PART 2

Responses to Regulatory and Public Comments

RESPONSE TO DHCS-01

ID:	**DHCS-01**
Expert Department or Group:	Department of Health and Community Services
Guideline Reference:	4.2.1.9.4.1 Population Health
EIS Reference:	Chapters 14 and 17
Context and Rationale:	-
Information Request:	Analysis of potential pathways of exposure to contaminants and risks to human health from the project is needed.
Response:	A Human Health Risk Assessment (HHRA) has been completed for the Valentine Gold Project (Appendix A). A conceptual site model is provided in Section 4.4 of the HHRA. Evidence-based justifications for the inclusion / exclusion of potential exposure pathways are provided in Table 4.7 of the HHRA.
Appendix:	See Appendix A: Human Health Risk Assessment

RESPONSE TO DHCS-02

ID:	**DHCS-02**
Expert Department or Group:	Department of Health and Community Services
Guideline Reference:	4.2.1.9.4.1 Population Health
EIS Reference:	Chapters 14 and 17
Context and Rationale:	-
Information Request:	As there may be project-related impacts to human health, the proponent should provide information regarding exposure potential for all relevant exposure pathways associated with project activities. A Human Health Risk Assessment is an effective and comprehensive means to examine all exposure pathways for contaminants of potential concern (COPCs) and assess the potential for adverse human health effects.
Response:	A Human Health Risk Assessment (HHRA) has been completed for the Valentine Gold Project (Appendix A). A conceptual site model is provided in Section 4.4 of the HHRA. Evidence-based justifications for the inclusion / exclusion of potential exposure pathways is provided in Table 4.7 of the HHRA. The Indigenous and non-Indigenous receptors are identified in Section 4.1 – Receptor Characterization of the HHRA. The general assumptions that govern frequency and duration of potential exposures for Indigenous and non-Indigenous receptors are provided in Section 4.1.1. Receptor assumptions specific to Indigenous receptors, such as country food consumption rates, are provided in Section 4.1.2. Receptor assumptions specific to non-Indigenous receptors are provided in Section 4.1.3. Receptor locations were selected to represent the places where human receptors are likely to be present and could be exposed to emissions from the Project. The selection of receptor locations was based on consideration of land use and input from local communities. The locations of seasonal cabins, camps, and outfitters, as well as the worker accommodations camp and exploration camp, are provided in Figure 3-3 of the HHRA.
Appendix:	See Appendix A: Human Health Risk Assessment

RESPONSE TO DHCS-03

ID:	**DHCS-03**
Expert Department or Group:	Department of Health and Community Services
Guideline Reference:	4.2.1.9.4.1 Population Health
EIS Reference:	Chapters 14 and 17
Context and Rationale:	-
Information Request:	Baseline country food (consumption) data is needed to support the evaluation of potential project-related impacts to human health. An accurate baseline is necessary to assess the potential impacts to country food for the project.
Response:	The potential human health risks associated with exposure to contaminants of potential concern (COPC) through the consumption of country foods (vegetation, wild meat, fish) have been evaluated in Section 4.3.4 - Country Foods of the Valentine Gold Human Health Risk Assessment (HHRA; Appendix A). This includes an assessment of baseline conditions for metal concentrations in baseline country foods (vegetation, wild meat, fish). The HHRA evaluated potential human health risks associated with exposure to COPC for Baseline Case and Future Case conditions for Indigenous and non-Indigenous receptors present in the Local Assessment Area. The results demonstrated that the predicted changes in COPC exposures through country food consumption represent a negligible change in human health risk for Indigenous and non-Indigenous receptors.
Appendix:	See Appendix A: Human Health Risk Assessment

RESPONSE TO DHCS-04

ID:	**DHCS-04**
Expert Department or Group:	Department of Health and Community Services
Guideline Reference:	4.2.1.9.4.1 Population Health
EIS Reference:	Chapter 14
Context and Rationale:	--
Information Request:	a. Additional information describing proposed mitigation measures, their effectiveness and implementation is needed. b. Additional information should be provided to describe the mitigation measures to be utilized, the effectiveness of such mitigation measures and their implementation, in order to address potential impacts to human health from project related activities. c. Any environmental protection plans/environmental management plans that describe mitigation measures to address potential impact to human health should be provided for technical review.
Response:	a./b. Mitigation and management measures related to community health are provided in Chapter 14, Section 14.4, with a complete list of mitigation and management measures provided in Chapter 23. As a follow-up to DHCS-02, which asks about the potential human health risks of the Project, the assessment of air, soil, water, and country foods in the Valentine Gold Human Health Risk Assessment (HHRA; Appendix A) determined that concentrations of contaminants of potential concern under Baseline Case and Future Case conditions would represent a negligible change in human health risks. Based on these findings, it is reasonable to conclude that additional mitigation measures specific to human health, beyond those measures already proposed in the Atmospheric Environment (Chapter 5 of the EIS) and Surface Water Resources (Chapter 7 of the EIS) assessments, are not required to address potential human health risks. • Marathon will conduct monitoring to verify regulatory compliance, effects predictions in the EIS, and effectiveness of mitigations. Air quality and surface water monitoring programs will be conducted as described in Sections 5.9 and 7.9 of the EIS, respectively, with final design of the monitoring programs subject to regulatory review and approval. In addition, environmental effects monitoring (EEM) pursuant to the *Metals and Diamond Mining Effluent Regulations* (MDMER) requires that biological studies evaluate effects of effluent on fish and fish habitat in receiving waters. Biological

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	studies include a fish population survey (to monitor effects on growth, reproduction, condition, and survival), a fish tissue study (if selenium and mercury concentrations in effluent warrant such study), and a benthic invertebrate community study. Biological studies are conducted every three years. EEM requirements continue throughout the life of the mine until it becomes a recognized closed mine under MDMER. In 2021, baseline studies will continue to collect information to support future EEM under MDMER. In addition, ongoing monitoring related to country foods will be employed and, should the need for further mitigation measures be identified, these would be developed in consultation with regulators, Indigenous groups and stakeholders. c. As described in Chapter 2, Section 2.7.3 of the EIS, a series of Environmental Management Plans will be developed under the overarching Environmental Management System and will encompass the environmental regulatory requirements and commitments made for the Project. This includes the formal conditions of the environmental assessment processes, as well as subsequent requirements of federal and provincial Project permitting processes. They will also encompass commitments made in the EIS, which include applicable compliance standards and/or industry best management practices. The Environmental Management Plans will therefore be finalized following the Ministers' Decision and in consultation with applicable regulators, including Department of Health and Community Services, as applicable. Marathon is also developing a Corporate Health and Safety Management System, including a comprehensive Occupational Health and Safety Program with safe work policies, procedures and practices, to be implemented prior to Project construction. In addition to adhering to legislated occupational health and safety requirements in compliance with the Newfoundland and Labrador *Occupational Health and Safety Act* and *Occupational Health and Safety Regulations, 2012*, Marathon's Occupational Health and Safety Program will incorporate safe work policies, procedures and practices covering Project activities, including general blasting, explosives and blasting operations. Marathon is committed to preventing incidents and accidents and reducing health and safety risks by implementing best practices, including the following: • Actively identifying and addressing hazardous conditions and health and safety risks

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	• Conducting mandatory site orientations for employees, contractors / consultants and visitors, and providing specialized safety training, as applicable • Providing adequate supplies of personal protective equipment appropriate to the task • Incentivizing near miss reporting • Developing, measuring and reporting on Key Performance Indicators that include both leading and lagging indicators • Focusing on continuous improvement
Appendix:	See Appendix A: Human Health Risk Assessment

RESPONSE TO DHCS-05

ID:	**DHCS-05**
Expert Department or Group:	Department of Health and Community Services
Guideline Reference:	4.2.1.9.4.2 Community Services Infrastructure
EIS Reference:	Chapter 13
Context and Rationale:	-
Information Request:	Potential impacts on passenger and freight traffic on the Trans-Canada Highway and through Gander International Airport or other nearby landing strips; and freight traffic on ferry services across the Strait of St. Lawrence are not discussed.
Response:	As described in Sections 13.5.2.1 and 13.5.2.2 of the EIS, the transportation of Project goods, services and workers could lead to additional use of existing transportation infrastructure. It is anticipated that most materials, equipment, and supplies will be brought to the Project site by road from larger communities in Newfoundland, such as Grand Falls-Windsor and Gander. However, some materials, equipment, and supplies may need to be brought in from outside the Island and may be delivered by air to airports in Deer Lake or Gander. They may also be delivered from outside the province on truck via the Marine Atlantic-operated ferry which connects North Sydney, Nova Scotia with Port-aux-Basques on the west coast of Newfoundland. During construction, vehicle traffic is estimated at an average of six trucks per day for delivery of goods, with a peak of 18 vehicles per day on worker rotation change days (1- to 2-day period each week). During operation, estimated traffic on the access road is estimated to be five trucks per day, with a peak of 10 vehicles per day on rotation change days. The Trans-Canada Highway (Route 1) and Highway 370 through the local assessment area / regional assessment area (and beyond) are major transportation routes and capable of accommodating Project-related transportation demands. Since it is expected that most Project supplies and equipment will come from the Island of Newfoundland, it is unlikely that shipping will have adverse effects on the Gander International Airport, other local airstrips, or ferry services. With respect to the transportation of Project workers, it is estimated that 90% of the construction and operation workforces will be sourced from the Island of Newfoundland. Approximately 65% will come from communities within the local assessment area / regional assessment area (Chapter 15 of the EIS). The arrival of 10% of the Project workforce (approximately 65 people) through Gander International or St. John's

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	International Airport, who will likely have alternating work rotations, will not exceed the capacity of either airport. During construction and operation, standard procedures, including traffic management and control where applicable, will be implemented to reduce effects on local communities and community infrastructure during construction and operation. As described in Section 2.7.3 of the EIS, a series of Environmental Management Plans, including a Traffic Management Plan, will be developed under the overarching Environmental Management System and will encompass the environmental regulatory requirements and commitments made for the Project. The Traffic Management Plan procedures will be developed to manage transportation of workers and materials to site, product leaving site, and the number of vehicles accessing the site, and to reduce traffic delays during these operations. Mitigation measures may include traffic staging to reduce delays. Marathon will continue to communicate with local communities and service providers with respect to scheduling so they may prepare for potential increased demands related to transportation.
Appendix:	None

RESPONSE TO DHCS-06

ID:	**DHCS-06**
Expert Department or Group:	Department of Health and Community Services
Guideline Reference:	4.2.1.9.4.2 Community Services Infrastructure
EIS Reference:	Chapter 13
Context and Rationale:	-
Information Request:	The EIS indicates that Marathon will develop a Traffic Management Plan (page 13.21). The Plan should include consideration of the potential impacts of increased traffic on pedestrian safety in the communities of Millertown and Buchans Junction.
Response:	A Traffic Management Plan will be developed under the overarching Environmental Management System and will include standard mitigation to reduce Project-related traffic and protect pedestrians in the communities of Millertown and Buchans Junction, and in other communities (e.g., Badger) where Project-related traffic will occur. Employees and contractors will be required to review and follow the procedures within the Traffic Management Plan, and Marathon will work closely with nearby communities to review and revise procedures should concerns arise or if issues are identified. Drivers engaged by Marathon will be required to act responsibly when travelling through communities. This includes compliance with posted speed limits on community roads, the access road and any other roads, set in accordance with provincial regulations, and yielding the right of way to pedestrians and cyclists. A shuttle bus system will be used to reduce the overall volume of traffic passing through communities by transporting staff to the site from designated pick-up locations. Arrivals / departures of employee traffic in the communities will be scheduled to occur earlier than the existing observed a.m. peak hour for local traffic and later than the existing observed p.m. peak hour, if needed. In addition, the use of fog lights, high beams, and compression or engine brakes will be reduced to the extent possible when driving through communities. During construction, once long-term contractors have brought their necessary tools, equipment and specialized work vehicles to site, these will stay on site for the duration of their contract. Short-term contractors may bring their tools and vehicles to site and leave with their vehicles upon contract completion.
Appendix:	None

RESPONSE TO DHCS-07

ID:	**DHCS-07**
Expert Department or Group:	Department of Health and Community Services
Guideline Reference:	4.2.1.9.4.2 Community Services Infrastructure
EIS Reference:	Chapter 13
Context and Rationale:	-
Information Request:	The EIS indicates that Marathon will develop a Traffic Management Plan (page 13.21). Any environmental protection plans/environmental management plans that describe mitigation measures to address potential impact to human health should be provided for technical review.
Response:	As described in Chapter 2, Section 2.7.3 of the EIS, a series of Environmental Management Plans, including a Traffic Management Plan, will be developed under the overarching Environmental Management System and will encompass the environmental regulatory requirements and commitments made for the Project. This includes the formal conditions of the environmental assessment processes, as well as subsequent requirements of federal and provincial permitting processes required for the Project. These will also encompass commitments made in the EIS, which includes applicable compliance standards and/or industry best management practices. The development of the Environmental Management Plans will therefore be completed following the Ministers Decision and in consultation with applicable regulators. Environmental protection plans/environmental management plans that describe mitigation measures to address potential impacts to human health (including the Traffic Management Plan; refer to Marathon's response to DHCS-06 for key mitigation) will be provided to applicable regulators for review.
Appendix:	None

RESPONSE TO DHCS-08

ID:	DHCS-08
Expert Department or Group:	Department of Health and Community Services
Guideline Reference:	-
EIS Reference:	Chapter 5
Context and Rationale:	-
Information Request:	There are no provincial environmental noise standards. However, additional baseline data would be required to appropriately assess potential impacts of noise on the environment and human health.
Response:	The Project site is located in a rural area, with no substantial sources of noise (unwanted sounds) contributing to the baseline within 50 km. The potential impacts on the acoustic environment were assessed following guidance published by Health Canada in "Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise" (2017). The Health Canada guidance recommends the collection of measured baseline data to be used in the assessment, and states that: "sounds that are not generated by human activity (e.g., ocean, wind and animal noises) should not be included in determining a baseline sound level". As there are no nearby sources of sound generated by human activity, it is very likely that the existing acoustic environment is not highly variable, and therefore the two days of baseline data is considered representative of the area and adequate to assess potential Project-related adverse effects. Baseline monitoring was completed to estimate the sound pressure levels for the region. The monitoring confirmed that the region is relatively quiet and similar to many other rural areas in Atlantic Canada, with daytime noise levels (Ld) near 45 dBA and nighttime noise levels (Ln) near 38 dBA. The noise monitoring was undertaken during times of low winds and no precipitation and also excluded extraneous sources that may contaminate or otherwise artificially raise the sound levels that were measured. The measurements would therefore be a reasonable indication of noise levels in the region. This is also considered a conservative approach with respect to future monitoring, as any increase in sound levels detected in the area during Project construction and operation would be attributed to the Project. References: Health Canada. 2017. Guidance for Evaluating Human Health Impacts in Environment assessment: Noise. January 2017. Available online at: https://iaac-aeic.gc.ca/050/documents/p80054/119378E.pdf
Appendix:	None

RESPONSE TO DHCS-09

ID:	**DHCS-09**
Expert Department or Group:	Department of Health and Community Services
Guideline Reference:	-
EIS Reference:	Chapter 5
Context and Rationale:	"Another shortcoming is the absence of regular acoustic monitoring during all of the project phases (construction, operation, decommission). The proponent needs to provide evidence that the mitigation measures contained in the EIS will actually result in noise levels that are below the threshold of disturbance for the different Valued Components." – Canadian Parks and Wilderness Society
Information Request:	Monitoring plans are required to ensure that all identified mitigation measures are achieving their objectives.
Response:	As described throughout the EIS, and summarized in Chapter 23.3.2 of the EIS, Marathon will implement monitoring plans to verify the results of the assessment and determine the effectiveness of mitigation measures. Marathon will develop follow-up and monitoring programs in consultation with government departments, Indigenous groups, and stakeholders, and in accordance with conditions of Environmental Assessment approval. Results of the follow-up monitoring will be reported to required government departments and other stakeholders. As discussed in Section 5.9 of the EIS, a sound pressure level monitoring program to monitor the effectiveness of Project mitigation measures will be developed and conducted at locations to be determined in consultation with regulators. This will include an indoor sound monitoring program at the accommodations camp to confirm daytime and nighttime noise levels. While the results of the sound pressure level monitoring program will be used to verify the predicted effects of the Project on human health, the results will also be considered in the environmental effects monitoring programs for wildlife, including avifauna and caribou.
Appendix:	None

RESPONSE TO DIET-01

ID:	**DIET-01**
Expert Department or Group:	Dept Industry, Energy and Technology
Guideline Reference:	-
EIS Reference:	Section 2.11.9 (Chapter 1-3)
Context and Rationale:	Section 2.11.9 (Chapter 1-3) notes that Marathon has consulted with NL's power authority, Nalcor, who have indicated that power for the Project can be provided via a direct connection to the existing power grid at a location near the Star Lake hydro generating station.
Information Request:	It should be clearly described if Nalcor has indicated willingness to provide the required capacity of 23 MW to the project. It should be clarified with Nalcor, if power will be supplied from the Star Lake Generating station facility alone or will include power from other generation sources.
Response:	On May 5, 2021, NL Hydro filed the Registration document for the Star Lake to Valentine Gold Transmission Line TL271 Project with the province (found here: https://www.gov.nl.ca/ecc/projects/project-2136/). This registration demonstrates their willingness to provide the required capacity of 23 MW to the Project. As described in the Registration, power will be supplied from the Star Lake Generating Station facility.
Appendix:	None

RESPONSE TO DIET-02

ID:	**DIET-02**
Expert Department or Group:	Dept Industry, Energy and Technology
Guideline Reference:	-
EIS Reference:	Section 2.3.8 (Volume 1-3)
Context and Rationale:	Section 2.3.8 (Volume 1-3) notes that site power will be provided from a 66 kV high voltage (HV) line extending from the Star Lake area to the main substation at the mine site, constructed and connected by NL Hydro, and who will own and maintain the line. A peak demand of 22 megawatts (MW) is required for the mine operation: 18 MW are required for Phase 1, and an additional 4 MW will be required for the Phase 2 expansion. It is anticipated that the HV line will follow the existing rights of way (gravel roads between the grid connection and the Project site), thereby eliminating the creation of a new corridor. Preliminary routing of the HV line is provided in Figure 2-35.A peak demand of 23 MW is required for the Project.
Information Request:	Please describe the exact length and location (route) of the transmission line.
Response:	On May 5, 2021, NL Hydro filed the Registration document for the Star Lake to Valentine Gold Transmission Line TL271 Project with the province (found here: https://www.gov.nl.ca/ecc/projects/project-2136/). NL Hydro is responsible for the selection of the route of the transmission line. The latest information on the transmission line, including length and routing, can be found in Section 2.2 and Figure 2-1 of the Registration document (NL Hydro 2021). Reference: Newfoundland and Labrador Hydro. 2021. Transmission Line 271 Star Lake to Valentine Gold Project Environmental Registration. Prepared by Stantec Consulting Ltd. Available online at: https://www.gov.nl.ca/ecc/files/env-assessment_y2021_2136_registration-document.pdf
Appendix:	None

RESPONSE TO DIET-03

ID:	**DIET-03**
Expert Department or Group:	Dept Industry, Energy and Technology
Guideline Reference:	-
EIS Reference:	Section 2.3.8 (Volume 1-3)
Context and Rationale:	-
Information Request:	Who is responsible for the cost of the transmission line?
Response:	NL Hydro is responsible for the design, environmental assessment and permitting, construction, maintenance, and decommissioning of the transmission line, and provision of power to the Valentine Gold Project; however, Marathon is responsible for all costs.
Appendix:	None

RESPONSE TO DIET-04

ID:	**DIET-04**
Expert Department or Group:	Dept Industry, Energy and Technology
Guideline Reference:	-
EIS Reference:	-
Context and Rationale:	The EIS indicates that Marathon will continue to engage with NL Hydro over the life of the project.
Information Request:	IET recommends continuing this engagement and engagement with Newfoundland Power, on all aspect of powers supply, and impact on electricity infrastructure (assets) in the province.
Response:	Based on Marathon's consultation and engagement with NL Hydro, it is NL Hydro that would engage with NL Power on any aspect of power supply and or electrical infrastructure (assets) in the province. If Marathon needs to engage with NL Power at any point on these issues, that engagement will be completed in a similar manner as to the engagement with NL Hydro.
Appendix:	None

RESPONSE TO DIET-05

ID:	**DIET-05**
Expert Department or Group:	Mines Branch
Guideline Reference:	Section 4.1.10 Environmental Management: The entire project should be designed with closure in mind.
EIS Reference:	Section 2.6.3.3. Tailings Management Facility
Context and Rationale:	-
Information Request:	The tailings management facility (specifically the tailings dams) are structures requiring long term monitoring and maintenance (50 years+). At some point, the dams ultimately become the responsibility of the province to maintain. As it is stated the tailings will be non-PAG, the EIS must present a detailed plan for the closure of the TMF that includes the potential reclassification and decommissioning of the tailings dams.
Response:	The tailings that are produced from the milling process will be deposited in the tailings management facility (TMF) for the first nine years of the Project operation phase using a thickened tailings process. Once the Leprechaun open pit is exhausted in Year 9, the tailings will be pumped to and deposited in this open pit. The composite tailings from the Marathon and Leprechaun pits are considered non-potentially acid generating (non-PAG) and therefore require no special measures for long-term chemical stability (e.g., permanent water or geomembrane liner cover). As such, the current closure concept focuses on long-term physical stability of the TMF. It should be noted that if the geochemical classification of the tailings changes, the TMF design is flexible enough to accommodate alternative closure measures as required, including a more robust cover design. The TMF is being designed for closure in accordance with the guidance provided by the Canadian Dam Association (CDA), such that the geometry of the dams will not require modification during the mine closure phase to provide long-term stability of the facility (see Appendix 2-B in the EIS). When the tailings deposition shifts to the Leprechaun open pit in Year 9, the process of closure and rehabilitation of the TMF will commence, prior to final mine closure scheduled in Year 12. Additional information is provided below on the rehabilitation and closure concepts for the TMF. As the Project progresses, Marathon will evaluate the tailings impoundment with the objective of further dewatering the stored tailings, working towards classifying the TMF as a landform (under the CDA closure guidelines) and therefore removing the requirements to maintain and inspect the dams

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	post-closure. To be conservative, it will be assumed the dams will be required post-closure, and Marathon will work with the Newfoundland and Labrador of Department of Industry, Energy and Technology (NLDIET) and Newfoundland and Labrador Department of Environment and Climate Change (NLDECC) - Water Resources Division, and use the guidance established by the CDA and Mining Association of Canada (MAC), and Global Industry Standards on Tailings Management (GISTM) to establish a plan for long-term inspection and maintenance of the dams. In 2020, Marathon engaged a third-party, independent reviewer for the ongoing TMF engineering and design program. Mr. Mark E. Smith, M.Sc., P.E., P.Eng., G.E, D.GE, S.E., who is the Chief Advisor – Geotechnical for Piteau Associates USA Ltd., has over 40 years of experience including the design, construction, operation and closure of more than 100 tailings management facilities. He has directed detailed investigations and design studies, performed peer reviews and forensic analyses, designed retrofits, provided resident engineering and construction management services, and conducted training seminars and short courses. He has worked as a consultant, designer, resident engineer, independent reviewer, and on the owner's team for every phase of project development from discovery through development to closure. His North American tailings experience includes projects in Newfoundland and Labrador, British Columbia, and the Yukon; ten projects in the USA; seven in Chile; twelve in Peru; eight in Brazil; and other projects ranging from Indonesia and the Philippines to Saudi Arabia. He also led the post-failure analyses of the five other impacted dams in the aftermath of the Samarco failure and provided remote consulting following the Brumadinho failure. The regulatory landscape regarding tailings management has been changing as a result of significant dam failures in recent years, and it is anticipated that regulation and guidance will continue to change with respect to tailings management, closure of tailings facilities, and climate change adaptation. Marathon is committed to working with provincial regulators and conforming with CDA and MAC guidelines (MAC guidelines have been updated in 2021 to incorporate GISTM) such that the TMF is designed, constructed, operated, and ultimately rehabilitated, in a safe and responsible manner that will protect the environment in the long term. <u>Surface Water</u> The major closure and reclamation activities planned for the TMF are expected to occur during the first two years of closure. To reduce the tailings pond depth, the final year of tailings deposition will be strategically carried out to fill the lowest elevations of the TMF with tailings.

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	The water treatment plant and polishing pond components of the TMF will operate for the remainder of the operation phase of the Project, and the water collecting within the tailings pond (seepage drainage from the tailings and runoff) will continue to be pumped to the mill as reclaim water. As water quality and flows reach equilibrium within the facility, a larger closure spillway will be constructed to lower the water level within the tailings impoundment. The decant pump system, water treatment plant and polishing pond will then be decommissioned and water flowing from the tailings impoundment will be channelled to release directly to the environment once testing confirms that water quality meets the appropriate guidelines for release. Subsequently, the emergency spillway will be breached / lowered to allow for passive drainage of the facility and complete removal of the supernatant pond. Note that the spillway will be located to the north of the northern abutment of the dam, and not within the dam itself. For closure, the spillway channel will remain in the same location, however, will require widening. Following closure, covered tailings beaches are not expected to produce acidic runoff nor have high or moderate leaching other than phosphorus (P). However, this water is not expected to require treatment (passive or active). Runoff over the covered tailings surface will be considered non-contact water and will drain overland via the post-closure spillway. <u>Tailings Cover</u> Regrading and contouring of the tailings surface will be carried out where necessary to ensure drainage towards the closure spillway. Excavation of a defined channel within the tailings may be required to ensure drainage to the lowered spillway. Exposed tailings will be covered with overburden and organic soil materials and revegetated. The main objective of the closure cover will be to limit the migration of contaminants, limit infiltration into the tailings, and prevent wind and runoff erosion of the tailings. The proposed closure cover will be minimum of 0.3 m thick and will consist of overburden (mixture of organics / peat and mineral soil reclaimed from mining activities). The top surface area of the cover will be seeded, based on recommendations from an agronomist, consultation with regulators, and input from the Indigenous groups. It is expected that over time saturated tailings will undergo consolidation and surficial desiccation, which will improve material strength and trafficability of construction equipment. Cover materials may need to be placed in the softer areas during the winter if sufficient frost penetration exists to support construction traffic, or that waste rock may used to create access if and where required.

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	<u>Dams and Infrastructure</u> The TMF dams have been designed for long-term physical stability in accordance with the criteria set in the CDA guidelines. Thus, no additional regrading of the side slopes will be required at closure. The downstream slopes of the TMF dam will be left as exposed rockfill to permit drainage of the downstream shell and to permit inspection and monitoring in the long term should landform status not be achieved, or not achieved in the short-term. Once the tailings pond decant system, water treatment plant and polishing pond are no longer required, these will be decommissioned, including removing all pumps, pipelines, powerlines and other associated infrastructure. Disturbed areas will be regraded and revegetated. Sediment collected within the polishing pond will be tested and characterized and disposed of within the TMF or open pit (to be flooded or covered), if required. The dams will be breached, and the area regraded to re-establish local drainage patterns, then revegetated. <u>Seepage</u> Toe seepage from the TMF is predicted to exceed *Metal and Dimond Mining Effluent Regulations* (MDMER) limits for total cyanide (CNT), un-ionised ammonia (NH3), and copper (Cu) post-closure. The seepage water collection system, including the pumps, will be kept in service until monitoring demonstrates that water quality collected in the system has stabilized. At that time, the pumping systems will be removed. Based on the prediction of MDMER exceedances post-closure, two seepage treatment options may be employed: (1) conversion of the perimeter conveyance ditches into subsurface flow Permeable Reactive Barrier (PRB) trenches; and/or (2) conversion of the perimeter conveyance ditches into subsurface “French Drains” to convey effluent to an engineered wetland treatment system. Please refer to Figures DIET-05.1 and DIET-05.2 for an illustration of these two options, which are further discussed below. The seepage from the TMF is expected to require passive treatment for decades and the proposed treatment options can be designed to last for similar periods. The selection of the best option will be based upon predicted water quality (from operational monitoring) and testing. To support the design of the PRB and the engineered wetland system, pilot scale treatment studies will be conducted to evaluate the treatment efficiency and to better define the systems’ design parameters. While the summary below was first developed to describe the installation of the PRB and engineered wetland system in the ditching and ponds surrounding the waste rock piles, the same process will be used for, and tailored to, the TMF.

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	Seepage Treatment Option #1 (Figure DIET-05.1) The collection ditches would be plugged at intervals to prevent flow down the ditch and converted to sub-surface PRB trenches. In closure, the TMF will be covered with soil and vegetation and therefore shed rain/runoff with non-contact water. However, a portion of precipitation will infiltrate and form seepage. The subsurface PRB would backfill the rock-lined ditches with carbon-rich organic material (e.g., compost) to promote sulfate reducing conditions and subsequent precipitation of metal sulfide solid phases. Groundwater would passively flow through the compost mixture where dissolved metals would be removed via iron sulfide precipitation reactions. Under reducing conditions, sulfate-reducing bacteria convert sulfate to sulfide by catalyzing the oxidation of organic carbon producing hydrogen sulfide. Divalent metals would precipitate in the presence of high concentrations of hydrogen sulfide to form the highly insoluble iron sulfide precipitate. A soil cap (minimum 30-cm) would be installed over the surface of the PRB trench to prevent oxygen diffusion into and water flow out of the reactive mixture. Rip rap would be installed over the surface, where necessary, surrounding the PRB collection chamber to prevent scouring and erosion from the conveyance of non-contact runoff to the surrounding undisturbed ground. The subsurface PRB would continue to receive contact seepage, albeit at a reduced seepage rate due to the presence of the soil and vegetation cover over the tailings. The contact seepage would migrate through the subsurface zone of the trench (smallest proposed ditch class is trapezoidal with 1 m depth, 1 m base width, and 2:1 side slopes), through the PRB under anaerobic conditions where metals removal through sulphidic precipitation can occur. Seepage water would then outlet through the opposite side of the trench to the downgradient and outside receiving groundwater environment. Soil for the trench cover and soil plugs that would be placed in the existing ditches to promote transverse seepage migration across the trench would be available as ditch excavation sidecast material proposed in operation as shallow earthen berms. The rate of seepage migration across the subsurface trench is constrained by the seepage inflow and outflow rates which are based on local soils characteristics, hydraulic conductivity and gradients. The average linear groundwater velocity is estimated at between 0.126 m/year to 12.61 m/year. Thus, the seepage residence time through the subsurface trench would range from a few days to weeks, which is sufficient retention time to promote sulphate reducing conditions and the subsequent metal sulphide

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	precipitation reactions. Due to the predictions that seepage quality would not be substantially elevated above the MDMER or Canadian Water Quality Guidelines for Freshwater Aquatic Life, the PRB would be sized based on a minimum hydraulic retention time (HRT) of 24 hours, which is expected to be sufficient. Seepage Treatment Option #2 (Figure DIET-05.2) For this scenario, the perimeter collection ditches would be converted to subsurface French drains to allow contact seepage from the covered stockpiles to passively intercept seepage and convey seepage downgradient to the collection pond. The collection pond would be converted to an engineered wetland or subsurface passive bioreactor, essentially creating treatment with greater capacity and HRT than the PRB. Metals entering the engineered wetland would be initially removed via sedimentation and filtration processes. Following these physical processes, metals would be buried and sequestered in the wetland sediments via adsorption and chemical precipitation reactions. Within the wetland substrates, anaerobic conditions promote the growth of sulfate-reducing bacteria. The substrates are designed to be rich in organic matter and sulfates. Under anaerobic conditions, sulfate-reducing bacteria convert sulfate to sulfide by catalyzing the oxidation of organic carbon producing hydrogen sulfide. Divalent metals (e.g., iron, silver, copper, zinc, cadmium, manganese and lead) would precipitate in the presence of high concentrations of hydrogen sulfide to form insoluble metal sulfide precipitates. These precipitates would be removed from the water and permanently sequestered within the substrate. The average HRT in the collection ponds would be in the range of 24 hours, which is expected to be sufficient, and also may be improved using outlet controls. Seepage water would be monitored and would not be discharged to the environment until such time that water quality has been shown to consistently meet closure effluent criteria. The engineered wetland would use existing outlet infrastructure to the extent feasible. Once the contact water collection system is retrofitted to an engineered wetland treatment system, monitoring frequencies would be adjusted based on site conditions and performance objectives. Monitoring and Maintenance Monitoring and maintenance of the rehabilitated facilities will be carried out during operations and into closure. It is anticipated that monitoring and maintenance will be carried out during the active closure stage at frequencies similar to those required during operations. Post-closure monitoring and maintenance will be carried out at a reduced frequency

ID:	**DIET-05**
	depending on the results of the monitoring and the measures of success selected for closure. The proposed closure monitoring and maintenance activities include conducting visual inspections of reclaimed areas to identify unstable areas; maintaining facilities and equipment to be used during active closure until they are no longer required; installing instrumentation at selected locations for monitoring of the rehabilitated areas; and testing surface and groundwater quality and measuring water volumes at select locations to confirm that the closure measures are performing as predicted and are not adversely affecting the environment, as required by the Newfoundland and Labrador Mine Regulation 42/00. The extent and frequency of monitoring will depend on the final closure design, and the ability or potential to achieve landform status for the impoundment. In the event that landform status is not achieved, Marathon will consult with NLDIET - Mines Branch, NLDECC - Water Resources, and other regulators to establish a schedule of Dam Safety Inspections and Reviews, as well as maintenance cycles (e.g., vegetation removal) that are commensurate with the policies and guidelines in place at that time.
Appendix:	None

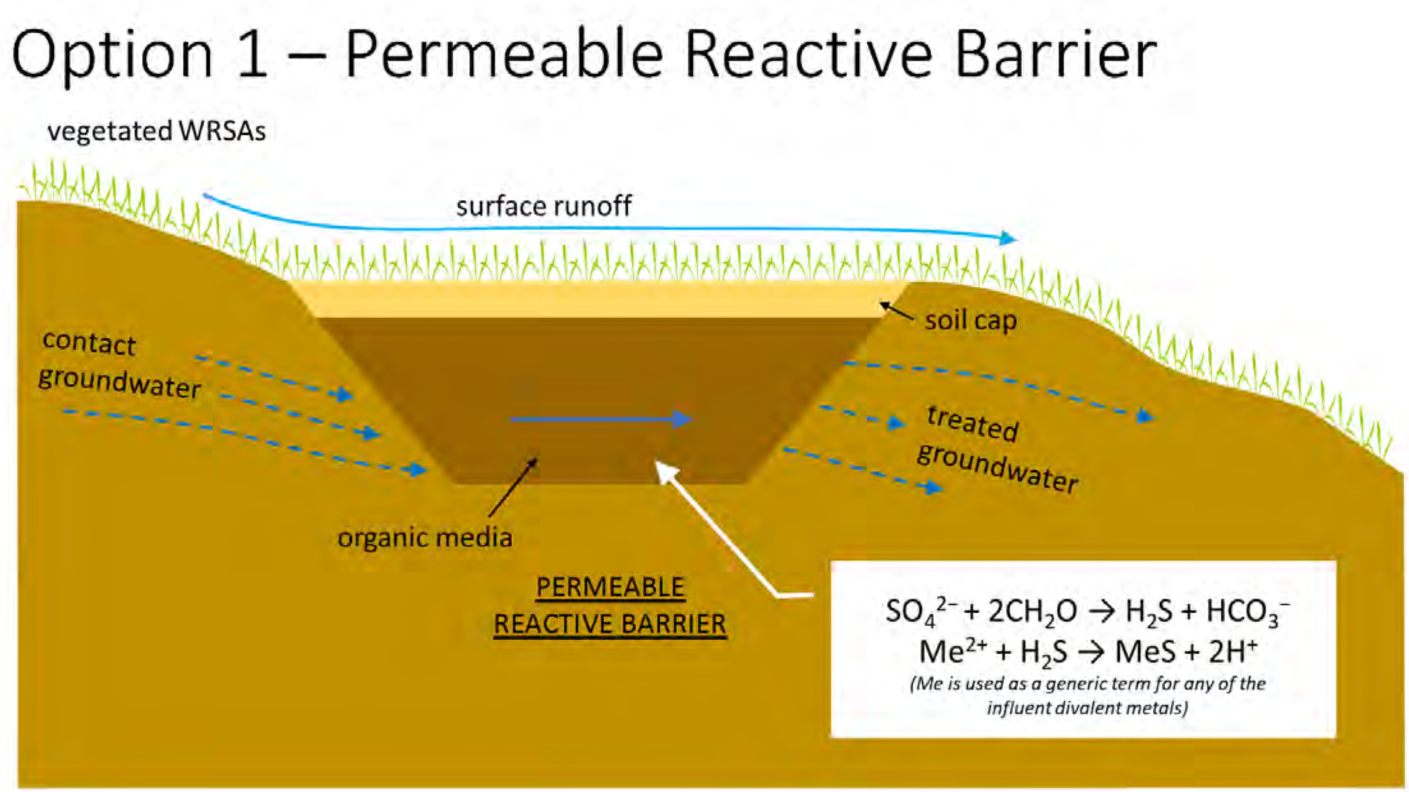


Figure DIET-05.1 Option 1 – Permeable Reactive Barrier

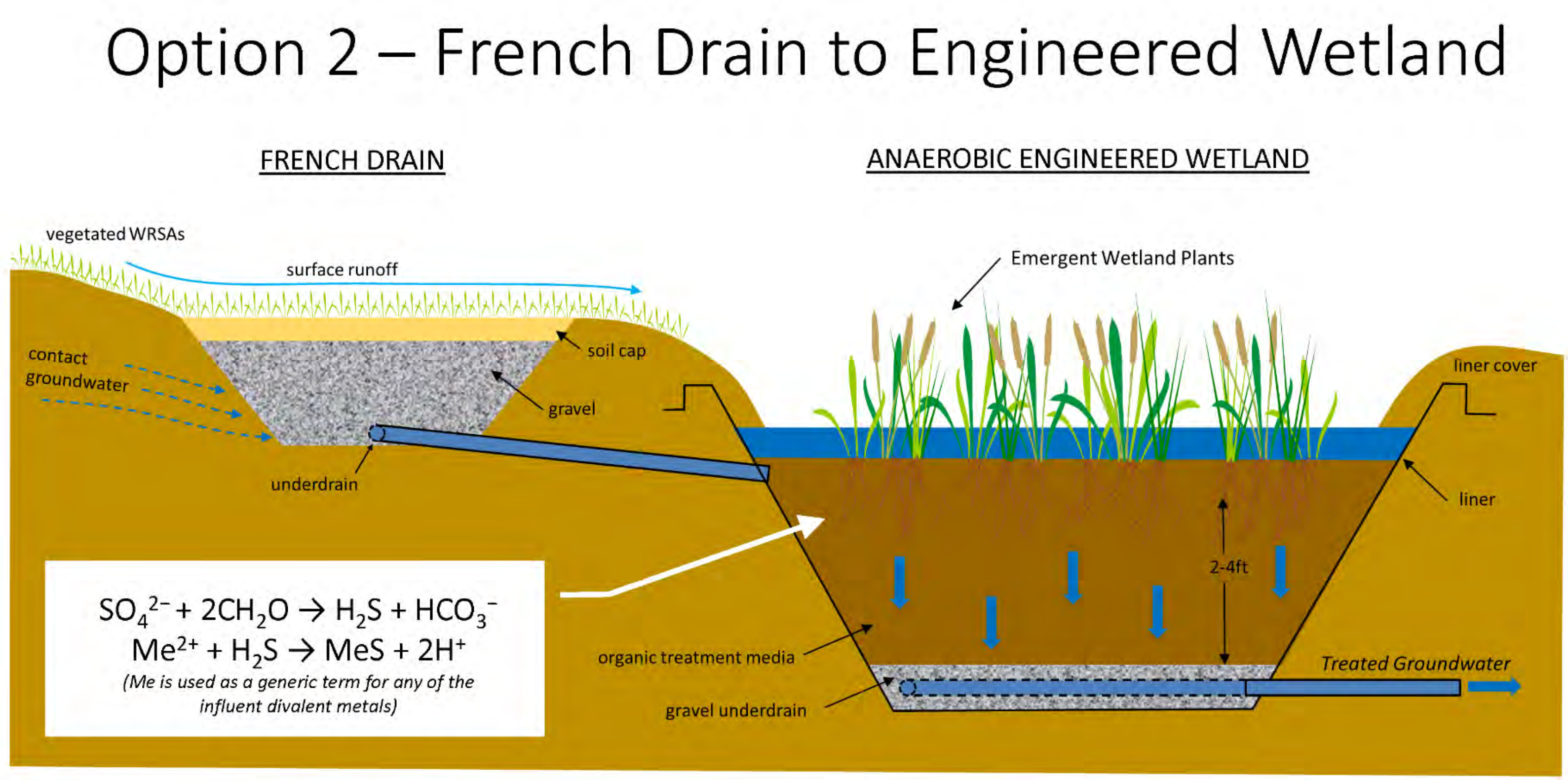


Figure DIET-05.2 Option 2 – French Drain to Engineered Wetland

RESPONSE TO DIET-06

ID:	**DIET-06**
Expert Department or Group:	Mines Branch
Guideline Reference:	Sections 4.1.4.5 / 4.1.7.1 A/ 4.2.1.5
EIS Reference:	-
Context and Rationale:	-
Information Request:	Potential acid generating (PAG) waste rock has been identified in both the Marathon and Leprechaun deposits. The current proposal is to mitigate the ARD potential by blending PAG and non-PAG rock in the waste dump. The EIS must evaluate the feasibility of segregating PAG and non-PAG waste rock during operation with the intent of relocating the PAG waste to the mined-out pit for final deposition under water cover.
Response:	The placement of potentially acid generating (PAG) rock in the open pit under water cover was considered. The volume of waste rock considered to be PAG is approximately 0.5% and 14% for Leprechaun and Marathon, respectively. Separating PAG rock from non-potentially acid generating (non-PAG) rock for storage is feasible, and the process for testing and identifying PAG rock is described in the response to DIET-11. For Marathon pit, the volume of PAG waste rock is 10 Mm^3. While relatively small compared with the total volume of waste rock, stockpiling PAG material would require a separate stockpile approximately twice the footprint size of the Marathon overburden stockpile, plus water management ditching and water management pond. Due to the storage inefficiencies associated with the separate stockpile for PAG rock, the permanent non-PAG waste rock pile would only be reduced in size (footprint) by an estimated 5 to 8%. Unless located at significant distance from the Marathon pit, in addition to the direct environmental footprint, the separate PAG stockpile will create further environmental footprint within the caribou migration corridor and will likely impact some wetlands and habitat for avifauna and other wildlife. Other environmental effects that are anticipated include increased dust generation (additional surface area due to separate stockpile), increased contact water runoff during storage, and additional fuel usage and associated air emissions (including dust generation) during relocation to the open pit at closure. The Acid Rock Drainage/Metal Leaching (ARD/ML) management approach proposed by Marathon has been successfully applied to waste rock piles at other mine sites as referenced in sections 6.6.3.5 and 6.6.3.6 of the Global ARD management guide (http://www.gardguide.com/index.php/Chapter_6).

ID:	**DIET-06**
	Marathon will use the proposed ARD block model and PAG testing protocols (see response to DIET-11) to plan / design areas within the waste rock pile to place blended PAG and non-PAG materials and subsequently encapsulate these materials within non-PAG rock. As part of rehabilitation and closure, the waste rock pile will be covered with soil and revegetated. If the ARD block model indicates there are PAG materials near the base of the open pit that cannot be adequately encapsulated within the waste rock pile, the materials (expected to be relatively small volume as waste rock production decreases significantly with pit depth) will be stockpiled within the pit, or in a designated location for relocation to the pit during closure activities.
Appendix:	None

RESPONSE TO DIET-07

ID:	**DIET-07**
Expert Department or Group:	Mines Branch
Guideline Reference:	Sections 4.1.7.1 / 4.2.1.5
EIS Reference:	-
Context and Rationale:	-
Information Request:	Stantec Report 2020: The report uses the phrase “not expected to generate ARD” in numerous locations when describing the results of the ARD/ML testing. The conclusions from the ARD/ML testing must be definitive and clearly state whether ARD/ML will or will not be generated.
Response:	The language used in the referenced report was not intended to give the impression that the results obtained from geochemical testing were not conclusive and definitive. That is, results of the geochemical characterization program indicate that none of the materials sampled generate Acid Rock Drainage/Metal Leaching (ARD/ML) even though some samples from the material classify as potentially acid generating (PAG), based to conservative criteria. The sample size tested to date is adequate to draw the conclusion that the materials will not generate ARD/ML and to use those results in preparation of the EIS for the Project. Marathon and its consultants also acknowledge that additional test work and monitoring is needed to further support the work completed to date, and there is some uncertainty simply because the mine has not been built / operated. Thus, Marathon has committed to continuing the ARD/ML test work program and to continuing with rock characterization throughout the mining process as well as the following strategies to limit the potential for development of ARD/ML, including the following: • PAG rock will not be used in construction (see response to ECCC-24) • Preferential milling of PAG ore and stockpiling non-potentially acid generating (non-PAG) ore • Blending PAG and non-PAG materials and encapsulation of blended material with non-PAG rock within the waste rock piles (see response to DIET-06) • Use of soil covers and revegetation to limit infiltration and oxygen flux as part of progressive and final rehabilitation and closure • Relocation of any excess PAG rock (waste rock or low-grade ore) remaining at closure to the mined-out pit, where it will be permanently flooded (see response to DIET-06) • Collection and monitoring of contact water.

ID:	**DIET-07**
	On-going and future ARD/ML testing, including operational monitoring, will expand the results obtained to date and refine the associated mitigation measures identified that will be incorporated into the mine plans via the ARD/ML Management Plan. Details on additional testing and on the content of ARD/ML Management Plan are provided in Appendix B.
Appendix:	See Appendix B: ARD/ML Management Approach

RESPONSE TO DIET-08

ID:	**DIET-08**
Expert Department or Group:	Mines Branch
Guideline Reference:	Section 4.1.10 E / 4.1.7.1 / 4.2.1.5
EIS Reference:	Section 2.5.1.4 Mine Production: Table 2.13; Stantec Report – Section 5.3.1 Leprechaun; Stantec Report – Section 5.3.2 Marathon
Context and Rationale:	Production Schedule indicates the combined low-grade ore stockpiles could contain over 11 million tonnes of low-grade ore by year 9 of the project. Stantec Report – Section 5.3.1 Leprechaun: "Analysis of a composite low-grade ore created using individual samples from Leprechaun site classified the material as non-PAG. Based on the analysis of individual samples, about 10% of low-grade ore is classified as PAG. The low-grade ore composite is classified as non-PAG and produces neutral leachate in humidity cell testing. The composite analysis was used to estimate an NP depletion time of approximately 17 years for laboratory conditions (Table 5-2). Therefore, isolated PAG pockets in the low-grade stockpile are not expected to generate ARD before the stockpile is processed in the mill. No exceedances of the MDMER limits are observed. Kinetic testing suggests Al and P are PoPCs with moderate ML potential (Table 5-1)". Stantec Report – Section 5.3.2 Marathon: "Based on the analysis of individual samples, about 50% of the low-grade ore is conservatively classified as PAG. The composite sample of low-grade ore, created as part of metallurgical studies, has uncertain ARD potential (Table 5-2). Humidity cell leachate pH from this sample was near neutral throughout the test period. The minimum ARD onset time for discrete zones of PAG materials (i.e., PAG pockets) is approximately six years based on the first month leaching rates from the humidity cell."
Information Request:	a. The results of the kinetic testing appear based on one composite sample from Leprechaun and one composite sample from Marathon. As per the Stantec recommendations, additional kinetic field testing to refine the ARD onset time estimates and identify the need for mitigation measures related to ARD is required. The testing must consider the extremes in the blending that may occur in the stockpile (i.e., all PAG) and the impact this would have on the ARD/ML potential. b. The EIS must also include the full design of the low-grade stockpile (stockpile base, effluent collection and treatment system) and the plans to rehabilitate the LGO stockpile areas upon closure.

ID:	**DIET-08**
Response:	a. Additional field tests including samples of low-grade ore were started in September of 2020. Recent results for Marathon potentially acid generating (PAG) low-grade ore (MLGO-Met) demonstrate that field derived acid rock drainage (ARD) onset time (200 years) is approximately 30x longer than the neutralization potential (NP) depletion time (6.3 years) based on laboratory humidity cells, indicating estimates presented in the EIS using the NP depletion time are conservative (refer to Appendix C). Therefore, recent results of field tests confirm that the low-grade ore (LGO) stockpile will be processed and/or rehabilitated before it becomes acidic even if all the LGO stockpile is PAG. Kinetic testing of the PAG samples indicates that multiple years would pass before the NP is depleted and acidic leachate generated. To avoid the long testing time, a carbonate-depleted humidity cell was established using the composite sample of Marathon low-grade ore. The first month leaching rates for select constituents in this cell were higher than rates from the initial (non-depleted) sample of LGO as follows: 11.9x for Zn, 7.5x for Ni, 3.5x for Fe, 1.8x for Cd, 1.6x for Pb 1.2x for Cu, and 1.1 for SO_4. These acidic condition leaching rates were used in the water quality model presented in the EIS to predict the increase in metal loading from a PAG mass of LGO at the conservative ARD onset time (see Section 5.3.1.1 in Appendix 7B of the EIS). The water quality model used conservative inputs such as maximum leaching rates, shortest ARD onset time based on laboratory data, and dry climate conditions. In addition, the PAG ore mass used in water quality modeling conservatively includes “uncertain” ore with NPR values between 1 and 2. Probabilistic combinations of conservative inputs produced conservative results for water quality presented in the EIS (Appendix 7B of the EIS). Additional sensitivity analyses related to the effect of ARD onset on metal loading for low-grade ore PAG is presented in Appendix C. The results of this analysis show that even with a reduction of ARD onset time there is only a minor increase in predicted metals concentrations in LGO seepage. Marathon is committed to initiating additional kinetic testing of PAG low-grade ore from the Marathon pit, as indicated in Appendix B. For this testing, Marathon will consider selection of samples that further consider extreme parameters such as lowest Net Potential Ratios and high concentrations of sulphur and metals.

