than 30 days ("30-Day report") after the day on which the accident or malfunction occurred, with information including:
    - A detailed description of the accident or malfunction and of its adverse environmental effects.
    - A description of the measures taken by Marathon to mitigate the adverse environmental effects caused by the accident or malfunction.
    - Any view from Indigenous groups and advice from relevant authorities received with respect to the accident or malfunction, its adverse environmental effects, and the measures taken by Marathon to mitigate these adverse environmental effects.
    - A description of any residual adverse environmental effect and any modified or additional measure required by Marathon to mitigate residual adverse environmental effects.
    - Details concerning the implementation of the AMPRP.
6. Report to IAAC no later than 90 days ("90-Day Report") after the day on which the accident or malfunction occurred, with information including:
    - A description of the changes made to avoid a subsequent occurrence of the accident or malfunction.
    - The modified or additional measure(s) implemented by Marathon to mitigate and monitor residual adverse environmental effects and to carry out any required progressive reclamation, accounting for the information submitted in the 30-Day Report.
    - All additional views from Indigenous groups and advice from relevant authorities received by Marathon since the views and advice received in the 30-Day Report.

The Project Contact List is presented in Section 6.0.

6.0 CONTACT LIST

Entity	Contact List	Contact Number
EMERGENCY/MEDICAL	Emergency Radio Channel	Channel 4 (MOZ Repeater Channel)
	Air Ambulance	1-709-777-6320
	Newfoundland Helicopter	1-709-636-8908 (Chris – Deer Lake hangar)
	Canadian Helicopter	1-709-686-2095 (Pasadena) 1-709-896-5259 (Goose Bay 24 hrs)
	Medical Contractor (Main Street Medical Clinic)	1-877-578-4861
	Buchans Hospital	1-709-672-2111 (Ambulance) 1-709-672-3304 (Emergency Dept
	Grand Falls-Windsor Hospital	1-709-292-2111 (Ambulance) 1-709-292-2133 (Emergency Dept)
	RCMP – Buchans	1-709-672-3944
	RCMP Grand Falls-Windsor	1-709-489-2121 (24 hr Search and Rescue)
	Workplace Health, Safety, and Compensation Commission (WHSCC)	1-709-729-4444 (24 hrs) OHS Division
	Canadian Coast Guard Emergency Response	1-800-563-2444
MARATHON GOLD PERSONNEL	Marathon Gold Corporation – Toronto Office	1-416-987-2366
	Marathon Gold Corporation – GFW Office	1-709-489-0069
	Matt Manson (President and CEO)	1-416-987-0711 (Office) 1-416-618-5885 (Cell) mmanson@marathon-gold.com
	Tim Williams (COO)	1-416-998-5157 twilliams@marathon-gold.com
	James Powell (VP Regulatory and Government Affairs)	1-709-730-5046 jpowell@marathon-gold.com
	Tara Oak (EA Manager)	1-902-266-3157 toak@marathon-gold.com

	Matt Hynes (Environmental Superintendent)	1-709-636-1399 mhynes@marathon-gold.com
	Noah Buller Rowsell (Logistics)	1-709-672-7878 nrowsell@marathon-gold.com
	Victoria Lake Camp	1-709-981-1151
	Nic Capps (Exploration Manager)	1-709-727-7953 ncapps@marathon-gold.com
	Adam Wall (Project Manager)	1-709-763-5438 awall@marathon-gold.com
PROVINCIAL GOVERNMENT	Environmental Emergencies	1-709-772-2083 (24 hrs) 1-800-563-9089 (24 hrs)
	Environmental Concerns	1-709-256-1423
	Spill Report	1-709-772-2083
	Forest Fires	1-709-852-4291
	Poison Information Center	1-709-292-2500
MUNICIPAL GOVERNMENT	Town of Buchans Town of Millertown Local Service District of Buchans Junction Town of Badger Town of Grand Falls-Windsor Town of Bishop's Falls	1-709-672-3972 1-709-852-6216 On file with Marathon 1-709-539-2406 1-709-489-0407 1-709-258-6581
INDIGENOUS GROUPS	Miawpukek First Nation	1-709-882-2470
	Qalipu First Nation	709-634-0996
OTHER	Buchans Junction Garage	1-709-852-5181
	Millertown Gas Bar and Store	1-709-852-6486
	Robs / RNR Drilling	1-709-673-8842
	Blundon's Trucking and Excavating Ltd.	1-709-293-0204 (Sheldon Blundon) 1-709-636-9350 (Denis Cross)

7.0 REVISIONS

The AMPRP will be reviewed on an annual basis, at a minimum. Proposed revisions can be requested by submitting a Revision Request Form (Appendix C) to the Mine Manager, including the following information:

- Section to be revised,
- Nature of the revision,
- Rationale for the revision, and
- Name of the revision requester.

