

Goliath Gold Project – Clarification on the response to Information Requirement #2

Table 1: The Agency seeks clarification on the following mitigation measures and commitments by the proponent to support the Agency’s understanding of the effects of the Project to the environment. If these clarifications result in changes to the document “R.1 Goliath Gold Project Mitigation, Monitoring and Commitments (March 6, 2019)”, update that document and resubmit it to the Agency.

Item No.	Context	Mitigation, Monitoring Requirement, or Commitment proposed by the proponent in the response to IR#2	Clarification of the commitment
1	<p><u>Mercury concentration in the pit lake</u> The Agency notes that during and after operations, water discharged into the Blackwater Creek would be treated to meet the background concentrations for mercury in Blackwater Creek (0.00001 mg/L), as mentioned in Table 6.3.4.3-1 of the revised EIS.</p> <p>Since the pit lake would be connected with Blackwater Creek upon filling during abandonment, the Agency seeks clarification on the appropriate water quality criteria for mercury that will be targeted for treatment of pit lake water.</p>	<p>MMC-7.14: The pit lake will be monitored as it is filling to determine whether batch treatment will be required to ensure the water meets PWQO, or background concentrations if background levels are greater than the PWQO, prior to the discharge from the pit lake to a tributary of Blackwater Creek.</p> <p>MMC-7.2: During Operations, effluent discharged from the Project to Blackwater Creek will meet the Provincial Water Quality Objectives (PWQO) for the parameters listed below, or background concentrations if background levels are above the PWQO. Where there is no PWQO for a parameter, the commitment will be to meet the Canadian Water Quality Guidelines (CWQG). For total mercury, the commitment will be that effluent discharged to Blackwater Creek will meet background concentrations for that watercourse. Background concentrations for Blackwater Creek are defined as the 75th percentile in accordance MOECC receiving water assessment policy. Detailed parameters will be determined through engagement with appropriate Provincial and Federal regulatory bodies [Cmt_034].</p>	<p>Clarify whether water in the pit lake would be treated to meet the same concentration for mercury as is committed for Blackwater Creek (0.00001 mg/L).</p>
2	<p><u>Beaver Management Strategy</u> Beaver is an important species to the Métis Nation of Ontario that is traditionally hunted and commercially trapped. Additional communities, such as Eagle Lake First Nation and Wabigoon Lake Ojibway Nation have indicated that beavers are important for hunting and trapping.</p> <p>The Agency notes that mitigation measures proposed by the proponent refer to beavers as nuisance wildlife, which is not reflective of Indigenous communities’ perspectives and use of beavers for traditional and commercial purposes.</p>	<p>MIT 126: Prior to construction activities, Treasury Metals will engage with the local trapping council, Indigenous communities and the MNR to prepare a plan for the removal of nuisance wildlife (i.e., beaver) within the Blackwater Creek watershed.</p> <p>MMC-13.9: Prior to overburden removal, any beaver dams within the Project footprint will be removed and the impoundments will be allowed to draw down. This will reduce the number of fish that will remain in isolated sections of Blackwater Creek Tributary 1 and Blackwater Creek Tributary 2.</p>	<p>The mitigation measures regarding beavers should be revisited in consideration of the factors outlined in the Context column. Any plans to address potential effects on beavers should be prepared and implemented in consultation with the Indigenous communities.</p>