ID:	DIET-08
	b. The design of the LGO stockpiles is described as follows and shown with their maximum potential volumes and heights in Figures DIET-08.1 to DIET-08.6. The foundation base will be on natural ground which consists of a blanket of glacial till. The natural till is of low permeability and will reduce seepage from the base of the pile. The base will be prepared by removing all organic materials and grading of the base to direct drainage from the stockpile to ditching constructed around the perimeter of the stockpile pad. If required, additional glacial till (excavated as part of pre-stripping for the open pits) will be placed, graded and compacted to provide the required grading for positive drainage to the ditching. The stockpile base (pad) will be constructed from non-PAG waste rock and will provide the working platform for the placement of LGO. The LGO stockpiles will be placed on prepared pads using 15 m lift heights with 19 m wide benches from lift crests to toes, to form overall slope angles of 2.6 horizontal: 1 vertical. A 25 m wide haul road will be incorporated into each stockpile to access each lift. The drainage from the stockpile will be collected in ditches which are designed to convey the average and peak flows from the stockpile (1:100 year return event considering climate change) to the downstream sedimentation pond. As described above, no *Metal and Diamond Mining Effluent Regulations* (MDMER) exceedances are predicted in the drainage from the stockpile, and therefore there is no active water treatment required. A downstream sedimentation pond will receive the drainage and allow sufficient settling time to remove TSS prior to release to the environment. Approximately one-half of the Marathon's LGO is conservatively classified as PAG. The minimum ARD onset time in PAG LGO is approximately six years based on maximum laboratory leaching rates; however, the field bin tests indicate a much longer onset time. There were no exceedances of MDMER limits observed in humidity cell leachates from LGO under neutral conditions. Based on kinetic testing, Al, P and Zn have moderate leaching potential. The Marathon LGO stockpile effluent has been segregated from other mine component flow streams in the overall mine design to facilitate collection and further ARD treatment, if required. About 10% of LGO from Leprechaun pit is estimated to be PAG. The LGO stockpile PAG materials are not expected to generate ARD before all the LGO has been processed at

ID:	**DIET-08**
	the mill. Kinetic testing suggests moderate leaching potential for Al and P and no exceedances of MDMER limits. It is planned that all LGO material will be milled, however, it is understood that for rehabilitation and closure planning it must be assumed that the material is not milled and remains on the stockpile at closure. The following scenarios are considered for closure: On the basis that all LGO material is milled prior to closure, the non-PAG waste rock pad will be excavated and placed on the waste rock pile or back to the open pit. The glacial till base will be tested to confirm there is no ARD/ML concerns and then regraded, covered with topsoil/organics and revegetated. In the event there are ARD/ML impacts to the upper portions of the glacial till base (and then likely the waste rock pad as well, though the pad should be acid-buffering), these materials will be excavated and disposed of in the open pit and permanently flooded. On the basis that all or some of the LGO remains at closure, the LGO material can either be left in place and covered using an engineered cover or returned to the open pit for long term disposal. The design and costing associated with these scenarios will be addressed in the Rehabilitation and Closure Plan which will be submitted to NLDIET, Mines Branch who also refer the plan to other provincial and federal regulators for review.
Appendix:	See Appendix B: ARD/ML Management Approach and Appendix C: ARD Onset and Tables

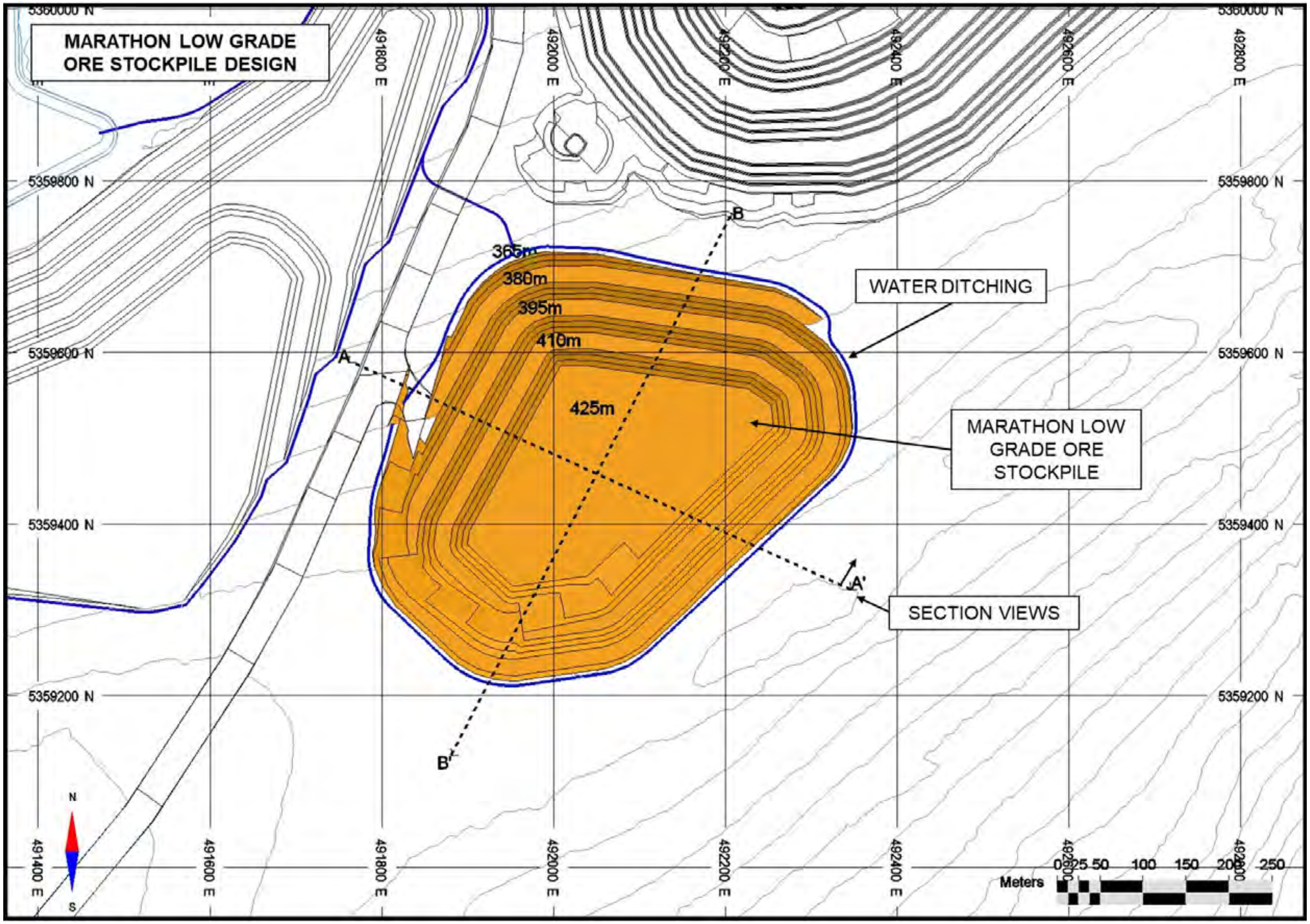


Figure DIET-08.1 **Marathon Low-grade Ore Stockpile Design**

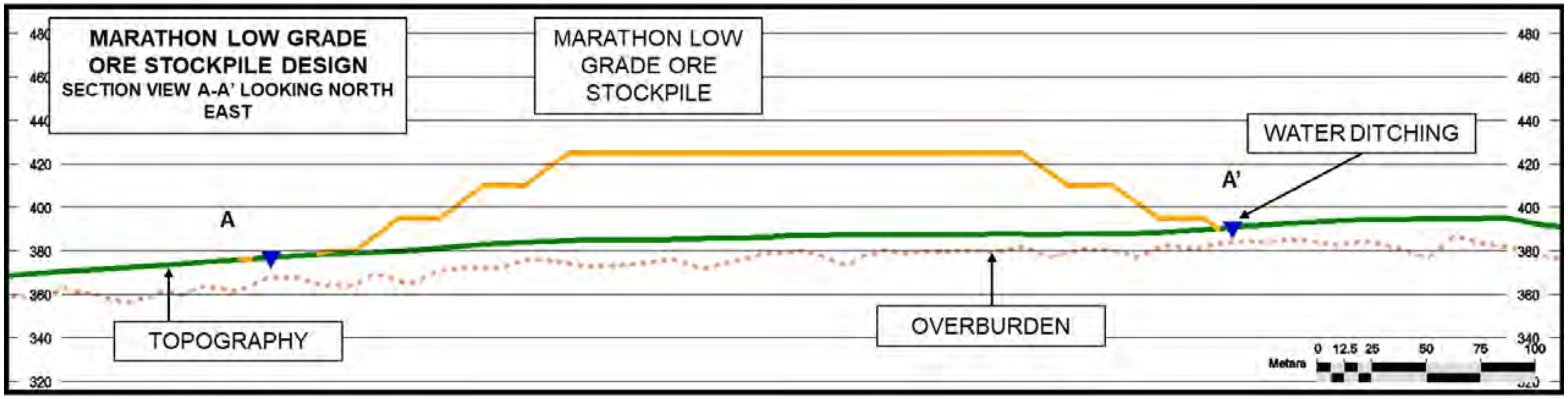


Figure DIET-08.2 Marathon Low-grade Ore Stockpile Design – Section View A-A' Looking Northeast

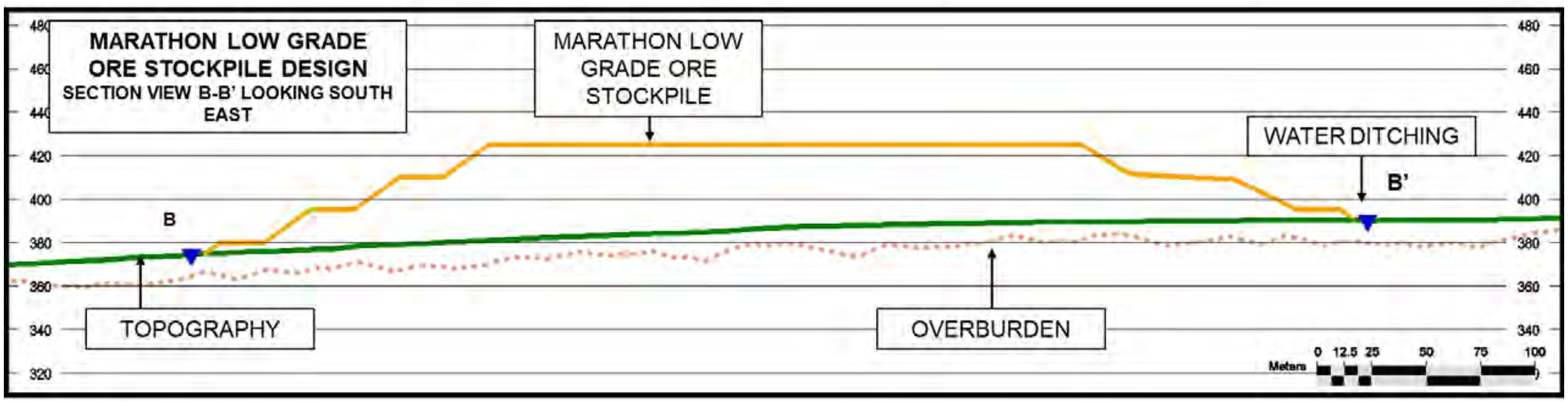


Figure DIET-08.3 Marathon Low-grade Ore Stockpile Design – Section View B-B' Looking Southeast

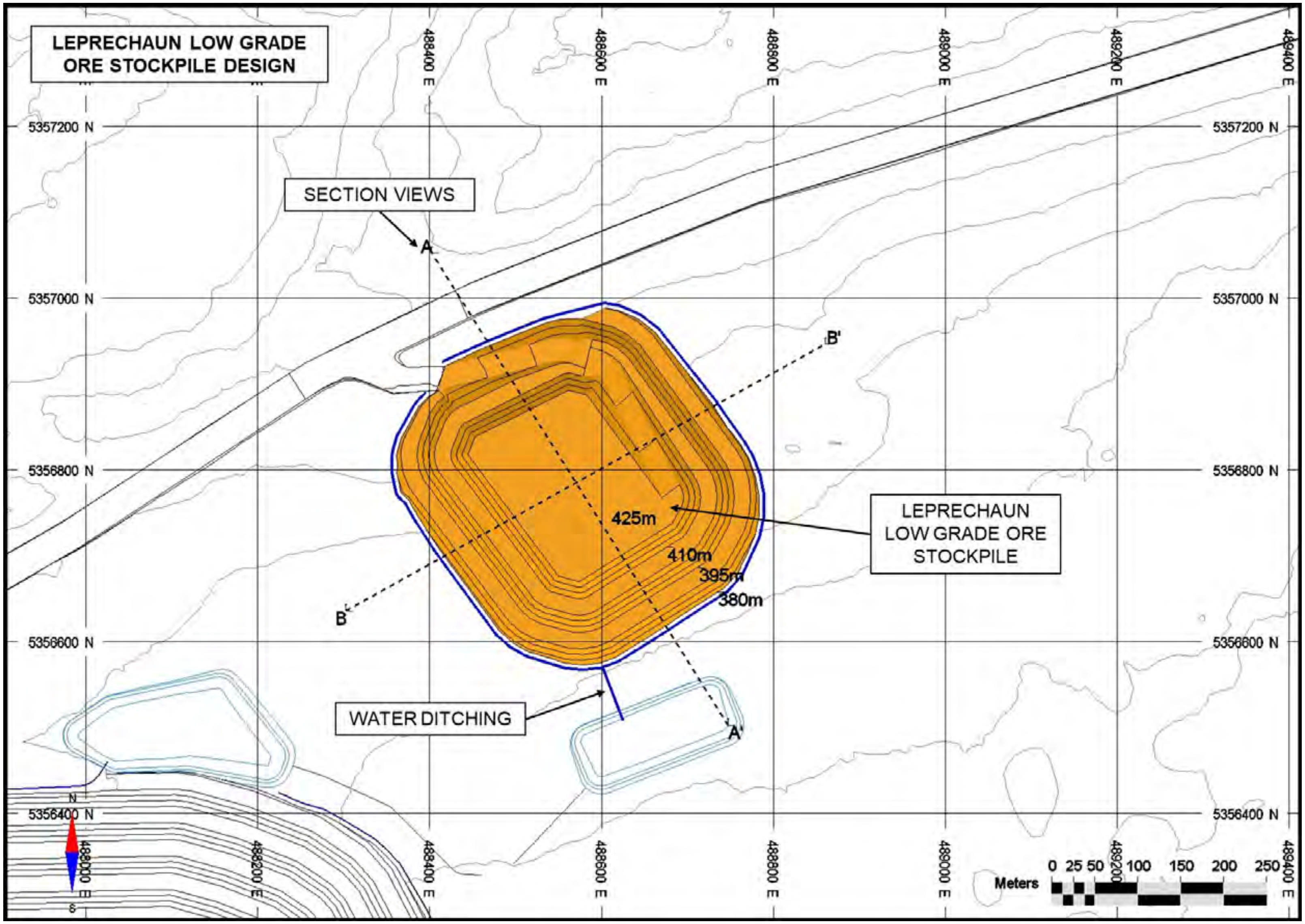


Figure DIET-08.4 **Leprechaun Low-Grade Ore Stockpile Design**

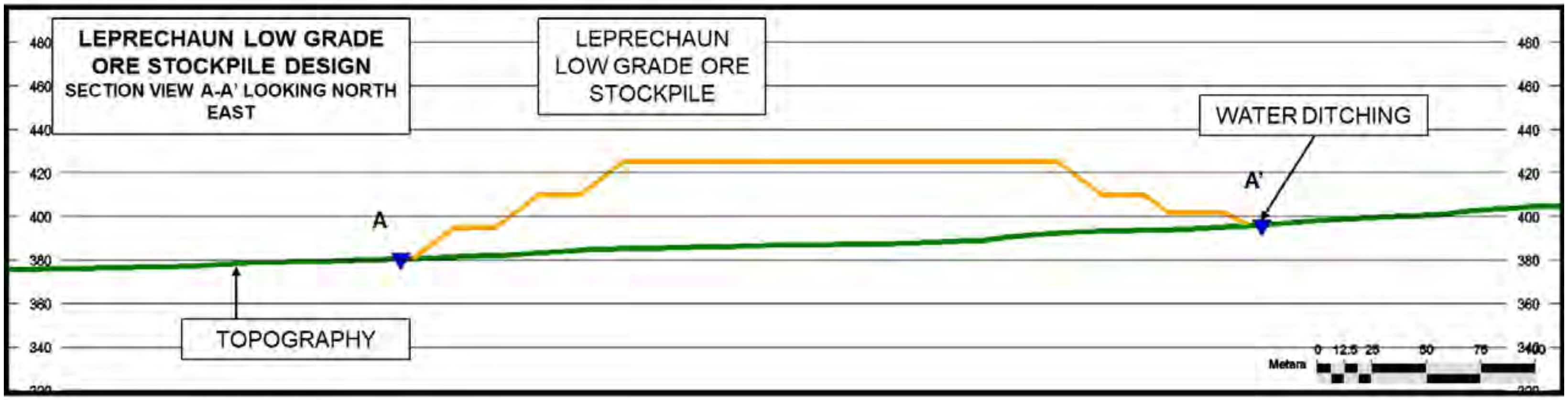


Figure DIET-08.5 **Leprechaun Low-grade Ore Stockpile Design – Section View A-A' Looking Northeast**

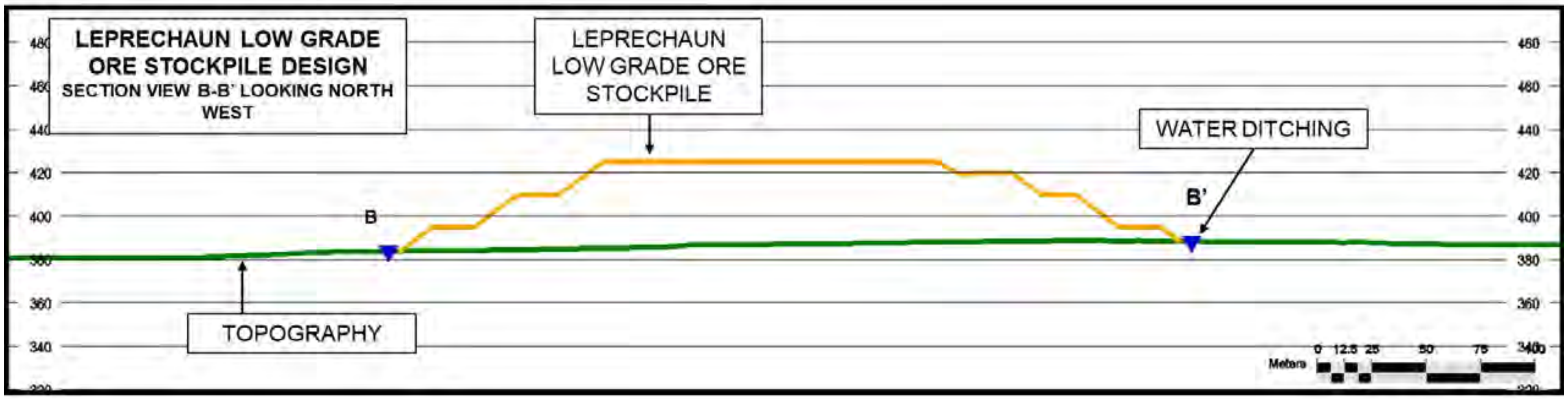


Figure DIET-08.6 **Leprechaun Low-grade Ore Stockpile Design – Section View B-B' Looking Northwest**

RESPONSE TO DIET-09

ID:	**DIET-09**
Expert Department or Group:	Mines Branch
Guideline Reference:	Sections 4.1.7.1 / 4.2.1.5
EIS Reference:	Stantec Report 2020 - Section 5.4; 5.5
Context and Rationale:	The analysis of the ARD potential for the high-grade stockpile appears based on the blending of a percentage of Leprechaun (30%) ore with Marathon (70%) ore and the assumption that 13% of Leprechaun ore and 67% of Marathon ore is PAG. The conclusion that the high-grade stockpile is not expected to generate ARD is based on the ideal blending of PAG and non- PAG ore. During production, there is a high probability of operational issues that could result in an imperfect blending of the appropriate portions of Leprechaun and Marathon ore in the high-grade stockpile. The operations issues could range from pit flooding events to weather events to occurrences of low equipment availability to improper ore/waste sequencing.
Information Request:	The EIS must address the extremes in the ore blending that may occur (i.e., all PAG rock from Marathon and Leprechaun) and the impact this would have on the ARD/ML potential for the high-grade ore stockpile. Additionally, the EIS must address the operational criteria that must be developed to mitigate the ARD/ML potential for the high-grade stockpile.
Response:	It is important to note that blending of the ores from Leprechaun and Marathon pits is a requirement, not an option, for the operation, and the mine plan and processing plant design rely on the grade and characteristics generated from mining both pits simultaneously and blending of ore as it is delivered to the mill. Further blending will take place within the milling and gold extraction process, and further still as the tailings are thickened, delivered, and deposited within the tailings management facility (TMF). While the operational issues noted (pit flooding, weather events, equipment issues) could impact mining operations in the short term, there is sufficient flexibility within the overall mining, stockpiling, crushing and milling system to address these issues on a short-term basis. If any of these issues were to persist longer-term, more significant adaptation to these processes would be required to deliver the needed blend of ores to the process circuit and to subsequently address potential acid rock drainage/metal leaching (ARD/ML) related issues downstream. The ARD/ML Management Plan will consider these potential issues, and the ARD block model will enable better

ID:	DIET-09
	understanding of the ARD potential and nature of blending within the mining plan (Appendix B). As noted in the rationale for this information request, ore from Marathon has higher Maximum Acid Potential (MAP, referred to as acid potential in the EIS), than Leprechaun ore, which has higher Neutralization Potential (NP) and buffers excess MAP in the ore blend. A case for extreme blending (or low probability case) was assessed by using the composite sample of Marathon ore MZC with the highest MAP and the composite sample of Leprechaun ore LZB, which has the lowest NP among ore composites (Table DIET-09.1). For additional sensitivity assessment, the percent of Leprechaun ore in the blend was varied based on the annual mill feed from the mine plan (Table DIET-09.2). Results of sensitivity analysis demonstrates that neutralization potential NP will be in excess of maximum acid potential MAP in the ore blend throughout the first 5 years (life-span of high-grade ore stockpile) considering the low probability case (Table DIET-09.2). Therefore, based on the available information, ore in the stockpile will not generate ARD. Operational ARD monitoring and testing of mined materials, including high grade ore, will be conducted as discussed in response to DIET-07. The monitoring will allow for determination of the NP and MAP balance in the stockpile at any time during the 5 year operational life of the stockpile. The preliminary criteria for ore stockpile acid-base accounting is that NP should be above MAP using moving annual averages for these values. When MAP starts to approach NP, the proposed criteria can be maintained by adding non-PAG ore and withdrawing stockpiled ore. In the low probability event that the high-grade ore stockpile generates ARD, the drainage from this stockpile already flows to the TMF. Any acidity in the stockpile drainage would be neutralized in the pond, in the mill during the normal pH adjustment required as part of the cyanide-based gold recovery process, or in the water treatment plant prior to discharge to the environment. Groundwater impacts are also not expected due to the low impermeability of the glacial till beneath the stockpile foundation (which are continuous to the TMF area) over the relatively short lifespan of the stockpile (5 years).
Appendix:	See Appendix B: ARD/ML Management Approach

Table DIET-09.1 Acid Base Accounting on Ore Composites from Marathon and Leprechaun Zones and on Tailings

Element	Milling Composites									
	Marathon Comps (tailings CND-1)					Leprechaun Comps (tailings CND-2)				
	MZA	MZB	MZC	MZD	MZE	LZA	LZB	LZC	LZD	LZE
% ore sample in tailings composite	15.7	21.8	21.6	23.6	17.3	27.9	17.3	14.5	20.4	19.9
S (t), %	0.68	0.68	0.79	0.70	0.51	0.30	0.28	0.43	0.34	0.36
$S^=$, %	0.68	0.60	0.74	0.64	0.47	0.28	0.25	0.37	0.34	0.33
C(t), %	0.48	0.41	0.38	0.33	0.38	0.80	0.64	1.40	0.93	0.84
C(g), %	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TOC Leco, %	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
CO_2, %	1.8	1.5	1.5	1.2	1.5	3.0	2.4	5.1	3.5	3.1
MAP, kg $CaCO_3$/t	21.3	21.3	24.7	21.9	15.9	9.4	8.8	13.4	10.6	11.3
NP Carb, kg $CaCO_3$/t	40.0	34.2	31.7	27.5	31.7	66.7	53.3	116.7	77.1	70.0
Carb NPR, unitless	1.9	1.6	1.3	1.3	2.0	7.1	6.1	8.7	7.3	6.2
MAP, kg $CaCO_3$/t	21.2					10.5				
NP Carb, kg $CaCO_3$/t	32.5					74.4				
Carb NPR, unitless	1.53					7.10				

Notes:
MAP (Maximum Acid Potential) = S(t) wt,% ×31.25
NP Carb (Carbonate Neutralization Potential) = C(t) wt.% × 83.3
Carb NPR (Carbonate Net Potential Ratio) = NP carb /MAP

Table DIET-09.2 Sensitivity Analysis for Acid Base Accounting in Ore Blend Based on Variability in Ore Zone Composites

Year	% of Leprechaun ore in mill feed (LP%)	Average case: MAP and NP Carb inputs from CND1 and CND2			Low probability case: MAP and NP Carb inputs from sample MZC and LZB		
		MAP	NP Carb	NP carb /MAP	MAP	NP Carb	NP Carb /MAP
-1	41.0	16.1	49.8	3.09	18.1	40.6	2.23
1	42.2	16.0	50.3	3.15	18.0	40.8	2.27
2	16.7	19.1	39.5	2.07	22.0	35.3	1.60
3	32.4	17.2	46.1	2.68	19.5	38.7	1.98
4	41.7	16.0	50.0	3.12	18.0	40.7	2.26
5	55.9	14.2	56.0	3.93	15.8	43.8	2.78

Notes:
Example of equations for annual calculation of ore blends is presented below
$MAP = MAP_{CND1} \times (1-LP\%/100) + MAP_{CND2} \times LP\%/100$
$NP = NP_{CND1} \times (1-LP\%/100) + NP_{CND2} \times LP\%/100$
MAP and NP under Low probability case is calculated in same way substituting MZC and LZB for CND1 and CND2.

RESPONSE TO DIET-10

ID:	**DIET-10**
Expert Department or Group:	Mines Branch
Guideline Reference:	Sections 4.1.7.1 / 4.2.1.5
EIS Reference:	Section 2.5.3 TMF Operation
Context and Rationale:	Exposed tailings beach that slopes 3% to the tailings pond. The high point of the tailings beach is up to 25 meters higher than the crest of the dam and 26 m higher than the pond elevation upon closure. The 2018 Stantec Report states: • ARD is not anticipated from tailings, unless Marathon ore is processed separately from Leprechaun ore and resulting solids are left exposed after closure. The 2020 Stantec Report states: • Section 5.4 - The high-grade stockpile will drain to the TMF and any acidity would be neutralized in the pond or in the mill during the pH adjustment required as a part of the gold recovery by cyanide process. • Section 5.5 - The "preferential settling of denser minerals, such as sulphides, near spigots may result in formation of patches of PAG tailings, which may create localized ARD. • Section 6.0 - Composite samples of tailings are classified as non-PAG and are not expected to generate ARD. • Section 6.0 -The TMF pond and pore water in tailings will likely exceed the MDMER limits for CN(T), unionized NH3, and Cu sourced from process water and collected seepage. In addition, high leaching potential is also predicted for NH3+NH4, CNWAD (surrogate for CN free), F, Hg, P, and Fe. After closure, covered tailings beaches are not expected to produce acidic runoff and/or have high or moderate leaching except for P, which shows moderate potential. The seepage from the TMF is conservatively predicted to exceed the MDMER limits for CN(T), un-ionized NH3, and Cu in post-closure.
Information Request:	The EIS must evaluate all sources of ARD/ML and incorporate the appropriate mitigation measures into the design of the TMF and the closure of the TMF.
Response:	The following sources and associated mitigation measures have been considered in the acid rock drainage/metal leaching (ARD/ML) prediction and water quality models that are included in tailings management facility (TMF) design:

ID:	DIET-10
	• TMF dams: No potentially acid generating (PAG) rock will be used for construction of TMF dams. The rock will be tested for ARD/ML and classified prior to use in construction using procedures similar to those presented in Appendix B. • Process water: approximately 95% of the process water discharged to the TMF will be recycled back to the process plant to minimize use of fresh water and discharge to the environment. The output from the process will be adjusted for pH and treated for cyanide at the plant to maintain discharge water quality to TMF. Discharge from the TMF will be treated during operation via the water treatment plant for cyanide species, total ammonia and copper to comply with the provincial and federal regulations. During treatment, concentrations of mercury, phosphorous, and iron will be also reduced. The parameters mentioned above, and fluoride will be further managed using an assimilative capacity approach and are predicted to be below Canadian Water Quality Guidelines at the edge of the mixing zone (Appendix 7C of the EIS). • TMF beaches: Tailings beaches will not produce acidic runoff during operation based on the assessment completed which shows that tailings samples are non-potentially acid generating (non-PAG) as discussed in detail in response to ECC-07. Humidity cell testing of tailings (samples CND-1 and CND2) show no exceedances of the *Metals and Diamond Mining Effluent Regulations* limits as shown in Table 5-1 and discussed in Sections 4.1.3.2 and 4.3.3.3 in Baseline Study Appendix 5, Attachment 5-B of the EIS. These results indicate that no treatment is required for this source (Table 5-1 of the EIS). At closure, tailings beaches will be covered, further minimizing risk of ARD/ML as discussed in more detail in Section 7.4 of the EIS and in the response to ECC-07. • TMF toe seepage: During operation, toe seepage will be collected and pumped back to the TMF pond. Discharge from the TMF pond will be treated as indicated in Sections 2.3.4 and 2.3.5 of the EIS. Seepage quality will be monitored throughout the life of mine to confirm parameters requiring treatment prior to discharge to the environment. Passive treatments systems to remediate toe seepage from the TMF will be designed and implemented during closure and post-closure, respectively. Marathon will develop a passive treatment assessment program as part of its Rehabilitation and Closure Plan that will be submitted to the Newfoundland and Labrador Department of Industry, Energy and Technology. The final Plan (finalized toward the end of the mine life) is subject to a provincial regulatory approval prior to implementation.

ID:	DIET-10
	• High Grade Ore (HGO) stockpile seepage: The HGO stockpile will not generate ARD as discussed in response to DIET-09. The metal leaching potential of the ore is also low for all parameters as discussed in Section 5.4 of BSA.5, Attachment 5-B of the EIS. In the unlikely case ARD/ML occurs in the HGO stockpile, the ARD/ML will be addressed via pH adjustment in the processing plant or at the water treatment plant, over the 5-year life of the HGO stockpile. On-going and future ARD/ML testing, including operational monitoring, will expand the results obtained to date and refine the associated mitigation measures identified that will be incorporated into the mine plans via the ARD/ML Management Plan. Details on additional testing and on the content of the ARD/ML Management Plan are provided in Appendix B.
Appendix:	See Appendix B: ARD/ML Management Approach

RESPONSE TO DIET-11

ID:	**DIET-11**
Expert Department or Group:	Mines Branch
Guideline Reference:	Sections 4.1.7.1 / 4.2.1.5
EIS Reference:	-
Context and Rationale:	-
Information Request:	The initial ARD/ML assessment indicated ARD/ML would not be a concern. The results of the ARD/ML program however show ARD/ML is going to be an ongoing concern during and after the completion of the project. The ARD/ML sampling program did not follow the MEND guidelines with respect to sample interval length, spatial distribution and minimum sampling frequency per lithology. Additional deficiencies are noted with respect to the composite samples and the conclusions derived from the samples. The deficiencies in the ARD/ML report must be corrected before the report is acceptable. Additionally, the EIS must also present the procedure / method for the identification and the management of PAG rock (ore and waste) which will be used during development and operational phase of the project.
Response:	The results of the second phase of acid rock drainage (ARD/ML) assessment show limited ARD/ML potential for some project components, however, with appropriate management and mitigations the potential for ARD/ML will be reduced and drainage from the site will meet regulatory requirements during operations and post-closure. Further ARD/ML assessment including testing of additional samples and longer-term testing (field bins), is ongoing and will continue, to confirm the results of the assessment to date. The collective results will be used to support the ARD/ML Management Plan which will provide operational management procedures and monitoring requirements. The approach taken in Marathon's geochemical characterization program is based on the geological interpretation and understanding of the gold mineralization and distribution / association of sulphide minerals specific to the deposits. Based on the mineralization characteristics at the Project, the one-meter sample interval is considered appropriate for evaluating the variability in geochemistry and mineralogy of materials and capturing appropriately the natural variability in distribution of ARD/ML properties of the mine rock. An example of the selection table for drill hole MA-18-281 is shown in Table DIET-11.1. The gold content is different in the sampled intervals (i.e., 84-85, 142-143, 203-204, 286-287, 362-363) as compared to the adjacent 1 m; this indicates variability in mineralization of the deposit.

ID:	DIET-11
	Longer sample intervals or compositing samples will mask the variability in material properties as indicated on page 8-9 of Mine Environment Neutral Drainage (MEND) Manual (2009). The tonnage estimates and number of samples tested are provided in Tables DIET-11.2 and DIET-11.3 for each lithology identified within the geologic block model. Some lithologies, such as mafic dykes and varieties of quartz porphyry are narrow and are therefore not represented in the block model based on the block sizes; these have been lumped in with larger geologic units containing these lithologies in models for both deposits. Additional sampling and testing of units with low mineralization, such as the gabbro and metasediments, is required. These units were not well covered by exploration drill programs targeting gold anomalies. Overall, gold mineralization correlates with sulphide content indicating that undersampled lithological units are likely to have lower ARD/ML potential. Therefore, additional sampling and testing of these units is expected to result in an increase in the estimated tonnage of non-potentially acid generating rock. The additional sampling and testing targets, according to MEND (2009) are presented in Tables DIET-11.3 and DIET-11.3. Composite samples of major lithologies were used for kinetic testing. The composite samples were prepared for each lithology using crushed residual material from individual samples used in the second phase of the ARD/ML program. The residual materials were mixed in approximately the same proportions to produce a composite sample representative of the average composition of each lithology. Tables DIET-11.4 to DIET-11.7 provide a quantitative comparison of parameters measured in the composite to select statistics (average, median and 25th percentile) determined from results of individual samples of the same lithology. The summary tables demonstrate that the majority of parameters of potential concern in composite samples (Table 5-1 of Baseline Study Appendix 5, Attachment 5-B of the EIS) have an equal or greater value than the average or/and median reported for the lithology. Therefore, the composite samples generated for kinetic tests are considered to be a conservative representation of each lithology. <u>Ongoing and Additional Assessment and Reporting</u> Kinetic testing of potentially acid generating (PAG) samples are anticipated to take years before the neutralization potential (NP) is depleted and acidic leachate is generated. To reduce the testing time, humidity cells were started on a carbonate-depleted tailings from Marathon ore (Sample CND-1) and on low-grade ore (sample MLGO-Met) from Marathon in August of 2020. Carbonate depletion transforms material into PAG, prior to testing.

ID:	DIET-11
	The results of these tests are presented in the Attachment DIET-11, following Table DIET-11.7, below. Additional kinetic testing of PAG materials (waste rock, ore and low-grade ore) from major lithologies of the Marathon pit and a composite sample of gabbro material have been started. These samples have also been submitted for static tests including net acid generating (NAG) tests, mineralogy and particle size distribution similar to the characterization of composite samples described in Attachment 5-B of the EIS. The results of this test work will be included in the ARD/ML Management Plan (see Appendix B for more information) which will be provided to the Newfoundland and Labrador Department of Industry, Energy and Technology, Mines Brach, for review and comment. Marathon recognizes that further ARD/ML work is required as well as further assessment and associated refinement of Project mitigation as design of the Project proceeds (refer to Appendix B for further information). Specifically, Marathon is committed to completing additional work to address testing gaps identified in the program completed to date. This information is required for final design and permitting under the Newfoundland and Labrador *Mining Act* (Newfoundland and Labrador Department of Industry, Energy, and Technology). Specifically, Marathon is committed to completing the following additional work within the indicated timeframes: Continue collection of results from on-going laboratory and field tests in 2021. Continuation of laboratory tests include two humidity cells containing carbonate depleted low-grade ore (LGO) and tailings from the Marathon deposit. Continuation of field bin tests of composite materials include nine composite samples representing major waste rock lithologies and low-grade ores from both deposits. In 2021, a subaqueous column, an aging test and a humidity cell has started on samples generated from on-going metallurgical work. It is expected that updated analysis will be conducted in Q4 of 2021. Additional static testing of samples in Q2 and Q3 of 2021. Additional static testing to be conducted: To address spatial distribution and sampling requirements per lithology (refer to Tables DIET-11.2 and DIET-11.3) To provide the data inputs required for ARD block models for Marathon pit

ID:	DIET-11
	To better define the location and volumes of non-potentially acid generating (non-PAG) rock, which is required for construction, in Leprechaun and Marathon starter pits Additional kinetic testing of PAG materials (waste rock, ore and low-grade ore) from major lithologies of the Marathon pit including a composite sample of gabbro. These samples have also been submitted for static tests including NAG tests, mineralogy and particle size distribution similar to characterization of composite samples described in the EIS. It is expected that updated analysis will be conducted in Q4 of 2021. PAG Rock Management The future ARD block model for Marathon pit will provide production schedules for ARD classes of rock and ore and will to help to map PAG materials on pit walls. The model will be verified by operational sampling and managed using the following procedures, which are subject to further refinement as the ARD/ML Management Plan is developed. The following procedure will be employed for all PAG rock excavated for the Project: Samples of drill cuttings from blast holes representing each mine block will be collected. The samples will be tested for total carbon and sulphur using LECO furnace or similar method. Average NP will be calculated from total carbon and average Acid Potential (AP) will be calculated from total sulphur using standard conversions per the MEND guidelines. If NP/AP ratios indicate the mine block rock is below 2, the block will be classified as PAG. PAG rock will be marked after the blast, excavated, and dispatched to the waste rock stockpile. PAG rock would only be deposited within a specified distance (to be defined) of the final stockpile shell and preferably next to a non-PAG truck load. Piled PAG rock will be marked and the geospatial coordinates recorded. A portion of PAG and non-PAG rock loads will be mixed during grading each lift of the stockpile. This mixture will be encapsulated with non-PAG rock deposited within a specified distance (to be defined) from the lift face and forming the topmost lift(s) on the final of the stockpile. Non-PAG rock will reduce oxygen flux into interior of the pile and provide alkalinity to infiltrating water. This approach has been successfully applied for waste rock piles in other mine sites as referenced in sections 6.6.3.5 and 6.6.3.6 of Global ARD management guide (http://www.gardguide.com/index.php/Chapter) and would be applicable to ARD/ML management at the Valentine Gold Project.

ID:	DIET-11
	Additional details describing the location and management of acid generating rock will be presented in the ARD/ML Management Plan, however, the approach is expected to be much the same as described above. The ARD/ML Management Plan will be prepared using additional ARD/ML test results as described in Appendix B. Reference: Mine Environment Neutral Drainage Program (MEND). 2009. Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials, MEND Report 1.20.1, p. 1-579.
Appendix:	See Appendix B: ARD/ML Management Approach

Table DIET-11.1 Logs and Assays of MA-18-281 Drill Hole used for Sample Selection.

Hole_ID	From_m	To_m	Au g/t	Lithology
MA-18-281	2.89	4		Conglomerate
MA-18-281	6	7		Conglomerate
MA-18-281	7	9	0.005	Mafic Dike
MA-18-281	9	11	0.005	Qtz-eye Porphyry
MA-18-281	11	13	0.009	Qtz-eye Porphyry
MA-18-281	13	15	0.015	Qtz-eye Porphyry
MA-18-281	15	17	0.005	Qtz-eye Porphyry
MA-18-281	17	19	0.022	Qtz-eye Porphyry
MA-18-281	19	21	0.060	Qtz-eye Porphyry
MA-18-281	21	23	0.011	Mafic Dike
MA-18-281	25	27	0.005	Aphanitic Qtz Porphyry
MA-18-281	27	29	0.005	Aphanitic Qtz Porphyry
MA-18-281	29	30	0.023	Aphanitic Qtz Porphyry
MA-18-281	30	31		Aphanitic Qtz Porphyry
MA-18-281	31	33	0.005	Qtz-eye Porphyry
MA-18-281	49	50	0.010	QZ - Qtz-eye Porphyry + QTP
MA-18-281	52	53	0.005	Qtz-eye Porphyry
MA-18-281	53	54	0.005	Qtz-eye Porphyry
MA-18-281	54	56	0.005	Qtz-eye Porphyry
MA-18-281	56	58	1.027	Qtz-eye Porphyry
MA-18-281	58	60	0.023	Qtz-eye Porphyry
MA-18-281	60	61	0.005	Qtz-eye Porphyry
MA-18-281	61	62	0.005	Qtz-eye Porphyry
MA-18-281	62	64	0.005	Qtz-eye Porphyry
MA-18-281	64	66	1.141	Aphanitic Qtz Porphyry
MA-18-281	68	70	0.005	Qtz-eye Porphyry
MA-18-281	82	83	0.016	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	83	84	0.005	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	84	85	0.123	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	85	86	0.341	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	86	87	0.005	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	87	88	0.005	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	88	89	0.135	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	89	90	0.083	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	90	91	0.005	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	91	92	0.005	Qtz-eye Porphyry
MA-18-281	94	96	0.005	Aphanitic Qtz Porphyry
MA-18-281	102	104	0.005	Qtz-eye Porphyry
MA-18-281	122	124	0.005	Aphanitic Qtz Porphyry
MA-18-281	134	136	0.012	Qtz-eye Porphyry
MA-18-281	136	138	0.069	Qtz-eye Porphyry
MA-18-281	138	139	0.201	Qtz-eye Porphyry
MA-18-281	139	140	1.091	Qtz-eye Porphyry
MA-18-281	140	141	0.526	Qtz-eye Porphyry
MA-18-281	141	142	2.028	Qtz-eye Porphyry
MA-18-281	142	143	0.504	Qtz-eye Porphyry
MA-18-281	143	145	0.724	Qtz-eye Porphyry
MA-18-281	145	147	0.015	Aphanitic Qtz Porphyry
MA-18-281	155	157	0.005	Qtz-eye Porphyry
MA-18-281	170	172	0.005	Aphanitic Qtz Porphyry

Note: Intervals highlighted in grey were selected for ARD/ML Testing Program

Table DIET-11.1 Logs and Assays of MA-18-281 Drill Hole used for Sample Selection.

Hole_ID	From_m	To_m	Au g/t	Lithology
MA-18-281	172	173	0.005	Aphanitic Qtz Porphyry
MA-18-281	173	174	0.005	Aphanitic Qtz Porphyry
MA-18-281	174	176	0.005	Aphanitic Qtz Porphyry
MA-18-281	176	177	0.005	Aphanitic Qtz Porphyry
MA-18-281	177	178	0.005	Aphanitic Qtz Porphyry
MA-18-281	178	179	0.005	Qtz-eye Porphyry
MA-18-281	191	193	0.005	Aphanitic Qtz Porphyry
MA-18-281	197	199	0.005	Qtz-eye Porphyry
MA-18-281	200	201	0.005	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	201	202	0.005	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	202	203	0.005	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	203	204	0.019	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	204	205	0.014	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	205	206	0.019	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	206	207	0.039	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	207	208	0.005	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	208	209	0.005	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	209	210	0.005	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	210	211	0.005	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	211	212	0.005	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	212	213	0.005	Qtz-eye Porphyry
MA-18-281	218	220	0.005	Aphanitic Qtz Porphyry
MA-18-281	228	230	0.011	Qtz-eye Porphyry
MA-18-281	230	232	0.005	Qtz-eye Porphyry
MA-18-281	232	233	0.005	Qtz-eye Porphyry
MA-18-281	233	235		Qtz-eye Porphyry
MA-18-281	234	236	0.005	Qtz-eye Porphyry
MA-18-281	236	238	0.005	Qtz-eye Porphyry
MA-18-281	238	240	0.005	Qtz-eye Porphyry
MA-18-281	240	242	0.005	Qtz-eye Porphyry
MA-18-281	242	244	0.005	Qtz-eye Porphyry
MA-18-281	244	246	0.016	Qtz-eye Porphyry
MA-18-281	246	248	0.005	Qtz-eye Porphyry
MA-18-281	248	250	0.012	Qtz-eye Porphyry
MA-18-281	250	252	0.005	Qtz-eye Porphyry
MA-18-281	252	254	0.005	Qtz-eye Porphyry
MA-18-281	254	256	0.005	Qtz-eye Porphyry
MA-18-281	256	258	0.005	Aphanitic Qtz Porphyry
MA-18-281	262	264	0.005	Qtz-eye Porphyry
MA-18-281	282	284	0.005	Mafic Dike
MA-18-281	284	286	0.005	Mafic Dike
MA-18-281	286	287	0.012	Mafic Dike
MA-18-281	287	288	0.012	Mafic Dike
MA-18-281	288	290	0.005	Mafic Dike
MA-18-281	290	292	0.005	Mafic Dike
MA-18-281	292	294	0.005	Mafic Dike
MA-18-281	294	296	0.005	Mafic Dike
MA-18-281	296	298	0.005	Mafic Dike
MA-18-281	298	300	0.005	Mafic Dike
MA-18-281	300	302	0.005	Mafic Dike
MA-18-281	302	304	0.005	Mafic Dike
MA-18-281	304	306	0.005	Aphanitic Qtz Porphyry

Note: Intervals highlighted in grey were selected for ARD/ML Testing Program

Table DIET-11.1 Logs and Assays of MA-18-281 Drill Hole used for Sample Selection.

Hole_ID	From_m	To_m	Au g/t	Lithology
MA-18-281	318	320	0.005	Qtz-eye Porphyry
MA-18-281	324	326	0.005	Mafic Dike
MA-18-281	342	344	0.007	Qtz-eye Porphyry
MA-18-281	344	346	0.007	Qtz-eye Porphyry
MA-18-281	346	348	0.008	Qtz-eye Porphyry
MA-18-281	348	350	0.007	Qtz-eye Porphyry
MA-18-281	350	352	0.026	Qtz-eye Porphyry
MA-18-281	352	354	0.050	Qtz-eye Porphyry
MA-18-281	354	356	0.009	Qtz-eye Porphyry
MA-18-281	356	357	0.005	Qtz-eye Porphyry
MA-18-281	357	358	0.005	Qtz-eye Porphyry
MA-18-281	358	359	0.060	Qtz-eye Porphyry
MA-18-281	359	360	0.005	Qtz-eye Porphyry
MA-18-281	360	361	0.005	Qtz-eye Porphyry
MA-18-281	361	362	0.006	Qtz-eye Porphyry
MA-18-281	362	363	0.014	Qtz-eye Porphyry
MA-18-281	363	364	0.019	Qtz-eye Porphyry
MA-18-281	364	365	0.007	Qtz-eye Porphyry
MA-18-281	365	367	0.005	Qtz-eye Porphyry
MA-18-281	367	369	0.005	Qtz-eye Porphyry
MA-18-281	369	371	0.005	Qtz-eye Porphyry
MA-18-281	371	373	0.005	Qtz-eye Porphyry
MA-18-281	373	375	0.007	Qtz-eye Porphyry
MA-18-281	375	377	0.005	Qtz-eye Porphyry
MA-18-281	377	379	0.005	Qtz-eye Porphyry
MA-18-281	379	381	0.005	Qtz-eye Porphyry
MA-18-281	381	383	0.005	Qtz-eye Porphyry
MA-18-281	383	385	0.005	Qtz-eye Porphyry
MA-18-281	385	387	1.229	Qtz-eye Porphyry
MA-18-281	387	388	0.038	QZ - Qtz-eye Porphyry + QTP
MA-18-281	395	396	0.309	Qtz-eye Porphyry
MA-18-281	402	403	0.088	QZ - Qtz-eye Porphyry + QTP
MA-18-281	408	409	1.200	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	409	410	0.026	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	410	411	5.069	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	411	412	0.007	QZ - Qtz-eye Porphyry + Minor QTP
MA-18-281	412	413	0.219	QZ - Qtz-eye Porphyry + QTP
MA-18-281	413	414	0.107	QZ - Qtz-eye Porphyry + QTP
MA-18-281	414	415	0.251	QZ - Qtz-eye Porphyry + QTP
MA-18-281	415	416	0.196	QZ - Qtz-eye Porphyry + QTP
MA-18-281	416	417	2.454	QZ - Qtz-eye Porphyry + QTP
MA-18-281	417	418	0.584	QZ - Qtz-eye Porphyry + QTP
MA-18-281	418	419	0.114	QZ - Qtz-eye Porphyry + QTP
MA-18-278	10.51	12	0.005	Qtz-eye Porphyry

Note: Intervals highlighted in grey were selected for ARD/ML Testing Program

Table IDIET-11.2 Tonnages of lithological units from geological block model and numbers of samples per unit for the Marathon Deposit

Block Model Lithology	Material type	Tonnage, Mt	# of samples tested to date	Suggested initial frequency per Table 8-2, MEND 2009	# of additional of samples to be tested per Table 8-2 MEND 2009
Metasediments	Waste Rock	30.3	9	80	71
Gabbro	Waste Rock	8.0	4	26	22
QEPOR	Waste Rock	106.7	125	80	0
High Grade Ore	Ore	14.6	28	80	52
Low Grade Ore	Ore	11.1	15	80	65
Overburden	Waste	7.5	14	26	12

Table DIET-11.3 Tonnages of lithological units from geological block model and numbers of samples per unit for the Leprechaun Deposit

Block Model Lithology	Material type	Tonnage, Mt	# of samples tested to date	Suggested initial frequency per Table 8-2, MEND 2009	# of additional of samples to be tested per Table 8-2 MEND 2009
Metasediments	Waste Rock	33	21	80	59
Trondhjemite	Waste Rock	105	93	80	0
High Grade Ore	Ore	8.6	24	26	2
Low Grade Ore	Ore	6.7	13	26	13
Overburden	Waste	3.8	6	26	20

Table DIET-11.4 Comparison of ABA statistics for individual samples to composite samples (ID is in bold).

Parameter	S_{TOTAL}	$S_{SULPHATE}$	$S_{SULPHIDE}$	Carb. NP	AP	NNP	Carb. NPR
Units	**wt.%**			**kg $CaCO_3$/t**			
1. Trondhjemite and Granodiorite (TRJ), 54 samples							
25th, %ile	0.020	0.010	0.01	28.7	0.3	54	96
Median	0.035	0.010	0.02	36.6	0.6	61	59
Average	0.06	0.013	0.05	42.4	1.5	65	29
L TRJ	0.08	0.050	0.03	48.3	0.9	47	**51**
2. QZ - Trondhjemite + QTP and QZ - Granodiorite + QTP (QZ-TQTP), 33 samples							
25th, %ile	0.056	0.005	0.04	27.7	1.3	54	21
Median	0.110	0.010	0.09	36.1	2.8	65	13
Average	0.15	0.017	0.13	45.2	4.1	69	11
L QZ-QTP	0.11	0.050	0.06	44.7	1.9	43	24
3. Conglomerate and Sediments (CG and SED), 17 samples							
25th, %ile	0.003	0.010	0.01	5.0	0.3	13	17
Median	0.010	0.010	0.01	12.5	0.3	21	42
Average	0.01	0.015	0.01	15.0	0.4	28	38
L SED	< 0.005	< 0.02	< 0.02	9.2	0.6	8.6	**15**
5. Mafic Dike (MD), 19 samples							
25th, %ile	0.076	0.025	0.05	72.1	1.4	113	51
Median	0.120	0.040	0.06	125.7	1.9	171	66
Average	0.19	0.039	0.15	116.3	4.8	159	24
L MD	0.13	0.060	0.07	97.3	2.2	95	**44**
7. QZ-QTP, 3 samples							
25th, %ile	0.049	0.020	0.02	54.1	0.8	53	69
Median	0.068	0.030	0.03	69.8	0.9	69	74
Average	0.06	0.027	0.03	69.7	1.2	90	60
L QZ-QTP	0.05	0.030	0.02	51.6	0.62	51	83
8. Low-Grade Ore, 10 samples							
25th, %ile	0.096	0.010	0.08	15.4	2.5	27	6.1
Median	0.213	0.015	0.15	34.1	4.5	52	8
Average	0.25	0.039	0.22	45.4	6.8	67	7
L LGO	0.16	0.060	0.10	37.9	3.1	35	12
LLGO-Met	0.27	0.040	0.23	61.3	7.2	54	9

Notes:
S_{TOTAL} - Total Sulphur; $S_{SULPHIDE}$ - Sulphide Sulphur; $S_{SULPHIDE}=S_{TOTAL}-S_{SULPHATE}$; $S_{SULPHATE}$ - Sulphate Sulphur;
Carb. NP - Carbonate Neutralization Potential; Carb; $NP=TIC*M(CaCO_3)/M(C)*10$(kg/t from % diff.);
AP - Acid Potential; $AP=S_{SULPHIDE}(\%) \times 31.25$; NNP - Net Neutralization Potential; NPR - Neutralization Potential Ratio;
TIC - Total Inorganic Carbon. Respective samples from Phase I and II are combined.
Values in cells highlighted yellow exceed either median or average value for the material;
Values in cells highlighted green are between the 25th percentile and average value for the material.

Table DIET-11.5 Comparison of trace element statistics for individual samples to composite samples (ID is in bold).

	Ag	Al	As	Be	Cd	Co	Cr	Cu	Fe	Hg	Mn	Mo	Ni	P	Pb	Se	Tl	U	V	Zn
ACUCx10	530	407639	48	21	0.90	173	920	280	320415	0.5	774.5	11	470	654.3	170	0.9	9	27	970	670
Units	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g
1. Trondhjemite and Granodiorite (TRJ), 54 samples																				
25th, %ile	0.050	6205	0.5	0.50	0.050	1.3	44	3.5	833	0.025	403	0.20	1.4	12	10.5	0.50	0.250	0.100	6.0	24
Median	0.050	6420	1.0	0.50	0.050	1.9	50	4.8	1025	0.025	465	0.30	1.7	14	12	0.50	0.25	0.20	9.0	32
Average	0.044	6323	1.4	0.59	0.044	3.5	53	8.3	2721	0.025	486	0.35	3.0	23	12	0.48	0.21	0.20	21	33
L TRJ	< 0.01	5600	0.8	0.12	0.030	3.3	54	6.9	12000	< 0.05	430	2.7	3.2	280	3.4	< 0.7	0.02	0.12	8.0	27
2. QZ - Trondhjemite + QTP and QZ - Granodiorite + QTP (QZ-TQTP), 33 samples																				
25th, %ile	0.050	6120	0.5	0.50	0.050	1.3	50	4.3	780	0.025	389	0.20	1.4	11.5	6.0	0.50	0.250	0.20	8.0	23
Median	0.050	6710	1.0	0.50	0.050	3.1	54	8.8	1180	0.025	446	0.30	1.7	18	8.7	0.50	0.25	0.30	10	33
Average	0.043	6674	1.1	0.69	0.049	3.8	55	14.1	3913	0.025	496	1.48	2.6	27	8.9	0.47	0.21	0.31	25	32
L QZ-TQTP	0.01	6300	0.8	0.13	0.030	4.0	59	10.0	13000	< 0.05	490	3.0	3.4	260	2.5	< 0.7	< 0.02	0.16	12.0	35
3. Conglomerate and Sediments (CG and SED), 17 samples																				
25th, %ile	0.005	6870	3.4	0.15	0.040	13.7	55	1.2	3690	0.025	773	0.05	20	67	1.1	0.35	0.010	0.53	41	65
Median	0.050	7250	5.0	0.50	0.050	15.2	68	3.9	4120	0.025	**877**	0.20	26	73	13	0.50	0.25	1.3	95	70
Average	0.037	9268	4.7	0.57	0.053	15.1	64	14.0	11032	0.025	**938**	0.74	24	75	10	0.46	0.18	1.1	81	69
L SED	< 0.01	14000	3.2	0.16	0.030	14.0	50	2.5	31000	< 0.05	750	0.8	24.0	810	1.2	< 0.7	0.02	0.47	46.0	61
5. Mafic Dike (MD), 19 samples																				
25th, %ile	0.050	7000	4.0	0.50	0.050	29.5	46	51.8	6580	0.025	**1060**	0.35	19.8	83	3.9	0.50	0.250	0.15	197	75
Median	0.050	7520	10	0.50	0.050	36.3	81	58.0	7570	0.025	**1400**	0.60	28	91	6.6	0.50	0.25	0.40	250	83
Average	0.041	11038	11	0.65	0.101	31.7	77	56.9	17397	0.025	**1264**	0.83	24	88	6.3	0.47	0.20	0.34	225	78
L MD	0.01	22000	2.2	0.17	0.070	29.0	70	50.0	59000	< 0.05	1100	1.1	22.0	610	2.0	< 0.7	< 0.02	0.12	170.0	70
7. QZ-QTP, 3 samples																				
25th, %ile	0.005	5100	1.4	0.13	0.010	3.6	55	5.6	5660	0.025	495	0.20	2.8	52	1.6	0.35	0.010	0.20	8.5	35
Median	0.005	6000	2.0	0.13	0.010	4.8	59	8.0	9900	0.025	530	0.20	3.5	52	1.7	0.35	0.01	0.20	12	36
Average	0.020	5403	1.9	0.42	0.023	4.2	60	16.7	9773	0.025	527	0.63	3.2	52	3.9	0.40	0.09	0.22	20	39
L QZ-QTP	< 0.01	5900	0.5	0.14	0.020	4.6	38	10.0	15000	< 0.05	460	1.9	3.2	440	1.6	< 0.7	< 0.02	0.17	11.0	42
8. Low-Grade Ore, 10 samples																				
25th, %ile	0.050	4780	1.10	0.16	0.043	3.8	61	8.0	1260	0.025	337	0.13	2.8	25	4.2	0.35	0.010	0.20	9.5	17
Median	0.050	6515	1.8	0.50	0.050	5.0	69	11.1	5975	0.025	414	0.40	4.3	39	6.4	0.50	0.25	0.22	23	33
Average	0.115	6547	2.2	0.45	0.048	10.5	81	42.1	10457	0.040	512	0.83	12	47	9.9	0.44	0.15	0.51	56	41
L LGO	0.03	4100	2.0	0.10	0.070	4.1	70	20.0	13000	< 0.05	340	1.7	5.3	390	1.8	< 0.7	< 0.02	0.15	8.0	26
LLGO-Met	0.04	5300	1.3	0.12	0.030	5.5	29	8.1	14000	0	430	0.8	3.8	-	7.3	< 0.7	< 0.02	0.80	8.0	33

Notes:
Respective samples from Phase I and II are combined.
ACUC - Average Concentration in the Upper Crust of the Earth based on Rudnick and Gao (2004); Values exceeding 10x the Average Concentration in the Upper Crust are double underlined and bold;
For the values less than Reportable Detection Limit (RDLs) values, 1/2 of RDLs are used to calculate statistical parameters.
Values in cells highlighted yellow exceed either median or average value for the material. Values in cells highlighted green are between the 25th percentile and average value for the material.