Prior to finalizing the revised AMPRP, Marathon shall submit the AMPRP to the Agency, Indigenous groups, and relevant authorities involved in its implementation within 30 days of the plan being updated. Approval for revisions will be required from Marathon. When the Mine Manager approves a revision request, details of the revision will be distributed and documented in the Document Revision History and in the Revision History Log (Appendix D).

8.0 REFERENCES

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Appendix A ACCIDENTS AND MALFUNCTIONS INDIGENOUS COMMUNICATION PLAN

Accidents and Malfunctions Indigenous Communication Plan

This Indigenous Communication Plan details the procedures that Marathon will employ to notify Miawpukek First Nation (MFN) and Qalipu Mi'kmaq First Nation (Qalipu) upon the occurrence of accidents and malfunctions associated with the Valentine Gold Project (the "Designated Project"). The Accidents and Malfunctions Indigenous Communication Plan has been developed pursuant to federal EA Conditions 10.5.3 and 10.6 which require Marathon to develop, in consultation with MFN and Qalipu, a communication plan, to include:

a. The types of accidents and malfunctions triggering a duty to notify;

b. The manner and timing of the notification;

c. The content of the notification;

d. Opportunities for Indigenous groups to assist in the response to accidents or malfunctions; and

e. The names and contact information of Marathon and each Indigenous group for purposes of notification and communication.

1.0 Accidents and Malfunctions Triggering a Duty of Notification

Indigenous groups will be notified upon the occurrence of an accident or malfunction presented in Table 1-1 in accordance with the protocol set out in Appendix A, Part 7.0. If a specific accident or malfunction occurs which is not listed in Table 1-1 but has a similar environmental consequence, Indigenous groups will be notified in accordance with the procedure set out in Appendix A, Part 7.0. Table 1-1 classifies accidents and malfunctions as "High", "Medium" or "Low". In addition, there may be accidents and malfunctions with minimal and localized impact (for example, fuel spills below the provincial reporting level of 100 L); these accidents and malfunctions will be reported to Indigenous groups as per Appendix A, Part 7.0, however they do not trigger a duty to notify under this Appendix A.

2.0 Notification Timeline

Notification timelines will be determined based upon the consequence rating of the accident or malfunction as presented in Table 1-1 as “High”, “Medium” or “Low” in accordance with the notification procedures set out in Appendix A Part 7.0.

3.0 Notification Information

Information provided in the initial notification to Indigenous groups will include the following:

f. Date and location of the accident or malfunction;

g. Summary description of the event;

h. Information on the accident or malfunction, including the type and quantity of substance(s) released, the location and duration of the release(s) and potential environmental impacts;

i. Remedial actions taken in response and those planned to be undertaken and a schedule of implementation of remedial actions;

j. Resources required and resources available;

k. Any health advisories for Indigenous groups; and

l. Details of subsequent monitoring related to the accident or malfunction.

Monitoring will be determined in consultation with regulatory authorities and Indigenous groups (including any environmental stewardship committees or similar bodies established under an agreement with the Indigenous group) and will comply with any regulatory requirements applicable to the specific accident or malfunction. Reporting will be governed by relevant regulatory requirements and the terms of any agreement concluded between Marathon and an Indigenous group.

4.0 Notification Methods

Notification methods will be determined by the consequence rating of the accident or malfunction as set out in Table 1-1 and will be conducted in accordance with Appendix A Part 7.0.

5.0 Opportunities to Assist with Accident or Malfunction Response

As part of notification, Marathon will provide an opportunity to each Indigenous Group offer their experience, resources and capabilities to provide emergency response services and assist in response to an accident or malfunction.

6.0 Contact Information and Management

Part 6 of the Accidents and Malfunctions Prevention and Response Plan provides emergency contact information for the Indigenous groups for purposes of notification. This Part will be regularly reviewed and updated to ensure accuracy and completeness.

7.0 Notification Procedures and Response Assistance

The table below details the notification procedures applicable to the accidents and malfunctions set out in Table 1-1. Notice will be provided by the responsible person(s) as specified in the Accidents and Malfunctions Prevention and Response Plan.