Item No.	Context	Mitigation, Monitoring Requirement, or Commitment proposed by the proponent in the response to IR#2	Clarification of the commitment
3	<p><u>Blasting</u> As it relates to Indigenous use in proximity to the operations area, providing a blasting schedule and time window for when blasting would likely occur would allow Indigenous communities to plan for disruption to their use of the land and waters surrounding the project.</p> <p>The Agency notes that a time window for blasting is not provided in the revised EIS or in the response to IR#2, but a commitment was made to produce a blasting schedule and plan.</p> <p>The Agency seeks clarification on this blasting schedule and plan, including the feasibility of providing a set time window when blasting would occur, in consultation with Indigenous communities, taking into account: statutory holidays except when necessary for safety reasons, days of cultural importance, and communications schedule to provide advance notice of blasting.</p>	<p>MMC-3.2: A blasting schedule and plan will be developed to notify the public when blasting will occur and to describe all blasting activities on site. This plan will be developed through consultation with local stakeholders and regulatory officials.</p>	<p>Clarify the commitment made for blasting schedule and plan, while taking into account the factors outlined in the Context column.</p>
4	<p><u>Chanterelle mushrooms sampling</u> The Agency seeks clarification on the sampling frequency and reporting of chanterelle mushrooms and collocated soil samples that informs both Indigenous communities and consumers about the quality of chanterelle mushrooms for consumption.</p>	<p>MMC-20.74: “...Treasury Metals will collect opportunistic chanterelle mushrooms samples and collocated soil samples, as required, and send all samples for chemical analysis to capture any potential effects of the Project on the quality of chanterelle mushrooms for consumption harvested by Indigenous communities for commercial or subsistence purposes, and in turn socio-economic effects. The results of the annual opportunistic chanterelle mushrooms sampling program will be shared with the Indigenous communities. Additionally, Treasury Metals will include the results of the chanterelle mushrooms sampling program (if any) in the annual...”</p>	<p>Clarify a timeline of chanterelle mushrooms sampling within areas of current use that is consistent with harvesting to adhere to annual reporting.</p> <p>Additionally, clarify the development of a sampling methodology with Indigenous communities that is reflective of Indigenous use and the sensitivity of harvested chanterelle mushrooms, prior to construction.</p>
5	<p><u>Invasive species surveys and monitoring</u> The Agency seeks clarification on the area and the phases of the Project that would be surveyed and monitored for invasive species.</p>	<p>MMC-11.49: Surveys of existing invasive species populations will be conducted prior to construction, followed by a monitoring plan to ensure invasive species populations are not increasing in numbers or areas.</p>	<p>Clarify the areas (e.g. project study area, local study area, etc.) that would be surveyed and monitored for invasive species. Also clarify the phases of the project (e.g. construction, operation, etc.) during which monitoring for invasive species would be conducted.</p>

Table 2: Clarification questions based on Agency’s review of the response to IR#2.

If these clarifications result in changes to the document “R.1 Goliath Gold Project Mitigation, Monitoring and Commitments (March 6, 2019)”, update that document and resubmit it to the Agency.

Item No.	Theme	Context	Question
6	Sulphate in the effluent and pit lake	<p><u>Sulphate concentrations in Blackwater Creek and the pit lake</u> The Agency notes in the response to SW(2)-04 and in the Water Addendum (R.3) that the effluent discharge in Blackwater Creek would meet the concentration of 20 mg/L for sulphate. Table W6-3 of the Water Addendum titled “Pit Lake Water Quality” shows that the sulphate concentration in the pit lake would be kept the same (20 mg/L).</p> <p>The Agency notes that the proponent cited a literature study (Ullrich, 2001; Jeremiason et al., 2006) to commit to the concentration of 20 mg/L for sulphate to protect against enhanced methyl mercury production. However, the Agency has learned from experience on Hammond Reef Gold Project (See Section 7.3.2.3 of the Comprehensive Study Report) that sulphate concentrations in excess of 10 mg/L are associated with increased rates of mercury methylation rates.</p> <p>The concentration of sulphate under 10 mg/L appears to be achievable based on the predictions presented by the proponent in the revised EIS. For example, the modelled concentrations of sulphate are below 10 mg/L in the surface water quality modelling results presented in Water Addendum (R.3), Tables W9-1 to W9-3, and Tables W10-1 to W10-3, and the sensitivity analysis presented in Tables W11-1 to W11-10 of the same addendum</p>	<p>Revisit the sulphate concentration limit for the effluent and pit lake water quality after considering the factors outlined in the Context column.</p>
7	Effects of the environment on the Project	<p><u>Drought scenario during abandonment:</u> The Agency notes that in Appendix JJ, Attachment JJ-1 includes an assessment of 1:100 dry year precipitation and 1:100 dry lake evaporation on the maintenance of water cover in the tailings storage facility. The Agency did not find a similar assessment for water withdrawal from the Tree Nursery ponds, which are identified as baitfishing sites by Indigenous communities. The Agency seeks clarification on how water withdrawal from the Tree Nursery ponds would be adjusted during 1:100 dry year precipitation and 1:100 dry lake evaporation scenarios to mitigate effects on fish and fish habitat, and the use of those ponds by Indigenous communities.</p> <p>Furthermore, the Agency notes in Section W5.3 of the Water Addendum that in both the “degraded liner case” and “no liner case”, water would be pumped from the pit lake (which may be at a lower elevation) to tailings storage facility for maintenance of the wet cover. The Agency seeks clarification on how the water from the pit lake would be redirected to the tailings storage facility.</p>	<p>Provide an assessment for 1:100 dry year precipitation and 1:100 dry lake evaporation for Tree Nursery ponds, and clarify how the water withdrawal from the Tree Nursery ponds would be adjusted to preserve the fish and fish habitat, and the use of those ponds for baitfishing by Indigenous communities.</p> <p>Clarify how the water from the pit lake would be redirected to the tailings storage facility to maintain the wet cover under the degraded and no-liner scenarios.</p>
8	Tailings storage facility	<p><u>Contingency measures for earlier onset of ARD in the tailings storage facility</u> There are no contingency measures proposed in the event that ongoing monitoring of the TSF wet cover shows that ARD onset time is quicker than predicted. This is important to understand as the proponent has acknowledged that there are uncertainties regarding the variability in tailings composition, and because the tailings beaches may be exposed for a longer time and may have preferential deposition, which could lead to elevated sulphides.</p>	<p>Provide contingency measures that would be implemented, in case monitoring results show an earlier onset of ARD than predicted, to ensure that the ARD can be managed before its effects extend into the surrounding environment.</p>