Table DIET-11.6 Comparison of ABA statistics for individual samples to composite samples (ID is in bold).

Parameter	Paste pH	S_{TOTAL}	$S_{SULPHATE}$	$S_{SULPHIDE}$	Carb. NP	AP	NNP	Carb. NPR
Units	**pH Units**	**wt.%**			**kg $CaCO_3$/t**			
1. Qtz-eye Porphyry and Qtz-Porphyry Breccia (QE-POR and QE-POR-BX), 66 samples								
25th, %ile	9.39	0.018	0.010	0.01	23.2	0.6	24	37
Median	9.52	0.100	0.020	0.07	36.8	2.0	48	18
Average	9.47	0.17	0.051	0.12	48.4	3.9	61	13
M QE-POR	8.74	0.08	0.030	0.05	62.5	1.6	61	40
2. Aphanitic Qtz Porphyry (AQPOR), 19 samples								
25th, %ile	9.45	0.037	0.010	0.03	13.0	0.8	9	17
Median	9.69	0.076	0.030	0.05	18.5	1.6	22	12
Average	9.60	0.27	0.062	0.22	31.5	6.9	30	5
M AQPOR	9.48	0.33	0.090	0.24	48.6	7.5	41	6
3. Conglomerate (CG), 9 samples								
25th, %ile	9.36	0.003	0.010	0.01	75.2	0.3	75	251
Median	9.56	0.003	0.010	0.01	84.2	0.6	99	136
Average	9.50	0.01	0.009	0.01	101.1	0.5	116	212
M CG	9.53	< 0.005	< 0.02	< 0.02	87.3	0.6	87	141
5. Mafic Dike (MD), 19 samples								
25th, %ile	8.82	0.030	0.010	0.01	44.9	0.6	77	72
Median	9.03	0.090	0.030	0.04	93.3	1.3	105	72
Average	9.05	0.12	0.051	0.08	96.4	2.5	118	38
M MD	8.96	0.27	0.080	0.19	88.7	5.9	82.7	15
6. QZ - Qtz-eye Porphyry + Minor QTP (QZ-QE-POR-QTP-MIN), 10 samples								
25th, %ile	9.61	0.041	0.015	0.03	17.3	1.0	13	17
Median	9.64	0.157	0.045	0.11	26.3	3.3	20	8
Average	9.67	0.25	0.056	0.20	32.9	6.2	27	5
M QZ-QE-POR-QTP-MIN	9.71	0.38	0.100	0.28	22.7	8.8	14	2.6
7. QZ - Qtz-eye Porphyry + QTP (QZ-QE-POR-QTP), 11 samples								
25th, %ile	9.45	0.161	0.010	0.14	16.2	4.2	24	4
Median	9.59	0.310	0.010	0.30	18.3	9.4	33	**2.0**
Average	9.57	0.33	0.028	0.30	30.8	9.6	35	3.2
8. Low-Grade Ore, 8 samples								
25th, %ile	9.35	0.433	0.009	0.36	17.4	11.1	4	**1.6**
Median	9.48	0.506	0.050	0.42	24.1	13.2	27	**1.8**
Average	9.50	0.55	0.066	0.49	26.2	15.3	21	**1.7**
M LGO	9.48	0.28	0.090	0.19	49.2	5.9	43	8
MLGO-Met	9.16	0.59	< 0.02	0.60	28.9	18.8	10	1.5

Notes:
S_{TOTAL} - Total Sulphur; $S_{SULPHATE}$ - Sulphate Sulphur; AP - Acid Potential; AP=$S_{SULPHIDE}$(%) x 31.25.
NNP - Net Neutralization Potential; NPR - Neutralization Potential Ratio;
TIC - Total Inorganic Carbon; Overburden AP is calculated using S_{TOTAL} x 31.25.
Respective samples from Phase I and II are combined.

Table DIET-11.7 Comparison of trace element statistics for individual samples to composite samples (ID is in bold).

	Ag	Al	As	B	Be	Cd	Co	Cr	Cu	Fe	Hg	Mn	Mo	Ni	P	Pb	Se	Tl	U	V	Zn
ACUCx10	530	407639	48	-	21	0.90	173	920	280	320415	0.5	774.5	11	470	654	170	0.9	9	27	970	670
Units	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g
1. Qtz-eye Porphyry and Qtz-Porphyry Breccia (QE-POR and QE-POR-BX), 66 samples																					
25th, %ile	0.006	5785	0.50	-	0.050	0.010	2.7	46.5	2.5	2860	0.025	320	0.53	1.9	19	0.37	0.35	0.010	0.085	7.0	8
Median	0.025	6345	0.60	-	0.070	0.010	4.5	73	4.7	13000	0.025	418	0.90	2.4	25	0.86	0.35	0.01	0.13	17.0	16
Average	0.029	9000	0.87	-	0.25	0.027	7.0	75	11.3	16551	0.025	537	1.4	6.0	28	1.5	0.42	0.10	0.21	38	21
M QE-POR	0.02	11000	< 0.5	-	0.06	< 0.02	6.3	100	14.0	25000	< 0.05	580	2.2	13.0	190	0.9	< 0.7	< 0.02	0.09	31.0	17
2. Aphanitic Qtz Porphyry (AQPOR), 19 samples																					
25th, %ile	0.005	6800	0.38	-	0.045	0.010	3.1	48.0	2.1	17500	0.025	295	1.05	1.55	21	0.22	0.35	0.010	0.093	5.5	15
Median	0.010	8700	0.60	-	0.060	0.010	4.7	82	4.3	23000	0.025	400	1.80	2.2	25	0.60	0.35	0.01	0.12	10.0	22
Average	0.029	11093	0.80	-	0.14	0.023	7.2	76	12.0	22955	0.025	494	1.8	7.7	23	0.93	0.49	0.05	0.15	18	28
M AQPOR	0.05	14000	0.7	-	0.10	< 0.02	8.4	110	15.0	33000	< 0.05	680	3.5	22.0	380	0.7	< 0.7	< 0.02	0.10	28.0	42
3. Conglomerate (CG), 9 samples																					
25th, %ile	0.050	5400	1.2	-	0.18	0.050	10.0	23	9.4	4420	0.025	**881**	0.30	16	56	2.1	0.35	0.010	0.400	30.0	40
Median	0.050	6470	1.6	-	0.23	0.050	11.0	66	22.0	22000	0.025	**918**	0.30	20	61	3.0	0.35	0.02	0.67	36.0	48
Average	0.058	7119	2.0	-	0.49	0.069	14.2	53	30.6	15193	0.025	**962**	0.43	20	59	4.9	0.42	0.12	0.75	69	49
M CG	0.05	6500	1.3	-	0.16	0.070	11.0	53	30.0	24000	< 0.05	1100	1.1	18.0	400	2.3	< 0.7	0.03	0.50	27.0	46
5. Mafic Dike (MD), 19 samples																					
25th, %ile	0.020	7540	0.50	-	0.060	0.030	18.7	30	11.3	7305	0.025	**1300**	0.20	4.5	22	0.49	0.35	0.010	0.032	146.0	52
Median	0.040	27000	0.80	-	0.090	0.050	32.0	56	55.1	65000	0.025	**1650**	0.30	7.1	25	0.84	0.35	0.01	0.06	250.0	81
Average	0.036	22793	1.2	-	0.26	0.040	27.4	109	67.3	47647	0.025	**1507**	0.44	26	28	1.9	0.41	0.11	0.15	223	67
M MD	0.03	35000	1.4	-	0.18	0.040	36.0	120	69.0	84000	< 0.05	1800	0.9	38.0	200	0.7	< 0.7	< 0.02	0.10	280.0	90
6. QZ - Qtz-eye Porphyry + Minor QTP (QZ-QE-POR-QTP-MIN), 10 samples																					
25th, %ile	0.005	4425	0.25	-	0.040	0.010	1.3	3.2	2.9	10050	0.025	248	1.03	0.60	-	0.27	0.35	0.010	0.072	3.5	6
Median	0.010	5200	0.38	-	0.045	0.010	2.1	93	4.7	17500	0.025	270	1.4	2.5	-	0.39	0.35	0.01	0.11	7.0	8
Average	0.015	5520	0.45	-	0.053	0.010	2.7	67	4.6	15480	0.025	322	1.6	1.8	-	0.63	0.35	0.01	0.11	8	8
M QZ-QE-POR-QTP-MIN	0.02	8100	0.5	-	0.07	< 0.02	3.5	95	13.0	20000	< 0.05	310	5.4	4.1	120	0.3	< 0.7	< 0.02	0.11	12.0	12
8. Low-Grade Ore, 8 samples																					
25th, %ile	0.028	5360	0.50	-	0.058	0.010	2.1	74	8.1	1503	0.025	245	1.33	1.7	4.5	0.81	0.35	0.010	0.100	3.5	7
Median	0.050	6020	0.50	-	0.11	0.040	3.5	89	11.3	14500	0.025	455	2.1	2.4	5.0	1.4	0.35	0.01	0.14	5.5	14
Average	0.121	6533	1.1	-	0.24	0.15	3.1	83	26.6	11976	0.025	401	3.7	2.5	7.7	2.6	0.41	0.10	0.22	5	12
M LGO	0.02	15000	3.0	-	0.09	0.030	9.9	98	11.0	33000	< 0.05	900	15.0	11.0	190	1.9	< 0.7	< 0.02	0.13	70.0	42
MLGO-Met	0.23	6800	2.6	-	0.08	0.100	4.0	57	19.0	21000	< 0.05	430	2.1	5.0	-	5.3	< 0.7	< 0.02	0.52	10.0	21

Notes:
Respective samples from Phase I and II are combined.
ACUC - Average Concentration in the Upper Crust of the Earth based on Rudnick and Gao (2004); Values exceeding 10x the Average Concentration in the Upper Crust are double underlined and bold.
For the values less than Reportable Detection Limit (RDLs) values, 1/2 of RDLs are used to calculate statistical parameters.
Values in cells highlighted yellow exceed either median or average value for the material. Values in cells highlighted green are between the 25th percentile and average value for the material.

ATTACHMENT DIET-11

Results of Testing

Test Specimen

Sample	Weight (g)
M-LGO CNP DPL	1000

Analysis of Weekly Humidity Cell Leachate

Parameter	Units	CCME FAL	MDMER	0	1	2	3	4	5	6	7	8	9
Date			Effective	12-Aug-20	19-Aug-20	26-Aug-20	02-Sep-20	09-Sep-20	16-Sep-20	23-Sep-20	30-Sep-20	07-Oct-20	14-Oct-20
LIMS			01-Jun-2021	10105-AUG20	10144-AUG20	10222-AUG20	10007-SEP20	10091-SEP20	10154-SEP20	10232-SEP20	10315-SEP20	10021-OCT20	10132-OCT20
Hum Cell Leachate Vo	mL	-	-	975	969	818	984	995	1018	1007	476	512	550
pH	no unit	6.0-9.5	-	**5.49**	**4.64**	**5.30**	**5.96**	**4.95**	**5.86**	**5.11**	**4.77**	**5.19**	**5.36**
Acidity	mg/L as $CaCO_3$	-	-	7	10	7	3	4	2	4	5	5	4
Alkalinity	mg/L as $CaCO_3$	-	-	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Conductivity	µS/cm	-	-	5	22	20	26	26	24	27	43	46	42
SO_4	mg/L	-	-	1.6	6.7	6.9	10	9.6	9.2	9.3	24	20	15
F	mg/L	0.12	-	< 0.06	< 0.06	< 0.06	---	< 0.06	---	---	---	< 0.06	---
NH_3+NH_4	as N mg/L			<0.1	<0.1	<0.1	---	<0.1	---	---	---	---	---
Un-Ionized NH_3	as N mg/L	0.020	0.50	0.000	0.000	0.000	---	0.000	---	---	---	---	---
Hg	mg/L	0.000026	-	< 0.00001	< 0.00001	0.00001	---	< 0.00001	---	---	---	< 0.00001	---
Ag	mg/L	0.00025	-	< 0.00005	< 0.00005	< 0.00005	---	< 0.00005	---	---	---	< 0.00005	---
Al	mg/L	0.005@pH<6.5	-	**0.007**	**0.039**	**0.006**	---	**0.022**	---	---	---	**0.058**	---
As	mg/L	0.005	0.10	< 0.0002	0.0002	< 0.0002	---	< 0.0002	---	---	---	< 0.0002	---
Ba	mg/L	-	-	0.00018	0.00021	0.00028	---	0.00056	---	---	---	0.00115	---
Be	mg/L	-	-	< 0.000007	< 0.000007	< 0.000007	---	< 0.000007	---	---	---	0.000019	---
B	mg/L	1.5	-	0.004	< 0.002	0.004	---	0.002	---	---	---	0.004	---
Bi	mg/L	-	-	< 0.000007	< 0.000007	< 0.000007	---	0.000020	---	---	---	< 0.000007	---
Ca	mg/L	-	-	0.20	0.80	1.45	---	2.41	---	---	---	4.60	---
Cd	mg/L	0.00009	-	0.000009	0.000007	0.000025	---	0.000055	---	---	---	**0.000203**	---
Co	mg/L	-	-	0.000038	0.000123	0.000306	---	0.000653	---	---	---	0.00177	---
Cr	mg/L	-	-	0.00014	< 0.00008	< 0.00008	---	< 0.00008	---	---	---	< 0.00008	---
Cu	mg/L	0.002	0.10	0.0003	0.0006	0.0004	---	0.0013	---	---	---	**0.0059**	---
Fe	mg/L	0.3	-	0.008	0.010	0.017	---	0.033	---	---	---	0.106	---
K	mg/L	-	-	0.056	0.082	0.077	---	0.083	---	---	---	0.138	---
Li	mg/L	-	-	0.0001	< 0.0001	0.0001	---	0.0001	---	---	---	0.0002	---
Mg	mg/L	-	-	0.027	0.093	0.174	---	0.274	---	---	---	0.457	---
Mn	mg/L	-	-	0.00421	0.0167	0.0345	---	0.0581	---	---	---	0.117	---
Mo	mg/L	0.073	-	0.00017	0.00020	0.00009	---	0.00005	---	---	---	0.00013	---
Na	mg/L	-	-	0.85	1.34	1.46	---	1.13	---	---	---	1.28	---
Ni	mg/L	0.03	0.25	0.0002	0.0003	0.0005	---	0.0008	---	---	---	0.0017	---
P	mg/L	-	-	< 0.003	< 0.003	< 0.003	---	< 0.003	---	---	---	< 0.003	---
Pb	mg/L	0.001	0.08	0.00001	< 0.00001	0.00003	---	0.00004	---	---	---	0.00003	---
Sb	mg/L	-	-	< 0.0009	< 0.0009	< 0.0009	---	< 0.0009	---	---	---	< 0.0009	---
Se	mg/L	0.001	-	< 0.00004	< 0.00004	0.00005	---	0.00004	---	---	---	0.00007	---
Si	mg/L	-	-	0.35	1.44	1.92	---	2.48	---	---	---	2.07	---
Sn	mg/L	-	-	0.00014	0.00013	0.00016	---	0.00014	---	---	---	0.00009	---
Sr	mg/L	-	-	0.00159	0.00135	0.00142	---	0.00298	---	---	---	0.00547	---
Th	mg/L	-	-	< 0.0001	< 0.0001	< 0.0001	---	< 0.0001	---	---	---	< 0.0001	---
Ti	mg/L	-	-	0.00009	< 0.00005	< 0.00005	---	< 0.00005	---	---	---	0.00006	---
Tl	mg/L	0.0008	-	< 0.000005	< 0.000005	< 0.000005	---	< 0.000005	---	---	---	< 0.000005	---
U	mg/L	0.015	-	0.000002	0.000006	0.000022	---	0.000007	---	---	---	0.000040	---
V	mg/L	-	-	0.00006	0.00003	< 0.00001	---	< 0.00001	---	---	---	< 0.00001	---
W	mg/L	-	-	0.00003	0.00007	0.00003	---	< 0.00002	---	---	---	0.00004	---
Y	mg/L	-	-	0.000017	0.000006	0.000014	---	0.000047	---	---	---	0.000500	---
Zn	mg/L	0.007	0.40	0.005	**0.012**	**0.013**	---	**0.016**	---	---	---	**0.049**	---

Test Specimen

Sample	Weight (g)
M-LGO CNP DPL	1000

Analysis of Weekly Humidity Cell Leachate

Parameter	Units	CCME FAL	MDMER	10	11	12	13	14	15	16	17	18	19
Date			Effective	21-Oct-20	28-Oct-20	04-Nov-20	11-Nov-20	18-Nov-20	25-Nov-20	02-Dec-20	09-Dec-20	16-Dec-20	23-Dec-20
LIMS			01-Jun-2021	10196-OCT20	10254-OCT20	10019-NOV20	10077-NOV20	10124-NOV20	10162-NOV20	10018-DEC20	10070-DEC20	10162-DEC20	10185-DEC20
Hum Cell Leachate Vo	mL	-	-	471	386	490	498	422	386	465	511	510	512
pH	no unit	6.0-9.5	-	**4.73**	**5.00**	**4.96**	**4.82**	**5.28**	**4.75**	**5.22**	**4.73**	**4.73**	**4.64**
Acidity	mg/L as $CaCO_3$	-	-	6	6	5	5	6	8	6	6	5	6
Alkalinity	mg/L as $CaCO_3$	-	-	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Conductivity	µS/cm	-	-	53	60	35	33	39	53	34	37	37	40
SO_4	mg/L	-	-	19	21	12	9.7	13	16	10	11	11	12
F	mg/L	0.12	-	---	---	< 0.06	---	---	---	< 0.06	---	---	---
NH_3+NH_4	as N mg/L			---	---	---	---	---	---	---	---	---	---
Un-Ionized NH_3	as N mg/L	0.020	0.50	---	---	---	---	---	---	---	---	---	---
Hg	mg/L	0.000026	-	---	---	< 0.00001	---	---	---	< 0.00001	---	---	---
Ag	mg/L	0.00025	-	---	---	< 0.00005	---	---	---	< 0.00005	---	---	---
Al	mg/L	0.005@pH<6.5	-	---	---	**0.064**	---	---	---	**0.059**	---	---	---
As	mg/L	0.005	0.10	---	---	0.0004	---	---	---	< 0.0002	---	---	---
Ba	mg/L	-	-	---	---	0.00122	---	---	---	0.00166	---	---	---
Be	mg/L	-	-	---	---	0.000027	---	---	---	0.000029	---	---	---
B	mg/L	1.5	-	---	---	0.003	---	---	---	0.002	---	---	---
Bi	mg/L	-	-	---	---	< 0.000007	---	---	---	< 0.000007	---	---	---
Ca	mg/L	-	-	---	---	3.06	---	---	---	2.99	---	---	---
Cd	mg/L	0.00009	-	---	---	**0.000180**	---	---	---	**0.000143**	---	---	---
Co	mg/L	-	-	---	---	0.00168	---	---	---	0.00172	---	---	---
Cr	mg/L	-	-	---	---	< 0.00008	---	---	---	< 0.00008	---	---	---
Cu	mg/L	0.002	0.10	---	---	**0.0094**	---	---	---	**0.0095**	---	---	---
Fe	mg/L	0.3	-	---	---	0.118	---	---	---	0.110	---	---	---
K	mg/L	-	-	---	---	0.139	---	---	---	0.143	---	---	---
Li	mg/L	-	-	---	---	< 0.0001	---	---	---	0.0002	---	---	---
Mg	mg/L	-	-	---	---	0.324	---	---	---	0.311	---	---	---
Mn	mg/L	-	-	---	---	0.0833	---	---	---	0.0775	---	---	---
Mo	mg/L	0.073	-	---	---	0.00069	---	---	---	< 0.00004	---	---	---
Na	mg/L	-	-	---	---	0.84	---	---	---	0.75	---	---	---
Ni	mg/L	0.03	0.25	---	---	0.0013	---	---	---	0.0011	---	---	---
P	mg/L	-	-	---	---	< 0.003	---	---	---	< 0.003	---	---	---
Pb	mg/L	0.001	0.08	---	---	0.00011	---	---	---	< 0.00001	---	---	---
Sb	mg/L	-	-	---	---	< 0.0009	---	---	---	< 0.0009	---	---	---
Se	mg/L	0.001	-	---	---	0.00010	---	---	---	0.00008	---	---	---
Si	mg/L	-	-	---	---	2.54	---	---	---	1.09	---	---	---
Sn	mg/L	-	-	---	---	0.00007	---	---	---	< 0.00006	---	---	---
Sr	mg/L	-	-	---	---	0.00492	---	---	---	0.00557	---	---	---
Th	mg/L	-	-	---	---	< 0.0001	---	---	---	< 0.0001	---	---	---
Ti	mg/L	-	-	---	---	< 0.00005	---	---	---	< 0.00005	---	---	---
Tl	mg/L	0.0008	-	---	---	< 0.000005	---	---	---	< 0.000005	---	---	---
U	mg/L	0.015	-	---	---	0.000069	---	---	---	0.000023	---	---	---
V	mg/L	-	-	---	---	0.00003	---	---	---	< 0.00001	---	---	---
W	mg/L	-	-	---	---	0.00012	---	---	---	< 0.00002	---	---	---
Y	mg/L	-	-	---	---	0.000537	---	---	---	0.000158	---	---	---
Zn	mg/L	0.007	0.40	---	---	**0.048**	---	---	---	**0.044**	---	---	---

Test Specimen

Sample	Weight (g)
M-LGO CNP DPL	1000

Analysis of Weekly Humidity Cell Leachate

Parameter	Units	CCME FAL	MDMER	20	21	22	23	24	25	26	27	28	29	30
Date			Effective	30-Dec-20	06-Jan-21	13-Jan-21	20-Jan-21	27-Jan-21	03-Feb-21	10-Feb-21	17-Feb-21	24-Feb-21	03-Mar-21	10-Mar-21
LIMS			01-Jun-2021	10240-DEC20	10025-JAN21	10066-JAN21	10142-JAN21	10207-JAN21	10018-FEB21	10044-FEB21	10166-FEB21	10262-FEB21	10020-MAR21	10120-MAR21
Hum Cell Leachate Vo	mL	-	-	517	498	515	472	507	513	502	502	490	519	535
pH	no unit	6.0-9.5	-	**4.51**	**4.56**	**4.67**	**4.58**	**4.55**	**4.82**	**4.59**	**4.74**	**4.55**	**4.77**	**4.42**
Acidity	mg/L as $CaCO_3$	-	-	7	7	6	5	8	5	6	6	7	7	9
Alkalinity	mg/L as $CaCO_3$	-	-	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Conductivity	µS/cm	-	-	47	44	43	36	44	38	41	38	41	41	49
SO_4	mg/L	-	-	12	12	13	13	13	11	12	13	12	12	12
F	mg/L	0.12	-	< 0.06	---	---	---	< 0.06	---	---	---	< 0.06	---	---
NH_3+NH_4	as N mg/L			---	---	---	---	---	---	---	---	---	---	---
Un-Ionized NH_3	as N mg/L	0.020	0.50	---	---	---	---	---	---	---	---	---	---	---
Hg	mg/L	0.000026	-	< 0.00001	---	---	---	< 0.00001	---	---	---	< 0.00001	---	---
Ag	mg/L	0.00025	-	< 0.00005	---	---	---	< 0.00005	---	---	---	< 0.00005	---	---
Al	mg/L	0.005@pH<6.5	-	**0.132**	---	---	---	**0.251**	---	---	---	**0.298**	---	---
As	mg/L	0.005	0.10	< 0.0002	---	---	---	< 0.0002	---	---	---	< 0.0002	---	---
Ba	mg/L	-	-	0.00222	---	---	---	0.00301	---	---	---	0.00302	---	---
Be	mg/L	-	-	0.000055	---	---	---	0.000081	---	---	---	0.000084	---	---
B	mg/L	1.5	-	0.003	---	---	---	0.005	---	---	---	< 0.002	---	---
Bi	mg/L	-	-	< 0.000007	---	---	---	< 0.000007	---	---	---	< 0.000007	---	---
Ca	mg/L	-	-	2.93	---	---	---	3.34	---	---	---	3.01	---	---
Cd	mg/L	0.00009	-	**0.000242**	---	---	---	**0.000407**	---	---	---	**0.000433**	---	---
Co	mg/L	-	-	0.00203	---	---	---	0.00235	---	---	---	0.00205	---	---
Cr	mg/L	-	-	< 0.00008	---	---	---	< 0.00008	---	---	---	0.00032	---	---
Cu	mg/L	0.002	0.10	**0.0253**	---	---	---	**0.0500**	---	---	---	**0.0655**	---	---
Fe	mg/L	0.3	-	0.295	---	---	---	**0.431**	---	---	---	**0.437**	---	---
K	mg/L	-	-	0.158	---	---	---	0.145	---	---	---	0.182	---	---
Li	mg/L	-	-	0.0002	---	---	---	0.0003	---	---	---	0.0003	---	---
Mg	mg/L	-	-	0.308	---	---	---	0.270	---	---	---	0.209	---	---
Mn	mg/L	-	-	0.0880	---	---	---	0.0965	---	---	---	0.0875	---	---
Mo	mg/L	0.073	-	0.00028	---	---	---	0.00016	---	---	---	0.00601	---	---
Na	mg/L	-	-	0.64	---	---	---	0.65	---	---	---	0.83	---	---
Ni	mg/L	0.03	0.25	0.0010	---	---	---	0.0011	---	---	---	0.0007	---	---
P	mg/L	-	-	< 0.003	---	---	---	< 0.003	---	---	---	< 0.003	---	---
Pb	mg/L	0.001	0.08	0.00013	---	---	---	0.00050	---	---	---	0.00040	---	---
Sb	mg/L	-	-	< 0.0009	---	---	---	< 0.0009	---	---	---	< 0.0009	---	---
Se	mg/L	0.001	-	0.00009	---	---	---	0.00017	---	---	---	0.00016	---	---
Si	mg/L	-	-	4.66	---	---	---	5.06	---	---	---	4.12	---	---
Sn	mg/L	-	-	< 0.00006	---	---	---	0.00007	---	---	---	< 0.00006	---	---
Sr	mg/L	-	-	0.00718	---	---	---	0.00704	---	---	---	0.00917	---	---
Th	mg/L	-	-	< 0.0001	---	---	---	< 0.0001	---	---	---	< 0.0001	---	---
Ti	mg/L	-	-	< 0.00005	---	---	---	< 0.00005	---	---	---	< 0.00005	---	---
Tl	mg/L	0.0008	-	< 0.000005	---	---	---	< 0.000005	---	---	---	< 0.000005	---	---
U	mg/L	0.015	-	0.000130	---	---	---	0.000150	---	---	---	0.000169	---	---
V	mg/L	-	-	< 0.00001	---	---	---	< 0.00001	---	---	---	0.00010	---	---
W	mg/L	-	-	< 0.00002	---	---	---	0.00002	---	---	---	< 0.00002	---	---
Y	mg/L	-	-	0.00122	---	---	---	0.00238	---	---	---	0.00288	---	---
Zn	mg/L	0.007	0.40	**0.055**	---	---	---	**0.079**	---	---	---	**0.082**	---	---

Test Specimen

Sample	Weight (g)
M-LGO CNP DPL	1000

Analysis of Weekly Humidity Cell Leachate

Parameter	Units	CCME FAL	MDMER	31	32	33	34	35	36	37	38	39	40
Date			Effective	17-Mar-21	24-Mar-21	31-Mar-21	07-Apr-21	14-Apr-21	21-Apr-21	28-Apr-21	05-May-21	12-May-21	19-May-21
LIMS			01-Jun-2021	10150-MAR21	10256-MAR21	10314-MAR21	10031-APR21	10114-APR21	10171-APR21	10199-APR21	10023-MAY21	10057-MAY21	10155-MAY21
Hum Cell Leachate Vo	mL	-	-	533	512	488	534	520	504	499	538	509	526
pH	no unit	6.0-9.5	-	**4.68**	**4.60**	**4.58**	**4.48**	**4.52**	**4.56**	**4.64**	**4.35**	**4.51**	**4.53**
Acidity	mg/L as $CaCO_3$	-	-	8	9	7	6	9	8	7	8	8	7
Alkalinity	mg/L as $CaCO_3$	-	-	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Conductivity	µS/cm	-	-	37	40	42	42	39	36	35	38	40	40
SO_4	mg/L	-	-	11	12	12	11	11	11	14	14	17	13
F	mg/L	0.12	-	---	< 0.06	---	---	---	< 0.06	---	---	---	< 0.06
NH_3+NH_4	as N mg/L			---	---	---	---	---	---	---	---	---	---
Un-Ionized NH_3	as N mg/L	0.020	0.50	---	---	---	---	---	---	---	---	---	---
Hg	mg/L	0.000026	-	---	< 0.00001	---	---	---	< 0.00001	---	---	---	0.00001
Ag	mg/L	0.00025	-	---	< 0.00005	---	---	---	< 0.00005	---	---	---	< 0.00005
Al	mg/L	0.005@pH<6.5	-	---	**0.431**	---	---	---	**0.370**	---	---	---	**0.393**
As	mg/L	0.005	0.10	---	< 0.0002	---	---	---	0.0002	---	---	---	< 0.0002
Ba	mg/L	-	-	---	0.0041	---	---	---	0.00329	---	---	---	0.00325
Be	mg/L	-	-	---	0.00011	---	---	---	0.000076	---	---	---	0.000078
B	mg/L	1.5	-	---	0.003	---	---	---	< 0.002	---	---	---	< 0.002
Bi	mg/L	-	-	---	< 0.000007	---	---	---	< 0.000007	---	---	---	< 0.00001
Ca	mg/L	-	-	---	3.33	---	---	---	2.45	---	---	---	2.00
Cd	mg/L	0.00009	-	---	**0.00060**	---	---	---	**0.000434**	---	---	---	**0.00037**
Co	mg/L	-	-	---	0.0023	---	---	---	0.001809	---	---	---	0.00171
Cr	mg/L	-	-	---	< 0.00008	---	---	---	< 0.00008	---	---	---	< 0.00008
Cu	mg/L	0.002	0.10	---	**0.101**	---	---	---	**0.0930**	---	---	---	**0.102**
Fe	mg/L	0.3	-	---	**0.554**	---	---	---	**0.427**	---	---	---	**0.351**
K	mg/L	-	-	---	0.129	---	---	---	0.131	---	---	---	0.083
Li	mg/L	-	-	---	0.0003	---	---	---	0.0005	---	---	---	0.0002
Mg	mg/L	-	-	---	0.222	---	---	---	0.146	---	---	---	0.123
Mn	mg/L	-	-	---	0.0979	---	---	---	0.0694	---	---	---	0.0626
Mo	mg/L	0.073	-	---	< 0.00004	---	---	---	< 0.00004	---	---	---	0.00013
Na	mg/L	-	-	---	0.59	---	---	---	0.75	---	---	---	0.34
Ni	mg/L	0.03	0.25	---	0.0009	---	---	---	0.0010	---	---	---	0.0004
P	mg/L	-	-	---	< 0.003	---	---	---	< 0.003	---	---	---	< 0.003
Pb	mg/L	0.001	0.08	---	0.00058	---	---	---	0.00045	---	---	---	0.00054
Sb	mg/L	-	-	---	< 0.0009	---	---	---	< 0.0009	---	---	---	< 0.0009
Se	mg/L	0.001	-	---	0.00013	---	---	---	0.00008	---	---	---	0.00011
Si	mg/L	-	-	---	5.97	---	---	---	4.40	---	---	---	3.64
Sn	mg/L	-	-	---	0.00007	---	---	---	< 0.00006	---	---	---	< 0.00006
Sr	mg/L	-	-	---	0.0070	---	---	---	0.00561	---	---	---	0.00454
Th	mg/L	-	-	---	< 0.0001	---	---	---	< 0.0001	---	---	---	< 0.0001
Ti	mg/L	-	-	---	< 0.00005	---	---	---	< 0.00005	---	---	---	< 0.00005
Tl	mg/L	0.0008	-	---	< 0.000005	---	---	---	< 0.000005	---	---	---	< 0.000005
U	mg/L	0.015	-	---	0.00023	---	---	---	0.000162	---	---	---	0.000166
V	mg/L	-	-	---	< 0.00001	---	---	---	< 0.00001	---	---	---	< 0.00001
W	mg/L	-	-	---	< 0.00002	---	---	---	0.00002	---	---	---	< 0.00002
Y	mg/L	-	-	---	0.0041	---	---	---	0.00342	---	---	---	0.00373
Zn	mg/L	0.007	0.40	---	**0.096**	---	---	---	**0.066**	---	---	---	**0.061**

Test Specimen

Sample	Weight (g)
M-LGO CNP DPL	1000

Analysis of Weekly Humidity Cell Leachate

Parameter	Units	CCME FAL	MDMER	41
Date			Effective	26-May-21
LIMS			01-Jun-2021	10230-MAY21
Hum Cell Leachate Vo	mL	-	-	501
pH	no unit	6.0-9.5	-	**4.58**
Acidity	mg/L as $CaCO_3$	-	-	10
Alkalinity	mg/L as $CaCO_3$	-	-	< 2
Conductivity	µS/cm	-	-	38
SO_4	mg/L	-	-	15
F	mg/L	0.12	-	---
NH_3+NH_4	as N mg/L			---
Un-Ionized NH_3	as N mg/L	0.020	0.50	---
Hg	mg/L	0.000026	-	---
Ag	mg/L	0.00025	-	---
Al	mg/L	0.005@pH<6.5	-	---
As	mg/L	0.005	0.10	---
Ba	mg/L	-	-	---
Be	mg/L	-	-	---
B	mg/L	1.5	-	---
Bi	mg/L	-	-	---
Ca	mg/L	-	-	---
Cd	mg/L	0.00009	-	---
Co	mg/L	-	-	---
Cr	mg/L	-	-	---
Cu	mg/L	0.002	0.10	---
Fe	mg/L	0.3	-	---
K	mg/L	-	-	---
Li	mg/L	-	-	---
Mg	mg/L	-	-	---
Mn	mg/L	-	-	---
Mo	mg/L	0.073	-	---
Na	mg/L	-	-	---
Ni	mg/L	0.03	0.25	---
P	mg/L	-	-	---
Pb	mg/L	0.001	0.08	---
Sb	mg/L	-	-	---
Se	mg/L	0.001	-	---
Si	mg/L	-	-	---
Sn	mg/L	-	-	---
Sr	mg/L	-	-	---
Th	mg/L	-	-	---
Ti	mg/L	-	-	---
Tl	mg/L	0.0008	-	---
U	mg/L	0.015	-	---
V	mg/L	-	-	---
W	mg/L	-	-	---
Y	mg/L	-	-	---
Zn	mg/L	0.007	0.40	---

TEST REPORT

Humidity Cell Test (ASTM D 5744-96)

Test Specimen

Sample	Weight (g)
M-LGO CNP DPL	1000

Summary of ABA Test Data

Parameter	Units	Ref No.: 10139-JUL20
Sulphur (S)	%	0.536
Sulphide ($S^{=}$)	%	0.50
NP	t $CaCO_3$/1000 t	4.5
CO_3 NP	t $CaCO_3$/1000 t	1.5

Leachate Parameters Measured							*Acid Generation* [1]				*Acid Neutralization* [1]		
Weekly Leach	**Volume Collected**	**pH**	**Acidity**	**Alkalinity**	**Conductivity**	**SO_4**	**SO_4 Production Rate**	**Cumulative SO_4 Production**	**Weekly $S^{=}$ Depletion**	**Cumulative $S^{=}$ Depletion**	**NP Consumption**	**Cumulative NP Depletion**	**Cumulative CO_3 NP Depletion**
No.	mL	units	$CaCO_3$ eq. mg/L	$CaCO_3$ eq. mg/L	µS/cm	mg/L	g/t/wk	g/t	%	%	$CaCO_3$, g/t/wk	%	%
0	975	5.49	7	<2	5	1.6	1.6	1.6	0.01	0.01	1.63	0.04	0.11
1	969	4.64	10	<2	22	6.7	6.5	8.1	0.04	0.05	6.76	0.19	0.56
2	818	5.30	7	<2	20	6.9	5.6	13.7	0.04	0.09	5.88	0.32	0.95
3	984	5.96	3	<2	26	10	9.8	23.5	0.07	0.16	10.25	0.54	1.63
4	995	4.95	4	<2	26	9.6	9.6	33.1	0.06	0.22	9.95	0.77	2.30
5	1018	5.86	2	<2	24	9.2	9.4	42.5	0.06	0.28	9.76	0.98	2.95
6	1007	5.11	4	<2	27	9.3	9.4	51.8	0.06	0.35	9.76	1.20	3.60
7	476	4.77	5	<2	43	24	11.4	63.2	0.08	0.42	11.90	1.46	4.39
8	512	5.19	5	<2	46	20	10.2	73.5	0.07	0.49	10.67	1.70	5.10
9	550	5.36	4	<2	42	15	8.3	81.7	0.06	0.54	8.59	1.89	5.68
10	471	4.73	6	<2	53	19	8.9	90.7	0.06	0.60	9.32	2.10	6.30
11	386	5.00	6	<2	60	21	8.1	98.8	0.05	0.66	8.44	2.29	6.86
12	490	4.96	5	<2	35	12	5.9	104.7	0.04	0.70	6.13	2.42	7.27
13	498	4.82	5	<2	33	9.7	4.8	109.5	0.03	0.73	5.03	2.53	7.60
14	422	5.28	6	<2	39	13	5.5	115.0	0.04	0.77	5.71	2.66	7.99
15	386	4.75	8	<2	53	16	6.2	121.2	0.04	0.81	6.43	2.80	8.41
16	465	5.22	6	<2	34	10	4.7	125.8	0.03	0.84	4.84	2.91	8.74
17	511	4.73	6	<2	37	11	5.6	131.4	0.04	0.88	5.86	3.04	9.13
18	510	4.73	5	<2	37	11	5.6	137.0	0.04	0.91	5.84	3.17	9.52
19	512	4.64	6	<2	40	12	6.1	143.2	0.04	0.95	6.40	3.31	9.94
20	517	4.51	7	<2	47	12	6.2	149.4	0.04	1.00	6.46	3.46	10.37

** Initial Week 0 leachate may included soluble sulphate, and may not indicate oxidation of sulphide in the sample material has occurred.*

[1] Calculated values

Summary - Weeks 0 to 20

	pH	Acidity	Alkalinity	Conductivity	SO_4	SO_4 Production Rate	Cumulative SO_4 Production	Weekly $S^{=}$ Depletion	Cumulative $S^{=}$ Depletion	NP Consumption	Cumulative NP Depletion	Cumulative CO_3 NP Depletion
Maximum Value	5.96	10	2	60	24	11.4	-	0.08	-	11.90	-	-
Minimum Value	4.51	2	<2	5	1.6	1.6	-	0.01	-	1.63	-	-
Average Value	4.92	6	2	36	12	7.1	-	0.05	-	7.41	-	-

This report refers to the samples as-received. SGS Minerals Services is not responsible for any use of this data beyond the result of this test method.

TEST REPORT

Humidity Cell Test (ASTM D 5744-96)

Test Specimen

Sample	Weight (g)
M-LGO CNP DPL	1000

Changes to Head Sample after 20 Weeks [1]

Parameter	Units	Ref No.: 10139-JUL20
Sulphide ($S^=$) Remaining	%	0.50
NP Remaining	t $CaCO_3$/1000 t	4.3
CO_3 NP Remaining	t $CaCO_3$/1000 t	1.3

Leachate Parameters Measured							*Acid Generation [1]*				*Acid Neutralization [1]*		
Weekly Leach No.	**Volume Collected** mL	**pH** units	**Acidity** $CaCO_3$ eq. mg/L	**Alkalinity** $CaCO_3$ eq. mg/L	**Conductivity** µS/cm	**SO_4** mg/L	**SO_4 Production Rate** g/t/wk	**Cumulative SO_4 Production** g/t	**Weekly $S^=$ Depletion** %	**Cumulative $S^=$ Depletion** %	**NP Consumption** $CaCO_3$, g/t/wk	**Cumulative NP Depletion** %	**Cumulative CO_3 NP Depletion** %
21	498	4.56	7	<2	44	12	6.0	155.4	0.04	1.04	6.23	3.60	10.79
22	515	4.67	6	<2	43	13	6.7	162.1	0.04	1.08	6.97	3.75	11.25
23	472	4.58	5	<2	36	13	6.1	168.2	0.04	1.12	6.39	3.89	11.68
24	507	4.55	8	<2	44	13	6.6	174.8	0.04	1.17	6.87	4.05	12.14
25	513	4.82	5	<2	38	11	5.6	180.4	0.04	1.20	5.88	4.18	12.53
26	502	4.59	6	<2	41	12	6.0	186.5	0.04	1.24	6.28	4.32	12.95
27	502	4.74	6	<2	38	13	6.5	193.0	0.04	1.29	6.80	4.47	13.40
28	490	4.55	7	<2	41	12	5.9	198.9	0.04	1.33	6.13	4.60	13.81
29	519	4.77	7	<2	41	12	6.2	205.1	0.04	1.37	6.49	4.75	14.24
30	535	4.42	9	<2	49	12	6.4	211.5	0.04	1.41	6.69	4.90	14.69
31	533	4.68	8	<2	37	11	5.9	217.4	0.04	1.45	6.11	5.03	15.10
32	512	4.60	9	<2	40	12	6.1	223.5	0.04	1.49	6.40	5.17	15.52
33	488	4.58	7	<2	42	12	5.9	229.4	0.04	1.53	6.10	5.31	15.93
34	534	4.48	6	<2	42	11	5.9	235.2	0.04	1.57	6.12	5.45	16.34
35	520	4.52	9	<2	39	11	5.7	241.0	0.04	1.61	5.96	5.58	16.73
36	504	4.56	8	<2	36	11	5.5	246.5	0.04	1.64	5.78	5.71	17.12
37	499	4.64	7	<2	35	14	7.0	253.5	0.05	1.69	7.28	5.87	17.60
38	538	4.35	8	<2	38	14	7.5	261.0	0.05	1.74	7.85	6.04	18.13
39	509	4.51	8	<2	40	17	8.7	269.7	0.06	1.80	9.01	6.24	18.73
40	526	4.53	7	<2	40	13	6.8	276.5	0.05	1.84	7.12	6.40	19.20

[1] *Calculated values*

Summary - Weeks 0 to 40

	pH	Acidity	Alkalinity	Conductivity	SO_4	SO_4 Production Rate	Cumulative SO_4 Production	Weekly $S^=$ Depletion	Cumulative $S^=$ Depletion	NP Consumption	Cumulative NP Depletion	Cumulative CO_3 NP Depletion
Maximum Value	5.96	10	2	60	24	11.4	-	0.06	-	12	-	-
Minimum Value	4.35	2	<2	5	1.6	1.6	-	0.01	-	1.6	-	-
Average Value	4.71	6	2	38	12	6.7	-	0.04	-	7.03	-	-

TEST REPORT

Humidity Cell Test (ASTM D 5744-96)

Test Specimen

Sample	Weight (g)
M-LGO CNP DPL	1000

Changes to Head Sample after 40 Weeks [1]

Parameter	Units	Ref No.: 10139-JUL20
Sulphide ($S^=$) Remaining	%	0.49
NP Remaining	t $CaCO_3$/1000 t	4.2
CO_3 NP Remaining	t $CaCO_3$/1000 t	1.2

Leachate Parameters Measured							Acid Generation [1]				Acid Neutralization [1]		
Weekly Leach	**Volume Collected**	**pH**	**Acidity**	**Alkalinity**	**Conductivity**	**SO_4**	**SO_4 Production Rate**	**Cumulative SO_4 Production**	**Weekly $S^=$ Depletion**	**Cumulative $S^=$ Depletion**	**NP Consumption**	**Cumulative NP Depletion**	**Cumulative CO_3 NP Depletion**
No.	mL	units	$CaCO_3$ eq. mg/L	$CaCO_3$ eq. mg/L	µS/cm	mg/L	g/t/wk	g/t	%	%	$CaCO_3$, g/t/wk	%	%
41	501	4.58	10	<2	38	15	7.5	284.0	0.05	1.89	7.83	6.57	19.72

[1] *Calculated values*

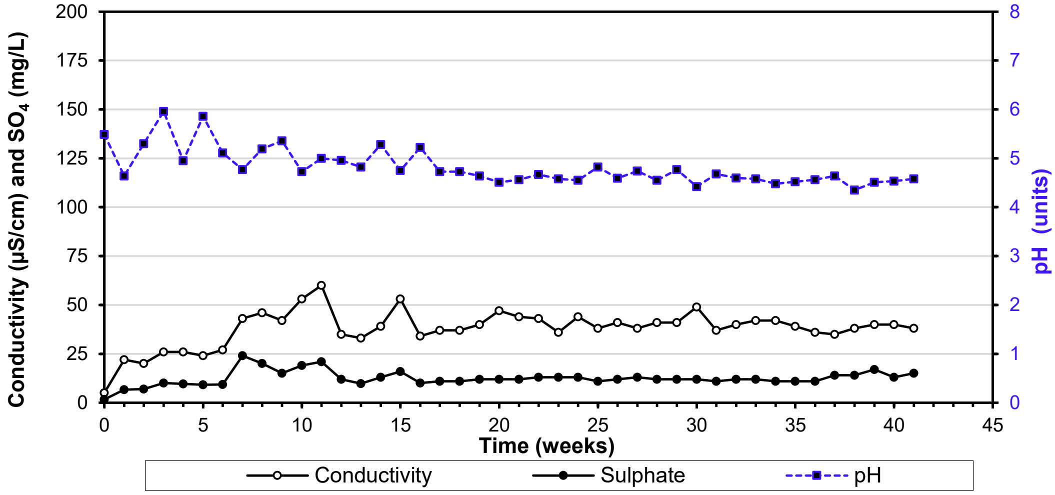
Summary - Weeks 0 to 60

	pH	Acidity	Alkalinity	Conductivity	SO_4	SO_4 Production Rate	Cumulative SO_4 Production	Weekly $S^=$ Depletion	Cumulative $S^=$ Depletion	NP Consumption	Cumulative NP Depletion	Cumulative CO_3 NP Depletion
Maximum Value	5.96	10	2	60	24	11.4	-	0.06	-	11.90	-	-
Minimum Value	4.35	2	<2	5	1.6	1.6	-	0.01	-	1.63	-	-
Average Value	4.57	6	2	38	12	6.8	-	0.05	-	7.04	-	-

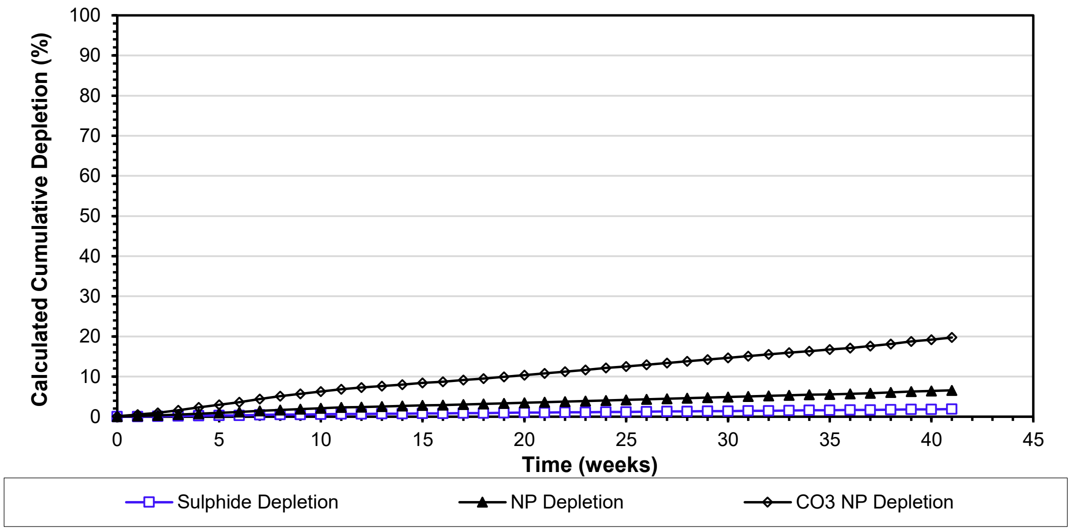
TEST REPORT

Humidity Cell Test (ASTM D 5744-96)

Conductivity, Sulphate, and pH in Weekly Humidity Cell Leachate - M-LGO CNP DPL



Cumulative Sulphide and NP Depletion M-LGO CNP DPL

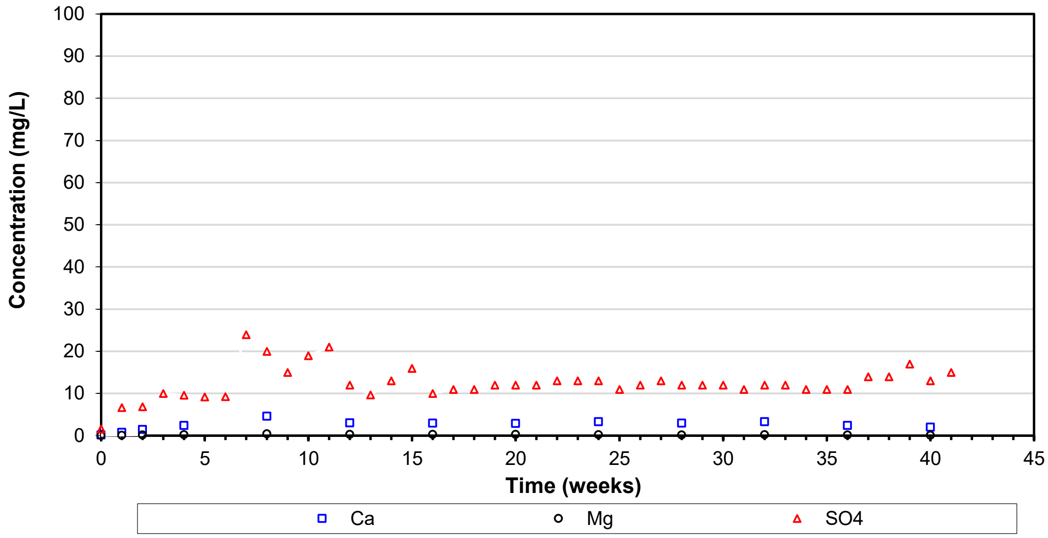


Note: NP depletion calculated based on sulphate assay.