Consequence Level	Timing of Notification	Person(s) Notified	Notification Method
Minimal / Localized[1]	**Within 30 days**	On-site Indigenous Environmental Technicians Environmental Stewardship Committee[2]	• Email • Include incident in any periodic report to Indigenous groups as required by agreement
Low	**Within 48 hours**	On-site Indigenous Environmental Technicians Environmental Stewardship Committee	• Initial report by e-mail • Include incident in any periodic report to Indigenous groups as required by agreement • Copy of any compliance reporting to federal or provincial regulator to be provided concurrently to Indigenous groups • Include in Annual Report under federal EA Condition 2.10
Medium	**Within 24 hours**	On-site Indigenous Environmental Technicians Chiefs	• Phone call or text message • Email with read receipt within 24 hours of phone call • Include incident in any periodic report to Indigenous groups as

[1] Includes fuel spills below the provincial reporting threshold of 70 L.
[2] If established pursuant to agreement between Marathon and Indigenous groups.

		Environmental Stewardship Committee MFN Director of Natural Resources Qalipu Director of Natural Resources	required by agreement • Copy of any compliance reporting to federal or provincial regulator to be provided concurrently to Indigenous groups • Include in Annual Report under federal EA Condition 2.10
High	**Immediately**	On-site Indigenous Environmental Technicians Chiefs Environmental Stewardship Committee MFN Director of Natural Resources Qalipu Director of Natural Resources	• In person or text message • Phone call to each Chief • Phone call to members of any Environmental Stewardship Committee • Phone call to each Indigenous Director of Natural Resources • Follow-up e-mail with read receipt within 6 hours of phone call • Include incident in any periodic report to Indigenous groups as required by agreement Copy of any compliance reporting to federal or provincial regulator to be provided concurrently to Indigenous groups • Include in Annual Report under federal EA Condition 2.10

Marathon will continue to engage with each Indigenous group following notification of the accident or malfunction, including providing each group with information on adverse environmental effects and mitigation measures. Within 30 days after the occurrence of the accident or malfunction, Marathon will report to each Indigenous group on any adverse environmental effects of the accident or malfunction and describe the measures taken by Marathon to mitigate the adverse environmental effects. Marathon will provide each group the opportunity to comment upon the described mitigation measures and include the views and advice of each group in the 90-day report to IACC referred to in Section 5.0.

Appendix B SPILL REPORTING INFORMATION FORM

Spill Reporting Information Form

TO BE COMPLETED BY THE AREA SUPERVISOR FOLLOWING IMMEDIATE VERBAL NOTIFICATION TO THE ENVIRONMENT DEPARTMENT

DATE ISSUED	REVISION NOTES
Date of spill:	Time of spill:
Date reported (verbal):	Time reported (verbal):
Reported by (include title):	Company:
Supervisor:	Phone number:
Description of source spill:	
Equipment ID # (if applicable):	
Type of substance spilled:	
Quantity of substance spilled:	
Location of spill site:	
Description of spill location and surroundings:	
Distance to nearest infrastructure:	
Distance to nearest stream, waterbodies, sensitive areas:	
Please provide a sketch of the spill site including surrounding infrastructure, waterbodies, sensitive areas, roads, tree lines, etc., including approximate distances from the spill site to each, and use arrows to depict slopes and direction of flow.	
Description of the cause and any impacts of the spill:	

Section 2: Containment and Clean-up (describe immediate actions taken to contain and clean-up the spill and any actions remaining)	
Actions taken to contain and clean-up the spill (including storage and/or disposal of contaminated materials including soil and absorbents):	
Remaining clean-up requirements (if applicable):	
Responsible person:	Completion date:
Vehicle spill kit or site spill drum used? Yes / No (note: spill kits/drums must be replaced or restocked, even if only partially used)	
Location or Equipment ID # of spill kit/drum used:	
Section 3: Supporting Documentation (please ensure that all applicable supporting documentation is attached)	
☐ Pictures ☐ Employee Statements ☐ Pre-use Inspection ☐ Maintenance Records ☐ Other (_____)	

Section 4: Signatures (including the employee that observed/reported the spill, his/her Supervisor, and the Marathon Environment reviewer)		
Print	Signature	Date
Employee:		
Supervisor:		
Environment:		

Notes:

1) The Marathon Incident and Investigation Report Form must also be filled out for root cause analysis and to outline corrective actions.
2) Please refer to Section 6.0 of the Environmental Protection Plan (EPP) for guidance in spill response and in filling out this form. Please contact the Marathon Environment Department if you have any questions or concerns.

Appendix C REVISION REQUEST FORM

Revision Request Form

SECTION TO BE REVISED:	
NATURE OF REVISION:	
RATIONALE FOR REVISION:	
SUBMITTED BY:	
Please submit request to the Marathon Gold Mine Manager	

Appendix D REVISION HISTORY LOG

DOCUMENT REVISION RECORD

Version No.	Revised By	Date Issued	Comments
1.0	N/A	September 23, 2022	Final

Item No.	Description of Change	Relevant Section
1		
2		
3		
4		
5		
6		
7		
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9		
10		