9	Tailings storage facility	<p><u>Contingency measures if liner degrades</u> It is unclear what contingency measures would be in place if the results of the monitoring program show that the liner in the tailings storage facility is not performing as intended (i.e., has degraded).</p>	Propose contingency or supplemental measures that would be implemented if the liner degrades, or if it does not perform as intended.
10	Tailings storage facility	<p><u>Treatment of water used to place wet cover over the tailings storage facility:</u> It is stated in Section W5.2 of Water Addendum (March 14, 2019) that “At closure, there will be 320,000 m³ of water available in the minewater pond and collection ponds (Section 3.8.11 of the revised EIS [April 2018]) to be used as water cover for closure of the TSF”.</p> <p>The Agency is unclear whether the water from the minewater pond and collection ponds would be treated prior to its discharge into the tailings storage facility, and if so, which water quality guidelines would be targeted.</p>	Clarify whether water from the minewater pond and the collection ponds intended to replace the water on the tailings storage facility during decommissioning would be treated. If so, describe the water quality guidelines that would be met by the treatment.
11	Waste rock storage area	<p><u>Options to avoid ARD</u> The Agency notes that the waste rock storage area is predicted to be acid-generating. The Agency also notes that the primary intent of the cap on the waste rock storage area at decommissioning is to reduce the infiltration of precipitation through the waste rock, and to reduce the quantity of seepage from the waste rock storage area.</p> <p>The Agency, Natural Resources Canada, and Environment and Climate Change Canada are of the opinion that along with implementing measures to reduce the quantity of seepage, it is important to implement measures to reduce the potential for ARD, and prolong the onset time for ARD.</p>	Clarify and explain the measures that would be applied, from construction through abandonment, to minimize the potential for ARD, and prolong the onset time for ARD.
12	Waste rock storage area	<p><u>Performance of the waste rock storage area cover</u> Further information is needed regarding contingency measures to address future deterioration in cover performance of the waste rock storage area due to settlement, and alterations due to processes such as freeze thaw, wetting and drying, and root penetration.</p>	Provide contingency measures if the cover on the WRSA does not perform as expected from operations through abandonment (when no active intervention is required i.e. post-closure).
13	Waste rock storage area	<p><u>Monitoring and collection of seepage from the waste rock storage area</u> Section W7.7 of the Water Addendum (R.3) appears to assume a fully developed and dewatered open pit scenario, which would represent the maximum drawdown force and thus maximum seepage capture rate from the waste rock storage area, which may not be the case. The Agency notes that seepage would be monitored downstream of the waste rock storage area from operations to abandonment.</p>	Provide contingency measures that would be implemented, if monitoring indicates that there is more seepage from the waste rock storage area than predicted, to ensure that seepage is collected and treated before it discharges into the natural environment.
14	Low-grade ore stockpile and underground workings	<p><u>Effects of low-grade ore and underground workings on the pit lake water quality:</u> Low-grade ore that is stockpiled for many years may be partially oxidized, and may remain unprocessed if economic conditions become unfavourable. The Agency notes that if the low-grade ore remains unprocessed, it would be placed back into the open pit at decommissioning. The sulphide content of the low-grade ore may be higher than that of the waste rock and as a result, the drainage chemistry and solute release may be higher than that of the waste rock.</p> <p>For underground workings, the proponent has not conceptually identified mitigation measures to attenuate and prevent solute release. This will require consideration of geological and geochemical composition of underground mine walls, the time to onset of ARD, and the composition of materials that will be above the height of flooding.</p> <p>For both low-grade ore and underground workings, the Agency seeks clarity on contingency measures or options that would be available to attenuate and prevent solute releases. The Agency is also seeking information on contingency measures required to ensure that the commitments made to achieve the applicable water quality guidelines in the pit lake are achievable.</p>	<p>Provide mitigation measures to attenuate and prevent solute releases, in case the low-grade ore is not processed and placed into the pit lake.</p> <p>Provide mitigation measures to attenuate and prevent solute release from the underground workings.</p>