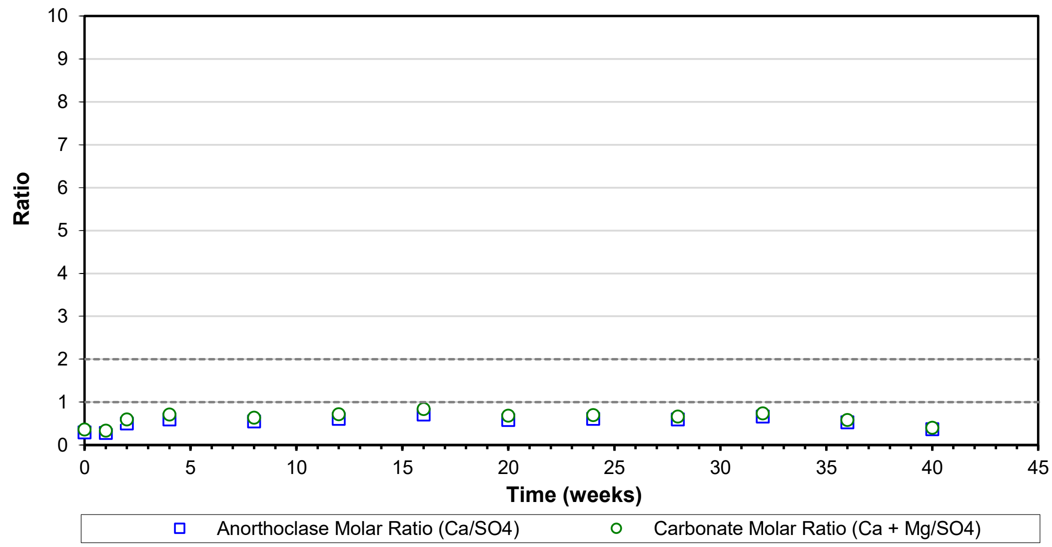
TEST REPORT

Humidity Cell Test (ASTM D 5744-96)

Selected Parameters in Weekly Humidity Cell Leachate M-LGO CNP DPL



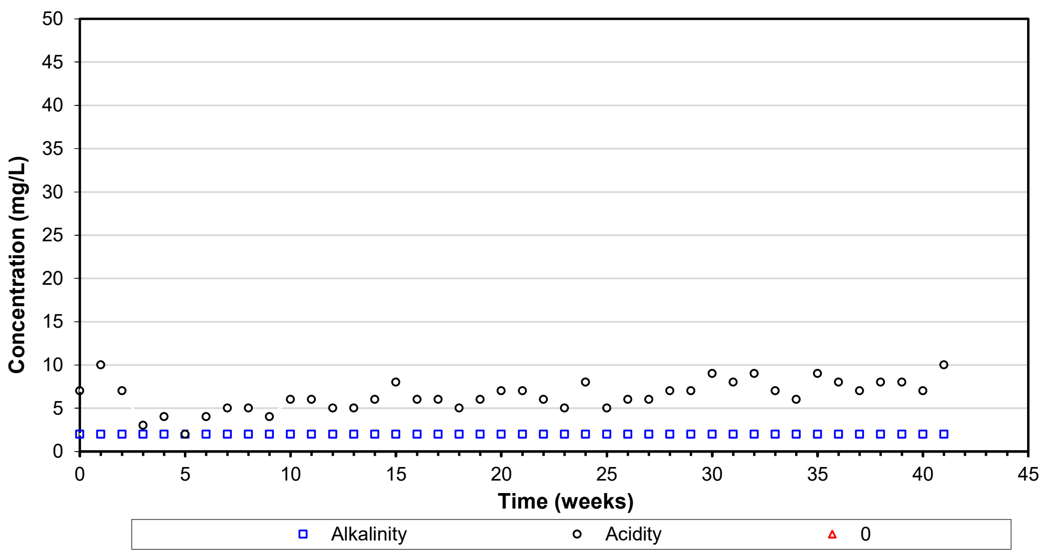
Carbonate (Ca + Mg/SO 4) and Anorthoclase (Ca/SO 4) Molar Ratios M-LGO CNP DPL



TEST REPORT

Humidity Cell Test (ASTM D 5744-96)

Selected Parameters in Weekly Humidity Cell Leachate M-LGO CNP DPL

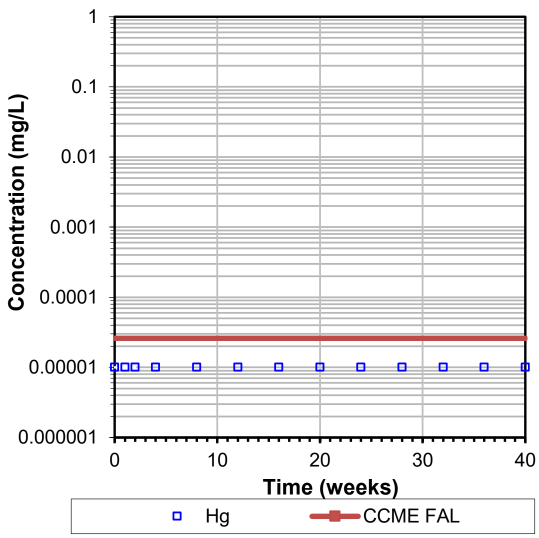


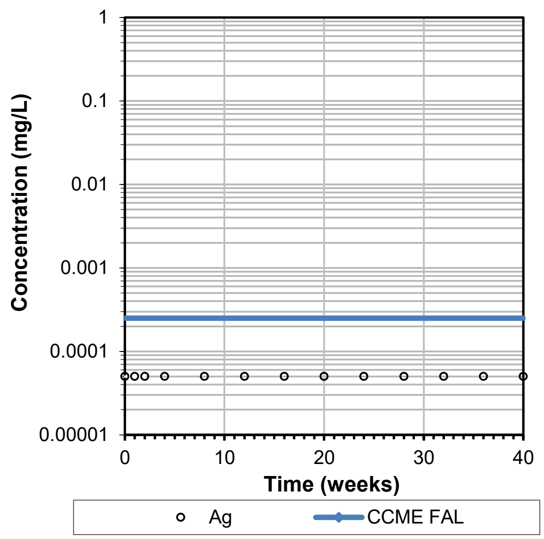
This report refers to the samples as-received. SGS Minerals Services is not responsible for any use of this data beyond the result of this test method.

TEST REPORT

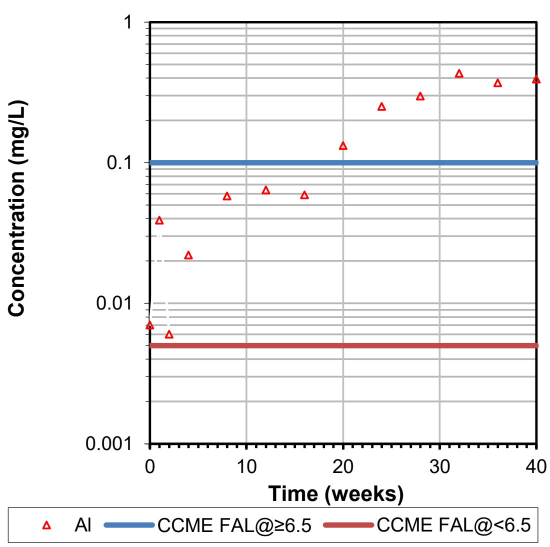
Humidity Cell Test (ASTM D 5744-96)

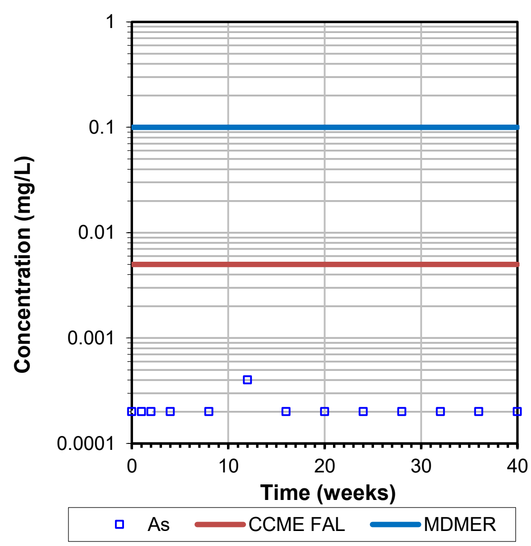
Selected Parameters in Weekly Humidity Cell Leachate M-LGO CNP DPL





Selected Parameters in Weekly Humidity Cell Leachate M-LGO CNP DPL

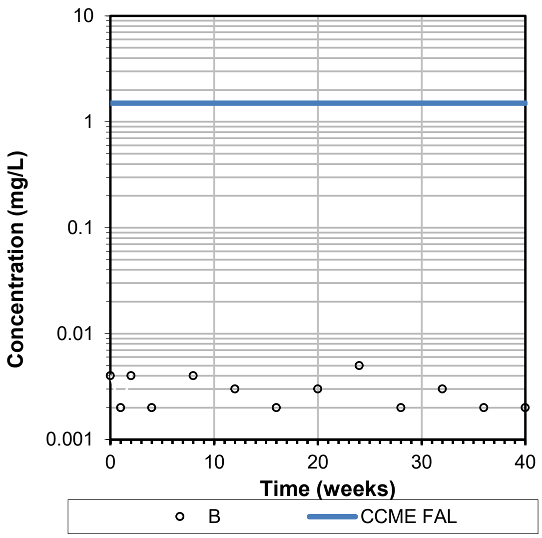


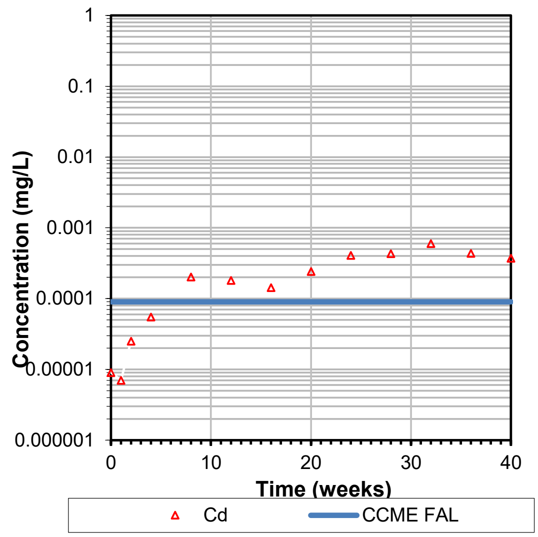


TEST REPORT

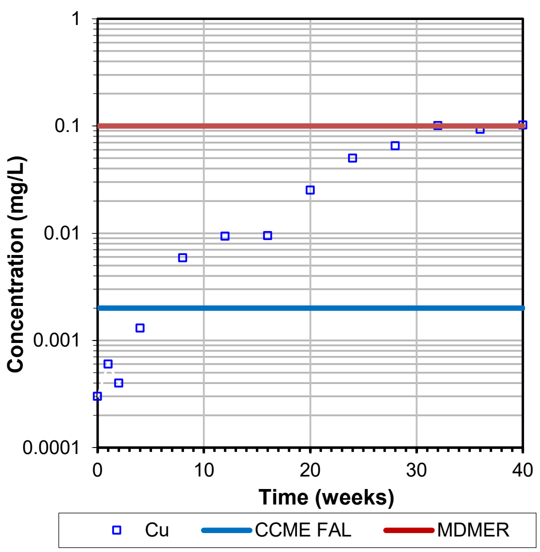
Humidity Cell Test (ASTM D 5744-96)

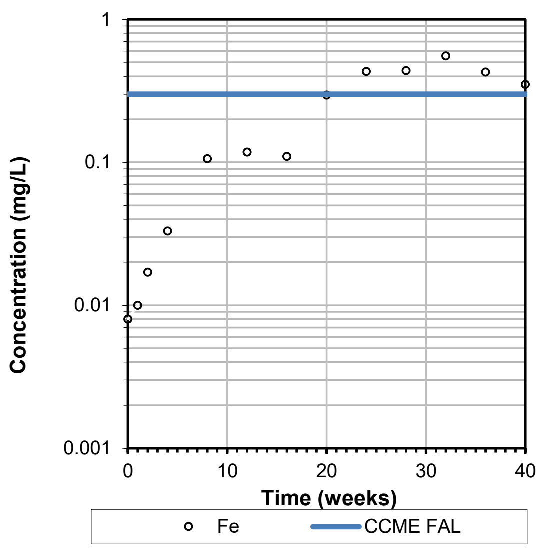
Selected Parameters in Weekly Humidity Cell Leachate M-LGO CNP DPL





Selected Parameters in Weekly Humidity Cell Leachate M-LGO CNP DPL

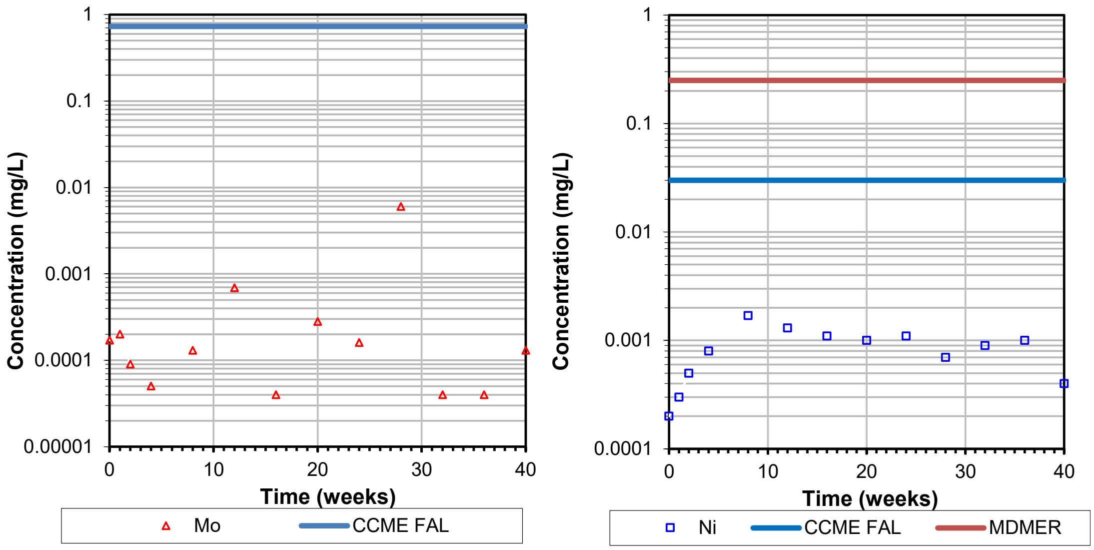




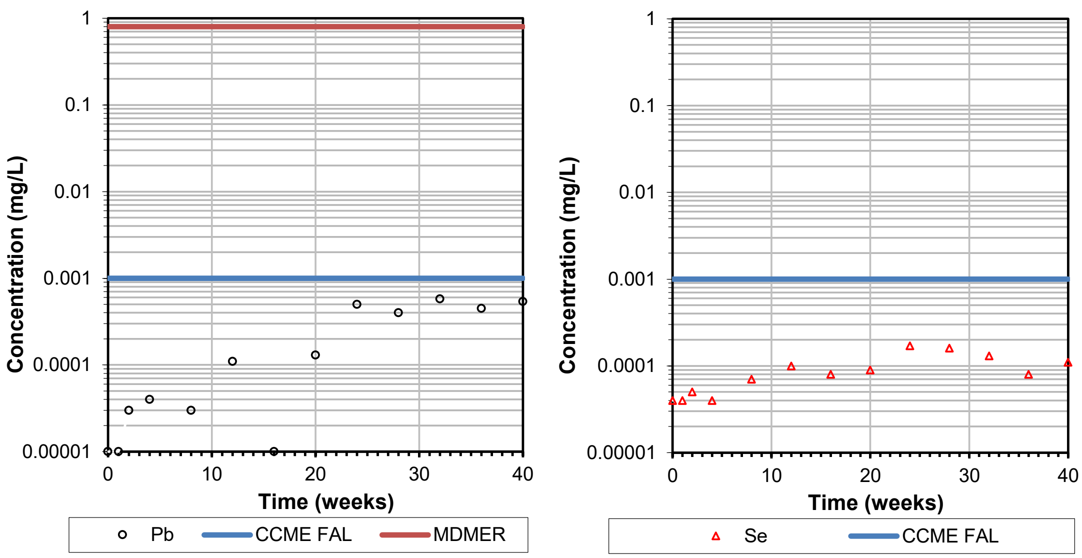
TEST REPORT

Humidity Cell Test (ASTM D 5744-96)

Selected Parameters in Weekly Humidity Cell Leachate M-LGO CNP DPL



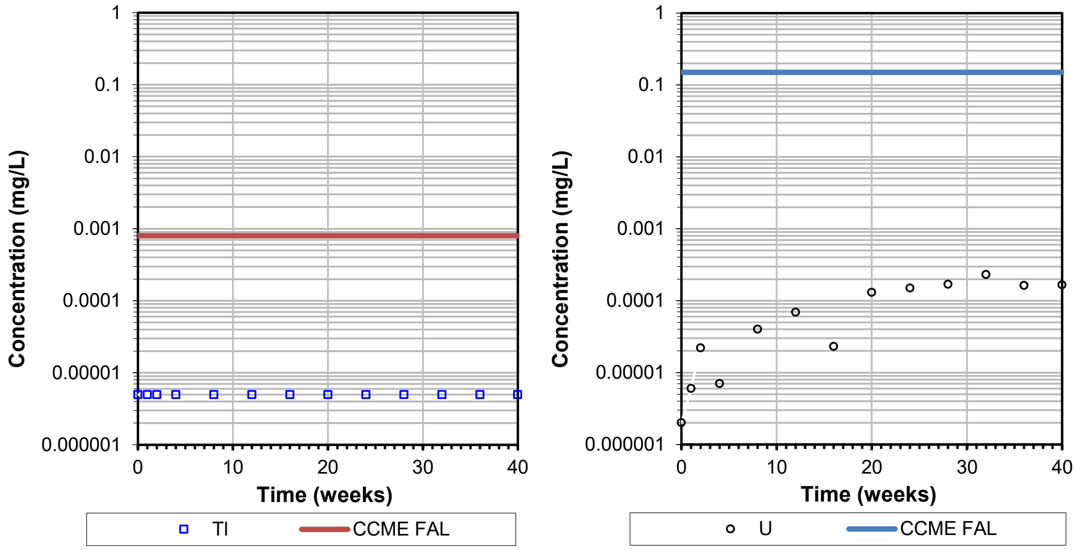
Selected Parameters in Weekly Humidity Cell Leachate M-LGO CNP DPL



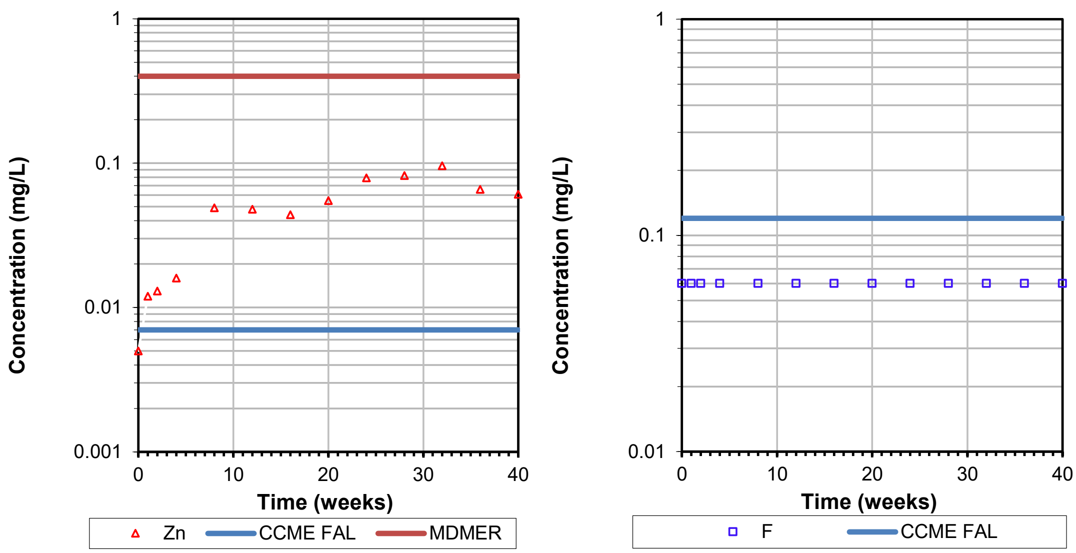
TEST REPORT

Humidity Cell Test (ASTM D 5744-96)

Selected Parameters in Weekly Humidity Cell Leachate M-LGO CNP DPL



Selected Parameters in Weekly Humidity Cell Leachate M-LGO CNP DPL



RESPONSE TO DIET-12

ID:	**DIET-12**
Expert Department or Group:	Mines Branch
Guideline Reference:	Section 4.2.1.5
EIS Reference:	-
Context and Rationale:	-
Information Request:	A source of construction aggregate (overburden, rock quarry or mine waste) will be required for the development of the site. The TMF will be constructed from mine waste rock. The EIS does not include a discussion on the criteria for determining what material is suitable or is planned for construction purposes. The EIS must evaluate the ARD/ML potential for all materials used for site construction.
Response:	It is currently planned that nearly all earthworks construction will use waste rock developed from the open pits. All bulk earthworks, including roads, building and stockpile pads, embankments for ditching and water management ponds and dams for the tailings management facility (TMF) will be constructed using waste rock. The waste rock has been characterized as described in Section 5.2 of Valentine Gold Project: Acid Rock Drainage/Metal Leaching (ARD/ML) Assessment Report (Baseline Study Appendix 5, Attachment 5B in the EIS). This report provides the basis for distinguishing between potentially acid generating (PAG) and non-potentially acid generating (non-PAG) rock using an Neutralization Potential to Acid Potential ratio of 2 as the classification criterion. Additional ARD/ML testing of waste rock will be completed prior to and during construction, to ensure that only non-PAG rock is used for construction, as discussed in response DIET-11. It is expected that a relatively small amount of quarried rock will be required to commence construction, prior to waste rock being available from the open pits, to develop temporary access roads and construction laydown areas. As part of the advancing engineering for the Project, Marathon will be investigating several potential quarry sites that exist within the footprints of future mine infrastructure (e.g., the Leprechaun waste rock pile area) in order to reduce environmental impacts overall. Any potential quarry sources will be sampled, and geochemical testing completed as part of this investigation and prior to use in earthworks. The Mine Plan also includes use of small amounts of overburden (glacial till) materials for embankment construction of water management infrastructure.

ID:	**DIET-12**
	The only construction material not sourced to date is sand for concrete. The current plan is to obtain sand from local suppliers who have existing, permitted sand quarries. If necessary, non-PAG waste rock will be crushed and screened to provide the sand required. These materials will also be tested to ensure only non-PAG materials are used.
Appendix:	None

RESPONSE TO DTCAI-01

ID:	**DTCAI-01**
Expert Department or Group:	Department of Tourism, Culture, Arts, Innovation
Guideline Reference:	-
EIS Reference:	Chapter 16
Context and Rationale:	The Valentine Lake Gold project may disrupt the big game carry capacity of the area in particular with regards to woodland caribou. This will devalue the visitor appeal and experience of our destination. It is imperative that Marathon Gold Corporation, Newfoundland and Labrador Outfitters Association (NLOA) and impacted outfitters work together in efforts to sustain the sector. The EIS as presented does not include an Outfitter Environmental Effects Monitoring Plan.
Information Request:	The Department of Tourism, Culture, Arts and Recreation recommends that Marathon Gold Corporation amend the EIS submission to include an Outfitter Environmental Effects Monitoring Plan (OEEMP). The OEEMP should: • Identify a program for monitoring the effectiveness of measures implemented to mitigate adverse environmental and negative economic effects to outfitters; • Build on existing information, consultations and commitments made in the EIS, and conditions of the relevant permits and licenses for the project including mitigation objectives, metrics and targets, following and monitoring mitigation efforts; and • Include a contingency plan should mitigation efforts not be successful. Also included in the OEEMP, the proponent shall work with affected outfitters and the NLOA to develop compensation provisions and in areas of new access and implement an access decommissioning plan to mitigate decreased big game success rates in the region.
Response:	As described in Chapter 2, Section 2.7.3 of the EIS, a series of Environmental Management Plans will be developed under the overarching Environmental Management System and will encompass the environmental regulatory requirements and commitments made for the Project. This includes the formal conditions of the Environmental Assessment processes, as well as subsequent requirements of federal and provincial permitting processes required for the Project. These will also encompass commitments made in the EIS, which includes applicable compliance standards and/or industry best management practices. The development of

ID:	**DTCAI-01**
	the Environmental Management Plans will therefore be completed following the Ministers' Decision and in consultation with applicable regulators. Marathon has engaged and will continue to actively engage with the Newfoundland and Labrador Outfitters Association (NLOA) to monitor and mitigate potential adverse environmental effects upon wildlife and associated effects upon outfitting activities via an Outfitter Environmental Effects Monitoring Plan. Marathon is currently working with an outfitter directly affected by Project activities to develop and implement agreed-upon mitigations. In areas of new access created within the Project Area or related to the Project, Marathon will consult with the appropriate regulators and the NLOA to address the decommissioning of these access points through the Rehabilitation and Closure Plan that is a requirement under the Newfoundland and Labrador *Mining Act*.
Appendix:	None

RESPONSE TO ECC-01

ID:	**ECC-01**
Expert Department or Group:	Department of Environment and Climate Change- Pollution Prevention Division
Guideline Reference:	Provide an emissions inventory for NO_x, PM2.5, PM10, and TPM for construction and operation.
EIS Reference:	-
Context and Rationale:	-
Information Request:	Table 5.13 notes an operating schedule of approximately 291,000 truck trips per Year (along the combined haul routes). Table 5.14 specifies 716,667 truck trips per year. This number needs to be verified and the emissions inventory recalculated if in error. Section 2.7.5.2 estimates 30 million litres of diesel fuel to be consumed annually during operation. This number appears high based on our experience with other mining operations in the province and may be related to the truck haul trip estimate.
Response:	With respect to the haul truck trips identified in Table 5.13 of the EIS (291,000 truck trips per year), the 716,667 trips identified in Table 5.14 of the EIS is the correct value. The air contaminant release estimates in the emissions inventory are based on the correct value of 716,667 truck trips per year. The 30 million litres identified in Section 2.7.5.2 of the EIS represent an estimate of the anticipated diesel fuel consumption in the peak year of operation. Fuel consumption during the other years of operation is expected to be less than 30 million litres.
Appendix:	None

RESPONSE TO ECC-02

ID:	**ECC-02**
Expert Department or Group:	Department of Environment and Climate Change - Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	Appendix 2-B
Context and Rationale:	Appendix 2-B, Section 5.2, pg. 8 “In accordance with the dam classification methodology presented in the CDA Dam Safety Guidelines, the proposed TMF dams have been provisionally classified as a “Very High” consequence of failure during the operations”.
Information Request:	As the dam consequence classification is only “provisional”, this will need to be confirmed. The tailings dam design will be dependent on a final dam consequence classification.
Response:	The statement quoted is from the Golder Pre-feasibility design report which was prepared prior to completion of the Dam Breach Assessment (DBA) in August 2020. The DBA confirmed the Canadian Dam Association (CDA) Consequence Classification of "Very High" based on the downstream impacts of the theoretical dam breach. The CDA Consequence Classification will continue to be reviewed as the design is advanced, however, it is expected to remain at “Very High”.
Appendix:	None

RESPONSE TO ECC-03

ID:	**ECC-03**
Expert Department or Group:	Department of Environment and Climate Change - Water Resources Management Division
Guideline Reference:	Section 4.2.1.3- Water Resources
EIS Reference:	Section 19
Context and Rationale:	-
Information Request:	This section talks about meetings and consultation with NL Hydro, but I don't see a plan, or information on what plan this would be contained in. Contact people/positions in Nalcor and Marathon should be identified, timelines for notification prior to specific events should be documented, etc.
Response:	Marathon continues to engage with NL Hydro with respect to the Victoria Lake Reservoir and Dam. Marathon's interests in the area, including the existing exploration camp and use of the Victoria River Bridge, are captured in NL Hydro's notification plans for operations and emergencies associated with the management of the Victoria Lake Reservoir and Dam. As Marathon develops the operational management plans and emergency response plans that are required prior to construction and/or operations, NL Hydro will be consulted, included in the review of any plans that may affect any aspect of NL Hydro's assets, and included in all notification procedures. As an example, Marathon has consulted with NL Hydro in terms of the access road and continuity of access to the Victoria Dam relative to Marathon's need to provide security to the Project.
Appendix:	None

RESPONSE TO ECC-04

ID:	**ECC-04**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.3- Water Resources
EIS Reference:	-
Context and Rationale:	-
Information Request:	Section 7 Possible locations for a 100 x 100 m climate monitoring station compound should be identified.
Response:	A potential location for a meteorological (met) station has been selected by Marathon in consideration of siting guidelines from Environment and Climate Change Canada and United States Environmental Protection Agency. Practical aspects have also been considered in the siting, including design of the site layout, terrain relief, the nearby surroundings, power availability, security, and capacity for data acquisition. The approximate proposed location, east of the processing plant, is shown on Figure ECC-04.1. Marathon will consult with Water Resources Management Division prior to final site selection. A number of technical and logistical factors were considered in identifying a potential site and will need to be considered in final site selection. Siting criteria from an equipment supplier / manufacturer were considered and will be followed, to the extent possible, during final site selection. A location up wind (most of the time, related to prevailing wind directions in the area) of the processing plant structures has been proposed to avoid influences on meteorological measurements from wake effects associated with air flow around the buildings, structures and/or ore storage piles. The winds predicted for the mine site were used to identify potential prevailing winds in the region and were extracted from the CALMET meteorological model, prepared in support of the CALPUFF dispersion modelling completed for the EIS. Additional details on the CALPUFF and CALMET modelling are provided in Appendix 5B - Dispersion Modelling Strategy of the EIS. A plot of the annual winds predicted for the mine site is provided in Figure ECC-04.2. Generally, the predicted winds prevail from the southwest, west and west-northwesterly directions. The highest and lowest wind speeds also occur most frequently from the west and southwesterly directions. Seasonal wind rose plots of the predicted winds at the site are provided in Figure ECC-04.3. For the predicted seasonal winds, the most dominant directions are from the northwest, west and southwest for all four seasons.

ID:	**ECC-04**
	Other logistical requirements that have been and will continue to be considered before finalizing a specific site include power connection, telemetry and data acquisition, site soil conditions, station access (for installation, maintenance and calibrations, data acquisition – if telemetry is not available), proximity to the operation and supporting structures and vegetation clearing requirements.
Appendix:	None

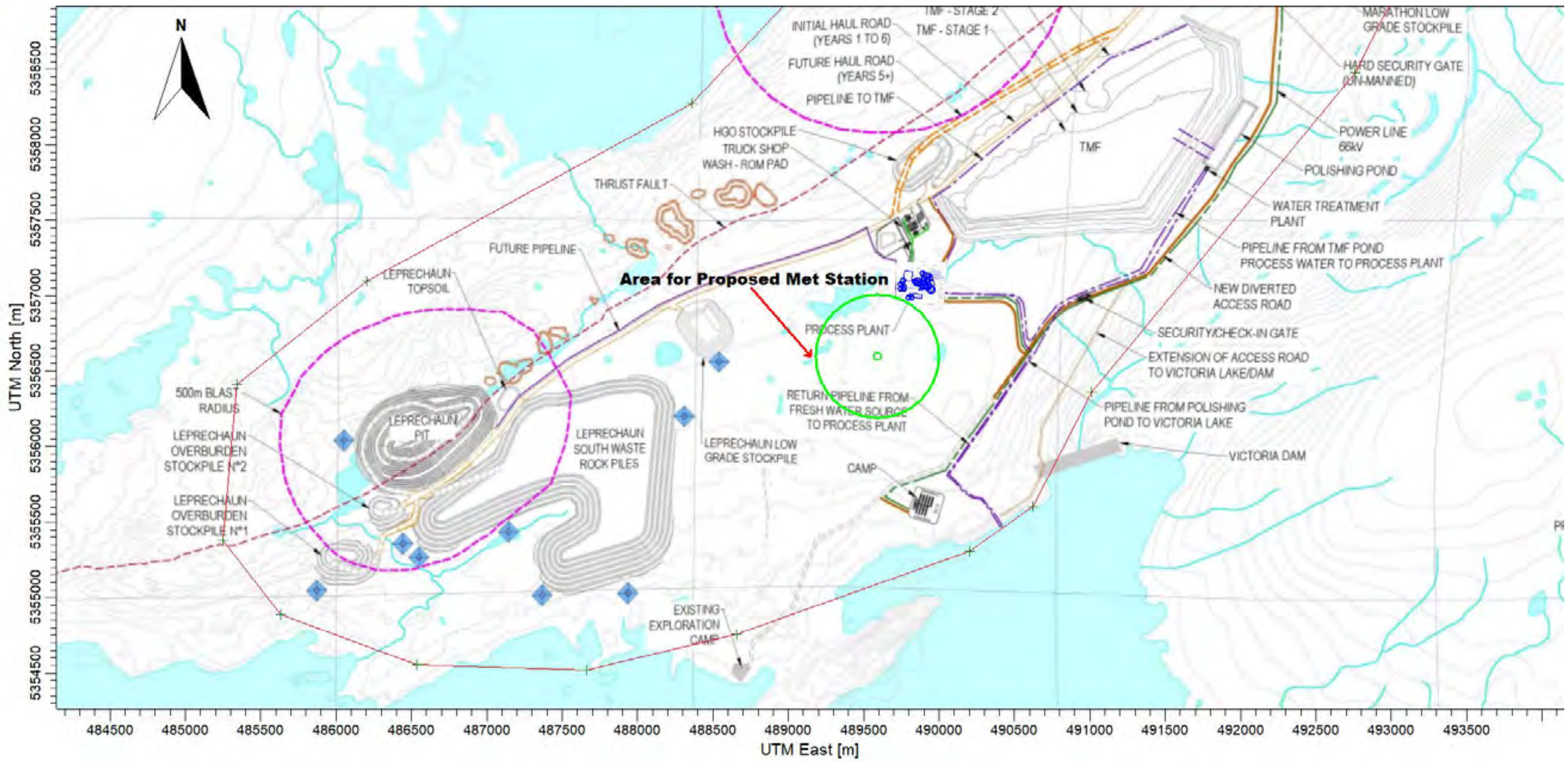


Figure ECC-04.7 Proposed Met Station Location

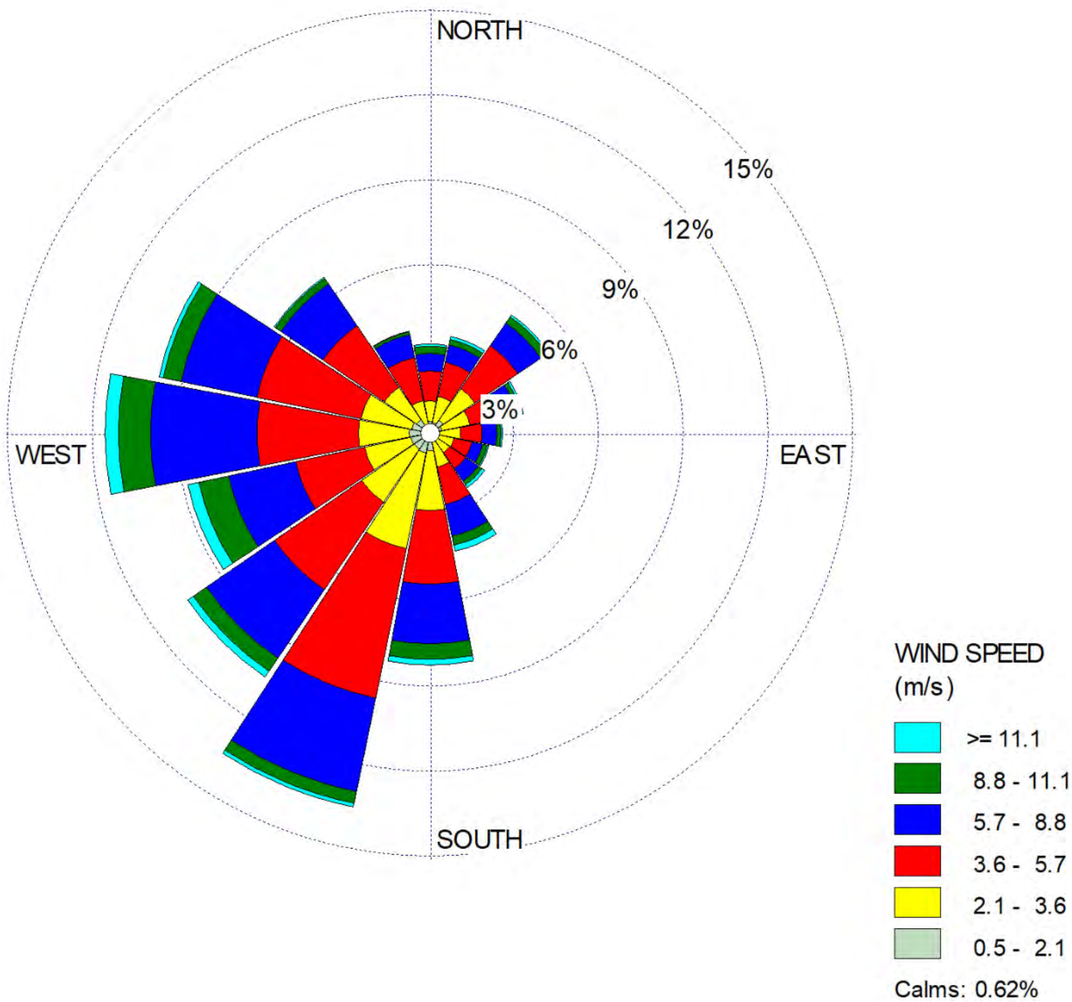


Figure ECC-04.8 CALMET Predicted Winds at the Valentine Gold Project Site (Level 1: 10m) – 2017-2019

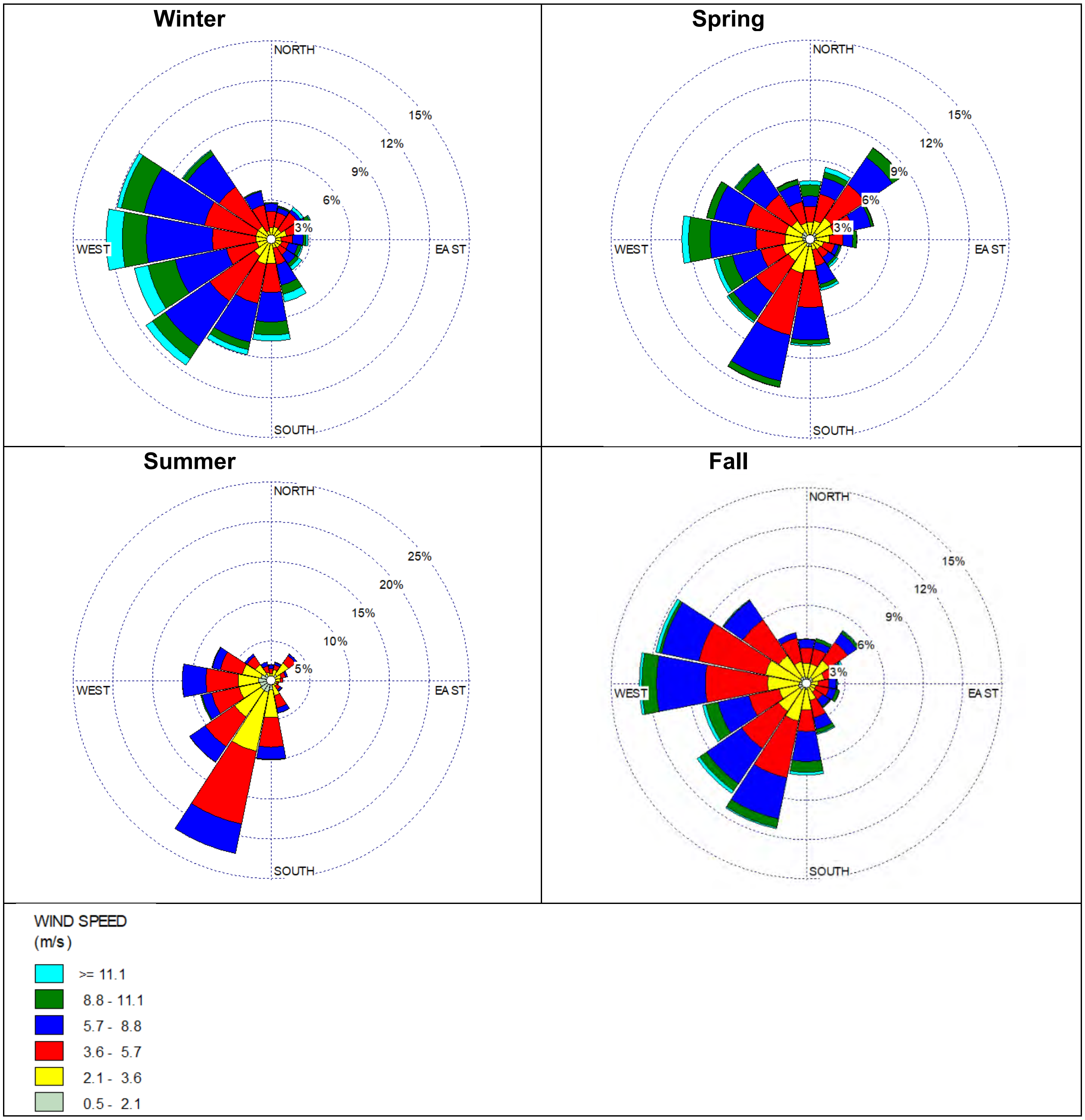


Figure ECC-04.9 CALMET Predicted Seasonal Winds at the Valentine Gold Project Site (Level 1: 10m) – 2017-2019

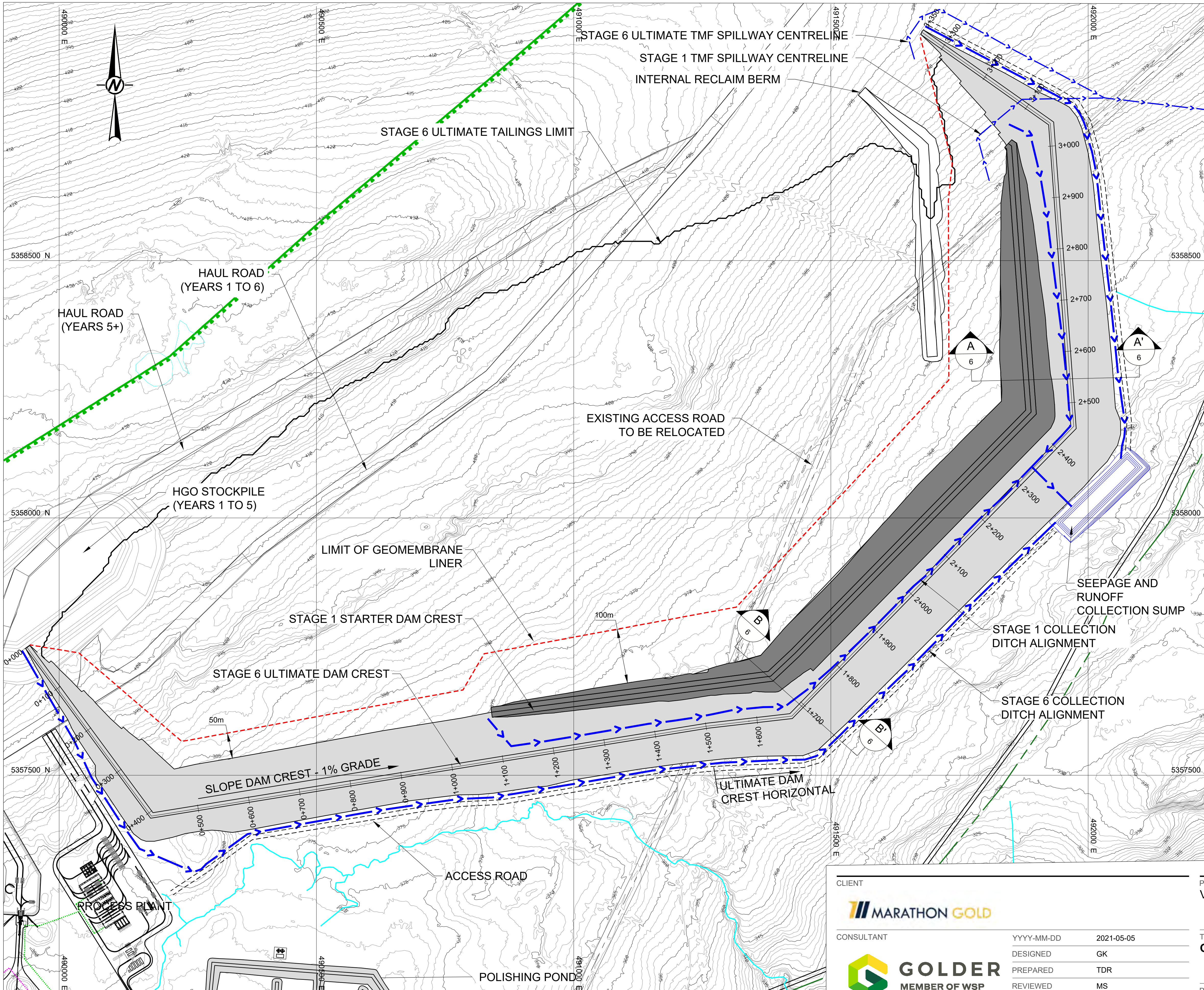
RESPONSE TO ECC-05

ID:	**ECC-05**
Expert Department or Group:	Department of Environment and Climate Change - Water Resources Management Division
Guideline Reference:	Section 4.2.1.3- Water Resources
EIS Reference:	Chapter 2
Context and Rationale:	Table 2.22, pg. 2.136, pg. 2.149"The potential effects of extreme weather including storms, precipitation, flooding/ice jams, and drought will be considered in Project planning, design and operation and maintenance strategies, including the selection of materials and equipment, and design of components, such as water management infrastructure and the TMF. These designs will consider projected climate change conditions over the life of the Project."
Information Request:	Design of stormwater management ponds and other water management features reference design AEPs (1:100, 1:25, 1:10, 1:200 etc.). Climate change AEPs should be used in the design and it is not clear if these will be used or not. This should be clarified.
Response:	The comment specifically makes reference to climate change adaptive design with respect to water crossings (i.e., culverts) and collection ponds and perimeter ditching around stockpiles. Section 7.2.11 of the EIS presents the EIS Water Resources climate change projections: "The Climate Atlas of Canada's online tool (Prairie Climate Center 2019) was used to generate projected climate change precipitation and temperature data for the Red Indian Lake Region, the Region identified in the online tool where the Project will occur. This online data portal provides downscaled data projections of temperature and precipitation from an ensemble of 24 different climate models. Projected climate changes in temperature and precipitation associated with the Intergovernmental Panel on Climate Change (IPCC) Representative Concentration Pathway 4.5 (RCP4.5) scenario over a 30-year time horizon were selected. The RCP4.5 scenario was chosen as it was used in the development of various climate change IDF curves for NL (CRA 2015). An IDF curve provides precipitation intensity and return period information for a specific location. The RCP4.5 scenario reflects an intermediate stabilization scenario for the emission of greenhouse gases, in which radiative forcing is stabilized at approximately 4.5 Watts per metre squared (IPCC 2020) and is further discussed in BSA.3, Attachment 3-C." The Project proposes a mining period of 12 years after construction, followed by up to 5 years of closure prior to post closure. Thus, the use of a 30 year prediction horizon is considered reasonable and conservative. With

ID:	**ECC-05**
	much of the site water management infrastructure such as perimeter ditching, collection ponds planned for rehabilitation in closure commencing in less than 15 years, the consideration of climate change over a < 15 year development horizon is itself conservative. Finally, the use of RCP 4.5, considering the projection horizon and life of mine is also considered reasonable. Regarding water crossings, the Project used the passage of the 1:100 year return period runoff event consistent with the associated perimeter ditches of piles. This design criteria exceeds the Newfoundland and Labrador Department of Transportation and Infrastructure design criteria for sizing the hydraulic capacity of Project water crossing with respect to road class. The culvert was sized for the 1.2 Headwater: Culvert diameter ratio and minimum of 30 cm freeboard from the road surface without overtopping of the adjacent ditch. The Project used the 1: 100 year storm derived from the above climate change method to account for anticipated culvert capacity increases. Regarding sedimentation/collection pond sizing, the flood control volume sizing criteria is containment of the 1: 100 year return period runoff event that was based on the Stephenville climate station. The RCP 4.5 1:100 year runoff event for this station was approximately equivalent to the 1:200 year return period runoff event. The sediment/collection ponds have been designed to contain the RCP 4.5 1:100 year return period event volume plus 30-day snowmelt and have been designed to manage/attenuate RCP 4.5 storms up to the 1:200 year return period event without overtopping and while maintaining freeboard requirements.
Appendix:	None

RESPONSE TO ECC-06

ID:	**ECC-06**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	Chapter 2; Appendix 2B
Context and Rationale:	Section 2.3.4.1, pg. 2.58 Appendix 2B, Section 3.4.2, pg. 5 “Finite sampling from borehole drilling suggests the till is primarily granular and non-cohesive in nature, comprising silt, sand, and gravel containing cobbles and boulders. It is a requirement that the TMF dams are founded on compact to dense native tills and/or bedrock with low permeability characteristics to limit seepage.” Appendix 2B, Section 7.5, pg. 15 “Given the uncertainty of the foundation conditions at this time…” Section 2.5.3.1, pg. 2.106 Figure 2-44 shows overburden remaining in place at the dam foundation, except where the liner ties into the bedrock. Section 2.11.6.6, pg. 2.194 “Technical challenges to the success of a lined rockfill dam include the need for an underlying, relatively impermeable “floor” material (e.g., glacial till) to tie the liner beneath the dam to retain water upstream, otherwise the entire impoundment may need to be lined.”
Information Request:	The foundation materials described for the tailings dam and hydraulic conductivity of MW4 well near the tailings dam location do not seem optimal. There is a lack of information on the foundation conditions and the possible design options that might need to be taken (e.g., foundation grouting). What are the plans for the design of the tailings dam with respect to the foundation of the dam, sub-surface conditions and how observed sub-optimal foundation material and sub-surface conditions will be addressed? There is no information on possible foundation seepage as there is not enough information on this aspect of the dam design.
Response:	Hydrogeological and geotechnical investigations completed in 2020 included 11 boreholes and 32 test pits over the footprint of the tailings management facility (TMF). The results of the investigation show widespread compact to very dense silty sand to sandy silt till overlying bedrock which will provide the base for a competent foundation. Hydraulic conductivity testing in the overburden and bedrock was carried out and foundation seepage analysis was undertaken as part of the updated TMF design. A seepage mitigation measure has been included in the updated design of the TMF dam in the form of a geomembrane liner blanket installed on the foundation, extending 50 m to 100 m upstream of the dam to reduce seepage. Figure ECC-06.1 illustrates the extent of the seepage blanket as a dashed red line in plan view.
Appendix:	None



LEGEND

- THRUST FAULT
- SEEPAGE AND RUN-OFF COLLECTION DITCH
- TMF EMERGENCY SPILLWAY ALIGNMENT
- WATERCOURSE (STANTEC 2020)
- HAUL ROAD
- EXISTING ROAD
- NEW DIVERTED ACCESS ROAD
- POWER LINE 66kV

NOTES:

1. ALL ELEVATIONS, GRID COORDINATES AND DIMENSIONS ARE IN METRES. GRID D COORDINATES ARE REFERENCE TO NAD83 UTM ZONE 21 DATUM.
2. GROUND CONTOURS INTERVALS AT 1m.

REFERENCES:

1. GROUND CONTOURS PROVIDED BY CLIENT. FILENAME MRG_01_Valentine_Mine_Survey_Data_Delivery.ZIP, DATED 11/6/2019.PS
2. BASEPLAN PROVIDED BY AUSENCO. FILENAME 104878-0000-G-001__ RevD_metres.DWG. DATED JAN18. 2021
3. STOCKPILES AND HAULAGE ROADS WERE UPDATED WITH FILES Valentine FS - Haul Roads - dxf - DRAFT - 201203.ZIP, Valentine FS - Leprechaun Stockpiles - dxf - DRAFT - 201203.ZIP AND Valentine FS - Marathon Stockpiles - dxf - DRAFT - 201203.ZIP AND Valentine FS - Marathon Stockpiles Update - dxf-DRAFT-201211.zip.
4. WATERCOURSES PROVIDED BY STANTEC. FILENAME WATER_BODIES_SHP AND WATERCOURSES_FINAL _2020.SHP DATED NOVEMBER 2, 2020.

0 125 250
1:7,500 METRES

CLIENT
MARATHON GOLD

CONSULTANT
GOLDER MEMBER OF WSP

YYYY-MM-DD	2021-05-05
DESIGNED	GK
PREPARED	TDR
REVIEWED	MS
APPROVED	WPM

PROJECT
VALENTINE GOLD PROJECT - NEWFOUNDLAND

TITLE
GENERAL ARRANGEMENT OF TMF

PROJECT NO.	CONTROL	REV.	FIGURE
20350991	0001	0	ECC-06.1

25 mm IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

RESPONSE TO ECC-07

ID:	**ECC-07**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	Section 2.3.4.1, pg. 2.58 “Composite samples of tailings from both deposits are classified as non-PAG and are not expected to generate ARD.” Appendix 2-B, Section 3.6.3, pg. 6 “overall the LGO stockpile at Marathon is non-PAG and not expected to generate ARD” “To date, ARD/ML test work has shown potential for some high-grade ore (HGO) to be potentially acid generating; however, based on the geology, further metallurgical testing and ARD/ML testing on source rock, and lab-scale process tailings, it is expected that the combined tailings will not generate ARD.” Section 2.6.1, pg. 2.111 “ARD/ML test results are presented in detail in Baseline Study Appendix 5. Overall, the soils and rock materials at the site have a low risk of being acid generating, with some ore materials having an increased risk and are currently classified as PAG. However, with appropriate mitigation (mixing and blending of PAG and non-PAG materials), none of the permanent site waste features (waste rock piles and TMF) are expected to generate acidic drainage. As such, the site design and development, as well as the plans for rehabilitation and closure, do not include measures to address ARD/ML issues. In the unlikely event that further testing determines that ARD/ML may present a risk post-closure, the Project design, as well as the rehabilitation and closure plans will be adapted. ”Section 2.6.3.3, pg. 2.114 “After closure, covered tailings beaches are not expected to produce acidic runoff and/or have high or moderate leaching except for P.” Section, pg. 7.100 “Accelerated pit filling will mitigate potential residual effects in that it will act to improve the water quality of the pit lake, reduce long term liability related to an extended period of natural pit filling, and expedites the submergence of PAG materials possibly exposed on the pit walls.”
Information Request:	The closure plan for the TMF is dependent on the ARD/ML test results which do not seem definitive. Based on various statements in the reports, it is not clear if tailings are conclusively acid generating or not. If there is some doubt on this, TMF closure with planned options for both PAG and non-PAG material should be looked at, or there needs to be a definitive answer on if the tailing are PAG or non-PAG. If tailings are PAG, the current TMF design is inadequate and any TMF will have to remain long-term and cannot be decommissioned.

ID:	**ECC-07**
Response:	It is important to note that blending of the ores from Leprechaun and Marathon pits is not optional for the operation, and the mine plan and processing plant design rely on the grade and characteristics generated from mining both pits simultaneously and blending of ore as it is delivered to the mill. Further blending will take place within the milling and gold extraction process, and further still as the tailings are thickened, delivered, and deposited within the tailings management facility (TMF). Therefore, the use of composite samples for the assessment for acid rock drainage (ARD) potential of tailings is considered the best approach. As indicated in Section 6 of Baseline Study Appendix 5, Attachment 5-B (The Valentine Gold Project: Acid Rock Drainage/Metal Leaching [ARD/ML] Assessment Report), composite samples of tailings classify as non-potentially acid generating (non-PAG) and are not expected to generate ARD. These results are conclusive given that the ratio of Neutralization Potential to Acid Potential (NP/AP), also referred to as Net Potential ratio (NPR) is above 2 in all samples of composite tailings analyzed, including the most recent tests as presented in Table ECC-07.1. Materials with NPR>2 are non-PAG based on classification presented in Mine Environment Neutral Drainage Program (MEND 2009). ARD/ML monitoring of tailings during operation will be conducted to verify this conclusion. In the unlikely presence of potentially acid generating (PAG) on the tailings surface, mitigation such as lime addition and/or cover with a layer of tailings generated from non-PAG mixture of low-grade ores would be implemented. These types of covers have been constructed in other tailing systems to reduce oxidation of underlying PAG tailings and have been monitored for over 20 years showing continued effectiveness of the mitigation (Dobchuk 2013). In addition to these potential mitigations implemented during operations, tailings will be covered with soil at closure, which will work as a diffusive barrier to oxygen increases to further reduce the risk of ARD/ML. As noted in the response to ECC-18, it is important to consider that facilities storing PAG do not always require permanent flooding. Should tailings be PAG, the design could accommodate a permanent engineered cover system (i.e., soil cover, geomembrane or geosynthetic clay liner) to isolate the tailings from oxidation and reduce infiltration. It is noted that removal of a permanent pond of water from the facility is inherently safer from a dam safety perspective and lowers overall long-term risk, requiring less monitoring and maintenance/management in closure.

ID:	**ECC-07**
	Reference: Dobchuk B., Nichol C., Wilson G.W., Aubertin M. 2013. Evaluation of a single-layer desulphurized tailings cover. Canadian Geotechnical Journal. Vol. 50, # 7, pp. 777 – 792. Mine Environment Neutral Drainage Program (MEND). 2009. Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials, MEND Report 1.20.1, p. 1-579.
Appendix:	None

ECC-07.1 Modified Acid Base Accounting of Tailings Samples (CO_3 by HCI Evolution)

Parameter	Unit	CND 1 Residue A	CND 1 Residue B (reassay)	CND 2 Residue	BL639-83D Detox Tls	BL639-83D-2 Detox Tls (reassay)
Sample Description		Marathon Tail	Marathon Tail	Leprechaun Tail	Gravity leach tailings	
Paste pH	standard unit	8.25	8.31	8.78	8.56	8.59
Fizz Rate	no unit	2	2	3	3	3
NP	t $CaCO_3$/1000 t	33.1	32.8	68.5	40.3	34.7
AP	t $CaCO_3$/1000 t	15.6	15.3	8.75	7.81	8.75
Net NP	t $CaCO_3$/1000 t	17.5	17.5	59.8	32.5	26.0
NP/AP (NPR)	ratio	2.12	2.14	7.83	5.16	3.97
S	% as S	0.509	0.536	0.314	0.391	0.401
Acid Leachable SO_4-S	% as S	< 0.02	0.05	0.03	0.14	0.12
Sulphide	% as S	0.50	0.49	0.28	0.25	0.28
C	% as C	0.388	0.411	0.919	0.559	0.530
CO_3	% as CO_3	1.91	2.02	4.49	2.77	2.62
CO_3 NP (calc'd)	t $CaCO_3$/1000 t	31.7	33.5	74.5	46.0	43.5
CO_3 Net NP (calc'd)	t $CaCO_3$/1000 t	16.1	18.2	65.8	38.2	34.7
CO_3 NP/AP (NPR)	ratio	2.03	2.19	8.5	5.89	4.97
NP Attributed to CO_3	%	96	102	109	114	125

Notes:
CO_3 NP calculated based on measured carbonate content (not total carbon).
NPR ratios used for classification are highlighted.

RESPONSE TO ECC-08

ID:	**ECC-08**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.3- Water Resources
EIS Reference:	Section 2.3.6.3
Context and Rationale:	-
Information Request:	The source of potable water has not been identified.
Response:	As noted in Section 2.3.6.1 of the EIS, raw water for the process and potable water treatment system will be obtained from Victoria Lake Reservoir. Section 2.3.6.3 of the EIS describes the potable water supply system.
Appendix:	None

RESPONSE TO ECC-09

ID:	**ECC-09**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	Section 2.5.3.1; Section 22.2
Context and Rationale:	-
Information Request:	pg. 2.105; Figure 2-43 shows a thrust fault within 300-550 m of the tailings dam. There is a lack of information on this fault and how it may impact the TMA. Further characterization of this fault area, in particular in the vicinity of the TMA is needed. Table 22.11, pg. 22.23; is this fault a geological hazard that could affect dam safety? It is not mentioned in Chapter 22.
Response:	From a hydrogeological perspective, the tailings management facility (TMF) does not overprint the Valentine Lake Fault (VLF) trace and the fault dips 70-90 deg to the north, not the south, so there is no intersection and no impact on the TMF. From site investigations (GEMTEC 2021; Appendix D), it has been determined that the hydraulic conductivities of faults and fault zones (including the VLF) are within the range of bedrock lithology values, and are not found to be hydraulically distinct from the surrounding rock mass (refer to response to ECC-20). From a geohazard perspective, this is not an active fault with any indications of recent movements. The Project site, and Newfoundland as a whole, is deemed to have a ‘low risk’ seismic hazard rating. Based on the in-situ testing results, the potential for seismic induced liquefaction of the foundation soils is negligible. Reference: GEMTEC Consulting Engineers and Scientists Limited. 2021. Summary of Packer Testing, 2020 FS-Level Geotechnical Pit Design Program, Marathon Valentine Gold Project, Central Newfoundland. Letter report prepared for Marathon Gold Corporation.
Appendix:	See Appendix D: Summary of Packer Testing

RESPONSE TO ECC-10

ID:	**ECC-10**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	Table 2.22, pg. 2.130
Context and Rationale:	"An Explosives and Blasting Management Plan will be developed by Marathon and its selected, licenced blasting contractor(s) to provide direction for the safe storage, handling and use of explosives and explosive components at the Project site, to address the safety of the public and Project personnel, and protection of both the environment, Project components and the Victoria Dam. The Explosives and Blasting Management Plan will include requirements for Blast Design vibration limits and seismic monitoring for blasting activities."
Information Request:	Possible monitoring sites for blast related ground vibration monitoring should be shown on a map. Monitoring sites should be established prior to any blasting for site development.
Response:	It is currently anticipated that monitoring stations will be established as follows: • at the Victoria Dam on the dam abutment or immediately adjacent to the abutment • at the northeast end of the tailings management facility (TMF) in a suitable location to monitor blast vibrations from Marathon pit • at the southwest end of the TMF • at the southwest side of the process area, likely on a building foundation or equipment foundation The precise locations of the seismic monitoring stations will depend on a number of factors including, but not limited to, protection and access to the monitoring location, and ground (soil and bedrock conditions) suitability for the monitoring platform. Details of the monitoring plan and locations will be provided to the Newfoundland and Labrador (NL) Department of Environment and Climate Change, Water Resources Management Division and NL Hydro for review prior to implementation.
Appendix:	None

RESPONSE TO ECC-11

ID:	**ECC-11**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	Section 19, pg. 19.5
Context and Rationale:	-
Information Request:	The assessment area for the dam VC ends at Red Indian Lake and only takes in a portion of Victoria Lake. A failure of the Victoria Dam would affect the entire Exploits River watershed, so this is not a valid assessment area.
Response:	Marathon has taken numerous steps in the planning and design of the Project to avoid or reduce interaction with the Victoria Dam and, as a result, there are no planned Project activities or accidental events that are predicted to affect the stability of the Victoria Dam, including a failure of the Project tailings management facility (TMF) dam. As discussed in Section 19.5.3 of the EIS and Baseline Study Appendix (BSA) 1, the estimated peak particle velocity transmitted to the Victoria Dam is well below the threshold at which a reduction in dam stability is likely to occur; therefore, the Victoria Dam will not be affected by routine Project-related effects such as blasting. In addition, the dam breach analysis of a TMF failure as presented in the EIS (BSA.1, Attachment 1A) and as recently updated (refer to response to ECC-23) has demonstrated that there would be no adverse effects on the Victoria Dam in the event of a worst-case accidental event. Given Project-related effects are not predicted to result in a failure of the Victoria Dam, an assessment of the failure of the dam is not required as part of the assessment of the environmental effects of the Project (i.e., if a failure of the Victoria Dam were to occur, it would be unrelated to the Project). The selected assessment area is therefore considered valid. It is understood that NL Hydro has completed dam breach assessments that consider the potential failure of the Victoria Dam. It is assumed that, as the stewards of dam safety in Newfoundland and Labrador (NL), the NL Department of Environment and Climate Change (NLDECC)- Water Resources Management Division has access to these results and that potential effects of a Victoria Dam failure on the Exploits River watershed are well understood. In the event of a 'sunny day' failure of the Victoria Dam, the Valentine Gold Project would have no contribution to the event. If the failure of the Victoria Dam were to occur due to an extreme flooding event, there is a chance that the Project TMF dam could also fail. Were this

ID:	**ECC-11**
	to occur, the incremental volume attributable to the Project would be less than 1% of the overall volume, as demonstrated in the dam breach assessment completed for the TMF. Marathon would be pleased to review these cases with NL Hydro and the NLDECC - Water Resources Management Division as part of the detailed engineering and permitting phases of the Project. As stated above, however, the planned activities and potential accidental events related to the Project are not predicted to contribute to a possible failure of the Victoria Dam.
Appendix:	None

RESPONSE TO ECC-12

ID:	ECC-12
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	-
Information Request:	One thing not really addressed is the added traffic and visitation that might occur at the Victoria Dam due to better access roads, mine workers in and out of the area, etc. This might be more of an issue for Nalcor, but more people in the area means more people around the dam and more potential public safety issues. Nalcor may have to undertake or update their public safety plan for the Victoria Dam and look at possible mitigative measures. For example, I believe there is an existing gate across the access road to the dam.
Response:	Marathon has been maintaining the access road to the exploration camp and general Project Area since 2010. While the access road will be further improved as part of the Project development (minor widening, improved ditching, road topping), it will not substantially improve the road with respect to general access, nor will it appreciably reduce travel time to the Victoria Dam area. However, it is acknowledged and agreed that additional traffic and visitation could occur to the area and to the Victoria Dam. Marathon plans to consult and work with NL Hydro to address this issue. Marathon will have security gates and likely closed-circuit television cameras established at the exits from the public road (which lead to the Victoria Dam area), as well as a guard house at the main gate. NL Hydro has established a fence and gate system to prevent vehicle access to the Victoria Dam. Marathon will also have daily and weekly monitoring activities, including vibration monitors, in proximity to the Victoria Dam, and will therefore be in the area on a regular basis to identify potential issues in terms of public access to Victoria Dam.
Appendix:	None

RESPONSE TO ECC-13

ID:	**ECC-13**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	Section 19.5.2, pg. 19.17 "Project-related environmental effects on the water quality in Victoria Lake Reservoir are not expected greater than 300 m from the discharge location into the lake"
Context and Rationale:	Agree that expected water quality changes unlikely to have any significant impact on the Victoria Dam.
Information Request:	Changes in water quality from the development will impact the entire Lake, not just the portion of the Lake in the assessment area, and watershed systems connected to Victoria Lake, although dilution will significantly reduce any impact.
Response:	Comment noted. Please refer to the response to ECC-44.
Appendix:	None

RESPONSE TO ECC-14

ID:	**ECC-14**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	-
Information Request:	More a questions for Nalcor: • Are there any known geotechnical deficiencies in the Victoria Dam, or known data gaps on geotechnical characteristics that may impact the evaluation of the geotechnical stability of the Victoria Dam with respect to the impact from blasting at the proposed mine? • Using the expected loading from blasting at the mine site, has Nalcor incorporated this into revised stability models? At what level of ground movement may there possibly be effects at the Victoria dam based on Nalcor stability models? • Does Nalcor have any thresholds for allowable ground movement near their dams? I have some concerns that the foundation material at the tailings dam may be sensitive to vibration. This needs to be examined more closely and dealt with as part of the TMF design. Also, the question of if blasting is likely to have any effect on the thrust fault located near the TMF has not been looked at. The Explosives and Blasting Management Plan should allow for sufficient time between blasts to allow for the dissipation of blast-induced excess pore pressures.
Response:	As part of ongoing consultation, Marathon has provided NL Hydro with the tailings management facility (TMF) design report, dam breach assessment and assimilative capacity reports, and blast vibrations analysis report for review. Marathon will continue to update and consult with NL Hydro regarding these aspects of the Project design and operations, and will consult with NL Hydro regarding the Explosives and Blasting Management Plan that will be developed for the Project. The TMF foundation materials (compact to dense glacial till and bedrock) are not sensitive to vibration. Sufficient geotechnical investigation work has been conducted to date to confirm there are no deposits of sensitive soils within the TMF foundation area. The thrust fault is located to the northwest of the TMF and has been assessed in terms of pit slope stability, hydraulic conductivity, and potential

ID:	**ECC-14**
	effects with respect to the TMF; the fault does not impact the design or stability of the TMF. The blast design and frequency associated with the operation of both open pits has been considered in the design of the TMF, including the stability of the tailings deposit itself.
Appendix:	None

RESPONSE TO ECC-15

ID:	**ECC-15**
Expert Department or Group:	Department of Environment and Climate Change - Water Resources Management Division
Guideline Reference:	Section 4.2.1.3- Water Resources
EIS Reference:	BSA1, Table 2.1, pg. 5
Context and Rationale:	“The modeled water chemistry in Victoria River is not anticipated to result in adverse environmental effects, subject to confirmation that TMF water does not present the potential for acute toxicity.” “Confirmation of mixing zone volume would provide verification and greater assurance as to the duration of concentrations greater than chronic exposure criteria.”
Information Request:	This statement relates to a possible tailings dam breach. Is there a plan for acute toxicity testing of tailings pond water? Tailings pond water could also be released through the emergency spillway. This statement relates to Red Indian Lake. Is there a plan for confirmation of the mixing zone volume on Red Indian Lake?
Response:	Reasonable predictions for water quality within the tailings management facility (TMF) have been made in order to assess the potential effects on the environment through operation (e.g., seepage), closure and accidental events (e.g., dam breach). Water contained within the TMF pond during operations will be a mix of process water and precipitation, and the TMF pond volume and chemistry will change over time as the tailings impoundment is expanded / raised, with seasonality, and due to other factors. Operationally, the water quality and quantity within the tailings pond relate to the need for water recycling to the process plant, excess water discharge to the environment via the water treatment plant and polishing pond or, in the event of a precipitation / runoff event in excess of the Environmental Design Flood (which can be accommodated in the tailings pond above the maximum operating water level in accordance with Canadian Dam Association guidelines), discharge through the spillway. To confirm the predictions made in the EIS and engineering studies, a TMF water quality and quantity monitoring program will be required to assess water quality and quantity within the tailings impoundment for process control and environmental requirements. Acute lethality testing will be completed on water that will or could be discharged to the environment via operations or via accidental events. The results of the monitoring program will be used to make any necessary adjustments within the process system or water treatment plant, and/or implement additional mitigations to manage water quality for reuse (in process) or discharge to the environment. Please refer to the response to ECC-34

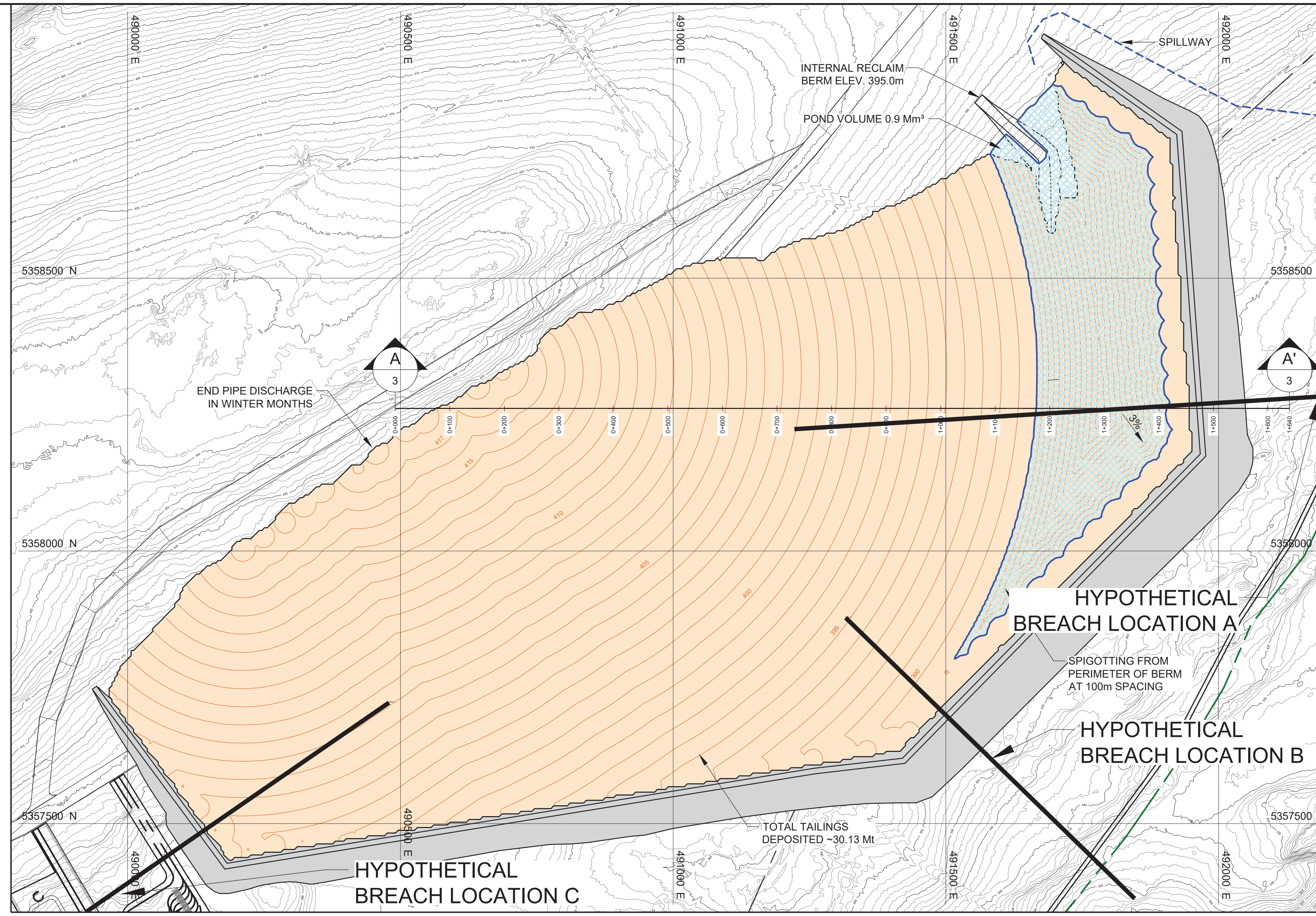
ID:	**ECC-15**
	regarding the recommendation to confirm the mixing zone volume on Red Indian Lake.
Appendix:	None

RESPONSE TO ECC-16

ID:	**ECC-16**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	-
Information Request:	For the dam break modeling, was the model only run for the tailings dam at the final phase of construction? This should be looked at and potentially modeled for each phase of the dam construction.
Response:	Based on the life of mine water balance, the stage of the tailings management facility (TMF) construction with the largest combined water and tailings potential release is used to provide a conservative effects assessment for the EIS and with the intention to inform the Emergency Response Plan and dam classification. The Dam Breach Assessment was modelled for the ultimate stage because, based on the deposition plan, this is the stage with the most critical potential releases to the environment. As such, dam break modelling for other phases of dam construction is not considered to be required. The potential need to complete dam break modelling for other phases of TMF development will continue to be reviewed as the engineering progresses (detailed engineering) and in consultation with regulators throughout the permitting process, prior to construction.
Appendix:	None

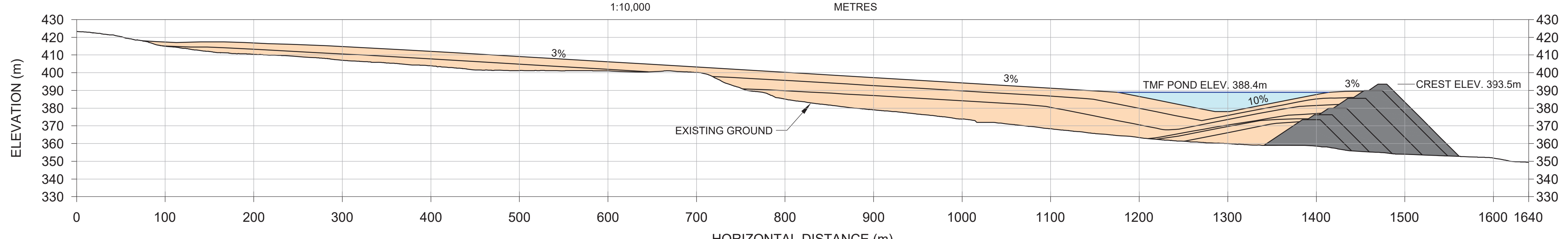
RESPONSE TO ECC-17

ID:	**ECC-17**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	BSA1
Context and Rationale:	-
Information Request:	BSA1 refers to the TMF dam as having East Dam, South Dam and West Dam. There is no figure indicating which portions of the TMF are what dam.
Response:	The East, South and West Dam naming convention was previously used in the Dam Breach Assessment (DBA) to identify the locations selected to be breached as a part of the DBA; the East Dam referred to the approximate area from chainage 2+500 to the 3+350, the South Dam from 0+500 to 2+400 and the West Dam from 0+000 to 0+400 (Figure ECC-06.1). However, this naming convention is no longer used. The specific breach locations are now referred to as locations A, B and C as shown in Figure ECC-17.1. These locations were selected for the following reasons: • Location A: allows for the peak release of the tailings management facility (TMF) pond (water and tailings followed by liquefied tailings beneath the pond) • Location B: is the location with the maximum tailings deposition depth; additionally, a release at this location has the largest potential impact on the Victoria Dam • Location C: a breach in this location would have the largest potential impact on plant site infrastructure and personnel
Appendix:	None



PLAN VIEW - DEPOSITION PLAN - END OF STAGE 6

0 250 500
1:10,000 METRES



SCALE 1:6,000 m
VERT. SCALE 1:3,000m
A
3
PROFILE B - B' - END OF STAGE 6

NOTE:

1. TYPICAL TMF POND VOLUMES WERE SELECTED FOR THE DEPOSITION MODELLING. TMF POND VOLUMES WILL FLUCTUATE SEASONALLY UP TO A MAXIMUM OF 391.4m DEPENDING ON THE OPERATIONAL MONTH.

REFERENCE

1. GROUND CONTOURS WERE PROVIDED BY CLIENT. FILENAME MRG_01_Valentine_Mine_Survey_Data_ Delievery.ZIP, DATED 11/6/2019.

CLIENT

MARATHON GOLD

CONSULTANT

GOLDER

YYYY-MM-DD	2020-03-30
DESIGNED	MS
PREPARED	TDR
REVIEWED	AC
APPROVED	WPM

PROJECT
DAM BREACH ASSESSMENT AND INUNDATION STUDY
VALENTINE GOLD TAILINGS MANAGEMENT FACILITY

TITLE
TAILINGS DEPOSITION SUMMARY - STAGE 6

PROJECT NO.	CONTROL	REV.	FIGURE
20141194	0001	A	ECC-17.1

RESPONSE TO ECC-18

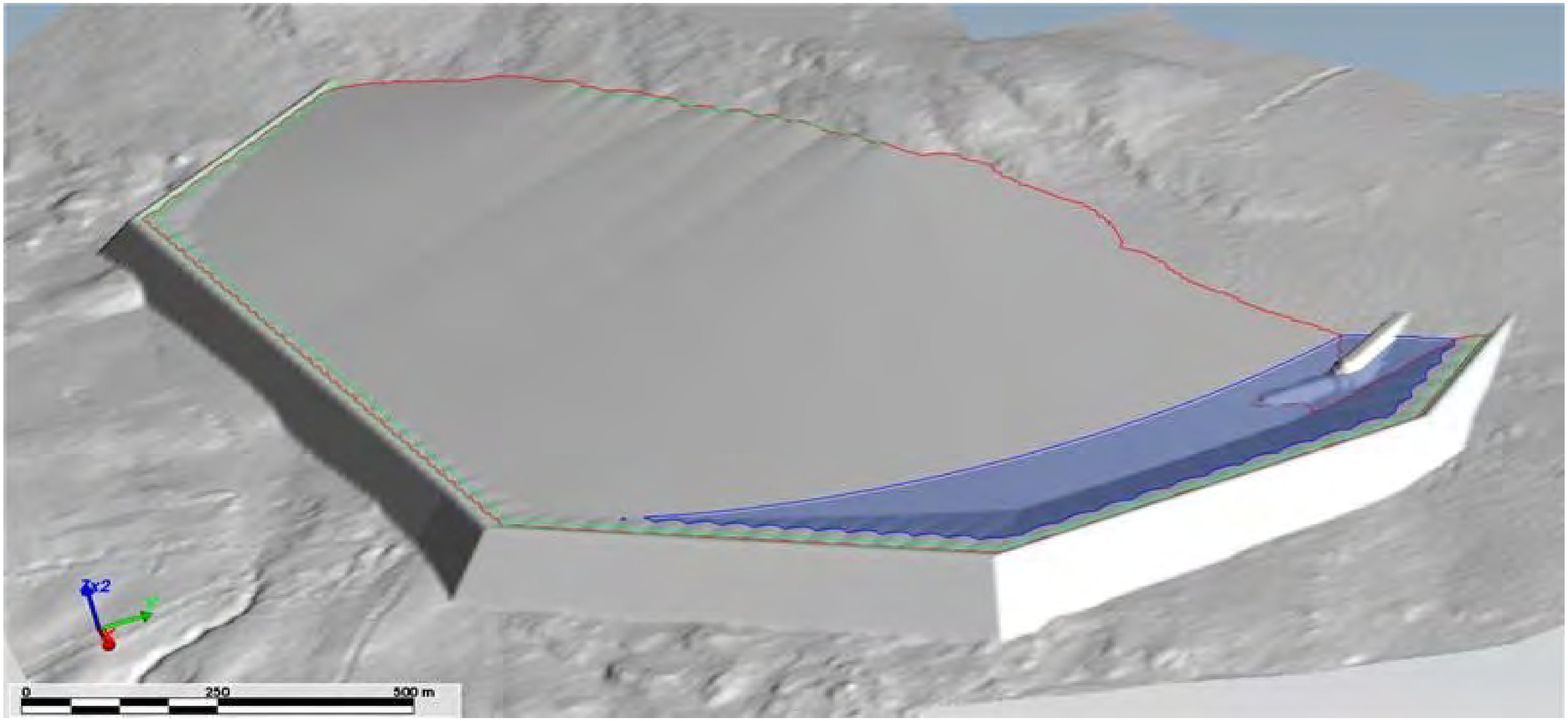
ID:	**ECC-18**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	
Context and Rationale:	There is no definitive statement in the EIS as to whether the tailings are PAG or not. A typical tailings dam design for PAG tailings requires a tailings dam with a constant crest elevation to contain sub- aqueous deposited tailings. The TMF design in the EIS is for a tailings dam of varying elevation with water ponded on the eastern end and tailings deposited on the western end. The majority of tailings will not be covered in water and will be deposited to elevations that exceed the dam crest elevation, particularly the "east" and "south" dams. The difference in crest elevation from the west to the east end of the tailings dam by Phase 5 is 19.5 m. This is not a typical TMF design we see in the province. Subaqueous disposal tends to be used in areas with high precipitation, steep terrain, or high seismicity. The maximum tailings elevation is listed as 416 m, which is 7.7 m higher than the highest dam crest elevation. Table 2.2, pg. 2.138 "The tailings deposition strategy to deposit thickened tailings as beaches will reduce porewater lock-up in comparison to sub-aqueous deposition and will reduce the quantity of porewater seepage in closure." Section 2.5.3.1, pg. 2.104"The maximum final crest elevation of the TMF is 408.5 masl and the maximum embankment height is 49 m." Figure 2-43, pg. 2.105For stage 1B, the TSF Pond elevation is shown as 380 m and the dam crest elevation is 375 m. This figure also shows the uneven crest elevation across the length of the dam from 408.3 m to 390.5 m in stage 4.
Information Request:	a. This design will not work if the tailings are PAG. b. All of the other associated dam safety work for the TMF in the EIS is based on this design and the assumption of non-PAG tailings. c. What about the flowability of the tailings within the TMA? Is there potential for them to migrate and overtop the tailings dam? What about the flowability of the tailings under stressor conditions (e.g., blasting, high precipitation events)? What are the expected characteristics of this thickened tailings? Tailings characteristics listed in the Appendices of Appendix 2B are either assumed, no data, or to be revised following additional testing. d. Are there examples of this type of TMF design with thickened tailings working well in similar northern/wet climates? There is no such current

ID:	ECC-18
	TMF design in the province, and this approach is currently relatively uncommon worldwide. e. Tailings are to be mechanically thickened at the mill (pg. 2.192). Is there any redundancy if this infrastructure breaks down? f. How will dust from the tailings beach be controlled? g. Is there any manual or plan developed on best-practice for tailings deposition and O&M of this system? h. Will a thickening agent be used to increase the stability of the tailings? i. What are the characteristics of the thickened tailings? j. How was a beach slope of 3% predicted or was this value just assumed (pg. 2.58)? What if the tailings beach slope above water are less than 3%? How will that affect the design and/or phased construction of the TMF? Will the beached tailing mounds be stable? k. What if the tailings beach slopes below water are less than 3%? l. Can we get a 3D rendering of what the TMF will look like? This will help put the uneven dam crest and height of the tailings mounds into perspective. m. Will there be piezometers installed in the tailings deposit to monitor pore pressure in the tailings? n. How many points of discharge of thickened tailings will there be into the TMA?
Response:	a./b. Stantec geochemical test work in 2020 further supports the prediction of the composite tailings from Leprechaun and Marathon pits being classified as non-potentially acid generating (non-PAG) (refer to response to ECC-07). It is important to consider that facilities storing potential acid generating (PAG) tailings need not always require permanent flooding. Should tailings be PAG, the design could accommodate a permanent engineered cover system (i.e., soil cover, geomembrane or geosynthetic clay liner) to isolate the tailings from oxidation and reduce infiltration. It is noted that removal of a permanent pond of water from the facility is inherently safer from a dam safety perspective and lowers risk, requiring less monitoring and maintenance / management in closure. c. The tailings characteristics presented in Appendix 2B of the EIS have been selected based on experience and typical values expected for thickened tailings and are considered reasonable for design at the current level of study. Geotechnical testing of representative samples of

ID:	ECC-18
	the tailings from the Marathon and Leprechaun deposits has been completed in Golder laboratories as of April 2021. Data from the test results will be used to refine the tailings design parameters during the detailed engineering phase of the Project, the results of which will be presented to regulators via the detailed permit applications. The results of the testing indicate agreement with the assumed parameters presented in the EIS, and no significant changes to the tailings characteristics used to date are expected. Furthermore, the most accurate tailings characteristic data will be obtained from the field during the initial years of operation which will guide the design of the subsequent stage raises and ultimate closure of the tailings management facility (TMF). In comparison to conventional slurry deposited tailings, thickened tailings are non-segregated with a higher relative density which inherently improves physical stability of the tailings. The tailings beach surface will be very shallow (i.e., grade of 3% or 33H:1V); static and earthquake induced liquefaction of the tailings are not expected to occur. Even if the tailings were to liquefy, the post-liquefied residual strength of the tailings would preclude flow failures overtopping the dam given the very flat beach slopes. d. Kidd Creek (Timmins, ON), Musselwhite (Musselwhite, ON) and Nunavik Nickel (Nunavik, QC) are examples of successful thickened tailings facilities in northern Canadian climates. All three sites have beach slopes above perimeter containment dams. e. The tailings are thickened by the high-rate tailings thickener, then pumped to the TMF. Were the thickener unit to breakdown, the likely cause would be a malfunction of the thickener hydraulics / rake or of one of the two sets of tailings pumps. The following response actions would be implemented: • Issue with the thickener hydraulics / rake: Cease production or route unthickened tailings to the final tailings pumps until the mechanical issue is corrected. The latter option would allow mill operation to continue with tailings of approximately 50-52% solids being sent to the TMF (in Phase 2 onwards). Note that while sending tailings to the TMF at 50%+ solids would ultimately require additional storage capacity at the TMF, this would only be used as a temporary, short-term (days or weeks) measure until the equipment can be repaired. The TMF design can accommodate either conventional slurry or thickened tailings discharge. • Issue with a set of tailings pumps: Mill throughput would decrease to approximately 60% of nameplate capacity, and only one of the

ID:	ECC-18
	two tailings pumping systems would be utilized until the mechanical issue is corrected (short term, likely days). f. Dust will be primarily controlled by maintaining the tailings beach in a saturated state by actively depositing tailings uniformly over the beaches during dry periods from multiple discharge spigots. Experience has shown that thickened tailings are less susceptible to dusting. It is important to note that the tailings impoundment starts small and will grow over a period of 9 years, noting the exposed tailings area will be minimized throughout the life of the facility. In the last years of deposition to the impoundment, areas filled to the final capacity will be prepared and covered/revegetated for closure. Air quality monitoring, including fugitive dust generation, will be conducted over the life of the Project, and if dust release is above levels predicted in the Air Quality Model presented in the EIS, dust control palliatives could be implemented, as required. g. An Operations, Maintenance & Surveillance (OMS) Manual will be prepared for the Project (required per Canadian Dam Association [CDA] / Mining Association of Canada [MAC] guidelines, and necessary for efficient Project operations) and updated as required throughout the TMF lifecycle based on site-specific tailings deposition conditions. The OMS will be prepared in accordance with CDA and MAC guidelines for management of tailings facilities and will detail tailings deposition and management best-practices, which will guide the operation of the facility. h. No thickening agent is planned to be used. The tailings beaches are expected to be globally stable. i. Refer to response to ECC-18, part (c), above. j. The beach slope value of 3% was assumed for design, based on the degree of dewatering and on experience from other projects in Canada. Sensitivity analysis was carried out for flatter beach slope angles during deposition. The results indicate that with a slope of 1.5%, the facility would only require raising of the ultimate dam elevation by 4 to 5 m to account for the loss of storage capacity, which can be accommodated in the final phases of construction, if needed. Beach slopes will be confirmed during initial stages of operation such that the design of the TMF can be refined as needed during staged raising to account for field site-specific conditions. In comparison to conventional slurry deposited tailings, thickened tailings are non-segregated with a higher relative density which inherently improves physical stability of the tailings, and a 3% beach slope (or flatter) will be geotechnically stable. Static and

ID:	**ECC-18**
	earthquake induced liquefaction of the tailings are not expected to occur. Even if the tailings were to liquefy, the post-liquefied residual strength of the tailings would preclude flow failures overtopping the dam given the very flat beach slopes. k. Subaqueous beach slopes are steeper than sub-aerial slopes and are predicted to be 10% based on experience with similar projects Golder has worked on in Canada and beyond. Similar to the subaerial slopes, the sub-aqueous beach slopes will be confirmed with field data during initial stages of operation with pond bathymetry surveys, such that the design of subsequent stages of the TMF can be refined as needed. l. A 3-D view of the TMF at its ultimate stage is attached (Figure ECC-18.1). m. The tailings are not a foundation material for the TMF design. The pore pressure of the tailings will not be monitored with piezometers. The design of the TMF is not governed by the pore pressure within the tailings and this practice is not typically required for downstream raised dam construction. The TMF dams and pond will be monitored with instrumentation for dam safety and safe operation of the facility. n. Deposition will occur from spigot points located along the entire dam perimeter, spaced approximately 100 m apart. The number of discharge points will increase as the dam length increases over the life of the TMF. Deposition from the natural ground at the northwest perimeter of the TMF is currently envisioned to occur from spigots at a tighter spacing (approximately 25 to 50 m) and over a shorter length of discharge pipe to provide more control over the discharge velocity and beach slope grade. During the winter months, discharge will occur via single point end pipe discharge to mitigate freezing of the tailings lines and freezing bleed water in the deposited beach. The single point discharge location which will be actively repositioned to ensure basin filling is carried out in accordance with the deposition plan.
Appendix:	None



GOLDER
MEMBER OF WSP

3D Rendering of TMF - Stage 6 Configuration

PROJECT NO: 20350991		DATE:	06-May-21
BY:	GK	CHECK:	MAS

VALENTINE GOLD - TMF FEASIBILITY STUDY

FIGURE ECC-18.1

RESPONSE TO ECC-19

ID:	**ECC-19**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	Section 2.5.3.1, pg. 2.104 “An emergency discharge spillway and runout channel will be included for each embankment raise.” BSA1, Attachment 1-A, pg. 6 “The emergency spillway, located on the northeastern abutment of the dam, is an open cut channel with an invert elevation of 389.5 masl and a width of 6 m at the spillway channel inlet.”
Information Request:	The location of this emergency spillway and direction of flow is not indicated in the EIS or Figure 2-43. Will the spillway be fixed at the stage 1A NE abutment, or move to that abutment with each stage?
Response:	The spillway location and discharge channel alignment for the various stages have been determined. While the channel alignment will be fixed, the spillway and inlet will move with the stages. The alignment for the Stage 1 (starter) and Stage 6 (ultimate) configurations are shown on Figure ECC-06.1.
Appendix:	None

RESPONSE TO ECC-20

ID:	**ECC-20**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.3- Water Resources
EIS Reference:	-
Context and Rationale:	Section 2.3.4.2, pg. 2.61 "For in-pit tailings storage, this makes the requirement for a liner within the pit unlikely. In addition, contact water and surface water will be directed to the Leprechaun open pit at the same time as tailings deposition is occurring to help expedite the flooding of the pit for closure. This will act to further dilute any potential parameters of potential concern (POPCs) within the tailings effluent pumped to the pit."
Information Request:	There is a lack of detail on the in-pit tailings disposal at the Leprechaun pit after year 8. If the hydrogeological parameters affecting the migration of seepage and contaminants are poorly understood, tailings with toxic contaminants or reactive tailings may be poor candidates for open pit tailings impoundment. Unless the purpose is to isolate sulfide tailings underneath water, the water table should be below the tailings disposed in the pit. This may require backfilling with mine rock or overburden. If backfilling underneath the tailings is necessary, and/or if the surrounding rock is not sufficiently impermeable, a liner may be required. The hydrogeological parameters affecting the migration of seepage and contaminants are poorly understood, so tailings with toxic contaminants or reactive tailings may be poor candidates for this type of impoundment.
Response:	Particle tracking results from groundwater modeling of seepage from the Leprechaun and Marathon waste rock piles, and from the tailings disposed in the bottom of the Leprechaun pit are presented for post-closure in Figure ECC-20.1 (for the condition of enhanced fault permeability), and in Figure ECC-20.2 (for reduced fault permeability). As shown on the figures, the predicted flow of groundwater from the Leprechaun pit is toward Victoria Lake Reservoir. The predicted chemical mass loading associated with groundwater flow from the open pit is minor compared to the chemical mass loading from the discharge of surface water from the Final Discharge Points due to the much larger flow of surface water compared to groundwater. The effects of the in-pit disposal of tailings on surface water was described in Chapter 7 (Surface Water Resources) of the EIS and supports the previous statement about relative chemical mass loadings from groundwater versus surface water.

ID:	ECC-20
	Packer testing across a variety of depths in bedrock at Leprechaun pit in the Valentine Lake Intrusive Complex and the Rogerson Lake Conglomerate resulted in hydraulic conductivity measurements ranging from 4×10^{-10} metres per second (m/s) to 6×10^{-6} m/s, with a geometric mean of approximately 5×10^{-8} m/s (GEMTEC 2021; Appendix D). Hydraulic conductivity values of shallow wells were generally higher than those observed in deep wells, consistent with a decreasing degree of fracturing and bulk hydraulic conductivity with depth. Results were similar to recovery testing completed in existing exploration boreholes at the Leprechaun (3.4×10^{-8} m/s) and Marathon (7.8×10^{-8} m/s) pits. A broad range in bedrock hydraulic conductivity values were determined for the Leprechaun Pit during the GEMTEC (2021; Appendix D) investigation program, spanning five orders of magnitude from 4.8×10^{-11} m/s to 1.8×10^{-6} m/s, and with a geometric mean of 3.3×10^{-8} m/s. The permeability (geometric mean) of the bedrock below depths of 100 m and 200 m in the pit are 6.2×10^{-9} m/s and 7.7×10^{-10} m/s, respectively. The tailings will be stored below a depth of 115 m. The differences in bedrock hydraulic conductivity in the area were shown to be more strongly influenced by depth than rock type, with a general decreasing trend in hydraulic conductivity with tested depths down to approximately 300 m for all rock types. In addition, the Valentine Lake thrust fault and other faults tested in the pit area had similar hydraulic conductivities as the various bedrock types, and were not hydraulically distinct from the surrounding rock mass (GEMTEC 2021; Appendix D). Hydraulic head monitoring data collected from two vibrating wire piezometers installed as part of the GEMTEC (2021; Appendix D) program indicate slight upwards vertical hydraulic gradients into the pit ranging from 0.3% (0.003 m/m) to 3% (0.032 m/m). Following cessation of mining in the pit and tailings deposition, the pit will be flooded with surface water run-off, precipitation, ground water seepage until an overflow channel (draining to Victoria Lake Reservoir) elevation of 377 m is reached. Results of the groundwater modelling carried out by Stantec indicate that during the decommissioning, rehabilitation and closure period, the local groundwater movement will continue to be toward the open pits long term, however, as the water levels rise in the open pits, the degree of distant drawdown will gradually recover to near pre-mining levels. It is predicted that the water table within the vicinity of the flooded pit will be permanently drawn down to between 5 and 10 m from baseline levels. The pit lake will continue to be a groundwater discharge location with net seepage flows into the pit lake. The water quality modelling shows that there will be no *Metals and Diamond Mining Effluent Regulations*

ID:	**ECC-20**
	exceedances predicted at the facilities and final discharge points in the Leprechaun mine complex during all mining phases (at 95th percentile confidence level) (refer to Appendix 6A [Hydrogeology Modelling Report] and Appendix 7A and 7B [Water Quantity and Water Quality Modelling Reports] in the EIS). It is noted that there is already an existing surface water body at the location of the Leprechaun pit indicating that this area is a groundwater discharge. Based on the findings above, lining of the pit prior to deposition is not required in the design. Additional studies and assessment will be completed as the open pit is developed during mining operations to confirm the predicted rock mass quality and hydraulic conductivities, and support the determination that a liner is not required. Reference: GEMTEC Consulting Engineers and Scientists Limited. 2021. Summary of Packer Testing, 2020 FS-Level Geotechnical Pit Design Program, Marathon Valentine Gold Project, Central Newfoundland. Letter report prepared for Marathon Gold Corporation.
Appendix:	See Appendix D: Summary of Packer Testing

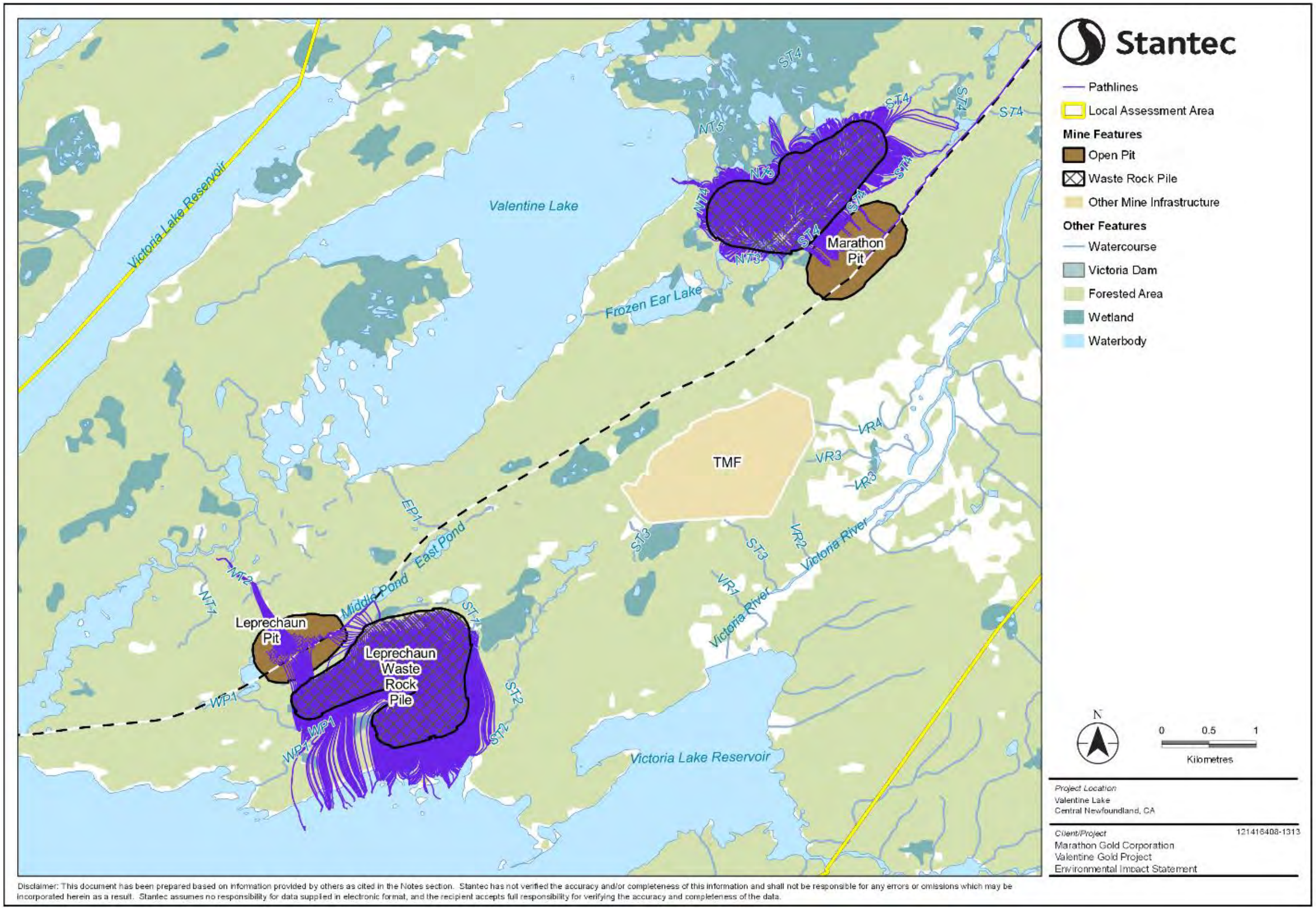


Figure ECC-20.1 Particle traces illustrating flow paths from Waste Rock Piles and LGO Stockpiles following closure with enhanced permeability fault

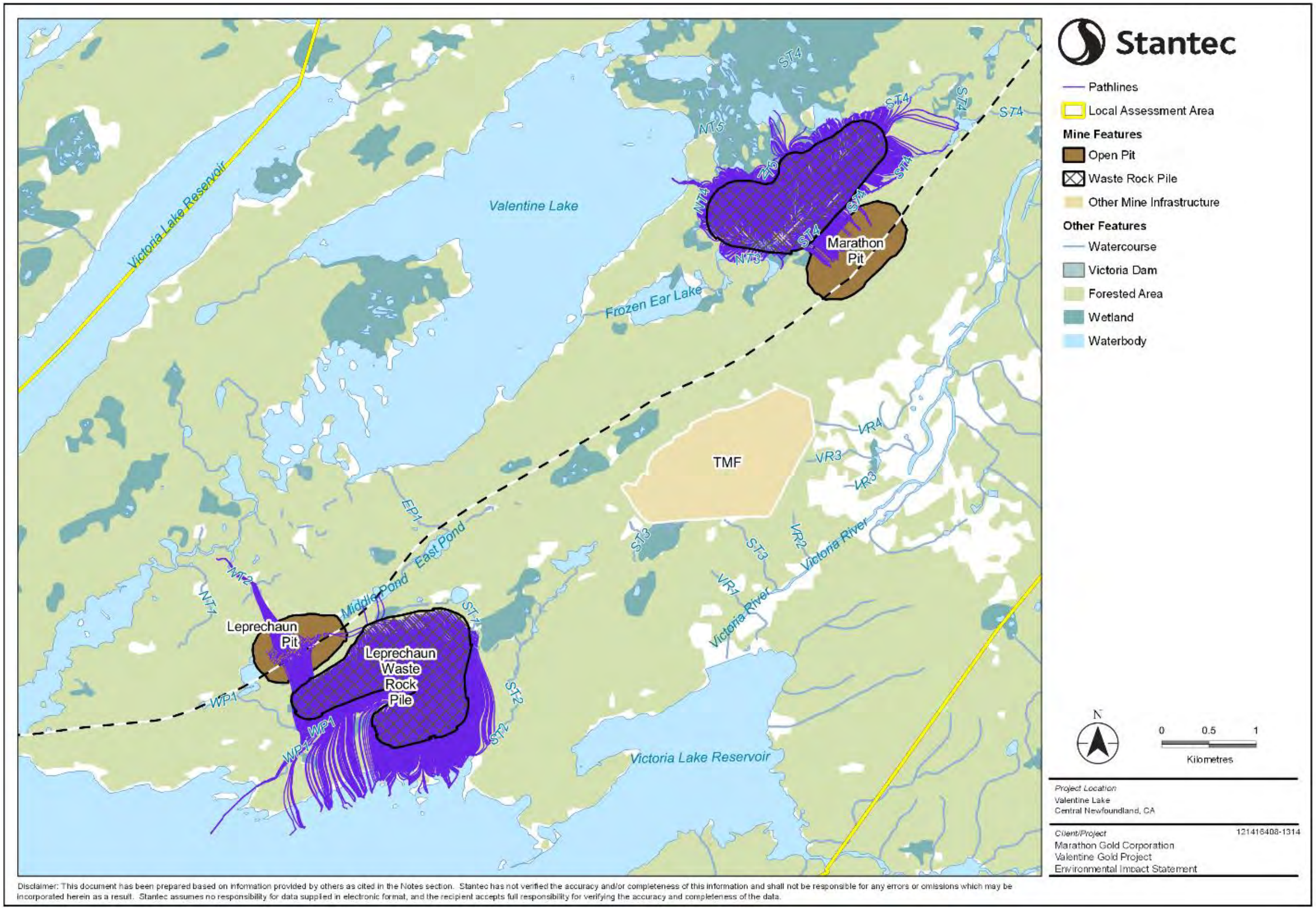


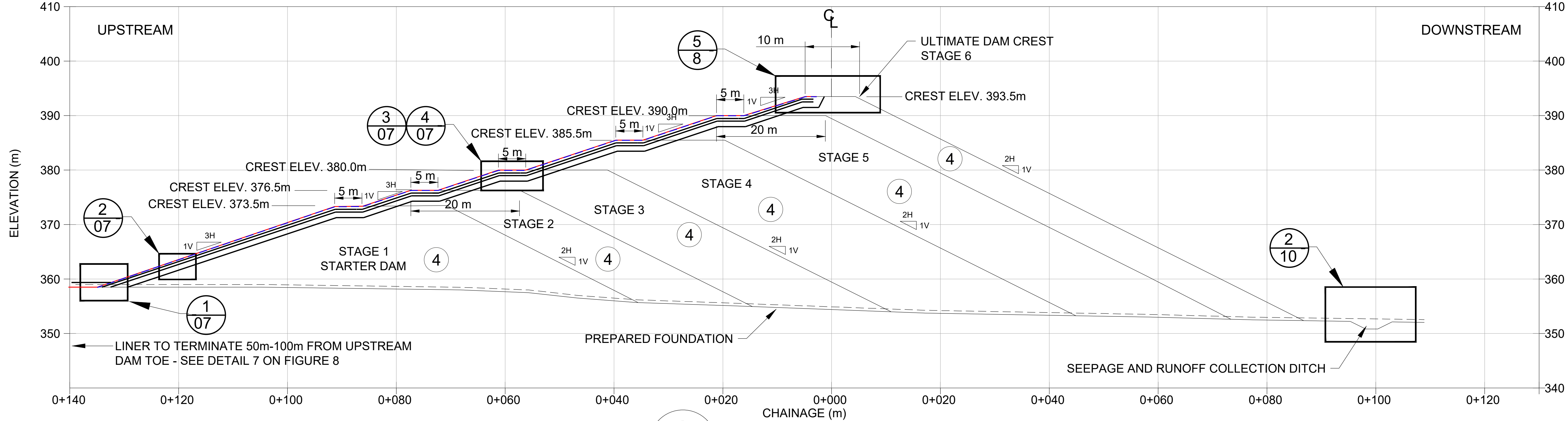
Figure ECC-20.2 Particle traces illustrating flow paths from Waste Rock Piles and LGO Stockpiles following closure with reduced permeability fault

RESPONSE TO ECC-21

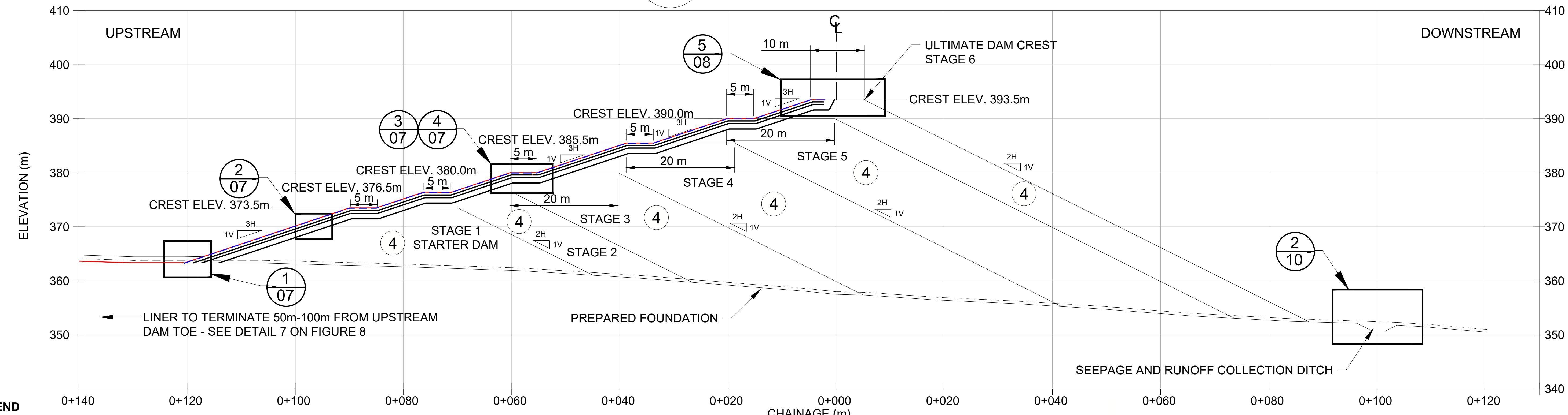
ID:	**ECC-21**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	Section 2.3.4.1, pg. 2.54 “Seepage and stability analyses were carried out as part of the design. Based on the model results, the dams are expected to be stable under the assumed loading and expected foundation conditions.”
Information Request:	This analysis is included in Appendix 2A. Limitations on this analysis are the use of assumed values for most parameters and the sensitivity analysis that indicates that dam stability may be affected by currently unknown dam foundation properties.
Response:	The dam design and stability assessment presented in the EIS considered the preliminary geotechnical data available using conservative geotechnical parameters. Additional geotechnical investigations were completed in 2020, which confirmed the results of the previous geotechnical work. The foundation of the tailings management facility (TMF) is competent, comprising compact to very dense silty sand to sandy silt till underlain by bedrock. An update to the slope stability analyses has been carried out as part of the most recent TMF dam design. The shear strength of the foundation has been selected based on in-situ testing results. The Factors of Safety for slope stability under the various applicable loading conditions were calculated and satisfy the minimum targets set out in the Canadian Dam Association guidelines.
Appendix:	None

RESPONSE TO ECC-22

ID:	**ECC-22**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	Section 2.3.4.1, pg. 2.58 "A geomembrane liner will be incorporated into the upstream slope of the embankment to retain water within the impoundment."
Information Request:	Will the liner extend the entire 3km length of the dam? Figure 2-44, pg. 2.106 A 1 m thick coarse filter zone is indicated along the upstream embankment face of the tailings dam immediately beneath the sand bedding/liner. Will this filter layer extend to the downstream toe of the dam? The drawing cuts this off.
Response:	The upstream slope face of the dam at all stages is lined with Linear Low Density Polyethylene (LLDPE) geomembrane along the entire dam alignment (length). Furthermore, the geomembrane will be extended as a blanket along the foundation 50 to 100 m upstream of the dam toe as a seepage mitigation measure. This will improve dam safety by increasing the seepage pathway length and reducing the critical gradients at the dam toe. The filter zone extends to the crest of the ultimate dam (stage 6), not along the downstream face of the dam, as it is only required for the placement of the liner system. See figures ECC-22.1 to ECC-22.3 illustrating the dam design details.
Appendix:	None



SCALE 1:750 m **A** 03 TYPICAL SECTION A - A'



SCALE 1:750 m **B** 03 TYPICAL SECTION B - B'

LEGEND

- - - - ORIGINAL GROUND

CONSTRUCTION MATERIALS

1. FILTER / BEDDING SAND - 25mm MINUS
2. TRANSITION SAND AND GRAVEL - 75mm MINUS
3. SELECT ROCK FILL - 450mm MINUS
4. ROCK FILL - 900mm MINUS
5. ROAD SURFACING

—— LLDPE GEOMEMBRANE - 80mil DOUBLE SIDED TEXTURED

- - - NON-WOVEN GEOTEXTILE (TERRAFIX 600R OR EQUIV.)