15	Pit lake water quality	<p><u>Stratification of the pit lake</u> The proponent stated in the revised EIS that the groundwater inflow would continue into the open pit during abandonment, which includes seepage from the waste rock storage area. It is noted in the proponent's response to SW(2)-08 in IR#2 that "Over time it is expected that the water quality of surface inflows will improve, and thus a density difference between surface and water at depth could develop to a point that could maintain permanent stratification".</p> <p>The Agency is uncertain that the pit lake will be able to achieve permanent stratification, as the acidic water from the waste rock storage area would continually seep into the upper layers of the pit lake through the abandonment phase. Furthermore, Environment and Climate Change Canada, Ministry of Environment, Conservation and Parks, and Ministry of Energy, Northern Development and Mines note that the pit lake configuration may not be amenable to establish a permanent stratified condition, as there is a shallow open fetch in the west pit which appears to be oriented parallel with the prevailing wind direction. This could introduce mixing that could prevent stratification.</p> <p>The Agency notes in MMC-7.14 of the R.1 Goliath Gold Project Mitigation, Monitoring and Commitments (March 6, 2019) that "the pit lake will be monitored as it is filling to determine whether batch treatment will be required to ensure the water meets PWQO, or background concentrations if background levels are greater than the PWQ, prior to the discharge from the pit lake to a tributary of Blackwater Creek".</p> <p>In consideration of the question raised in Item No. 9 of Annex 2 regarding low-grade ore and underground workings, and a scenario where the pit lake is unable to achieve permanent stratification, the Agency requires clarification on mitigation measures that would be implemented to meet the applicable water quality criteria for the pit lake during abandonment.</p>	<p>Provide clear contingency measures that would be implemented in the event that the pit lake is unable to reach permanent stratification during abandonment. Describe how the condition of permanent stratification would be confirmed through monitoring.</p> <p>Clarify the methodology of proposed batch treatments that are proposed in MMC-7.14 in the case that pit lake water quality is degraded as a result of ARD from the underground workings or the low-grade ore put into the pit lake.</p>
16	Access management plan: Baitfishing	<p><u>Baitfishing in the Tree Nursery ponds</u> Baitfishing in the Tree Nursery ponds is not currently accounted for within access management plans despite Métis Nation of Ontario and Wabigoon Lake Ojibway Nation referring to ongoing and future use within these ponds.</p> <p>The Agency notes that there is an access management plan for chanterelle mushrooms and blueberries that are located just into the local study area. The Agency seeks clarification on whether the same access management plan is also applicable for baitfishing in the Tree Nursery ponds.</p>	<p>Provide a description of how baitfishing within the Tree Nursery ponds is accounted for within the access management plans. In particular, clarify whether the access management plans for baitfishing would be the same as that for chanterelle mushrooms and blueberries within the local study area.</p>
17	Clarification on data	<p><u>Habitat loss in upland and wetland habitats</u> In the document titled "Final Round 2 Wildlife Information Requests February 1, 2019", there are two tables that present information on the amount of habitat loss in upland and wetland habitats: TMI_952-WL(2)-07_Table_5 and TMI_870-WL(2)-01_Table_10.</p> <p>The Agency also noted other tables (TMI_871-WL(2)-02_Table_4, TMI_871-WL(2)-02_Table_5, and TMI_871-WL(2)-02_Table_2) that contained information regarding wetland habitat.</p> <p>The data presented in these the tables regarding upland and wetland habitats do not match for a number of parameters. For example, the amount of habitat currently present (baseline), the amount of habitat loss (from both direct and indirect causes), and the amount of habitat to be rehabilitated.</p>	<p>Clarify the differences and update the data presented in tables: TMI_952-WL(2)-07_Table_5 and TMI_870-WL(2)-01_Table_10.</p>