CLIENT: MARATHON GOLD

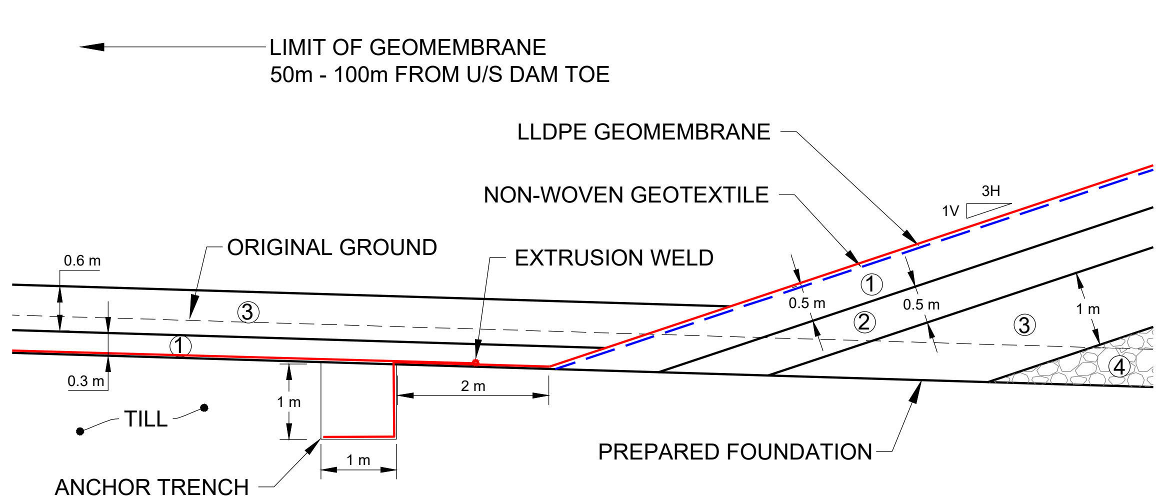
CONSULTANT: GOLDER MEMBER OF WSP

YYYY-MM-DD	2021-05-05
DESIGNED	GK
PREPARED	TDR
REVIEWED	MAS
APPROVED	WPM

PROJECT: VALENTINE GOLD PROJECT - NEWFOUNDLAND

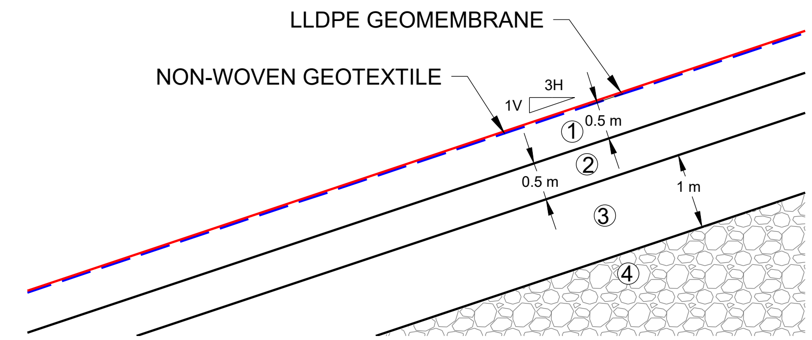
TITLE: **TMF DAM TYPICAL SECTIONS**

PROJECT NO.	CONTROL	REV.	FIGURE
20350991	0001	0	ECC-22.1



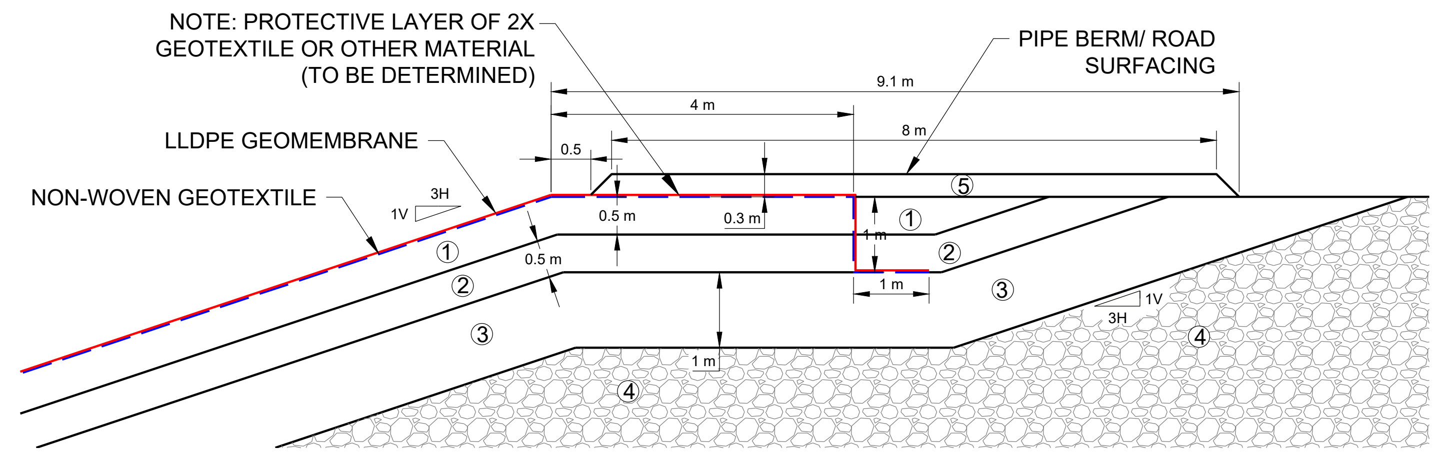
DETAIL 1 - UPSTREAM TOE ANCHOR TRENCH

0 2.5 5
1:100 METRES



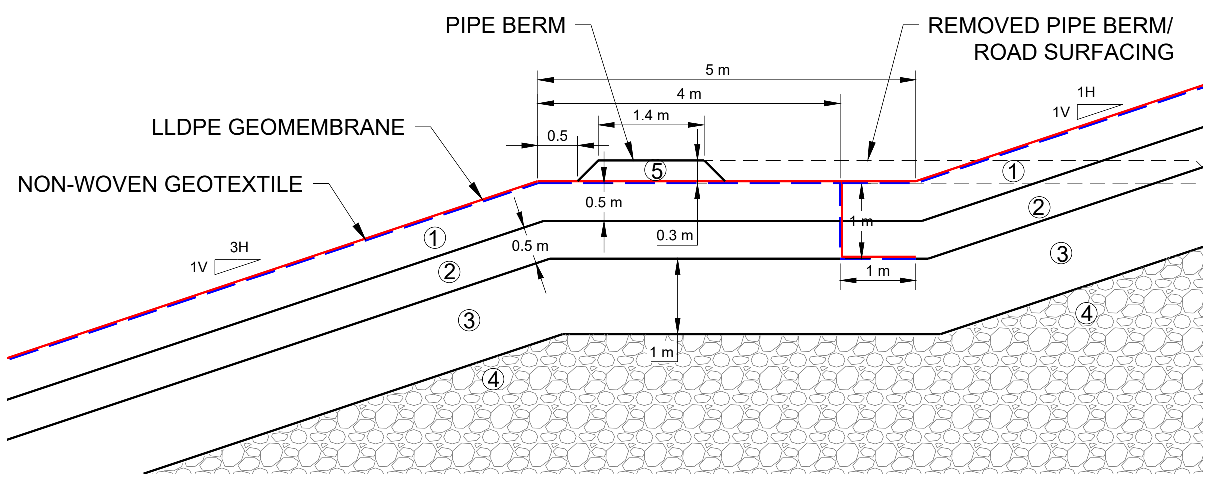
DETAIL 2 - UPSTREAM DAM SLOPE CONSTRUCTION

0 2.5 5
1:100 METRES



DETAIL 4 - INTERMEDIATE STAGE DAM CREST AND LINER ANCHOR CONFIGURATION

0 2.5 5
1:100 METRES



DETAIL 3 - INTERMEDIATE BENCH CONFIGURATION

0 2.5 5
1:100 METRES

LEGEND

- - - ORIGINAL GROUND

CONSTRUCTION MATERIALS

1. FILTER / BEDDING SAND - 25mm MINUS
2. TRANSITION SAND AND GRAVEL - 75mm MINUS
3. SELECT ROCK FILL - 450mm MINUS
4. ROCK FILL - 900mm MINUS
5. ROAD SURFACING

(red line) LLDPE GEOMEMBRANE - 80mil DOUBLE SIDED TEXTURED

(blue dashed line) NON-WOVEN GEOTEXTILE (TERRAFiX 600R OR EQUIV.)

CLIENT
MARATHON GOLD

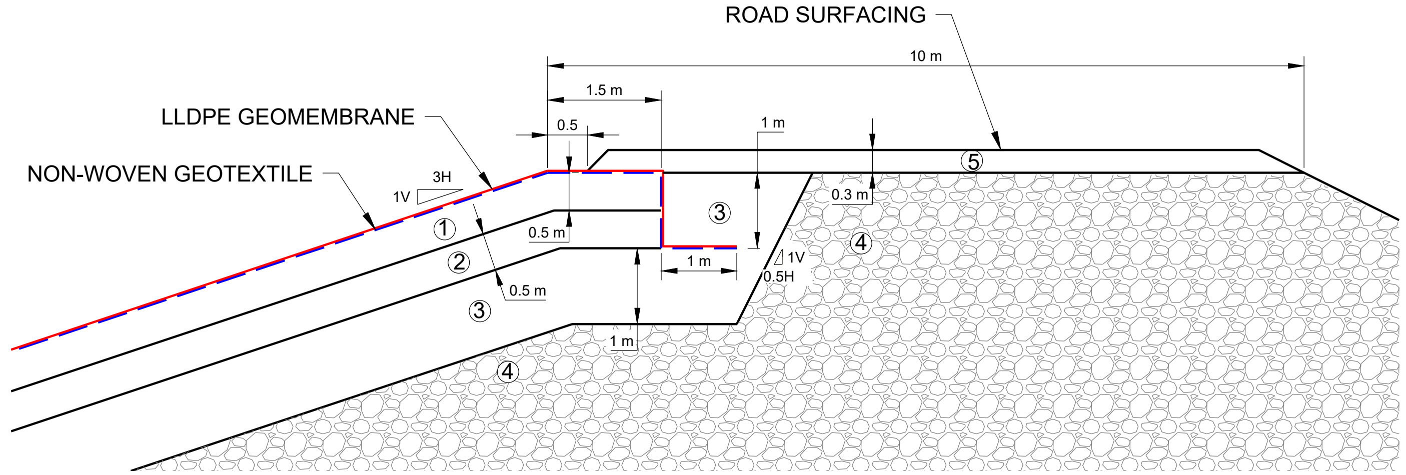
CONSULTANT
GOLDER MEMBER OF WSP

YYYY-MM-DD	2021-05-05
DESIGNED	GK
PREPARED	TDR
REVIEWED	MS
APPROVED	WPM

PROJECT
VALENTINE GOLD PROJECT - NEWFOUNDLAND

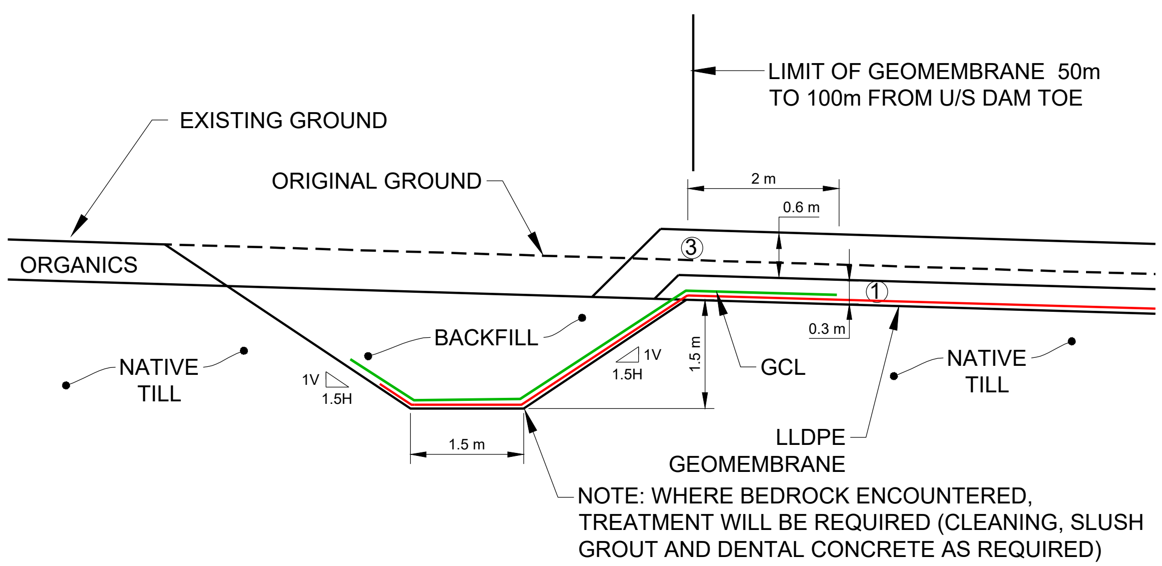
TITLE
TYPICAL DETAILS - 1 OF 2

PROJECT NO.	CONTROL	REV.	FIGURE
20350991	0001	0	ECC-22.2



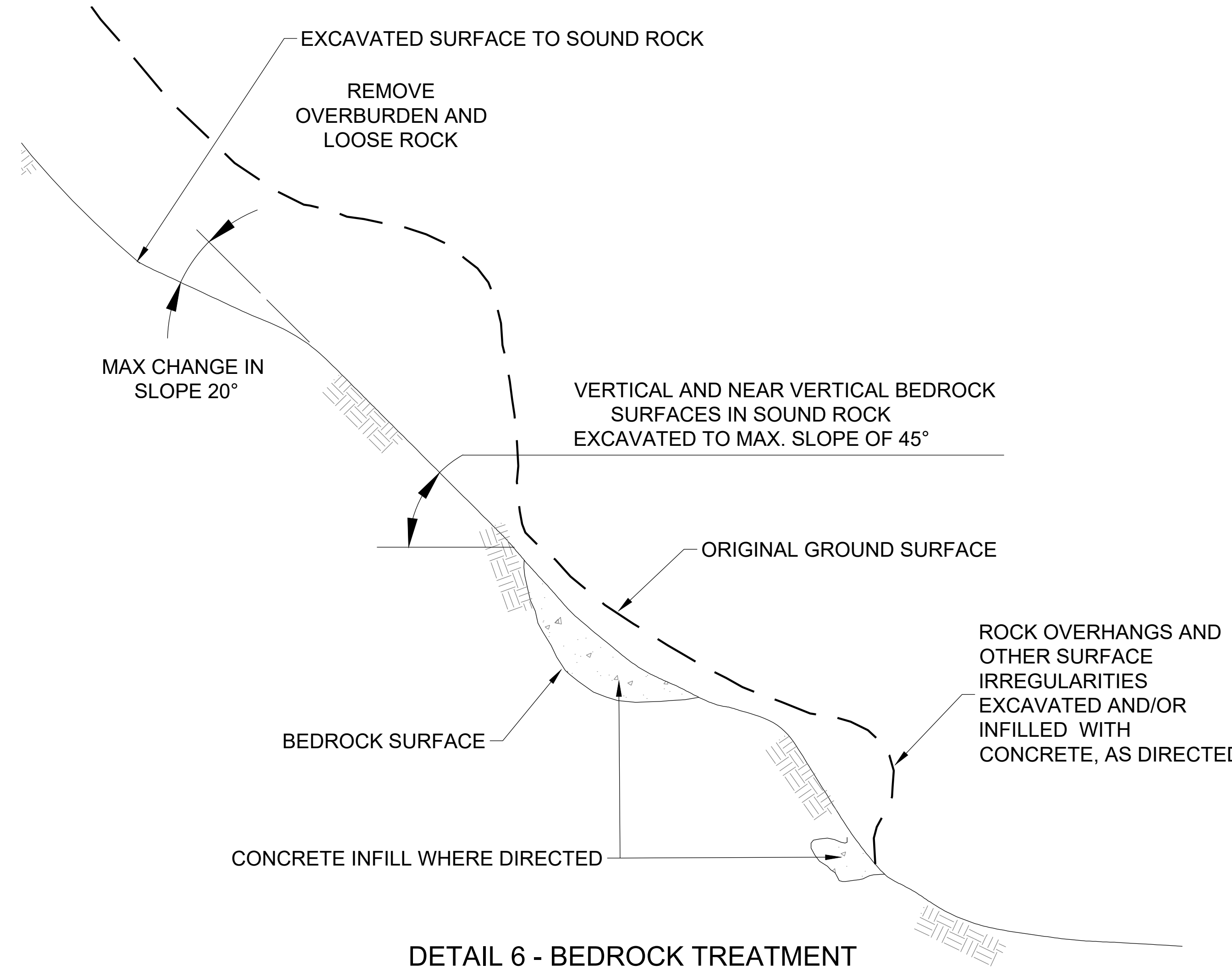
DETAIL 5 - ULTIMATE DAM CREST AND LINER ANCHOR CONFIGURATION

0 2.5 5
1:100 METRES



DETAIL 7 - LINER TERMINATION / KEY TRENCH EXCAVATION

0 2.5 5
1:100 METRES



DETAIL 6 - BEDROCK TREATMENT

0 2.5 5
1:100 METRES

LEGEND

- - - - ORIGINAL GROUND

CONSTRUCTION MATERIALS

① FILTER / BEDDING SAND - 25mm MINUS

② TRANSITION SAND AND GRAVEL - 75mm MINUS

③ SELECT ROCK FILL - 450mm MINUS

④ ROCK FILL - 900mm MINUS

⑤ ROAD SURFACING

LLDPE GEOEBRANE - 80mil DOUBLE SIDED TEXTURED

NON-WOVEN GEOTEXTILE (TERRAFIX 600R OR EQUIV.)

GEOSYNTHETIC CLAY LINER (GCL)

CLIENT	MARATHON GOLD
CONSULTANT	GOLDER MEMBER OF WSP
YYYY-MM-DD	2021-05-05
DESIGNED	GK
PREPARED	TDR
REVIEWED	MS
APPROVED	WPM

PROJECT
VALENTINE GOLD PROJECT - NEWFOUNDLAND

TITLE
TYPICAL DETAILS - 2 OF 2

PROJECT NO.	CONTROL	REV.	FIGURE
20350991	0001	0	ECC-22.3

RESPONSE TO ECC-23

ID:	**ECC-23**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	BSA1, Attachment 1-A, pg. 12 "For the current study, the effective water storage was increased by 20% to account for tailings flow as slurry." "The breach bottom under the fair-weather and PMF conditions was predicted as 1.7 and 2.7 m below the pond bottom, respectively (Schematic 2)."
Information Request:	Where did this 20% value come from? Where did the 1.7 and 2.7 m values come from? Could more tailings end up being released from the TMA during a breach? A volume of tailing equivalent to 20% of the volume of the pond water being released during a breach does not seem like a lot, although the report says this is a "conservative estimate". Is the tailings slope likely to be maintained under the tailings pond? There is a lack of information on the characteristics and behavior of the tailings and how they might behave during a breach scenario.
Response:	The Dam Breach Assessment (DBA) has been updated for the latest tailings management facility (TMF) design. The TMF pond is no longer in direct contact with the dam under normal operating conditions. Therefore, the values reported previously (1.7 m and 2.7 m) no longer apply. At location A (Figure ECC-17.1), there is the potential for water and tailings release under a dam breach. The 20% is an estimate of the eroded tailings released with the pond water (Case 1A -CDA 2020). It is also credible that tailings runout will follow the initial release of water from the TMF pond, consequently breaching the TMF dam to its base (CASE 2A in CDA 2020). In addition, in locations where a water release is not feasible (Locations B and C in Figure ECC-17.1), tailings-only release is also possible in the event of a breach. The estimated tailings release was calculated based on geometry. A post failure slope from the dam base equal to 6% within the TMF (corresponding to the average post liquified residual angles [CDA 2020]) was adopted. The width of the breach control section (breach entrance) was taken as three times the dam height at that location. The resulting tailings release parameters and volumes for the breach locations assessed are shown in Table ECC-23.1.

ID:	**ECC-23**
	Reference Canadian Dam Association (CDA). 2020. Technical Bulletin: Guidelines for Tailings Dam Breach Analyses, 2020 (under review).
Appendix:	None

Table ECC-23.1: Tailings Runout Dam Breach Parameters – Locations A, B C

Dam / Breach Parameter	Location A	Location B	Location C
Breach Failure Mechanism	Piping (flood scenarios) or Slope Instability (fair-weather scenario)	Slope Instability	Slope Instability
Tailings Elevation Against the Dam (masl)	389.9	390.5	404.5
Estimate of Volume of Tailings Released[2] (Mm^3)	3.83	6.20	1.05
Final Bottom Breach Width (m)	105	122[1]	57[1]
Final Top Width of Breach (m)	175	203	95
Bottom Elevation of Breach (masl)	358.5	353.0	386.6
Foundation Elevation (masl)	358.5	353.0	386.6
Ultimate Breach Height (m)	35	40.5	18.9
Final Breach Side Slope[3] (H:1V)	1	1	1

Notes:

1) Assumed as three times breach height.

2) Hydrograph characteristics not estimated as flow properties of liquefiable tailings are characterised as mudflow.

3) Assumed.

RESPONSE TO ECC-24

ID:	**ECC-24**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	BSA1, Attachment 1-A, pg. 12, pg. 18 "24-hr Probable Maximum Precipitation (PMP) depth used for the Stephenville Environment and Climate Change Canada (ECCC) meteorological station (ID: 8403800) is 309 mm (Golder 2020b)" Table 6 indicates a PMP value from 1985 (Hogg & Carr).
Information Request:	This PMP value is outdated and low. It should be up in the 370 mm range according to more recent data from ECCC. Also, this is for Stephenville. How applicable is climate data/PMP from Stephenville for this location?
Response:	An assessment of the available meteorological data, including the proximity of each station to the Project Area and the quality of data available from each meteorological station, is presented in the response to ECCC-06. Based on the available meteorological data, in consideration of the advancement of the engineering design for the tailings management facility (TMF), and to provide a more conservative assessment of potential effects from the Project, the most conservative values, from the stations in the region, for the long-term design precipitation events will be utilized in updating the Dam Breach Assessment (DBA) as further described below. For final engineering design, alternate Probable Maximum Precipitation (PMP) values may be considered, if further collection and assessment of meteorological data indicate these are warranted. These would be included in the final design information submitted for regulatory review and approval via the detailed permitting process. The PMP value only affects the sizing of the emergency spillway for "Very High" consequence category dams and is used in the DBA. In selection of the PMP value, the Buchans meteorological station (ID 8400698) provides the most conservative data, with a PMP depth of 450 mm. The DBA has been updated based on the revised TMF design, as well as the Buchans station PMP value. It is important to note that the DBA will continue to be updated as the detailed engineering for the TMF and associated infrastructure is advanced.
Appendix:	None

RESPONSE TO ECC-25

ID:	**ECC-25**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	BSA1, Attachment 1-A, pg. 12, pg. 18"downstream flow paths were prorated based on the unit flow rate for the Great Rattling Brook above Tote River Confluence Water Survey of Canada (WSC) hydrometric station (ID: 02YO010) for the month of August (0.008 $m^3/s/km^2$), as presented in the 2020 hydrology baseline report (Stantec 2020)".
Information Request:	Why was the Great Rattling Brook above Tote River Confluence station used? It is 128 km to the NE of the site. Why not use LLOYDS RIVER BELOW KING GEORGE IV LAKE 02YN002 as it is only 55 km away and is in the neighbouring watershed to the west?
Response:	Based on a detailed technical review of the regional hydrometric stations (see ECC-48), although the Lloyd's River station is closer, it is not part of the northeast (NE) hydrological region. The Lloyds River station unit flows fall outside the standard deviation range of NE Regional unit flows and was therefore not included in the regional hydrological dataset. Great Rattling River is included in the NE hydrological region and was considered a more suitable station for the assessment.
Appendix:	None

RESPONSE TO ECC-26

ID:	ECC-26
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	BSA1, Attachment 1-A, pg. 19 "high-level calibration of a hydrologic input parameter representing precipitation losses was performed for the 24-hr 100-year storm event hydrographs. This input parameter was adjusted by matching the computed 100-year peak flow to an estimate derived from the regional regression equation defined in the 2020 baseline hydrology report (Stantec, 2020) for the North East hydrologic region of Newfoundland."
Information Request:	The hydrologic model was calibrated using modeled data, which can compound errors.
Response:	Unfortunately, long-term monitoring data is not available on the Victoria River and therefore, extreme flow events cannot be determined based on the actual flow regime of the river. Given the lack of flow monitoring data on the Victoria River, the established inflow design flood values were used instead. An extensive review of the available Water Survey of Canada stations was completed in determining the regional regression equations. In addition, given that the Dam Breach Assessment looks at incremental impacts, it is the relative difference between the breach flows and the non-breach flows that are critical, not the magnitude.
Appendix:	None

RESPONSE TO ECC-27

ID:	**ECC-27**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	-
Information Request:	LIDAR should also be flown, or talk to Nalcor to see if they have LIDAR, of the Victoria River to Red Indian Lake.
Response:	Marathon is reviewing the availability of mapping and topographical information to supplement the provincial mapping used for the Dam Breach Assessment (DBA). Any new mapping information/data that is obtained will be utilized in subsequent updates to the DBA for detailed engineering/permitting. The objective is to improve the accuracy of the mapping, and this additional accuracy will not change the effects analysis presented in the EIS. While more accurate topography would alter the base and breach inundation extents, it is unlikely to alter the hazard classification, which is based on the incremental impacts of a dam breach. Improved topography would improve the accuracy in the extent of the inundation areas modelled, however because these areas are not located near areas of concern (i.e., inhabited areas or crossings), these improvements would have no effect on the conclusions of the EIS for the Dam Safety Valued Component.
Appendix:	None

RESPONSE TO ECC-28

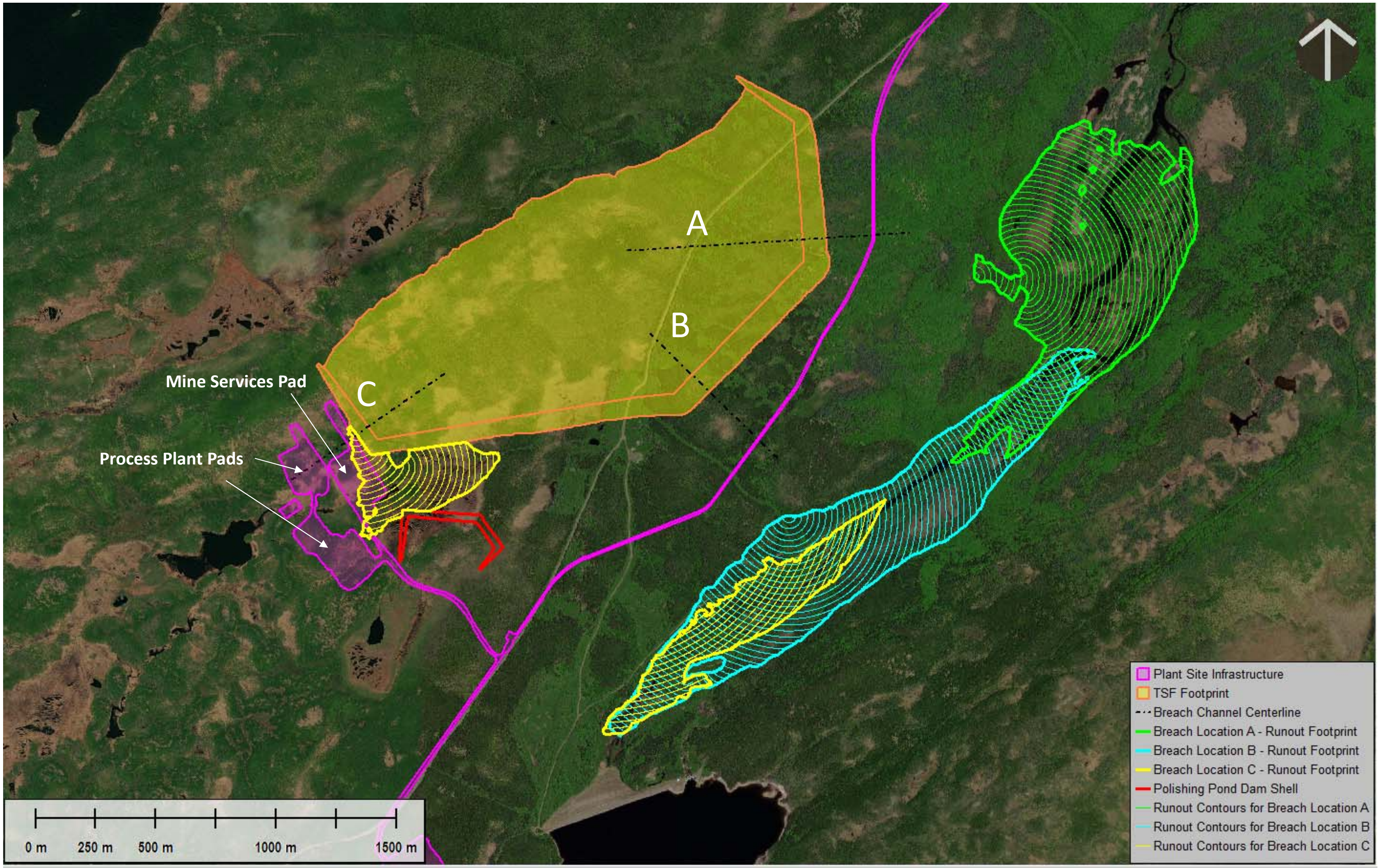
ID:	**ECC-28**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	-
Information Request:	Does Nalcor agree with this assessment? Nalcor has seepage weirs and other infrastructure (drains) located at the toe of the Victoria Dam. Would any of this be impacted? The work done in the EIS indicates that there will be impact to the Victoria Dam from a tailings dam breach, but does not establish whether this impact will be adverse or not. Stating that there would be no adverse impact is not the same as showing modelling results that prove there is no impact. The only way to establish no impact is to do a stability analysis of the Victoria dam under these impact conditions, which has not been done. This must be looked at in order to determine the safety of the Victoria dam. There are 3 ways to get this done: 1) the dam owner (Nalcor) takes this information and has the Victoria dam analyzed, 2) Marathon covers the cost for Nalcor to get this work done, 3) Nalcor shares sufficient information on the Victoria dam so that Marathon can conduct this analysis.
Response:	Some relatively minor adjustments made to the tailings management facility design, including realignment of the central area of the dam have resulted in improvements in the results of the Dam Breach Assessment (DBA), as fully described in the response to ECC-23. The upstream flow (or backwater effect) of a dam breach does not extend as far as predicted in the DBA submitted with the EIS and terminates approximately 500 m downstream of the toe of the Victoria Dam. The updated design information and DBA report have been provided to NL Hydro for review, and it is not expected that further analysis of the Victoria Dam will be required as a result.
Appendix:	None

RESPONSE TO ECC-29

ID:	**ECC-29**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	BSA1, Attachment 1-A, pg. 25 "The volume of tailings mobilized due to liquefaction and erosion for a hypothetical breach of the western portion of the TMF and which does not contain a supernatant pond (i.e., CASE 2A in ICOLD, 2019)."
Information Request:	There are repeated references to ICOLD, 2019, but the reference is not included in the list of references at the end of the report. This should be added.
Response:	The ICOLD (2019) reference is as follows: International Commission on Large Dams (ICOLD). 2019. Technical Paper: CDA Technical Bulletin on Tailings Dam Breach Analyses. The Dam Breach Assessment has been updated and all references included. However, in the updated assessment, ICOLD (2019) has been replaced with the recently released Canadian Dam Association (CDA 2020): Canadian Dam Association (CDA). 2020. Technical Bulletin: Guidelines for Tailings Dam Breach Analyses, 2020 (under review).
Appendix:	None

RESPONSE TO ECC-30

ID:	**ECC-30**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	BSA1, Attachment 1-A, pg. 26 “A relocation of the Process Plant 200 m southwest or 500 m northwest could prevent it from being inundated…” “The depth of tailings at the toe of the TMF’s South Dam is approximately 0.5 m. Given the slope and gross width of the rockfill dam, the net effect of any scour in the vicinity as tailings are deposited is expected to be minor. Consequently, the rockfill dam shell is unlikely to be affected.”
Information Request:	Has relocation of the Process Plant been looked at? The effect of the scour from the tailings release on the South Dam should be properly analysed.
Response:	It is important to note that a dam breach at Location C (the southwest end of the tailings management facility [TMF]) has a substantially lower potential of occurrence than any other location along the tailings impoundment dam due to no water ponding at this location, and a lower dam height. As with any Dam Breach Assessment (DBA), a failure must be assumed and in this case the failure mode is strictly geotechnical, rather than water-related (flooding causing overtopping, piping, etc.). Marathon is continuing to assess the potential impact of the dam breach at the southwest end of the tailings impoundment. The updated DBA (refer to ECC-23), which includes the latest process plant area arrangement, shows that the tailings inundation does not reach the process plant pad, however, it does inundate a portion of the mine services pad (see Figure ECC-30.1). Marathon will consider options to reduce or eliminate this potential (e.g., raising the elevation of the mine services pad to prevent inundation) and/or use of dam instrumentation to warn of a potential failure as geotechnical failures can be progressive, and movements can be detected prior to large-scale failure. The scour potential along the southern extent of the TMF dam is not considered critical as the velocity of moving tailings without additional water (from the tailings pond) will be relatively slow. Marathon will continue to assess this issue as the TMF design advances. If scour along the toe is of potential concern, the best solution is expected to be placement of large diameter waste rock blocks to prevent scour along the toe.
Appendix:	None



CLIENT MARATHON GOLD CORPORATION	PROJECT DAM BREACH ASSESSMENT AND INUNDATION STUDY RESPONSE TO ECCM-32

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-04-23
PREPARED	MAR
DESIGNED	MAR
REVIEWED	AC
APPROVED	PM

TITLE
TAILIGS RUNOOUT EXTENTS

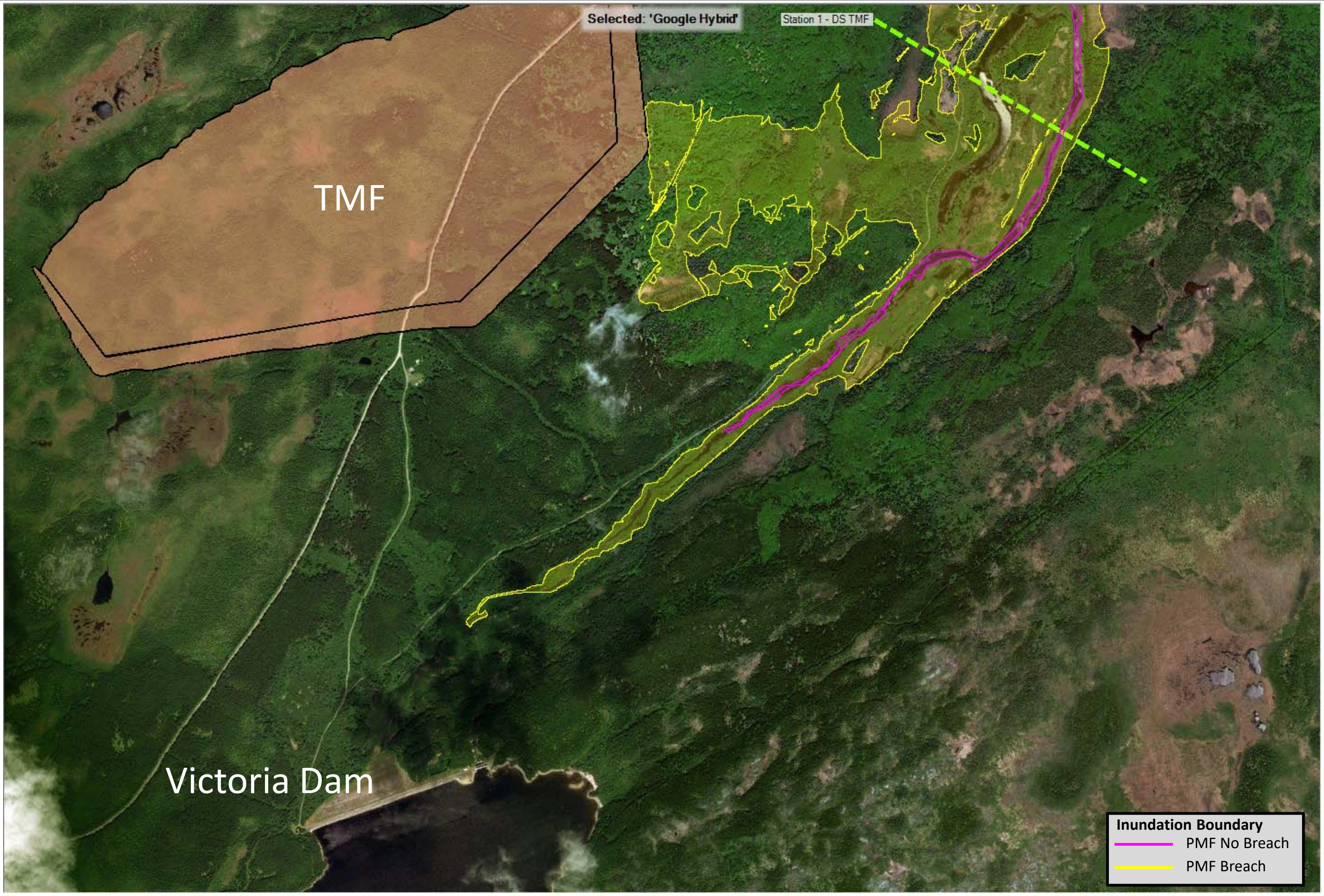
PROJECT NO.	REV.	FIGURE
20141194	B	ECC-30.1

RESPONSE TO ECC-31

ID:	**ECC-31**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	BSA1, Attachment 1-A, pg. 29
Context and Rationale:	-
Information Request:	Will the recommendations of Section 8 be acted upon?
Response:	Marathon has commenced actions on these recommendations where possible, and intends to follow the recommendations as follows: • See response to ECC-27. • Marathon will review flow monitoring in the Victoria River in consultation with NL Hydro and with the Newfoundland and Labrador Department of Environment and Climate Change with respect to the Real Time Water Quality Monitoring program that will be implemented for the Project. • Marathon's engineering team and consultants are reviewing the location of the process plant area and the potential effects of a dam breach at the west end of the tailings management facility, including the risk to personnel, assets, and Victoria Lake Reservoir. Mitigations to reduce risk to personnel will be reviewed and incorporated into the detailed engineering phase. • A comprehensive emergency preparedness and notification plan will be developed as is required under regulatory requirements, including the Canadian Dam Association Guidelines, which are the standard requirements at the provincial level.
Appendix:	None

RESPONSE TO ECC-32

ID:	**ECC-32**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	-
Information Request:	BSA1, Attachment 1-A, pg. 38 In Figure 5, the flow path for the South Dam does not show the flow going upstream towards the toe of the Victoria dam as discussed in the sections of the preceding report.
Response:	Based on the current tailings management facility (TMF) design and operation, the peak water and tailings discharge from the TMF under a breach is now at Location A. The impacts of the Location A breach in the Victoria Dam area are shown in Figure ECC-32.1.
Appendix:	None



CLIENT
MARATHON GOLD CORPORATION

PROJECT
DAM BREACH ASSESSMENT AND INUNDATION STUDY
RESPONSE TO IR63

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-04-23
PREPARED	MAR
DESIGNED	MAR
REVIEWED	AC
APPROVED	PM

TITLE
INUNDATION AREA OF SIMULATED PMF BREACH AND NO BREACH SCENARIOS – AREA OF VICTORIA DAM

PROJECT NO.	REV.	FIGURE
20141194	B	ECC-32.1

RESPONSE TO ECC-33

ID:	**ECC-33**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	-
Information Request:	BSA1, Attachment 1-A, Figure 17, 19, 21 How come there is no incremental difference area indicated between the tailings dam and Station 1 on this figure? Is there no flow over the emergency spillway on the tailings dam during PMF no breach scenario?
Response:	The Victoria Dam spillway design flow was not readily available at the time of the assessment. Therefore, for conservative reasons, ‘no flow’ was assumed from the tailings facility or the Victoria Dam under the non-breach scenario. Because the consequence classification is based on the incremental impacts, this results in a more conservative assessment.
Appendix:	None

RESPONSE TO ECC-34

ID:	**ECC-34**
Expert Department or Group:	Department of Environment and Climate Change - Water Resources Management Division
Guideline Reference:	Section 4.2.1.3- Water Resources
EIS Reference:	BSA1, Attachment 1-B, pg. 18
Context and Rationale:	The following recommendations were made in BSA1, Attachment 1-B, pg. 18: • Retain an aquatic toxicologist to assess potential for acute toxicity in TMF water among those constituents for which no acute CCME criteria exists, and specifically those constituents estimated to occur at two orders of magnitude above the CCME criteria (i.e. cobalt and copper). • Conduct investigation of water depths in Red Indian Lake (within the perimeter of the assuming mixing zone) to refine estimates of the mixing zone volume. The primary objective should be to confirm the average depth exceeds the 5 m assumed value used herein to determine that the estimates are conservative and that no additional COPCs should be identified. • While a bathymetric survey to determine actual basin volume may support a reduction in estimated concentrations of copper in the assumed mixing zone; copper is anticipated to continue to exceed CCME criteria due to elevated baseline concentrations for a portion of Red Indian Lake. A hydrodynamic modelling study supported by additional field measurements would be needed to estimate the actual extents of the mixing zone in Red Indian Lake.
Information Request:	Will the recommendations of Section 6 be acted upon?
Response:	The effects of a tailings management facility (TMF) dam breach on fish and fish habitat were assessed in Section 21.5.1 of the EIS. The primary effect pathways were identified as changes in water and sediment quality, sediment deposition and increased turbidity. Fish and benthic invertebrate communities may experience injury or mortality from smothering or lethal toxicity from impounded water and suspended tailings. These effects could extend downstream of the dam breach along Victoria River to Red Indian Lake, depending on the dam breach scenario. Fish and benthic invertebrate communities may also experience chronic toxicological effects from the uptake of contaminants from sediments given they live in and on the sediment. If a TMF dam breach were to occur during spawning, sediment deposition could also smother fish eggs, as well as potentially alter physical substrate characteristics such that substrates are no longer suitable for

ID:	ECC-34
	spawning. Benthic and aquatic plant communities may be lost which may take a long time to recover or require rehabilitation of disturbed areas. The modelled dam breach conditions are considered to be reversible over a relatively short period of time once inundated areas drain to ambient water levels. When considering the flood-induced dam breach scenario in particular, substantial assimilative capacity will exist in the receiving environment and the parameters of potential concern with concentrations above chronic criteria will be rapidly conveyed downstream through the Victoria River to Red Indian Lake. Given the above and depending on the magnitude and location of the release, a TMF dam breach has the potential to affect the productivity of fish and fish habitat; however, populations would eventually return to pre-breach levels (i.e., in decades). The residual adverse effects on fish and fish habitat were therefore predicted to be of high magnitude, long-term and reversible. As indicated in response to ECC-23, the design of the TMF has been refined, which requires updating of the dam breach assessment and associated assimilative capacity study. When the latter study is completed, the updated results will be reviewed with respect to acute toxicity and potential effects on fish and fish habitat. It is considered unlikely, however, that this updated study and review will affect the assessment results provided in the EIS and the predicted residual effects on fish and fish habitat will continue to be high magnitude, long-term and reversible. Following identification of additional data sources which reduce uncertainty associated with the assumed mixing zone volume, Golder has re-evaluated the remaining recommendations (in Baseline Study Appendix 1, Attachment 1-B, pg. 18) for a bathymetric survey and hydrodynamic modelling. Golder has since referred to local topography and coarse bathymetric mapping presented in Environment Canada (1977), which indicates maximum water depths within the mixing zone of greater than 300 feet (91 m), with most of the mixing zone having a minimum water depth of at least 50 feet (15 m) and a typical thermocline depth of 40 m. Golder has indicated that, based on this information, it is reasonable to expect that the actual average depth is substantially greater than 5 m, thereby resulting in a greater mixing zone volume and reduced concentrations in Red Indian Lake than those predicted. Further, hydrometric data reported at station 02YO016 (ECCC, 2021) indicates that among monthly flow data from 2007 through 2019, the lowest monthly mean discharge from Red Indian Lake occurs in November and was 93.3 m^3/s during this period, or approximately 240,000,000 m^3/month,

ID:	**ECC-34**
	a volume which is two-orders of magnitude greater than the maximum breach volume and represents a continuous flow through the mixing zone. Therefore, based on potential effects to Red Indian Lake of relatively short-duration concentrations greater than chronic aquatic life guidelines, Golder has indicated that the assumptions are sufficiently conservative to estimate the maximum possible water quality effects in Red Indian Lake, and the potential effects to Red Indian Lake evaluated within the scope of the assimilative capacity assessment are of sufficiently low risk that refining the mixing zone volume is no longer recommended. References: Environment Canada. 1977. Limnology and Fish Populations of Red Indian Lake, a Multi-Use Reservoir. Technical Report No. 691. Fisheries and Marine Service. St. John's, NL. ECCC. 2021. Historical Hydrometric Data. Government of Canada (GOC). Accessed 05 April 2021. Available at: https://wateroffice.ec.gc.ca/mainmenu/historical_data_index_e.html
Appendix:	None

RESPONSE TO ECC-35

ID:	**ECC-35**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	BSA1, Attachment 1-B, Section 6 This statement is made in Attachment 1-A: "Environmental consequences from the breach failures of the TMF East, South and West Dams are assessed as part of the Assimilative Capacity study for this Project (Golder 2020c). The Assimilative Capacity assessment determined environmental effects related to water chemistry are moderate and alone would only correspond to a SIGNIFICANT classification. However, while not assessed directly in either assessments, environmental effects related to habitat destruction as a result of erosion and tailings deposition are assumed to correspond to a HIGH dam classification. A VERY HIGH dam classification is not selected as the affected habitat is not considered "critical" habitat."
Information Request:	Why isn't this statement made in Attachment 1-B. The whole point of the assimilative capacity study was to arrive at this conclusion.
Response:	The purpose of the assimilative capacity assessment was to determine the water quality impacts resulting from a breach. Based on the results of the assessment, short-duration concentrations of up to thirteen constituents may temporarily exceed the Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life at one or more locations in Victoria River. The modeled conditions are considered to be temporary over a relatively short period of time until all inundated areas have drained to ambient water levels. The environmental impacts of tailings deposition (resulting from a breach), which also needs to consider remediation potential and methods, were not considered in the assimilative capacity assessment but were assessed in Chapter 21 of the EIS. As discussed in Section 21.5.1.3, Marathon will mitigate a tailings management facility (TMF) dam failure by stopping pumping of tailings to the TMF, engaging the *Metal and Diamond Mining Effluent Regulations* tailings / effluent emergency response plan, and initiating deployment of 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, and deploy turbidity curtains and/or other similar mitigation within affected watercourses until remedial actions are implemented. As also discussed in Section 21.5.1.3 of the EIS, in the

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	event of a TMF failure, Marathon will subsequently develop a specific remedial action and monitoring plan for the event, and initiate remedial action, such as deploying earthworks equipment to reduce further damage to the dam and stabilizing escaped tailings to the extent feasible, establishing additional containment as needed around the inundation area, and deploying turbidity curtains and/or other similar mitigation within affected watercourses. In the event of a dam breach, it is anticipated that a risk assessment and investigation will be completed to map the extent and thickness of the tailings runout, and a remediation plan would be developed. This strategy was successfully executed following the Mount Polley dam failure in British Columbia (Golder 2019). It is anticipated that an accidental release of tailings would cause an outwash fan or delta of tailings and dam construction material between the dam and the Victoria River as discussed in BSA 1, Attachment 1-A, but is not predicted to reach the Victoria River. Based on the Dam Breach Assessment (DBA) as presented in the EIS, tailings suspended in the release of ponded water would reach the Victoria River and be deposited in the river and lakebed of Red Indian Lake. It is anticipated that the tailings would run out primarily to the Victoria River valley, with some finer silt / clay sized tailings particles remaining in suspension eventually reaching Red Indian Lake and deposited on the lakebed. Excavators would be effective at recovering sand / silt tailings deposited in terrestrial habitats that are sufficiently thick to be recovered by excavator. These deposits would be removed and transported by truck back to a stable area of the TMF for storage. Remediation activities would likely also include bank stabilization and revegetation of riparian areas in Victoria River and other affected headwater streams draining into the Victoria River. Tailings that are thin and impractical to recover would remain in place, scarified and mixed with the native substrate to improve soil fertility. Areas may require additional imported soil and fertilizer to facilitate rehabilitation. Once soil conditions are amenable to seed germination and growth, vegetation will establish through natural ecological succession supported by planting efforts. Within the riverbed, the focus would be on remediating and rehabilitating the habitat within the river channel and stabilizing tailings in place. A two-phase approach would likely be adopted with the first phase focusing on repairing / constructing an erosion-resistant, physically stable channel, followed by a second phase focusing on re-establishing physical in-stream and riparian habitat along the channel to support a return of biological habitat function. A successful example of this approach was employed for the rehabilitation of Hazeltine Creek in BC following the Mount Polley

<table>
<tr><th>ID:</th><th>ECC-35</th></tr>
<tr><td></td><td>tailings dam failure (Bronso et al. 2016). Tailings that do not pose a physical risk would be left in place and regraded/contoured and remediated as noted above. New channel morphology and habitat would be designed and constructed within the riverbed for each affected reach. Erosion protection would be installed within the channel reaches first, followed by habitat construction, similar to the case examples provided (Golder 2019; Bronso et al. 2016). It is likely that a monitored natural recovery approach would be adopted for those tailings that travel down to Red Indian Lake and deposit below water on the lakebed, given the disruption that would occur through clean-up options such as dredging.

Monitoring will be required to support the successful implementation of the remediation and to verify that remedial objectives have been met. Remediation can be adapted to the data obtained from the post breach monitoring program.

As described in the response to ECC-23, updated DBA results have been completed incorporating several design refinements to the TMF. The additional information provided above does not affect the conclusions in the EIS. The assessment of a TMF failure in the EIS (Section 21.5.1) was based on a conservative and worst-case scenario approach, including the acknowledgement that it may not be feasible to completely clean up or remediate tailings following a TMF failure. The assessment therefore incorporates long-term and, in some cases, potentially irreversible effects, in consideration of areas where tailing solids cannot be remediated.

References:

Bronsro, A., J. Ogilvie, L. Nikl, and M.A. Adams. 2016. River Rehabilitation Following a Tailings Dam Embankment Breach and Debris Flow.

Golder Associates Ltd. 2019. Remediation Plan for the Mount Polley Mine Perimeter Embankment breach.</td></tr>
<tr><td>Appendix:</td><td>None</td></tr>
</table>

RESPONSE TO ECC-36

ID:	**ECC-36**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	BSA1, Attachment 1-C, pg. 5-6
Context and Rationale:	"For structures where no laboratory data or field tests exist to the susceptibility to vibrations, the threshold should be set at a maximum of 50 mm/s."
Information Request:	No, we recommend the minimum should be 25 mm/s.
Response:	Marathon will design and implement a Blasting Management and Monitoring Plan which will include design review, field vibration monitoring, and vibration thresholds for specific receptors including, but not limited to, the tailings management facility and Victoria Dam. 25 mm/s is a typical threshold used in Newfoundland and Labrador, and it is expected that 25 mm/s will be the maximum threshold set for blast design and monitoring.
Appendix:	None

RESPONSE TO ECC-37

ID:	**ECC-37**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	BSA1, Attachment 1-C, pg. 9-11
Context and Rationale:	"It is suggested that a monitoring program be developed and conducted to calibrate and refine the ground vibration models used in this study."
Information Request:	Will the recommendations of Section 6 & 7, particularly for monitoring, be acted upon?
Response:	Marathon will follow the recommendations provided by Golder in Section 6 and 7 of the Blast Impact Assessment (Baseline Study Appendix 1, Attachment 1-C), including vibration monitoring, calibration of ground vibration models used, subsequent review and revision of blast design, infrastructure design, and/or vibration thresholds, and review of monitoring data alongside pore pressure, settlement and lateral movement monitoring of the tailings management facility.
Appendix:	None

RESPONSE TO ECC-38

ID:	**ECC-38**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	Section 21.5.1.2, pg. 21.14 Section 7.4, pg. 7.80 "The 100-year, 24-hour event (75 mm of rain) was selected as the EDF, which is on top of the 25-year return period wet hydrological conditions (Golder 2020b)."
Information Request:	What is the source for this rainfall amount? This value is low even based on recent ECCC IDF curves for Stephenville. It should easily be over 100 mm.
Response:	The Environmental Design Flood (EDF) event has been reviewed and updated. The critical EDF storage requirement for each stage has been updated to be the larger of the 30-day, 100-year rainfall plus snowmelt event (occurring during the freshet) or the 7-day, 100-year rainfall event (during the non-winter months). For each stage of deposition and dam raising, the 7-day, 100-year rainfall occurring over the maximum operating water level was found to be the critical EDF event (190 mm over 7 days). Data from the Buchans meteorological station was used. Refer to the response to ECC-24 for a discussion of the revised Probable Maximum Precipitation value used in the updated tailings management facility design.
Appendix:	None

RESPONSE TO ECC-39

ID:	**ECC-39**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	Section 21.5.1.4, pg. 21.16, pg. 21.23 “Loss of life: 100 or fewer” “As previously noted, Marathon will be reviewing the results of this assessment and developing mitigation to reduce or eliminate the risk of potential loss of life under this scenario. In general, monitoring of the dam, and preparing emergency notification procedures and emergency response plans will reduce the risk associated with a potential dam failure, and also address the health and safety of Project workers.”
Information Request:	A dam consequence classification of “very high” has been identified in part due to the potential loss of life from a dam failure. As most of the potential loss of life is likely to be workers at the mine site, how will this be mitigated? This section looks at different effects on the environment and how to mitigate them, but not much for the workers who are most potentially affected. They seem to be lumped in with “Community Health”.
Response:	The potential impact of tailings release at the process plant has been addressed through refinement of the tailings management facility dam design and the process plant arrangement. Please refer to the response to ECC-30 for further discussion.
Appendix:	None

RESPONSE TO ECC-40

ID:	ECC-40
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	Section 21.5.4.1, pg. 21.41“Seepage water associated with the TMF will be collected and pumped back to the TMF (Section 21.5.1); 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.”
Information Request:	More details should be provided on expected levels of seepage, seepage measurement, this seepage collection system, redundancy of the re-circulation system, etc.
Response:	Based on the latest seepage modelling conducted, the seepage collection system will capture up to 2,000 m^3/day (0.023 m^3/s) in Stage 1, dropping to 1,250 m^3/day (0.014 m^3/s) in Stage 6. However, the seepage collection system is not only sized for the seepage, but also for the design storm event (precipitation that will enter the seepage collection system from surface runoff). The seepage collection system is sized for the peak runoff from the 100-year rainfall storm event (up to 3.3 m^3/s for the ultimate stage) and is designed with a 0.5 m freeboard. Seepage is a small component and does not govern the ditch, sump or pump design. The seepage collection sump will capture all diverted seepage from the collection ditches. The sump is sized to manage the inflow volume of 18,100 m^3 resulting from the 100-year 1-hour storm event. It is assumed that the sump will be pumped empty within 7 days (pump capacity of 110 m^3/hour). Should the recirculation system temporarily fail during a storm event, a spillway constructed in the perimeter berm will provide safe conveyance of diluted storm flows to prevent an overtopping failure of the sump until pumps are back online. Should the recirculation system temporarily fail under fair-weather conditions, it would take over a week to exceed the seepage collection sump capacity, providing time to replace/repair the system. Seepage flows within the ditch can be measured using v-notched weirs installed at various points along the ditch alignment and/or at the sump inlets. The Stage 1 (starter) and Stage 6 (ultimate) seepage collection ditch and sump arrangements are shown on Figure ECC-54.1.
Appendix:	None

RESPONSE TO ECC-41

ID:	**ECC-41**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.3- Water Resources
EIS Reference:	-
Context and Rationale:	Section 21.5.4.2, pg. 21.42 "Sedimentation ponds will be constructed in-ground, and/or using earthen berms and till, or synthetic liners, where required, for water retention. The current design does not require the construction of dams (per CDA guidelines) for these sedimentation ponds."
Information Request:	Any sedimentation pond with a berm height greater than 1 m will be considered a dam.
Response:	Marathon acknowledges and understands that any water retaining berm greater than 1 m will be considered a dam. Marathon will comply with the requirements of the *Water Resources Act* and the Canadian Dam Association Guidelines with respect to all dams required as part of Project infrastructure.
Appendix:	None

RESPONSE TO ECC-42

ID:	**ECC-42**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.3 - Water Resources
EIS Reference:	-
Context and Rationale:	-
Information Request:	Section 22.3.1.1, pg. 22.10In the “Extreme Weather Events” section, there is no mention of rain on snowfall events that typically take place in winter and can result in extreme flooding in this region of the Island as happened in 1983 and 2018.
Response:	As noted in Section 22.3.1.1 of the EIS, winter storm events can consist of high winds, snow, ice and freezing rain. Table 22.5 of the EIS presents intensity-duration-frequency (IDF) precipitation curves for the locations near the Project. This table is inclusive of all seasons and considered in the design of Project infrastructure. The Stephenville Station ID 8403820 IDF was selected to represent precipitation at the site. The Stephenville IDF was developed based on 48 years of data (1967 – 2017). The Stephenville IDF curve has been adjusted to account for the effects of climate change for the 2011-2040-time horizon (2020s) for the Intergovernmental Panel on Climate Change (IPCC) Representative Concentration Pathways (RCP) 4.5 emissions scenario. The average increase of IDF rainfall amounts associated with the various projections are approximately 10% for the 2020s (CRA 2015). In the model, the storms were distributed using a 10-minute timestep over 24 hours based on the SCS (Soil Conservation Service) Type II distribution (representative of heavy rainfall events generated from tropical storms and hurricanes). The contact water management sedimentation ponds and ditches were designed to attenuate the 1:100 year precipitation event of 183.4 mm. This storm event was based on the Stephenville IDF curve has been adjusted to account for the effects of climate change for the 2011-2040-time horizon (2020s) for the IPCC RCP4.5 emissions scenario. The maximum daily snow melt for the month of April of 38.6 mm/day was assumed in addition to the direct precipitation event. The design conservatively assumed that this precipitation event would occur when the piles have a layer of snow/ice that limits infiltration into the pile and instead runs off. Design of the tailings management facility (TMF) dams considered the inflow design flood, as required by the Canadian Dam Association guidelines; a design flood event that is commensurate with the incremental

ID:	**ECC-42**
	consequence of a dam failure. Water management in the TMF considered freezing of the TMF wet tailings breach and the delayed melt in the spring contributing to peak water levels in the TMF.
Appendix:	None

RESPONSE TO ECC-43

ID:	**ECC-43**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.3 - Water Resources
EIS Reference:	Chapter 22
Context and Rationale:	Table 22.10, pg. 22.18 ECCM will require the establishment of a climate station on site as a condition of release of the project. “The potential effects of extreme weather including storms, precipitation, flooding/ice jams, and drought will be considered in Project planning, design and operation and maintenance strategies, including the selection of materials and equipment, and design of components, such as water management infrastructure and the TMF.”
Information Request:	It should be stated that the design of water management infrastructure will use future climate change precipitation values, not just that climate effects will be considered.
Response:	Table 22.10 in Chapter 22, page 22.18 provides a summary of mitigation measures that will be implemented to manage the interactions between climate/climate change and the Project. The mitigation measures are written in future tense as they will be implemented as the project design and development stages progress. During the Project effects assessment provided in the EIS, future climate change precipitation and temperature values were calculated and utilized to support the water management design aspects of this Project. Design of the water management infrastructure was based on the future Intensity-Duration-Frequency (IDF) events at the Stephenville Station (Station ID 8403820), in addition to snow melt. The Stephenville IDF was developed based on 48 years of data (1967–2017). The Stephenville IDF curve has been adjusted to account for the effects of climate change for the 2011-2040-time horizon (2020s) for the Intergovernmental Panel on Climate Change (IPCC) Representative Concentration Pathways (RCP) 4.5 emissions scenario. The average increase of future IDF rainfall amounts associated with the various projections are approximately 10% for the 2020s (CRA 2015). Therefore, the Project has used the RCP4.5 scenario IDF curve data to establish design storm events for the design and sizing of the Project water management infrastructure. Future climate predictions for Stephenville are presented in Chapter 7.2.2.1 of the EIS. Please refer to ECC-05 for further discussion of climate change integration into water management design.

ID:	ECC-43
	Reference: CRA. 2015. Intensity-Duration-Frequency Curve Update for Newfoundland and Labrador. Mount Pearl: Conestoga-Rovers & Associates: For the Office of Climate Change and Energy Efficiency, Government of Newfoundland and Labrador.
Appendix:	None

RESPONSE TO ECC-44

ID:	**ECC-44**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.3- Water Resources
EIS Reference:	-
Context and Rationale:	-
Information Request:	Section 7.1.3.1, pg. 7.5, Figure 7-1 The choice of local assessment area and regional assessment area for surface water are not sufficient to the likely impacts. Only a portion of Victoria Lake falls in these areas. Why isn't the Victoria River included in the local assessment area? Why isn't the entire Exploits watershed and Bay D'Espoir (Grey River, White Bear River) watershed included in the regional assessment area? This site is located at the headwaters of both of these major watershed systems on the Island. The project will affect the entire watersheds, not just up to the outlet of Red Indian Lake and half way across Victoria Lake.
Response:	The general definitions of Local Assessment Area (LAA) and Regional Assessment Area (RAA) are provided in Section 4.2.4.1 of the EIS: "The Local Assessment Area (LAA) encompasses the area in which Project-related environmental effects (direct or indirect) can be predicted or measured for assessment. The LAA, which is specific to each valued component (VC), encompasses the Project Area and is selected in consideration of the geographic extent of effects on the given VC." "The Regional Assessment Area (RAA) is the area established for context in the determination of significance of project-specific effects. It is also the area in which accidental events are assessed and it informs the assessment of cumulative effects. The RAA is VC specific and encompasses both the Project Area and the LAA." The LAA and RAA for Surface Water are defined and described in Section 7.1.3.1 and Figure 7-1 of the EIS. The LAA for surface water resources was considered to incorporate the Project Area and watersheds that intersect with the Project Area, as shown in Figure 7-1 of the EIS. The LAA also includes the portions of Victoria Lake Reservoir that are in the expected effluent mixing zones, which are typically considered to be up to several hundred metres from points of discharge into the lake. The LAA includes Valentine Lake and Victoria River to the point downstream where Project-affected tributaries converge with the main branch of the river, and the existing access road extending from the Exploits River Crossing to the Project Area. It also includes a 500-m buffer around the access road.

ID:	**ECC-44**
	The surface water LAA includes Valentine Lake and extends into Victoria Lake Reservoir and downstream along the Victoria River to points well beyond where water quality effects are predicted (Appendix 7-C in the EIS), and well beyond the ultimate receiving water mixing zone where water returns to baseline or Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life thresholds. As such, the surface water LAA as defined in Section 7.1.3.1 and depicted in Figure 7-1 is considered adequate. Refer to the response to PC-88 for further description of the assimilative capacity model and predicted mixing zones. The surface water RAA incorporates the Project Area and LAA and extends to also include the geographic areas where potential Project interactions (including from accidental events) may be observed, as shown in Figure 7-1. The surface water RAA extends to include Valentine Lake, a portion of Victoria Lake Reservoir, Victoria River, and Red Indian Lake, including its discharge at the head of the Exploits River. This area encompasses the potential downstream receivers of surface water that may flow from the Project Area. As indicated above, this is the area within which accidental effects (Chapter 21 of the EIS) are assessed, and it informs the assessment of cumulative effects (Chapter 20 of the EIS). The RAA for surface water is considered sufficiently large to address these potential Project effects.
Appendix:	None

RESPONSE TO ECC-45

ID:	**ECC-45**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.3- Water Resources
EIS Reference:	-
Context and Rationale:	Section 7.1.3.2, pg. 7.6 “However, as further described below, it is expected to take eight years for the pits to flood, which would be five years after cessation of processing, and approximately three to five years after the primary closure activities cease”
Information Request:	Environmental monitoring (water quality, quantity, climate) at the site should continue into closure and post-closure phases of the project, until the site is chemically and physically stable.
Response:	Comment acknowledged. Marathon will continue environmental monitoring at the site in accordance with the final Rehabilitation and Closure Plan (which is subject to regulatory approval) and in consultation with regulators until the site is considered rehabilitated.
Appendix:	None

RESPONSE TO ECC-46

ID:	ECC-46
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.3- Water Resources
EIS Reference:	-
Context and Rationale:	7.2.1.1, pg. 7.7 “Historical (74 years) and climate normal data from a meteorological monitoring station (Station ID 8400698) located northeast (NE) of the Project Area at Buchans were used to characterize climate conditions in the RAA.” 22.3.1.1, pg. 22.8, Figure 22.2 “ In Section 5.2, the existing climate was discussed using 1981 to 2010 climate normals for the Buchans station, with the exception of wind data which, due to non-availability, were sourced from the Deer Lake station.” BSA1, Attachment 1-A, pg. 17 “24-hr Probable Maximum Precipitation (PMP) depth used for the Stephenville Environment and Climate Change Canada (ECCC) meteorological station (ID: 8403800) is 309 mm (Golder 2020b)”
Information Request:	Different parts of this EIS, done by different consultants, reference different climate stations for different analytical purposes. This was necessitated by the lack of appropriate climate data for the project area, but demonstrates a lack of consistency. Did any of the consultants determine which climate station (and associated derived data) was the most appropriate to use as a best approximation for climate conditions at the site (looks like some comparison between Buchans and Stephenville was done, but what about Deer Lake)? This also demonstrates the need for the establishment of a climate station at the site.
Response:	In selecting climate stations within the region that could be representative of the Project Area, the following was considered: • Buchans (8400698) was selected with climate normal precipitation of 1236 mm/year and a long historical daily meteorological dataset to develop long term daily, monthly and annual climate statistics. The Buchans station meets climate code C, has 25 years of climate normal record with 97.7% of all possible observations, and is 50 km from the mine site (process plant). • The Project used Stephenville A (8403800) with climate normal precipitation of 1340 mm/year and a long historical hourly meteorological dataset (including tipping bucket rain gauge used to identify precipitation intensity, duration and frequency (IDF)) to represent event-based water resources design. The Stephenville A station meets climate code A, which applies to stations meeting World Meteorological Organization (WMO) climate standards for temperature

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	and precipitation and the WMO 3 and 5 rule, meaning no more than 3 consecutive and no more than 5 total missing data points for precipitation and temperature. • The Burnt Pond station is 30 km southwest of the mine site (process plant) and has climate normal precipitation of 1434 mm. The Burnt Pond station meets climate code D (lowest acceptable quality), has 19 years of record (toward the 30 year climate normal) with 96.7% of all possible observations. • The Exploits Dam climate station is located at the limit of the Project Local Assessment Area and Regional Assessment Area and is 55 km from the mine site (process plant) and 21 km from Buchans. The Exploits Dam climate station has a climate normal precipitation of 1104.4 mm/year and meets climate code C, has 26 years of climate data and 99.7% of all possible observations. Recognizing the climate variability represented in the regional climate stations (i.e., Buchans, Exploits Dam and Burnt Pond), the climate normal range extending from 1104.4 mm/year to 1434 mm/year, and the lower quality of the Burnt Pond climate dataset, the Buchans climate station was selected as representative of near the median of the climate normal precipitation range. The selection of the Stephenville A station to represent IDF information for event-based water management design with higher climate normal than Buchans and meeting WMO climate standards addresses the concern that the Project potentially used climate information that may under-represent the Project site. Marathon has committed to installation of an automated, datalogging and telemetered climate station on site which will inform site water resources monitoring and surveillance. Additionally, the Project will be designed and constructed to meet applicable engineering codes, standards and best management practices, such as the *National Building Code of Canada, the National Fire Code of Canada,* and *the Canadian Dam Association Guidelines*. The codes and standards account for weather variables, including extreme conditions, that could affect the structural integrity of buildings and infrastructure. Designs will also consider projected climate change over the life of the Project. For example, the tailings management facility (TMF) operating volume was designed based on typical precipitation volumes. The 25-year wet year precipitation was used to provide a flexible operating range. The impact of extreme events is considered above the operating water level, in the environmental design flood (EDF) storage. The EDF storage requirements for each stage has been updated to be the larger of the 7-day, 100-year rainfall event or the 30-day 100-year rainfall plus snowmelt event during the freshet.
Appendix:	None

RESPONSE TO ECC-47

ID:	**ECC-47**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.3 - Water Resources
EIS Reference:	-
Context and Rationale:	Section 7.2.1.1, pg. 7.8 “The RCP4.5 scenario was chosen as it was used in the development of various climate change IDF curves for NL (CRA 2015).”
Information Request:	Worst case scenarios should be looked at for design purposes, even if just for sensitivity analysis purposes.
Response:	The Intergovernmental Panel on Climate Change (IPCC) Representative Concentration Pathway (RCP) 8.5 is the worst-case, high emission scenario that assumes a future with no policy changes to reduce emissions. The RCP 4.5 is considered the 'middle of the road' scenario that assumes some emission reductions in the future. The Provincial Government has compiled and updated IDF curves for 19 locations in the province and developed projections of future extreme precipitation events based on the RCP 4.5 scenario (CRA 2015). As noted on the provincial Newfoundland Environment and Climate Change website: https://www.gov.nl.ca/eccm/occ/climate-data/, the RCP 4.5 scenario represents the most likely future scenario for Newfoundland (CRA 2015). Consistent with the province, the RCP 4.5 future projected mean Intensity-Duration-Frequency (IDF) 24-hour precipitation at the Stephenville Station ID 8403820 was selected for water management design. The design runoff event for the water management ponds assumed the 100-year rainfall plus the additional 38.6 mm/day of snowmelt. As infiltration into the piles was assumed negligible due to a rain on snow/ice scenario, these design assumptions resulted in a conservatively high estimate of total storage/conveyance volumes within the water management infrastructure design. The worst-case RCP 8.5 scenario would represent a higher mean precipitation and temperature, increase the intensity, frequency, and duration of adverse weather events, and less snowfall than the RCP 4.5 scenario. The RCP 8.5 scenario results in an approximately 5% higher 24-hour total precipitation than the RCP 4.5 scenario. However, this increase is balanced by the reduction in snowmelt under the RCP 8.5 scenario than the RCP 4.5 scenario and would not increase required design storage volumes.

ID:	**ECC-47**
	The Future IDF time horizon of 2011-2040 (IPCC AR5) was selected for water management design. The construction of the mine is projected to take 16-20 months, followed by an approximate 12-year operational period. Therefore, water management infrastructure associated with the topsoil and overburden piles, low-grade ore pile, and pit dewatering will remain in place less than 15 years. The life of the Project, including the decommissioning, rehabilitation, and closure phase, is expected to end by approximately 2040, which corresponds with the beginning of the mid-century climate-induced projected changes. The time horizon of 2011-2040 is considered a representation of future climate scenarios. Reference: CRA. 2015. Intensity-Duration-Frequency Curve Update for Newfoundland and Labrador. Mount Pearl: Conestoga-Rovers & Associates: For the Office of Climate Change and Energy Efficiency, Government of Newfoundland and Labrador.
Appendix:	None

RESPONSE TO ECC-48

ID:	**ECC-48**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.3- Water Resources
EIS Reference:	-
Context and Rationale:	-
Information Request:	Table 7.10, pg. 7.26A streamflow coefficient of 62.5% for the RRA is on the low end. The project area is likely to experience a higher percentage of rainfall contributing to streamflow.
Response:	This response addresses the following aspects associated with the information requirement: • Adequacy and robustness of climate dataset • Calibration of baseline flow estimates with local hydrometric data • The conservatism inherent in the proposed water management design <u>Adequacy and Robustness of Climate Dataset</u> In selecting climate stations within the region that could be representative of the Project Area, the following was considered: • Buchans (8400698), with climate normal precipitation of 1,236 mm/year and a long historical daily meteorological dataset, was used to develop long term daily, monthly and annual climate statistics. The Buchans station meets Climate Code C, has 25 years of climate normal record with 97.7% of all possible observations, and is 50 km from the mine site (process plant). • Stephenville A (8403800), with climate normal precipitation of 1,340 mm/year and a long historical hourly meteorological dataset (including tipping bucket rain gauge used to identify precipitation intensity, duration and frequency [IDF]), was used to represent event-based water resources design. The Stephenville A station meets Climate Code A, which applies to stations meeting World Meteorological Organization (WMO) climate standards for temperature and precipitation and the WMO ‘3 and 5 Rule’, meaning no more than three consecutive and no more than five total missing data points for precipitation and temperature. • The Burnt Pond station is 30 km southwest of the mine site (process plant) and has climate normal precipitation of 1,434 mm. The Burnt Pond station meets Climate Code D (lowest acceptable quality) and has 19 years of record (toward the 30-year climate normal) with 96.7% of all possible observations.

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	• The Exploits Dam climate station is located at the limit of the Project Local Assessment Area (LAA) and Regional Assessment Area and is 55 km from the mine site (process plant) and 21 km from Buchans. The Exploits Dam climate station has a climate normal precipitation of 1,104.4 mm/year and meets Climate Code C and has 26 years of climate data and 99.7% of all possible observations. Based on the above, the use of the Buchans station to represent long term daily, monthly and annual records and the Stephenville A station to represent hourly duration events, without addition of other stations, is considered reasonable. <u>Calibration of Baseline Streamflow Estimate with Local Hydrometric Data</u> The meteorological station / climate data from both the northeast and southwest regions were used to estimate climate and meteorology. Of the eight local Project flow gauging stations, three were operated for a longer period extending from 2012–2019, with the other five stations set up in either 2018 or 2019. Using the three stations with longer data (HS1, HS2 and HS3), the following is noted: • HS1 is a small watershed of 0.397 km^2, and has a regional equation based mean annual flow (MAF) and unit flow of 0.098 m^3/s and 0.0247 $m^3/s/km^2$. Using the rating curve developed for HS1, the MAF measured for the monitoring period was 0.0127 m^3/s and a unit flow of 0.032 $m^3/s/km^2$. • HS2 is a small watershed of 1.047 km^2, and has a regional equation based MAF and unit flow of 0.0264 m^3/s and 0.0264 $m^3/s/km^2$. Using the rating curve developed for HS1 and adjusting for the anomalously high extended water levels/flow from 2014 (as mentioned in the comment), the MAF measured for the monitoring period was 0.021 m^3/s and a unit flow of 0.0201 $m^3/s/km^2$. • HS3 is a small watershed of 0.702 km^2, and has a regional equation based MAF and unit flow of 0.0175 m^3/s and 0.025 $m^3/s/km^2$. Using the rating curve developed for HS1, the MAF measured for the monitoring period was 0.0189 m^3/s and a unit flow of 0.0269 $m^3/s/km^2$. Notwithstanding the fact that these are very small headwater watersheds, the MAF and unit flows for these three small, field-monitored, watersheds are consistent with estimates derived from the selected regional hydrological regression dataset. The environmental water balance for the Project site estimated climate normal evapotranspiration at 431 mm, which is 35% of climate normal precipitation and is consistent with the Water Resources Atlas of

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	Newfoundland values of 450–475 mm/year. The evapotranspiration values estimated in the environmental water balance leave 65% to total streamflow. The selected northeast (NE) region gauging station subset yielded an average streamflow of 62.5% and shows close agreement with the environmental water balance for the site. A monthly baseflow index (BFI) was calculated using the Streamflow Analysis and Assessment Software (V4.1) based on 13 years of continuous daily flow data from Water Survey of Canada station 02YO014. Station 02YO014, located approximately 48 km to the NE of the site, is a small watershed of 8.15 km^2, and in that respect closely resembles the small watersheds characteristic of the Project site. Baseflow contributions to total flow at this station for its period of record varied from 23% (April) to 43% (March). The BFI calculated for the entire 13-year period of record was 35%. This BFI is considered applicable to the LAA with some potential variations that may include higher BFI in streams located in perched water tables (i.e., HS1 and HS2 which are located in or near bogs) and potentially lower BFI in streams located in areas of highly permeable bedrock (i.e., HS7 which exhibited very low summer flows). As the site is mapped in the NE region, a more locally based NE hydrological region gauging station dataset was used to develop regression relationships. This yielded hydrometric statistics that were validated by local flow gauging results, the environmental water balance and baseflow index estimation methods. Further, the site being located near the boundary of multiple regions is addressed by using precipitation information from both the NE and SW region. <u>Conservatism Inherent in Proposed Water Management Design</u> As described in the Water Management Plan (Appendix 2A of the EIS), Project seepage and runoff was modeled conservatively using both a continuous GoldSim water balance model, as well as the Hydrologic Modeling System (HEC-HMS). The Stephenville A climate station was used to develop meteorological models for input of hourly hyetographs in model runs. Although the proposed water management infrastructure will be largely decommissioned within 20 years, water management design accounted for climate change using RCP4.5 and project IDF data to the 30-year time horizon. Considering the above-noted conservative elements in combination with additional factors of safety (e.g., provision of minimum ditch and pond freeboard and emergency spillways), the Project will respond robustly to the potential for increased precipitation at the hourly event scale and extending to seasonal and annual scales.
Appendix:	None

RESPONSE TO ECC-49

ID:	**ECC-49**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.3- Water Resources
EIS Reference:	-
Context and Rationale:	-
Information Request:	Figures 7.12-13, pg. 40-41 Only partial bathymetry of Valentine Lake and Victoria Lake has been conducted. Is this sufficient to determine assimilative capacity and mixing zones? Will full bathymetry be done at some point?
Response:	Bathymetric data were collected in localized areas of Valentine Lake, Victoria Lake Reservoir and several smaller lakes. These localized areas represent detailed bathymetry around planned final discharge points. The ultimate mixing zone for the most conservative regulatory scenario extends to approximately 300 m from the outfall, at which point all parameters will meet the Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Collected bathymetry data extend beyond 300 m and sufficiently cover the ultimate receiver for the purpose of the Assimilative Capacity Assessment. There is no practical need to extend bathymetry further into Valentine Lake or Victoria Lake Reservoir.
Appendix:	None

RESPONSE TO ECC-50

ID:	**ECC-50**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	-
Information Request:	Figure 7-32, pg. 7.93 Figure 7-36, pg. 7.98 Seepage through the tailings dam is estimated at around 2300 m^3/d according to Figure 7-36. How was this estimated? What hydraulic conductivity values were used? Will the amount of seepage through the tailings dam be monitored, or will this be done through monitoring pumping of recirculated seepage water?
Response:	Seepage rates through the tailings dam were estimated by Golder (2020), by determining the potential leakage rate per defect in the geomembrane liner, for side slope areas where the geomembrane is in contact with water, or in contact with tailings. For the side-slope geomembrane that is in contact with water, the leakage rate per defect in the geomembrane was calculated using the method presented by Giroud et al. (1997) for leakage through a geomembrane underlain by a semi-permeable medium, (i.e., the liner bedding layer beneath the geomembrane liner). The key assumptions used for the calculation are: • 5 holes (defects) per hectare of geomembrane liner • hole diameter of 2.0 mm • uniform contact with the overlying geomembrane • average head of 3.5 m on the geomembrane at the midslope of the ponded area • hydraulic conductivity of the liner bedding layer is 5×10^{-4} m/s For the side-slope geomembrane that is in contact with tailings, the leak rate per defect was calculated using the method presented by Badu-Tweneboah and Giroud (2018) for leakage through a geomembrane overlain by the tailings. The key assumptions used for the calculation are: • 5 holes (defects) per hectare of geomembrane liner • hole diameter of 1.0 mm • geomembrane thickness of 1.5 mm • average head of 15.6 m on the geomembrane • hydraulic conductivity of the tailings of 1×10^{-6} m/s It is anticipated that the amount of seepage through the tailings dam will be monitored by interpreting the pumping rate of recirculated seepage water in the seepage collection ditch.

ID:	ECC-50
	References: Badu-Tweneboah, K. and J.P. Giroud. 2018. Discussion of: Leakage through Holes in Geomembrane below Saturated Tailings by R. Kerry Rowe, Prabeen Joshi, R.W.I. Brachman and H. McLeod.” Journal of Geotechnical and Geoenvironmental Engineering, 144(4). Giroud J.P., T.D. King, T.R. Sanglerat, T. Hadj-Hamou, and M.V. Khire. 1997. Rate of Liquid Migration Through Defects in a Geomembrane Placed on a Semi-Permeable Medium. Geosynthetics International, Vol. 4, Nos. 3-4, pp. 349-372. Golder Associates Ltd. 2020. Prefeasibility Study for Tailings Disposal at the Valentine Gold Project, Newfoundland. Prepared for Marathon Gold, March 2020.
Appendix:	None

RESPONSE TO ECC-51

ID:	**ECC-51**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.3- Water Resources
EIS Reference:	-
Context and Rationale:	-
Information Request:	Figure 7-30, pg. 7.85 The emergency spillway on the tailings pond is located in the NE abutment. Should the TMF emergency spillway not also be include as a Final Discharge Point (FDP)? Where will this water discharge?
Response:	The emergency spillway discharge for the tailings is located adjacent to the northeast (NE) abutment and is not constructed within the dam itself. While the discharge channel alignment will be fixed, the spillway and inlet will move with the stages. The alignment for the Stage 1 (starter) and Stage 6 (ultimate) configurations are shown on the figure included in response to ECC-06. The emergency spillway is designed to safely discharge extreme flooding events in the case where the maximum operating level in the tailings ponds is exceeded by the Environmental Design Flood (EDF) and a subsequent precipitation event (back-to-back events or cumulative) that cannot be handled by the operating water management system. The EDF storage requirements for each stage have been updated to be the larger of the 7-day 100-year rainfall event or the 30-day 100-year rainfall plus snowmelt event during the freshet (see response to ECC-38). Depending on the operating volume at the time of the event, any event larger than the 100-year event has the potential to activate the spillway. The spillway can safely pass events up to and including the Probable Maximum Precipitation (conservatively selected as 450 mm). The safe discharge of cumulative large precipitation events or a single extreme event through the spillway is intended to avoid these occurrences causing a dam breach through over-topping or piping. In the rare event of a release of effluent via the emergency spillway, the channel will convey the effluent downstream to the Victoria River. Untreated release of effluent from the tailings management facility will be managed via the processes established in the *Metals and Diamond Mining Effluent Regulations* Emergency Response Plan.
Appendix:	None

RESPONSE TO ECC-52

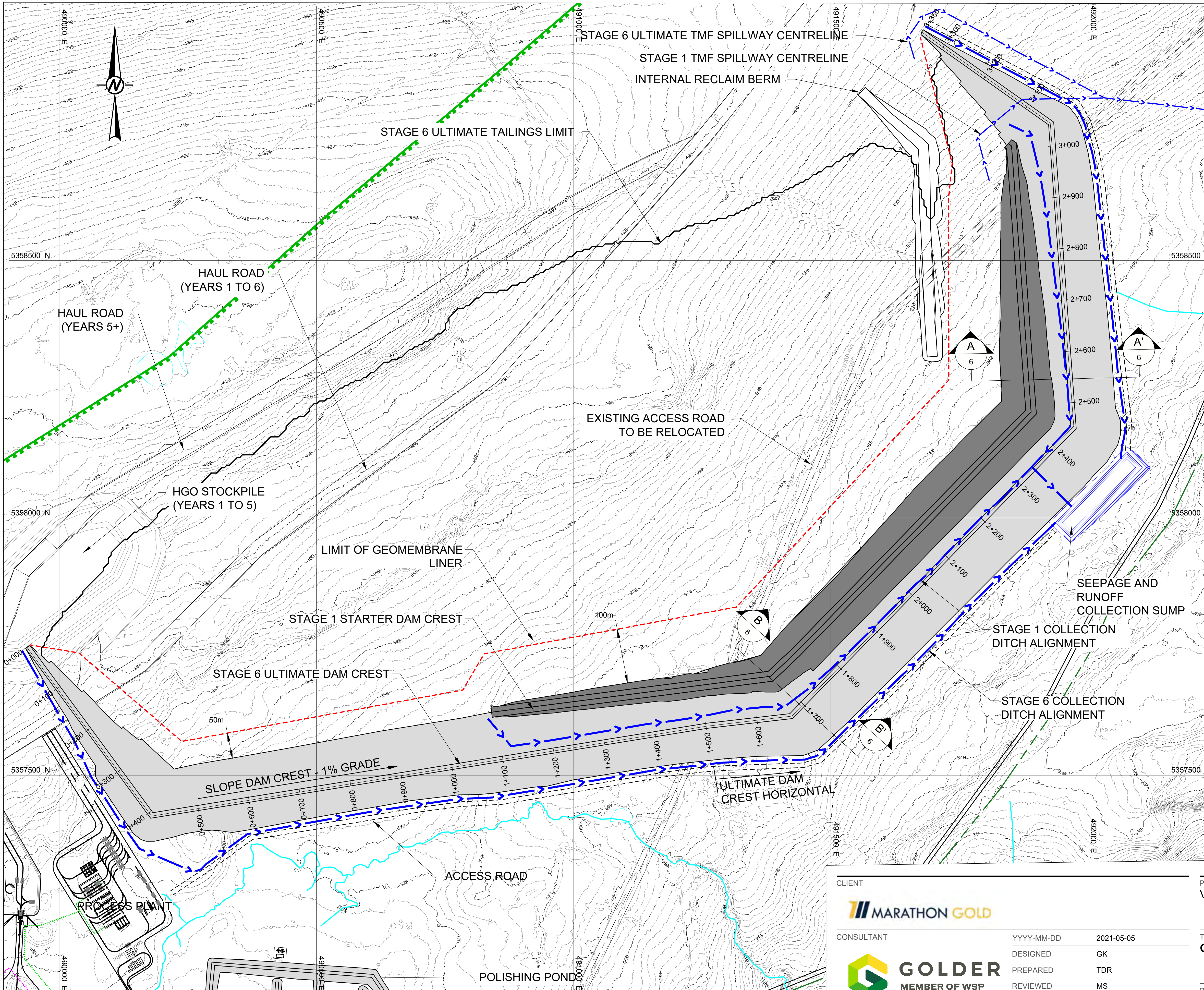
ID:	**ECC-52**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.3- Water Resources
EIS Reference:	Chapter 7
Context and Rationale:	-
Information Request:	Section 7-9, pg. 7.149 Due to the placement of mining operations, water quality and quantity in multiple watersheds has potential to be impacted. A network of multiple real time water quality and quantity monitoring stations will be necessary to monitor impacted areas. Discussions on real time monitoring locations with WRMD should occur as soon as possible.
Response:	Effluent, Final Discharge Point, Exposure and Reference location water quality monitoring including sampling locations, frequency, methods, parameters, thresholds and durations will be established with the Newfoundland and Labrador Department of Environment and Climate Change (NLDECC) and Environment and Climate Change Canada (ECCC) during detailed design and permitting. Section 7.9 of the EIS and Section 8.2 of Baseline Study Appendix 2A (Water Management Plan) provide preliminary overviews of initial surface water monitoring plans that will be further refined with NLDECC and ECCC.
Appendix:	None

RESPONSE TO ECC-53

ID:	**ECC-53**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	-
Information Request:	There should be a table similar to Table 7.51 outlining proposed monitoring for the TMA/dams included in Section 19. This should at a minimum include piezometers, seepage weirs/flows, vibration monitoring, movement and the frequency of each monitoring activity.
Response:	Please see the response to ECC-37; seepage monitoring will be included.
Appendix:	None

RESPONSE TO ECC-54

ID:	**ECC-54**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	Appendix 7A, pg. 31, Figure 4 “Toe seepage from the tailings pond will be intercepted by seepage collection ditches along the down gradient perimeter of the dam.”
Information Request:	Will the seepage ditch be fixed in location or continue to move downstream of the toe for each raise of the tailings dam? If it is fixed, it will be around 150 m downstream of the toe of the Stage 1A tailings dam (Figure 4). Will the ditch at this distance be able to capture seepage of the earlier tailings dam phases? Or is the ditch ~10 m downstream of the toe of each dam raise (based on distance indicated in Figure 4)? There should be some separation between the dam toe and the seepage ditch so as not to affect the stability of the dam.
Response:	The seepage and run-off collection ditch system will be constructed in Stages 1, 2, 3 and 5, moving downstream with subsequent raises of the dam, and remaining in proximity to the dam toes in order to effectively capture most of the seepage. Ditches constructed in Stage 3 will also be suitable for Stage 4. Ditches constructed in Stage 5 will also be suitable for Stage 6. The locations of the Stage 1 (starter) and Stage 5 (ultimate) ditch alignments are shown on the Figure ECC-54.1. The ditches are shallow in depth, will be located at a suitable offset distance from the downstream toe that will not impact the overall stability of the dam.
Appendix:	None



LEGEND

- THRUST FAULT
- SEEPAGE AND RUN-OFF COLLECTION DITCH
- TMF EMERGENCY SPILLWAY ALIGNMENT
- WATERCOURSE (STANTEC 2020)
- HAUL ROAD
- EXISTING ROAD
- NEW DIVERTED ACCESS ROAD
- POWER LINE 66kV

NOTES:

1. ALL ELEVATIONS, GRID COORDINATES AND DIMENSIONS ARE IN METRES. GRID D COORDINATES ARE REFERENCE TO NAD83 UTM ZONE 21 DATUM.
2. GROUND CONTOURS INTERVALS AT 1m.

REFERENCES:

1. GROUND CONTOURS PROVIDED BY CLIENT. FILENAME MRG_01_Valentine_Mine_Survey_Data_Delivery.ZIP, DATED 11/6/2019.PS
2. BASEPLAN PROVIDED BY AUSENCO. FILENAME 104878-0000-G-001__ RevD_metres.DWG. DATED JAN18. 2021
3. STOCKPILES AND HAULAGE ROADS WERE UPDATED WITH FILES Valentine FS - Haul Roads - dxf - DRAFT - 201203.ZIP, Valentine FS - Leprechaun Stockpiles - dxf - DRAFT - 201203.ZIP AND Valentine FS - Marathon Stockpiles - dxf - DRAFT - 201203.ZIP AND Valentine FS - Marathon Stockpiles Update - dxf-DRAFT-201211.zip.
4. WATERCOURSES PROVIDED BY STANTEC. FILENAME WATER_BODIES_SHP AND WATERCOURSES_FINAL _2020.SHP DATED NOVEMBER 2, 2020.

0 125 250
1:7,500 METRES

CLIENT	MARATHON GOLD	PROJECT	VALENTINE GOLD PROJECT - NEWFOUNDLAND
CONSULTANT	GOLDER MEMBER OF WSP	TITLE	GENERAL ARRANGEMENT OF TMF
YYYY-MM-DD	2021-05-05		
DESIGNED	GK		
PREPARED	TDR		
REVIEWED	MS		
APPROVED	WPM		

PROJECT NO.	CONTROL	REV.	FIGURE
20350991	0001	0	ECC-54.1

25 mm IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

RESPONSE TO ECC-55

ID:	**ECC-55**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.3- Water Resources
EIS Reference:	-
Context and Rationale:	-
Information Request:	Section 7 Appendix 7C There is no mention of the impact of lake turnover on POPCs and resulting water quality in receiver lakes (Victoria, Valentine, Red Indian). Lakes in the province do tend to see turnover events which can result in thorough mixing of the water column. To say that effects are limited to small areas of the receiver lakes may be initially correct, but impacts will eventually disperse throughout the entire waterbody.
Response:	Valentine Lake and Victoria Lake Reservoir are relatively deep lakes which experience thermal stratification. Lake turnover generally occurs two times per year—once in the spring after the ice melts, and once in the fall before ice forms. Lake turnover is a positive factor for mixing as it increases assimilative capacity of the receiver. As a result of lake turnover, the mixing zones would be smaller than those conservatively predicted in the EIS. The EIS predicts a maximum extent of the mixing zone into the lakes as 300 m. The mixing zone boundary is defined as the point at which receiving water quality returns to either baseline or Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life. Given the size and assimilative capacity of Victoria Lake Reservoir and Valentine Lake, water quality effects will be below regulatory thresholds and below detection thresholds at the lake outlets. Therefore, no water quality effects are predicted beyond the mixing zone and no water quality effects will extend to Red Indian Lake.
Appendix:	None

RESPONSE TO ECC-56

ID:	**ECC-56**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.3- Water Resources
EIS Reference:	-
Context and Rationale:	Attachment 3-C, Section 3.4.2, pg. 14 “monitoring locations established at the Duck Pond Operations (ID NF02YO0190 Tributary to Gill’s Pond Brook and NF02YO0192 East Pond Brook Below East Pond) were used as regional water quality references.”
Information Request:	As both these stations are impacted by the Duck Pond Mine TMA, they are not appropriate to use as a regional water quality or quantity reference.
Response:	Section 3.2.4 of Baseline Study Appendix (BSA) 3, Attachment 3-C addresses the referenced regional water quality stations. As indicated in Section 4.3.1 of BSA.3, Attachment 3-C, the Environment and Climate Change Canada (ECCC) regional water quality stations ID NF02YN0001 Lloyds River at Bridge, Route 480, Burgeo Road, and NF02YO0107 Exploits River approximately 0.5 km downstream from Exploits Dam have longer periods of record than the referenced Water Resource Management Division (WRMD) provincial stations. As the referenced WRMD stations are associated with the Teck Duck Pond mine site, Section 4.3.1 and Table 4.34 discuss the regional water quality from the longer term ECCC sites and do not incorporate the WRMD stations. While the water quality data for the Duck Pond mine site stations is presented in C-1 and C-2, Appendix C of BSA.3, Attachment 3-C, regional water quality reported at the ECCC-managed sites was used in the development of Table 4.34 and the regional water quality discussion in Section 4.3.1.
Appendix:	None

RESPONSE TO ECC-57

ID:	ECC-57
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.3- Water Resources
EIS Reference:	-
Context and Rationale:	-
Information Request:	Attachment 3-C, Figure 4.3, pg. 29The map of evapotranspiration used to determine evapotranspiration at the project site is from 1992, and is based on empirical calculation of evapotranspiration using pre-1992 climate data. The project area location on this map is not correct, however, the evapotranspiration value used (463 mm) is at least in the correct range for the actual location. Due to the age of the data used to calculate the evapotranspiration, this value should be updated.
Response:	It is acknowledged that the red star identifying the Project Area on the Water Resources Atlas of Newfoundland (WRAN) (NLDOEC 1992) figure presented in Attachment 3-C as Figure 4.3 on page 29 is not in the correct location as it is too far east. However, the correct annual evaporation range for the site (450-474 mm) was used in Project calculations based on the actual location of the Project Area. As provided in Chapter 7.2.2.3, the monthly environmental water balance model for the site was run for three climate scenarios: climate normal, wet year and dry year. Using the water balance, the corresponding evapotranspiration rates for these climate scenarios were determined to be 435 mm/year, 435 mm/year and 431 mm/year respectively. These rates are within 4-8% of the mean annual evapotranspiration range of 450-474 mm reported for the Project Area in the WRAN (NLDOEC 1992). The climate normal annual precipitation at the Buchans Climate Station (Station ID 8400698) is 1,236.2 mm for the climate normal period of 1981-2010. The WRAN mean annual potential evapotranspiration rates published in 1992 therefore includes data from the climate normal period evaluated in the Environment Canada Climate Normal data set. The average annual evapotranspiration rate at the site as shown on the WRAN map is 463 mm which equates to 37.5% of the climate normal precipitation. Similarly, the climate normal evapotranspiration rate calculated in the water balance of 435 mm/year equates to 35% of the mean annual precipitation for a climate normal year. These evaporation rates are very similar, indicating that the evapotranspiration rate of 463 mm/year as determined from the WRAN figure is accurate for the Project Area. A review of online available data was conducted to source more recent evapotranspiration rates for the Project

ID:	**ECC-57**
	Area or for the province of Newfoundland and Labrador. The 1992 WRAN data is the most recent publicly available evapotranspiration data and is considered suitable for the Project as described above.
Appendix:	None

RESPONSE TO ECC-58

ID:	**ECC-58**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.3- Water Resources
EIS Reference:	Appendix 2A, Section 2.2.3.1, pg. 2.8“Passive treatment systems could take the form of subsurface anaerobic units in the ditches or subsurface / surface units that utilize the water management pond basins as constructed wetland features.”
Context and Rationale:	-
Information Request:	Any idea of how many retention ponds may be retained in closure for the above purposes?
Response:	The responses to ECCC-15 and ECCC-18 provide details regarding when and how perimeter ditches/drains will be converted to permeable reactive barriers and when and how they will be converted to French Drains to convey contact seepage to the retrofitted sedimentation basins. At this time, the exact number of sedimentation ponds to be converted to passive bioreactors in closure is not known and will be determined via passive treatment pilot testing during operations.
Appendix:	None

RESPONSE TO ECC-59

ID:	**ECC-59**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	Appendix 2A, Section 2.2.3.2, pg. 2.9 • "The surface of the TMF will be contoured as necessary to promote drainage towards the tailings pond • Downstream slope of the TMF dam will be left as exposed rockfill to permit drainage of the downstream shell • A larger closure spillway will be constructed to convey water from within the impoundment • Reduce pond water storage in the TMF to classify the TMF as a landform and therefore alleviating the requirements for maintaining and inspecting the dams post-closure"
Information Request:	If the tailings dam is retaining water or another substance such as tailings, it will still be classified as a dam. The closure description for the TMF is contradictory. The fact that the tailings dam will remain in place, and that there will still be a tailings pond at closure indicates a structure that will require long-term care and maintenance. The lack of detail concerning closure of the TMF, which is dependent on the design of the TMF, which is dependent on the tailings being non-PAG.
Response:	As indicated in paragraph 8 of section 6 in the Valentine Gold Project: Acid Rock Drainage/Metal Leaching (ARD/ML) Assessment Report (Baseline Studies Appendix 5, Attachments 5-A, 5-B), tailings will be produced from a combination of the Marathon and Leprechaun high-grade and low-grade ores, with approximately 38% of the material originating from the Leprechaun pit and the remainder from the Marathon pit. Composite samples of tailings are classified as non-potentially acid generating and are not expected to generate ARD. It is understood that if the tailings dam is required post-closure to retain water and/or tailings that it will remain classified as a dam in perpetuity. Under closure requirements in Newfoundland and Labrador, this will require posting Financial Assurance for maintenance and inspection of the dam for 100 years. Marathon's Rehabilitation and Closure Plan (and associated Financial Assurance) will consider the more conservative case – that the dam(s) will be required post-closure. However, with the tailings deposition within the impoundment being completed in Year 9 of operations, Marathon will have an additional 4 to 5 years prior to closure and rehabilitation of the

ID:	ECC-59
	remainder of the Project in order to assess and complete work towards classifying the tailings impoundment as a landform, and declassifying the dams.
Appendix:	None

RESPONSE TO ECC-60

ID:	**ECC-60**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	Appendix 2A, Section 3.1, pg. 3.1“The CDA classifies a dam as an embankment of 2.5 m or greater from the toe of the downstream slope to the dam crest and 30,000 m^3 of liquid storage. A criterion was to design berms to avoid the CDA dam classification.”
Information Request:	NL considers any structure retaining water between 1-2.5 m to be a very small dam. Such structures will require an approval under Section 48 of the *Water Resources Act*.
Response:	Marathon acknowledges and understands that any water retaining berm greater than 1 m will be considered a dam. Marathon will comply with the requirements of the *Water Resources Act* and the Canadian Dam Association Guidelines with respect to all dams required as part of Project infrastructure.
Appendix:	None

RESPONSE TO ECC-61

ID:	**ECC-61**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	-
Information Request:	The design of the TMF based will entail significant tailings beaches as the tailings surface area under water is only about 20%. Tailings not under water could become wind-blown and deposit in the surrounding area.
Response:	As discussed in Section 5.5.1 of the EIS, fugitive releases of particulate matter (total suspended particulate [TSP], respirable particulate matter [PM_{10}] and fine particulate matter [$PM_{2.5}$]) and trace metals (within the dust) from the tailings management facility (TMF) due to wind erosion of dry, exposed tailings beach surfaces was considered in the assessment. A larger beach area was conservatively modelled to assess the adverse effects from associated air contaminants. The spigotting subaerial deposition of tailings will keep part of the beach area wet and covered with fresh tailings. The movement of spigot discharge points to prevent build-up of tailings depositional berms will also reduce potential for tailings to dry-out and generate dust. Should dust generation from the TMF exceed regulatory thresholds (based on visual monitoring and/or ambient air quality monitoring station results), Marathon will assess and implement additional dust suppression measures, as applicable.
Appendix:	None

RESPONSE TO ECC-62

ID:	**ECC-62**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	Appendix 2B, Executive Summary, pg. iii-iv • "Geotechnical site investigations at the preferred TMF site to characterize the foundation conditions associated with the proposed infrastructure. • In-situ permeability tests of the overburden soils and bedrock beneath the proposed dam foundations. The results of the investigation shall be used to evaluate the proposed dam design and seepage cut-off requirements (i.e., bedrock grouting). • Tailings testing to determine the geotechnical properties to understand the settlement, permeability and deposition characteristics. • A dam breach and inundation study to support the dam classification."
Information Request:	The recommendations made in the Executive Summary need to be actioned, in particular the above. The stability analysis for the tailings dams should be updated using information gathered from future geotechnical site investigations. The following recommendation made in Appendix 2B, Annex D should be made: "The analyses should be updated at the next phase of the project and following completion of a geotechnical investigation and laboratory testing campaign at the TMF site location. For example, if very loose to loose non-cohesive foundation soils are encountered, a liquefaction assessment should be carried out, or if cohesive soils are encountered, undrained conditions should be considered in the analysis."
Response:	With respect to the specific recommendations listed, the following actions have occurred: • Further geotechnical site investigations at the tailings management facility (TMF) were completed in the fall of 2020, and supplemental geotechnical investigations to support the detailed design are planned for 2021. • The results from the fall 2020 investigations were considered in refinements to the TMF design. The TMF foundation soils comprise compact to very dense till. No cohesive or soft soils were encountered. There were no potentially liquefiable foundation soils encountered in the boreholes drilled. Stability analyses have been carried out

ID:	**ECC-62**
	considering the subsurface conditions encountered during the investigation, with the results yielding satisfactory Factors of Safety in accordance with the Canadian Dam Association guidelines. • In-situ hydraulic conductivity testing of the foundation soils and bedrock were completed during the fall 2020 investigation. The dam design has been updated to include a seepage mitigation measure in the form of a geomembrane installed on the foundation upstream of the dam (see the response to ECC-06 and ECC-22, above for additional information). Supplemental field hydraulic conductivity testing is scheduled for the field investigations planned for 2021. • Laboratory testing on representative tailings samples from the Marathon and Leprechaun deposits have been completed. Geotechnical testing of representative samples of the tailings from the Marathon and Leprechaun deposits has been completed in Golder laboratories. Data from the test results aligns with the parameters assumed for the pre-feasibility study design (as presented in the EIS) and will be used to refine the tailings design parameters at the detailed design stage of study. • The original Dam Breach Assessment submitted in 2020 has since been updated to reflect the updated TMF design.
Appendix:	None

RESPONSE TO ECC-63

ID:	**ECC-63**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	-
Information Request:	Appendix 2B, Table 2, pg. 4 The IDF data is from 1966 – 2002 and under reports precipitation. The more recent climate change IDF curves should have been used: Final_Report_2018 (turnbackthetide.ca). Also, some reports have used Deer Lake for the IDF information, and some have used Stephenville. This should be consistent and the more appropriate station to represent the project site selected. Appendix 2B, Section 5.4, pg. 10 “The 100-year, 24-hour event (75 mm of rain) was selected as the EDF.” This rainfall value is not appropriate and underestimates the EDF. Climate change IDF should have been used.
Response:	See responses for ECC-24 and ECC-38.
Appendix:	None

RESPONSE TO ECC-64

ID:	**ECC-64**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	Appendix 2B, Section 7.1.1, pg. 14 “The following are the design assumptions used in the development of the tailings deposition plan: A deposited tailings slope of 3% above the tailings pond and 10% below water”
Information Request:	What is the basis of this assumption? The design of the TMF is highly dependent on the stability of the deposited tailings, especially as the tailings will be mounded higher than the crest elevation of the dams. If the tailings were to liquefy, they could potentially overtop parts of the dam. As well, how are rainfall/runoff events likely to impact the stability of tailings slopes? Are there examples of this disposal method and assumed slopes working well in similar latitudes/climates to the project site?
Response:	The tailings characteristics presented in the EIS, Appendix 2B have been selected based on experience and typical values expected for thickened tailings and are considered reasonable for design at current level of study. Geotechnical testing of representative samples of the tailings from the Marathon and Leprechaun deposits has been completed in Golder laboratories. Data from the test results aligns with the parameters assumed for the pre-feasibility study design (as presented in the EIS) and will be used to refine the tailings design parameters at the detailed design stage of study. Furthermore, the most accurate tailings characteristic data will be obtained from the field during the initial years of operation which will guide the design of the subsequent stage raises and ultimate closure of the tailings management facility. In comparison to conventional slurry deposited tailings, thickened tailings are non-segregated with a higher relative density which inherently improves physical stability of the tailings. The tailings beach surface will be very shallow (i.e., grade of 3% or 33H:1V), static and earthquake induced liquefaction of the tailings are not expected to occur. Even if the tailings were to liquefy, the post-liquefied residual strength of the tailings would preclude flow failures overtopping the dam. The tailings beach slopes will remain globally stable when saturated. Localized surficial erosion of the beach slope may occur following large precipitation events but would not cause any largescale stability issues. The temporarily formed erosion gullies would be filled by subsequent tailings deposition.

ID:	**ECC-64**
	Examples of successfully operating thickened tailings facilities include Kidd Creek Mine in Timmins, Ontario, and Musselwhite Mine in Northwestern Ontario. Kidd Mine in particular has beach slopes at elevations above the crest of the perimeter containment dams.
Appendix:	None

RESPONSE TO ECC-65

ID:	**ECC-65**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	-
Information Request:	Appendix 2B, Table 9, pg. 15 5 stages of tailings dam raises over 7 years is a lot. Is it possible some of these stages may be condensed together? Otherwise your TMF is constantly under constructions. How might this continuous construction affect the stability of the tailings dam?
Response:	It is very common for tailings dams to be raised at this frequency. Stages are governed by the tailings deposition plan with dam stage elevations (and associated construction material volumes) limited to what is practically achievable to construct within a construction season. Combining stages would present schedule risk within a given construction season (typically late spring to late fall) as the dam fill requirements would be condensed. It would also present risks associated with earthworks construction during freezing temperatures experienced in this area from October through April. The dams will remain stable during construction. Issued for Construction drawings will be provided for each individual staged raise of the dam and the construction will be monitored full time by the Engineer of Record to ensure compliance with the design intent. Temporary dam geometry during construction, such as interim slope faces and bench heights, will be controlled to maintain overall dam stability.
Appendix:	None

RESPONSE TO ECC-66

ID:	**ECC-66**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	Appendix 2B, Section 7.5, pg. 17 "Slope stability was analysed for a representative critical section of the dam, and for the Stage 1A (starter) and Stage 4 (ultimate) dam elevations. The details of the slope stability analyses are provided in Appendix D."
Information Request:	Dam stability analysis will need to be refined and evaluated for each phased lift of the dam. This can be done at a later stage as part of the more comprehensive design and permitting process.
Response:	Marathon confirms that slope stability analysis for each of the individual stages of construction will be carried out during the detailed design phase for each dam stage raise.
Appendix:	None

RESPONSE TO ECC-67

ID:	**ECC-67**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	Appendix 2B, Section 7.6, pg. 17 “The potential leakage rate through the proposed geomembrane liner is limited by the size and frequency of defects in the geomembrane liner…”
Information Request:	Is there any plan to control the occurrence of geomembrane liner defects? Are these expected to be the result of poor installation or occur due to operational issues (e.g., flying blasted rock from the pit puncturing the liner, debris from the TMF area puncturing the liner, movement of bedding material allowing rock from the dam rockfill material to penetrate the liner). How are these and other likely operational issues that could affect the liner to be managed?
Response:	The liner leakage rate estimate is based on hypothetical, undetected defects. Full time, rigorous construction Quality Control and Quality Assurance inspection and testing will be undertaken during installation of the liner, when it is most prone to defects and damage. During operations, initial tailings deposition by spigotting from the perimeter dam following starter dam construction and each subsequent stage raise will promote development of a tailings beach over the liner. The tailings beach will enhance dam safety, protect the liner from potential damage caused by ice or objects, and reduce seepage potential through the liner.
Appendix:	None

RESPONSE TO ECC-68

ID:	ECC-68
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	Appendix 2B, Section 9.0, pg. 19 "During operations, the implementation of a systematic performance monitoring program is critical to maintaining the physical integrity of the dams and ancillary structures at the TMF. Such a program should include environmental monitoring together with regular visual inspections of the entire facility and monitoring of piezometric levels within the containment dams."
Information Request:	Piezometers are not shown on any of the dam drawings. How many will be installed? With the 5 downstream raises over 7 years, how will the piezometers and other instrumentation be installed?
Response:	An instrumentation and monitoring plan will be developed as part of detailed design. Additional monitoring instruments may be installed based on field observations made during construction. A sufficient number of monitoring instruments will be installed such that the Engineer of Record can adequately assess performance of the dam. Instrumentation may include vibrating wire piezometers for monitoring pore pressures which would be installed in the foundation and dam fill either by drilling methods or shallow excavation prior to, and/or during construction. Read out cables would be buried and protected, with data loggers situated outside of the active construction area (i.e., downstream toe). At a minimum, it is anticipated that instrumentation will be required to monitor piezometric levels of underlying foundation soils at the dam. It is anticipated that a total of six vibrating wire piezometers will be installed within the foundation at critical locations of the tailings management facility (TMF) dam alignment such as the location of the maximum dam height and where the TMF pond is situated. Although not required for construction per se, it will likely be easier to install the piezometers during construction rather than through the rockfill embankment fills later. The piezometers will be connected to dataloggers such that a range of readings over time can be obtained rather than spot readings with a readout unit. Settlement plates, installed to a depth that penetrates the maximum expected frost depth, shall be installed on the crest of dam along to monitor any settlement of the dam fills and foundation following construction. Inclinometers can also be installed to monitor lateral deformations within the dam.

ID:	ECC-68
	It is anticipated that a total of three settlement plates will be installed on the crests at each stage of construction to monitor deformation. The settlement plates should be installed at the same alignment chainage as the piezometers. It is expected that two inclinometers will be installed at critical locations of the dam and at distances offset downstream of the centerline of initial dam stages such that, after final raising, the inclinometer is positioned at the Stage 6 ultimate crest to facilitate long term monitoring during closure. The downstream shell of the dam will likely be continuously raised, therefor the inclinometer casing must be adequately protected and will require raising until the final dam elevation is reached. The inclinometers should be installed at the critical section locations with respect to maximum dam height and greatest overburden thickness, with one of the inclinometers being installed where the TMF pond is located. Environmental monitoring wells will be installed downstream of the dam. Instrumentation will be delineated and protected per construction specifications developed during detailed design.
Appendix:	None

RESPONSE TO ECC-69

ID:	**ECC-69**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety, Section 4.2.1.3- Water Resources
EIS Reference:	-
Context and Rationale:	-
Information Request:	Appendix 2B, Section 9.3, pg. 20 Real-time groundwater monitoring at shallow and deep levels will be required at multiple sites including near the tailings dam.
Response:	Real-time groundwater monitoring stations will be installed downgradient of the tailings management facility dam, at shallow and deep monitoring locations. These and other locations for monitoring will be identified in the detailed design phase of the Project, in consultation with the Newfoundland and Labrador Department of Environment and Climate Change - Water Resources Division.
Appendix:	None

RESPONSE TO ECC-70

ID:	**ECC-70**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.1- Dam Safety
EIS Reference:	-
Context and Rationale:	-
Information Request:	Appendix 2B, Annex B, pg. 4 The water treatment plant operation is to be 8 months per year (April to Dec). The mill can operate and produce tailings 92.5% of the year. Is there sufficient storage in the TMF for this 4 month period when there will be input to the TMF but no discharge? How will the operation of the TMF be handled to ensure there is sufficient storage?
Response:	The tailings management facility (TMF) pond has been sized (designed) with sufficient capacity to store the excess water/effluent accumulated within the pond during the 4 months of winter. Recycling of water to the mill will continue, however no water will be sent to the water treatment plant, and therefore no water will be discharged to the environment during these months. To provide sufficient storage capacity for the winter months, the water treatment plant will be designed to treat water at a sufficient rate to gradually draw down water levels within the TMF pond over the period of April to December. The TMF pond and water treatment plant detailed designs will incorporate the design storm events and operating contingencies to ensure the necessary capacities are available.
Appendix:	None

RESPONSE TO ECC-71

ID:	**ECC-71**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	Section 4.2.1.3- Water Resources
EIS Reference:	-
Context and Rationale:	-
Information Request:	Section 20: There should be some discussion of overall environmental trends within the spatial boundaries being looked at to better be able to judge cumulative effects from the project. For example, water quality in the Exploits River has been on an improving trend, rebounding from the impact of the old Buchans Mine. Are effects from this development likely to impact this overall trend. What about the effects from the worst case scenario of a tailings dam breach and the cumulative effects of such an occurrence?
Response:	Section 7.2.2.4 of the EIS and Baseline Study Appendix 3, Attachment 3-C provide a review of regional and local water quality data and trends. Water quality monitoring at site has been undertaken since 2012. An analysis of local water quality detected trends related to geographic location, waterbody type and seasonality; however, no longer term trends were observed. Local water quality was compared with regional water quality, and a number of similarities and consistencies were observed and discussed. The Project Area is a greenfield area not influenced by previous development. Current water quality is stable with waterbody/seasonal trends as noted in Chapter 7. All mine effluent discharges will meet *Metal and Diamond Mining Effluent Regulations* limits. All discharges to the Exploits River system are at system headwater tributaries (i.e., Valentine Lake and Victoria River steadies), approximately 70 km upstream of the Exploits River, and these tributaries have significant assimilative capacity. The Assimilative Capacity Study (Appendix 7C of the EIS) demonstrated effluent water quality effects in receivers at the final discharge point, 100 and 250 m downstream, and in their ultimate receivers (i.e., Valentine Lake, Victoria Lake Reservoir) up to 300 m from the tributary discharge point. All effluent parameters of potential concern will return to baseline quality or Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life within 300 m of discharge point into an ultimate receiver. Therefore, the Project is not expected to have any detectable affect on water quality in the Victoria River or Red Indian Lake.

ID:	**ECC-71**
	Cumulative effects: Section 19(1)(a) of the *Canadian Environmental Assessment Act*, 2012 requires that an environmental assessment of a designated project, "take into account cumulative environmental effects that are likely to result from the designated project in combination with other physical activities that have been or will be carried out". The provincial EIS Guidelines indicates "cumulative effects shall be assessed in relation to each VEC for which a residual effect of the Project is predicted to be adverse and likely." As per the definition of cumulative effects, an assessment of a worst-case accidental event is not incorporated into the assessment of cumulative effects because it is not "likely to result". The environmental effects of a dam breach, including potential downstream effects on water quality and fish and fish habitat were fully assessed in Section 21.5.1 of the EIS, but as indicated above and in accordance with standard environmental assessment methods, were not considered within the context of cumulative effects.
Appendix:	None

RESPONSE TO ECC-72

ID:	**ECC-72**
Expert Department or Group:	Department of Environment and Climate Change- Water Resources Management Division
Guideline Reference:	4.2.1.3.3 Existing Environment, 4.2.1.3.3.1 Groundwater
EIS Reference:	-
Context and Rationale:	GEMTEC - Hydrogeology Baseline Report, within the Valentine Gold Project Baseline Study Appendix 3: Water Resources, page 329Appendix 6A, Section 4.1, page 12 and Stantec - Valentine Gold Project: Hydrogeology Modelling, Section 4.4.4 page 4.20: The hydrogeological report (GEMTEC - Hydrogeology Baseline Report) and the hydrogeological modelling (Appendix 6A) as presented in these reports indicate a paucity of data that delineate various faults, fractures and shear zones in the area. Significantly, there is a lack of information regarding a major thrust fault (the Victoria Lake Thrust Fault), which runs through both the proposed Leprechaun and Marathon open pits. The hydraulic conductivity of these structural features may be very different from the bulk hydraulic conductivity, which could change the inflow rate to the open pits, as well as potentially act as a more hydraulically conductive pathway for contamination to enter the environment.
Information Request:	Ideally, further characterization of these structural features should be completed; however, it may not be possible to characterize these features more completely at this stage of the project. A plan should be developed and presented outlining the timing of when this information will be acquired. The hydrogeological model should then be updated with all new data when available. This can be addressed as a condition of release.
Response:	Maps showing local and regional faults within the vicinity of the faults were prepared by Terrane and are presented in Terrane (2021) Figures 9 and 10 (attached). The structural geology information for these faults is presented in Terrane (2021) Tables 13 and 15 (attached). As shown, the regionally extensive Valentine Lake Thrust Fault is sub-vertical, dipping from 80º in the Marathon deposit, to 70.1º in the Leprechaun deposit. The faults are dominantly oriented along an east-northeast direction (strike between 230º to 250º). Packer testing of faults has been completed by GEMTEC for Terrane Geoscience Inc. (GEMTEC 2021; Appendix D) since completion of the EIS. The hydraulic conductivity for the Valentine Lake thrust fault ranged from 2.5×10^{-9} m/s to 6.7×10^{-6} m/s, with a geometric mean of 7.0×10^{-8} m/s at the Marathon deposit. Similar results were also obtained for the other faults local to the Marathon deposit. A packer test was completed for the

ID:	**ECC-72**
	Valentine Lake thrust fault, with a hydraulic conductivity value of 1.4×10^{-9} m/s. Although this value is approximately one order of magnitude lower than that determined at the Marathon deposit, the geometric mean for the other faults local to the Leprechaun deposit was 4.8×10^{-8} m/s. Overall, the hydraulic conductivities determined for the Marathon and Leprechaun deposit faults (including the Valentine Lake thrust fault) were within the range of values for the various rock types and were not found to be hydraulically distinct from the surrounding rock mass. This continues to support the assumption that the faults around the proposed open pits are not expected to be substantial preferred pathways for groundwater flow or constitute problem areas for seepage control. References: GEMTEC Consulting Engineers and Scientists Limited. 2021. Summary of Packer Testing, 2020 FS-Level Geotechnical Pit Design Program, Marathon Valentine Gold Project, Central Newfoundland. Letter report prepared for Marathon Gold Corporation, dated May 31, 2021.
Appendix:	See Appendix D: Summary of Packer Testing

MARATHON GOLD

VALENTINE GOLD PROJECT
FEASIBILITY
GEOTECHNICAL INVESTIGATION

FIGURE 9 - Terrane 2020 Fault Model
Marathon Deposit

Scale: 1:7000	Date: Jan.07, 2021
Drawn: ACH	Checked: AG
Approved: TLG	Figure 9

LEGEND

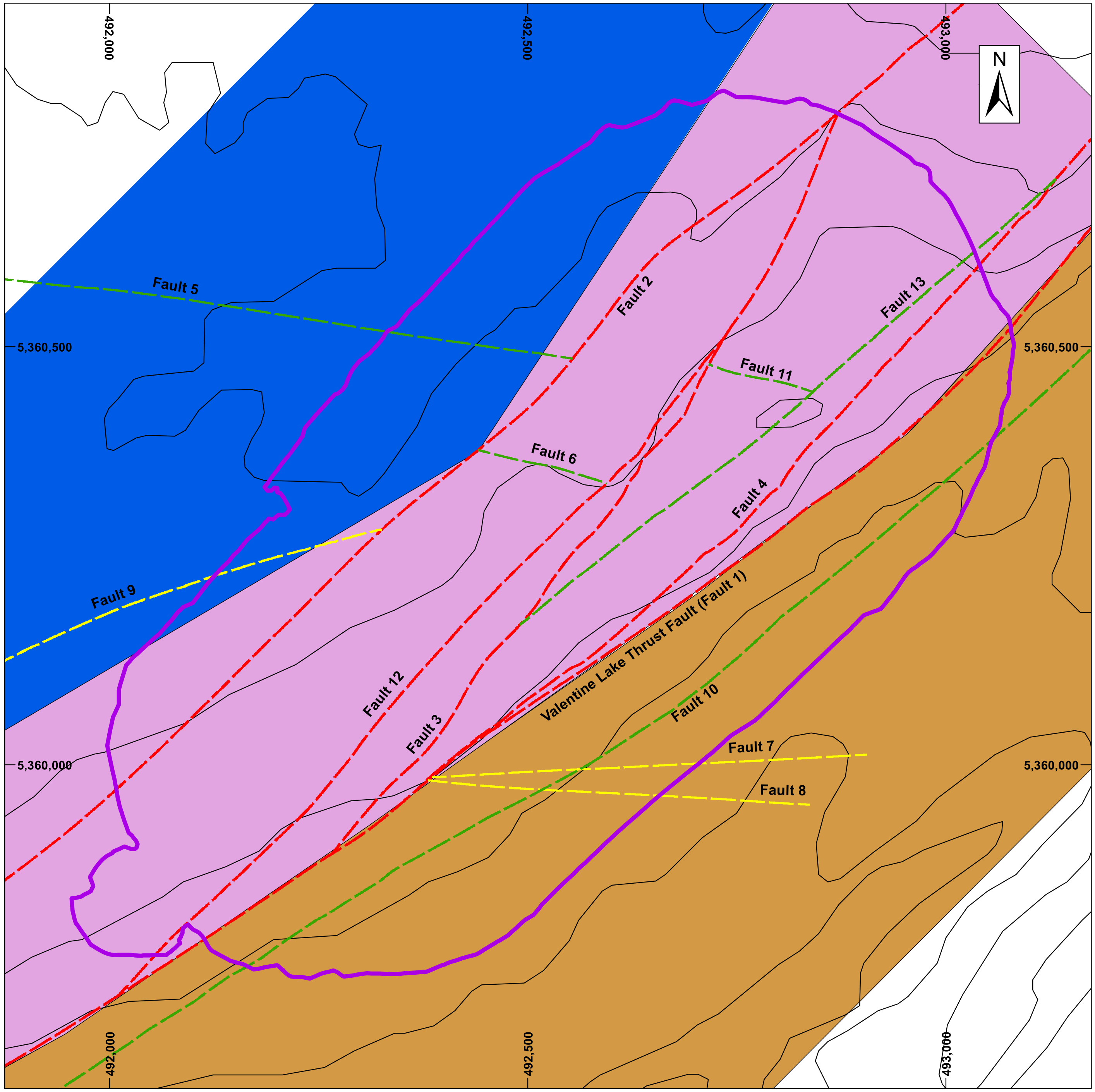
- Mafic Intrusive Domain[1.]
- Quartz-Eye Porphyry Domain[1.]
- Conglomerate Domain[1.]
- Fault - High Confidence[2.]
- Fault - Medium Confidence[2.]
- Fault - Low Confidence[2.]
- 10 m Topographic Contours
- Marathon Pit Outline (December 2020)

0 125 250 Meters

TERRANE GEOSCIENCE INC.

www.terranegeoscience.com

Notes
1) Lithology polygons provided by Marathon
2) All faults from 2020 Terrane Modelling
3) NAD83 UTM Z21N



MARATHON GOLD

VALENTINE GOLD PROJECT
FEASIBILITY
GEOTECHNICAL INVESTIGATION

FIGURE 10 - Terrane 2020 Fault Model
Leprechaun Deposit

Scale: 1:7,500	Date: Jan.07, 2021
Drawn: ACH	Checked: AG
Approved: TLG	Figure 10

LEGEND

- Trondhjemite Domain
- Conglomerate Domain
- Fault - High Confidence [1.]
- Fault - Medium Confidence [1.]
- Fault - Low Confidence [1.]
- 10 m Topographic Contours
- Leprechaun Pit Outline (December 2020)

0 150 300 Meters

TERRANE
GEOSCIENCE INC.
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Notes
1) All faults from 2020 Terrane Modelling
2) NAD83 UTM Z21N

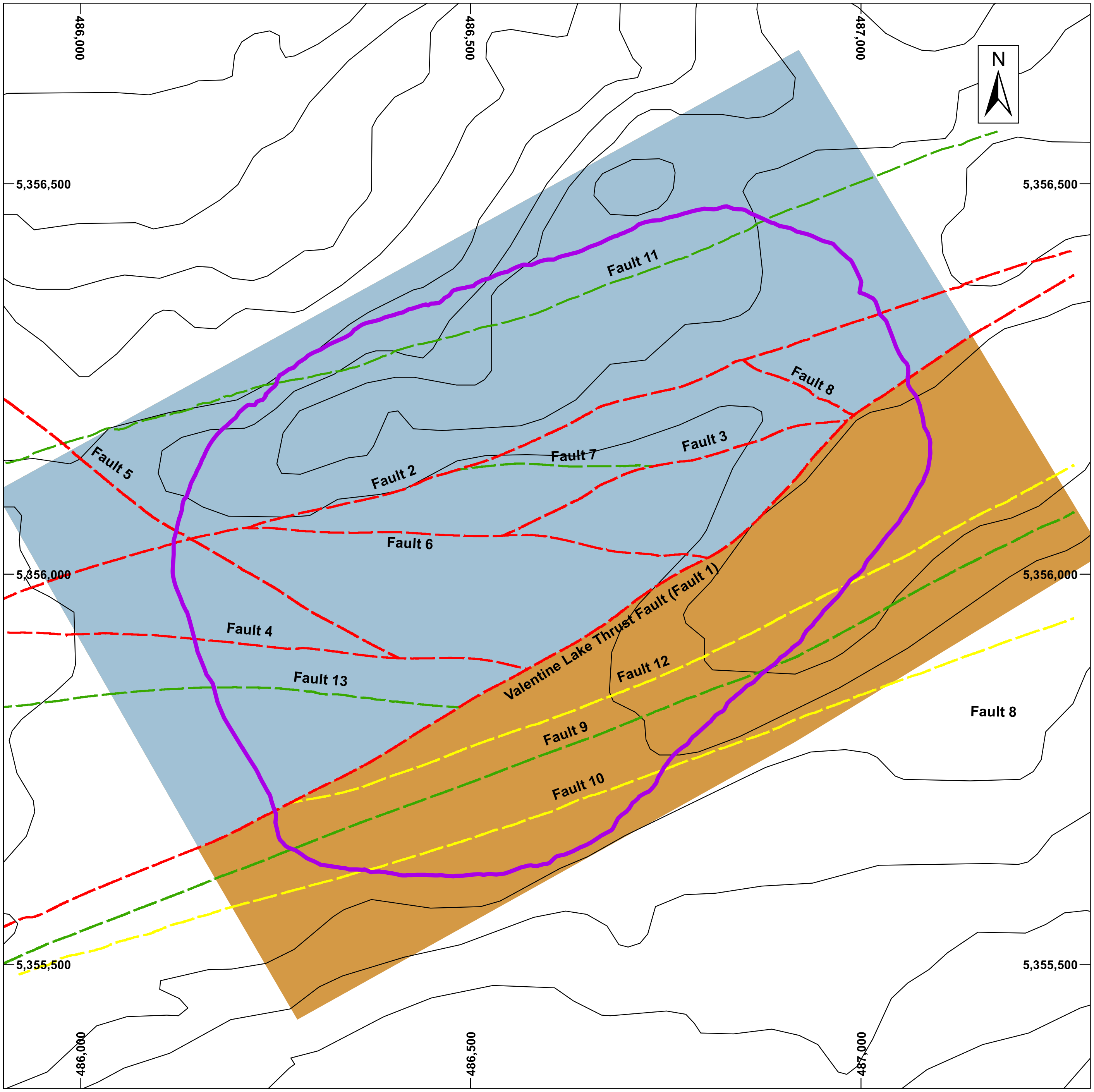

Table 13 - Marathon Modelled Fault Summary

Fault ID	Strike (°)1.	Dip (°)2.	Topo. Lineament3.	Magnetic Lineament3.	No. DDH Logged Faults4.	No. DDH Intercepts RQD < 50%5.	Televiewer /Orientated Core6.	Observed in Surface Mapping7.	Confidence Score	Confidence8.
Fault 1	233.6	80	1	1	5	5	3	1	16	High
Fault 2	226.4	77.1	1	1	2	5	3	0	12	High
Fault 3	216.8	79.1	0	1	5	5	4	1	16	High
Fault 4	228.8	75.1	1	1	3	5	3	1	14	High
Fault 5	277.1	66.8	1	0	1	1	2	0	5	Medium
Fault 6	283.9	77.1	0	1	0	3	3	0	7	Medium
Fault 7	265.6	76.5	1	0	0	2	1	0	4	Low
Fault 8	273.6	77.4	0	0	0	1	2	0	3	Low
Fault 9	254.2	41.9	1	0	0	0	1	0	2	Low
Fault 10	232.5	85.7	1	1	0	1	2	0	5	Medium
Fault 11	287.5	69.6	0	1	0	2	2	0	5	Medium
Fault 12	222.6	75.9	0	1	0	5	4	0	10	High
Fault 13	230.6	77.1	0	1	0	5	1	0	7	Medium

Notes:
1. Strike using right-hand rule, reported strike is the mean strike from stereonet analysis of each faults modelled vertices.
2. Dip is the mean dip from stereonet analysis of each faults modelled vertices.
3. Does a topographic or magnetic geophysical lineament exist, yes (1) or no (0).
4. Number of logged structures used to model fault that are coincide with logged fault zone (>0.25 m), lost core zones, and/or conglomerate-quartz eye porphyry contact (Fault 1 – Valentine Lake thrust fault). Score ranges from 0-5, score capped at 5.
5. Number of RQD runs used to model fault that are coincident with modelled fault with RQD<50%. Score ranges from 0-5, score capped at 5.
6. Number of times fault is observed in televiewer and/or oriented core. Score ranges from 0-3, score capped at 3.
7. Observed in surface mapping from S. Kruse, 2020.
8. Low (0-4), Medium (5-9), High (>10).

Table 15 - Leprechaun Modelled Fault Summary

Fault ID	Strike (°)[1.]	Dip (°)[2.]	Weak Topo. Lineament[3.]	Strong Topo. Lineament[3.]	No. DDH Logged Faults[4.]	No. DDH Intercepts RQD < 50%[5.]	Televiewer /Orientated Core[6.]	Observed in Surface Mapping[7.]	Confidence Score	Confidence[8.]
Fault 1	236.5	70.1	1	1	5	5	2	1	15	High
Fault 2	250.7	56.7	1	1	5	5	3	1	16	High
Fault 3	250	57.1	1	1	3	5	2	1	13	High
Fault 4	275.9	54.5	1	1	5	5	3	1	16	High
Fault 5	299.7	52.6	1	1	5	5	1	1	14	High
Fault 6	274.8	52.4	1	1	4	5	0	1	12	High
Fault 7	269	54.6	1	0	2	5	0	1	9	Medium
Fault 8	294.2	54.3	1	0	1	5	3	0	10	High
Fault 9	248.6	57.8	1	1	0	2	2	0	6	Medium
Fault 10	251	53.3	1	0	0	1	2	0	4	Low
Fault 11	250.2	55	1	1	0	2	0	1	5	Medium
Fault 12	248.1	64.3	0	0	0	0	3	0	3	Low
Fault 13	275.7	55.1	1	1	0	4	2	0	8	Medium

Notes:
1. Strike using right-hand rule, reported strike is the mean strike from stereonet analysis of each faults modelled vertices.
2. Dip is the mean dip from stereonet analysis of each faults modelled vertices.
3. Does a topographic lineament exist, if so, is it weak or very well defined, strong, yes (1) or no (0).
4. Number of logged structures used to model fault that are coincide with logged fault zone (>0.25 m), lost core zones, and/or conglomerate-quartz eye porphyry contact (Fault 1 – Valentine Lake thrust fault). Score ranges from 0-5, score capped at 5.
5. Number of RQD runs used to model fault that are coincident with modelled fault with RQD<50%. Score ranges from 0-5, score capped at 5.
6. Number of times fault is observed in televiewer and/or oriented core. Score ranges from 0-3, score capped at 3.
7. Observed in field mapping from S. Kruse, 2020.
8. Low (0-4), Medium (5-9), High (>10).

RESPONSE TO ECC-73

ID:	**ECC-73**
Expert Department or Group:	Department of Environment and Climate Change- Climate Change Branch
Guideline Reference:	-
EIS Reference:	4.2.1.3.3 Existing Environment 4.2.1.3.3.1 Groundwater
Context and Rationale:	-
Information Request:	GEMTEC - Hydrogeology Baseline Report, within the Valentine Gold Project Baseline Study Appendix 3: Water Resources, Section 4.3, page 16: Further characterization of the Victoria Lake Group (VLG) rocks, located under the Leprechaun waste rock pile, tailings storage facility, process plant, and accommodations camp, is required. Only one hydraulic conductivity test was available (from the potable well in the current work camp), and likely does not fully characterize these units, especially in areas that may impact the environment (e.g., The Leprechaun waste rock pile, tailings storage facility and process plant). It is recommended that more observation wells be installed and tested, and these data be used to update the model. This can be addressed as a condition of release.
Response:	Additional groundwater monitoring has been conducted at the site that includes the installation of new boreholes to support ongoing design work for the mine components (GEMTEC 2021), as shown on Figure ECC-73.1. Hydraulic conductivity testing was conducted in 35 of the boreholes, as presented by GEMTEC (2021), and summarized by hydrostratigraphic unit in Table ECC-73.1. Also presented in the table are the expected and calibrated values of hydraulic conductivity used in the groundwater model from Appendix 6A of the EIS. As shown in Table ECC-73.1, the range of values observed in the boreholes tested in 2020 are similar to the range of values determined in the baseline study completed for the EIS and therefore, an update to the groundwater model is not required. Additional groundwater monitoring wells will be installed downgradient of the waste rock piles and tailings management facility prior to the development of the Project to characterize the downgradient water quality and water levels. Reference GEMTEC Consulting Engineers and Scientists Limited. 2021. Feasibility-Level Site-Wide Geotechnical and Hydrogeological Investigations, Valentine Gold Project Marathon Gold Corporation. Dated January 30, 2021
Appendix:	None

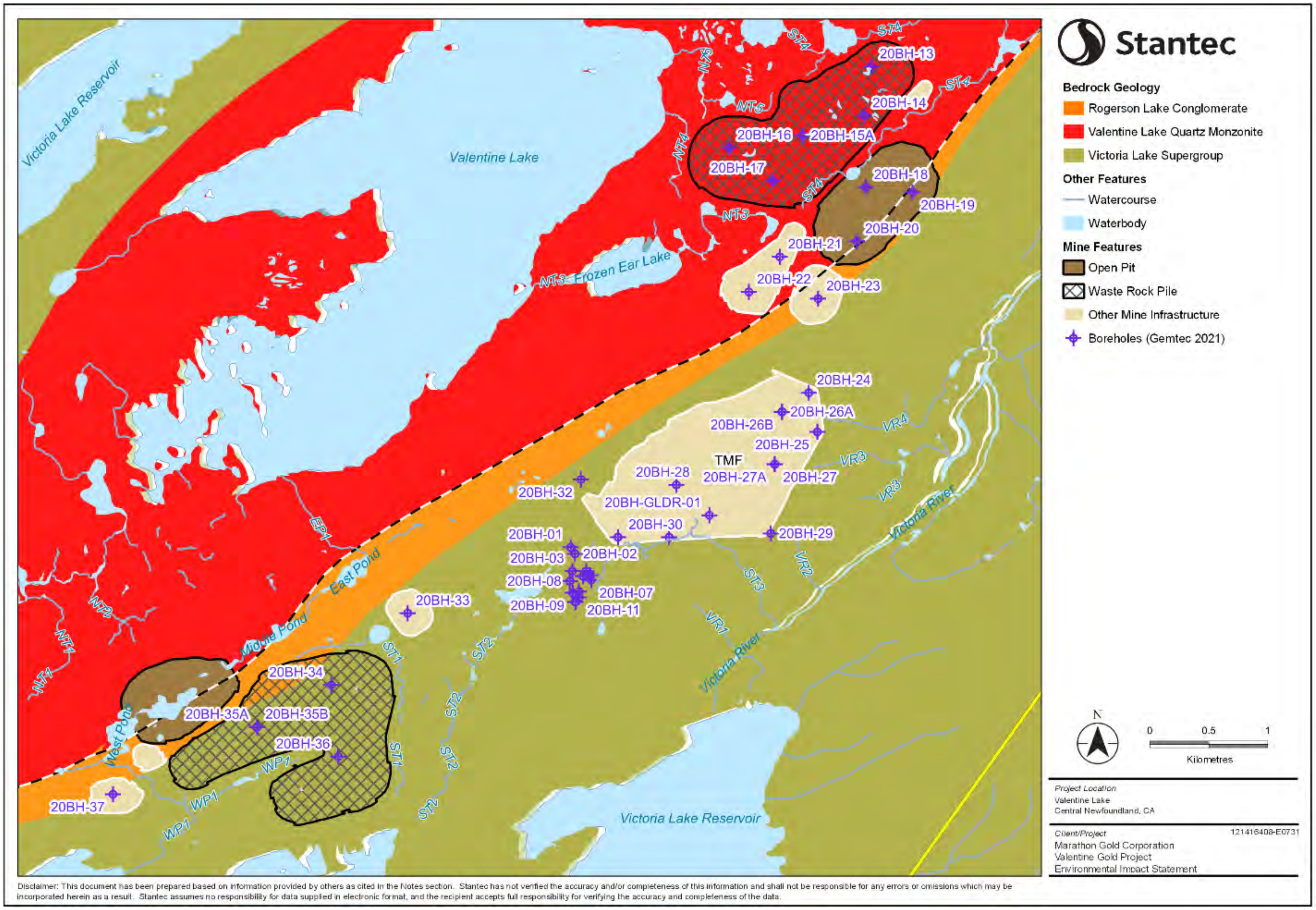

Figure ECC-73.1 Boreholes installed in 2020 (GEMTEC 2021)

Table ECC-73.1 Hydraulic Conductivity (m/s) Ranges in Boreholes Installed in 2020

Hydrostratigraphic Unit	Expected Range in EIS	Calibrated Value in EIS	Minimum from 2020 Boreholes	Maximum from 2020 Boreholes
Valentine Lake Supergroup	8.8×10^{-7} – 1.3×10^{-6}	9.9×10^{-7}	6.1×10^{-7}	9.9×10^{-5}
Rogerson Lake Conglomerate	1.3×10^{-6} – 1.5×10^{-5}	3.5×10^{-7}	1.3×10^{-6}	9.7×10^{-6}
Valentine Lake Quartz Monzonite	8.0×10^{-7} – 8.6×10^{-5}	9.6×10^{-7}	1.7×10^{-7}	6.2×10^{-5}

RESPONSE TO ECC-74

ID:	**ECC-74**
Expert Department or Group:	Department of Environment and Climate Change- Climate Change Branch
Guideline Reference:	4.2.1.3.3 Existing Environment 4.2.1.3.3.1 Groundwater
EIS Reference:	-
Context and Rationale:	-
Information Request:	GEMTEC - Hydrogeology Baseline Report, within the Valentine Gold Project Baseline Study Appendix 3: Water Resources, Section 4.4.2, page 21 The consultant notes that the abbreviated groundwater-level monitoring may not capture the full range of seasonal groundwater-level fluctuations, as the monitoring program had a duration of less than a year. An updated baseline study report and modelling should be provided once a full year of groundwater level monitoring has occurred. This can be addressed as a condition of release.
Response:	Groundwater monitoring has continued at the Marathon site at three of the monitoring locations presented in the EIS -- MW1 (located north of the Site), MW4 (located downstream of the TMF), and MW5 (located in the footprint of the Leprechaun Waste Rock Pile, as described by GEMTEC (2021; Appendix E). The year-long water level hydrographs show that groundwater levels were typically lower during the winter months, and in the mid- to late-summer corresponding to periods with relatively lower infiltration rates. The highest groundwater levels were recorded during the spring corresponding to the spring freshet, and during the fall rainy period. Seasonal fluctuations in groundwater levels ranged from 0.6 m in MW1 to 1.12 m in MW5. The water level hydrographs for these wells are provided in Appendix E. Since changes in the observed groundwater levels are within the range of those previously observed, further groundwater modelling is not required. References: GEMTEC Consulting Engineers and Scientists Limited. 2021. Hydrogeology Baseline Characterization - Update on Long-Term Groundwater Level Monitoring, Marathon Valentine Gold Project, Central Newfoundland. Letter report to Marathon Gold Corporation dated March 2, 2021.
Appendix:	See Appendix E: Hydrogeology Baseline Characterization - Update on Long-Term Groundwater Level Monitoring

RESPONSE TO ECC-75

ID:	**ECC-75**
Expert Department or Group:	Department of Environment and Climate Change- Climate Change Branch
Guideline Reference:	-
EIS Reference:	-
Context and Rationale:	While the proponent has proposed mitigation measures in the draft EIS document, the requirements for BACT under the Act have not be met. As per section 12(1) of the Act: “Where a person registers an industrial facility to which these regulations may apply, other than an offshore industrial facility or a mobile offshore industrial facility, in accordance with the *Environmental Protection Act*, the person shall, on the date the industrial facility is registered, provide information regarding best available control technology to the minister.” Furthermore, section 12.1(4) outlines what is needed to be presented to the minister in order for a determination to be made regarding BACT requirements: “An industrial facility is considered to meet the best available control technology requirements where the Lieutenant-Governor in Council is satisfied that the combination of machinery and equipment in the industrial facility (a) has the most effective greenhouse gas emissions control; (b) has proven performance and reliability in comparable industrial facilities; (c) is economically feasible, based on consultation with the operator; and (d) complies with an Act or regulation relating to air pollution, occupational health and safety and fire and life safety.
Information Request:	Therefore, the Climate Change Branch requests that the proponent provide appropriate information and/or analyses that illustrates how the facility plans to meet (or has met) the BACT requirements of the Management of *Greenhouse Gas Act* with regards to the machinery and equipment to be used by the facility. This information will need to be submitted to cabinet for final determination.
Response:	A Best Available Control Technology (BACT) Study is provided in Appendix F.
Appendix:	See Appendix F: Best Available Control Technology Study

RESPONSE TO ECC-76

ID:	ECC-76
Expert Department or Group:	Department of Environment and Climate Change- Climate Change Branch
Guideline Reference:	-
EIS Reference:	-
Context and Rationale:	-
Information Request:	"Once operational, the Project will be regulated under the NL Management of *Greenhouse Gas Act* (2016) (MGGA) during the years for which the annual GHG emissions are greater than 15,000 tonnes CO2e/year (predicted for the first nine years of operation)." (pg. 5.64) To clarify, section 4(1) of the Management of *Greenhouse Gas Act* (Act) states: "Except as provided in section 7, this Act applies to an industrial facility that emits 15,000 tonnes of carbon dioxide equivalent or more of greenhouse gases in any year after the coming into force of this Act." In other words, once the threshold of 15,000 tonnes has been met (during any phase of the project, construction or operation), the Act will apply to the industrial facility from that year forward, regardless of greenhouse gas emissions in future years. Exemptions can occur as per section 4(2) if certain conditions are met: "Notwithstanding subsection (1), where an industrial facility emits less than 15,000 tonnes of carbon dioxide equivalent in 3 consecutive years, the operator of the industrial facility may apply to the minister for an exemption from this Act." As per section 4(3), the exemption under subsection (2) expires if the facility emits 15,000 tonnes of CO2e in a year after the exemption is granted. Furthermore, as stated in section 10(1), "An operator of an industrial facility to which this Act applies shall submit to the minister annually a report regarding the greenhouse gas emissions released and containing other information prescribed in the regulations."
Response:	This comment has been noted and Marathon will abide by the Newfoundland and Labrador (NL) *Management of Greenhouse Gas Act* (2016) (the Act or MGGA) accordingly. Marathon will report greenhouse gas (GHG) emissions once the annual threshold of 15,000 tonnes CO_2e has been met (during any phase of the project, construction or operation) and for future years, unless an exemption from the Act is granted by the Ministry. Marathon understands that an exemption requires an application, and that the Facility is only eligible to apply after GHG emissions are less than 15,000 tonnes CO_2e for three consecutive years. Marathon understands that the exemption will

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	expire if the Facility emits 15,000 tonnes of CO_2e in a year after it is granted. The sentence on page 5.64 of the EIS (as described above in the IR) should read as follows: "The Project will be regulated under the NL MGGA and GHG emissions will be reported starting in the year for which the annual GHG emissions are greater than 15,000 tonnes CO_2e (during any phase of the Project, construction or operation). Project GHG emissions will continue to be reported unless an exemption is granted by the Ministry." This does not change the effects assessment or conclusions for Atmospheric Environment as presented in the EIS (Chapter 5).
Appendix:	None

RESPONSE TO ECC-77

ID:	**ECC-77**
Expert Department or Group:	Department of Environment and Climate Change- Climate Change Branch
Guideline Reference:	-
EIS Reference:	-
Context and Rationale:	-
Information Request:	"During the years in which GHG emissions are greater than 25,000 tonnes CO_2e/year (predicted for the first eight years of operation), the Project will be subject to greenhouse gas reduction targets as per section 5 of the MGGA and regulated under a performance standard, measured in terms of GHG emissions per unit of output within the facility boundary." (pg. 5.64) Section 5(1) of the Act states: "The Lieutenant-Governor in Council may make regulations establishing annual greenhouse gas emissions reduction targets for (a) industrial facilities that emit 25,000 tonnes of carbon dioxide equivalent or more of greenhouse gases in any year since the coming into force of this Act; and (b) opted-in facilities." An opted-in facility is defined in section 5.1(1) of the Act as an industrial facility that emits between 15,000 and 25,000 tonnes of carbon dioxide equivalent of greenhouse gases in a year. That facility may apply to the minister to be designated as an opted-in facility. Section 5(2) states: "An industrial facility shall achieve the prescribed annual greenhouse gas emissions reduction target each year." In other words, once the threshold has been met (the facility has emitted 25,000 tonnes or the facility has emitted 15,000-25,000 tonnes and has opted- in) and the facility has reached the fourth year of production (see more in part c below), the industrial facility will be subject to a greenhouse gas reduction target from that year forward, regardless of greenhouse gas emissions in future years. Exemptions can occur as per section 5(4) if certain conditions are met: "The Lieutenant-Governor in Council may make regulations exempting an industrial facility referred to in paragraph (1)(a) from achieving its annual greenhouse gas emissions reduction target where the industrial facility (a) emits less than 25,000 tonnes of carbon dioxide equivalent or more of greenhouse gases in 3 consecutive years; and (b) applies to the minister for an exemption."
Response:	This comment has been noted and Marathon will abide by the Newfoundland and Labrador *Management of Greenhouse Gas Act* (2016) (the Act or MGGA) accordingly. As it is expected that the annual greenhouse gas (GHG) emissions during operation will be greater than 25,000 tonnes CO_2e, Marathon will be subject to GHG emission reductions that are established by the Lieutenant-Governor as per Section 5(1) of the

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	Act. As per section 5(2) of the Act, Marathon will achieve the prescribed annual greenhouse gas emissions reduction targets each year starting in the fourth year of production (and from that year forward), unless an exemption is granted by the Lieutenant-Governor in Council. Marathon understands that an exemption requires an application, and that the Facility is only eligible to apply after GHG emissions are less than 25,000 tonnes CO_2e for three consecutive years. The sentence on page 5.64 of the EIS (as described above in the IR) should read as follows: "As the Project is expected to emit annual GHGs greater than 25,000 tonnes CO_2e during operation, the Project will be subject to greenhouse gas reduction targets as per section 5 of the MGGA and regulated under a performance standard starting in the fourth year of production (and from that year forward) unless an exemption is granted." This does not change the effects assessment or conclusions for Atmospheric Environment as presented in the EIS (Chapter 5).
Appendix:	None

RESPONSE TO ECC-78

ID:	**ECC-78**
Expert Department or Group:	Department of Environment and Climate Change- Climate Change Branch
Guideline Reference:	-
EIS Reference:	-
Context and Rationale:	-
Information Request:	"As the GHG emissions within the Project boundary are expected to be regulated under a performance standard pursuant to the MGGA (section 5), they will not be subject to the *Revenue Administration Act* carbon tax provisions." (pg. 5.64) Section 16.2 of the Revenue Administration Regulations states: "A carbon product used in a source category prescribed in paragraphs 5(1)(a), (c), (d) and (e) of the Management of Greenhouse Gas Reporting Regulations by an industrial facility that, at the time of the purchase of the carbon product, has a greenhouse gas reduction target under section 5 of the Management of *Greenhouse Gas Act* is exempt from paying the tax imposed under subsection 72.1(1) of the Act." Section 3(3) of Management of *Greenhouse Gas Act* (Act) states: "Notwithstanding paragraph (1)(a), where an industrial facility commences production after these regulations come into force, Parts I to III do not apply to the industrial facility until its fourth year of production." Greenhouse gas reduction targets are established in Part II of the Act; therefore, this facility would not be subject to a greenhouse gas reduction target until their fourth year of production. Subsequently, the facility would be subject to carbon tax under the Revenue Administration Regulations for years 1 through 3.
Response:	This comment has been noted and Marathon will abide by the *Revenue Administration Regulations* for the years prior to being subject to the greenhouse gas (GHG) reduction targets under the Act (i.e., for operation years one through three). The sentence on page 5.64 of the EIS (as described above in the IR) should read as follows: "The Facility will be subject to the carbon tax under the *Revenue Administration Regulations* for operational years one through three, prior to the establishment of a GHG reduction target under the Newfoundland and Labrador *Management of Greenhouse Gas Act* (2016) (the Act or MGGA). As the GHG emissions within the Project boundary are expected to be regulated under a performance standard pursuant to the MGGA (Section 5) starting in the fourth operational year, at that time and moving forward they

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	will no longer be subject to the *Revenue Administration Act* carbon tax provisions." This does not change the effects assessment or conclusions for Atmospheric Environment as presented in the EIS (Chapter 5).
Appendix:	None

RESPONSE TO OSW-01

ID:	OSW-01
Expert Department or Group:	Executive Council - Office for the Status of Women
Guideline Reference:	-
EIS Reference:	-
Context and Rationale:	-
Information Request:	OSW notes Marathon has not yet finalized socio-economic agreements with Indigenous stakeholders as of the drafting of this EIS and would like to know what Marathon plans to do if these agreements are not concluded in a timely manner.
Response:	Marathon has finalized a socio-economic agreement with Qalipu Mi'kmaq First Nation Band (Qalipu). The agreement provides the framework for a long-term, positive working relationship with Qalipu and addresses matters such as ongoing engagement processes, training, employment and business opportunities for Qalipu members and Qalipu businesses, environmental stewardship and monitoring and community investment. The agreement was reviewed and approved by Qalipu Council on March 27, 2021 and plans are now underway for signing by both parties. Marathon has invited Miawpukek First Nation (MFN) to enter into negotiations with a view to concluding a socio-economic agreement similar to that which has been entered into with Qalipu. Whether or not such an agreement is ultimately finalized, Marathon has engaged and will continue to engage with MFN. Consistent with the Gender Equity, Diversity and Inclusivity Plan and with the terms of any agreement entered into with MFN, Marathon will implement measures designed to promote access by MFN businesses and membership to the education and training, employment and business opportunities associated with the Project. In addition, Marathon has been engaged in discussions with MFN with respect to participation in monitoring activities.
Appendix:	None

RESPONSE TO OSW-02

ID:	**OSW-02**
Expert Department or Group:	Executive Council - Office for the Status of Women
Guideline Reference:	-
EIS Reference:	-
Context and Rationale:	-
Information Request:	Will the Project proceed if agreements are not made between Marathon and Indigenous stakeholders?
Response:	Marathon values its relationship with Qalipu Mi'kmaq First Nation Band (Qalipu) and with Miawpukek First Nation (MFN) and has actively engaged both groups since 2019 to better understand the potential impacts of the Project upon Indigenous interests, including land and resource use in the vicinity of the Project. Although the conclusion of an agreement with an Indigenous group is not a legal requirement under the *Canadian Environmental Assessment Act 2012* and has not been identified as a precondition to the Project proceeding, Marathon has formalized its relationship with Qalipu through the conclusion of a socio-economic agreement, which addresses matters such as ongoing engagement processes, training, employment and business opportunities for Qalipu members and Qalipu businesses, environmental stewardship and monitoring, and community investment over the life of the Project. Marathon has offered to enter into a similar arrangement with MFN. Whether or not such an agreement is ultimately finalized, Marathon has engaged and will continue to engage with MFN. Consistent with the Gender Equity, Diversity and Inclusivity Plan, will implement measures designed to promote access by MFN businesses and membership to the education and training, employment and business opportunities associated with the Project. In addition, Marathon has been engaged in discussions with MFN with respect to participation in monitoring activities. Marathon is committed to continuing to engage with each Indigenous group throughout the life of the Project to provide Project-related information and discuss issues of concern. Consistent with the Gender Equity, Diversity and Inclusivity Plan and the terms of any agreement which has been concluded with either group, Marathon will implement measures designed to promote access by each group's businesses and membership to the education and training, employment and business opportunities associated with the Project. Indigenous groups will also be involved in monitoring initiatives.
Appendix:	None