
HAMMOND REEF GOLD PROJECT RESPONSE TO COMMENTS ON FINAL EIS/EA

COMMENT – T-30

Source: Canadian Environmental Assessment Agency

Summary of Comment

The water quality modelling predictions for the TMF are based on geochemical testing of a single tailings sample (size of sample unknown) that may not be representative of the proportions of rock types that comprise the orebody.

Based on Table 1 of the Nov 21, 2013 memorandum in the Hammond Reef Gold project Geochemistry, Geology and Soils TSD version 2, it appears that no tailings composite samples were collected from major felsic rock units represented by fine grained granite and chloritic granite porphyry. The fine grained granite represents about 16% of the mineralized deposits, while the chloritic granite porphyry represents 8-13% of the mineralized deposits.

Furthermore, Table 3-5 of the Hammond Reef Gold project Geochemistry, Geology and Soils TSD version indicates that the fine grained granite has one of the highest detectable maximum selenium concentrations (0.8 ug/g) among all rock types. This rock unit also has the maximum concentration of cadmium (0.47 ug/g) and chromium (0.27% as Cr₂O₃ equivalent).

EC notes that there is quite a bit of variability in the concentrations of sulfide-sulfur (0.09-0.35 wt % S) and carbonates (2.6-20% CO₂) among the metallurgical samples in the data presented in Table 4.

Proposed Action

The Proponent is requested to test additional samples of tailings in order to develop a more reliable characterization of the geochemical behavior of tailings, and thereby develop a more reliable characterization of predicted water quality.

Please respond to questions related to the single tailings sample that was previously tested:

- 1) What was the size of the original tailings sample, and the size of the samples that underwent geochemical testing?
- 2) How do the composite tailings sample rock proportions compare to the proportions of rock types in the ore that is to be milled?
- 3) Were all ten variable metallurgical samples subjected to whole rock elemental analysis?

Reference to EIS

Hammond Reef Gold Project Geochemistry, Geology and Soils TSD, Section 3.5.2.6

Hammond Reef Gold project Geochemistry, Geology and Soils TSD version 2 Nov 21, 2013 memorandum, figure 1, Table 1

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Response

Canadian Malartic Corporation understands that the Government Review Team is concerned about the representativeness of the tailings sample used in the geochemistry and water quality predictions provided in the Final EIS/EA Report. This concern was addressed following submission of the Draft EIS/EA Report as provided in response to Information Request EC-21 and MOE-NR-GW-02 as presented in Appendix 1.IV of the Final EIS/EA Report. After receiving additional comments on this topic, Canadian Malartic Corporation also held a workshop in June 2014 with government regulators to further discuss and explain specific methods and assumptions, including tailings predictions. To summarize, the following is provided in answer to your questions:

- 1) The size of the samples that underwent geochemical testing are about 1 to 5 kg, however these were split from samples that were from 10 to 100 kg in size and used to produce the metallurgical samples.
- 2) The composite tailings sample rock proportions are similar to the proportions of rock types in the ore that is to be milled, as shown in the *attached* memorandum entitled 'Water Quality Background Information' in this supplemental to the Final EIS/EA Report.
- 3) Metallurgical composite samples were subjected to whole rock and trace metal elemental analysis which is provided in the *attached* memorandum entitled 'Water Quality Background Information' in this supplemental to the Final EIS/EA Report.

The tailings sample was generated from a set of ten variable Metallurgical (Met) samples each of which was tested individually, the results of which are provided in the Supplemental Information Package of the Geochemistry, Geology and Soil TSD. The ABA results show that regardless of the location within the deposit, the sulphide-sulphur contents of the samples were generally low, ranging from 0.09 to 0.35 wt% as S. The CaNPR values ranged from 5.8 to 62 t CaCO₃/1,000 t. Each of the individual samples, as well as the composite sample, are classified as non-acid generating with excess neutralization potential according to the MEND (2009) and AMIRA (2002) guidelines. It should be noted that at this stage of the Project there is very little actual tailings available for testing. As stated in MEND (2009), Section 8.2 "Prior to mining, the choice of material to sample is often restricted to drill core and to metallurgical testing for tailings"; and, "Limitations in the availability and accessibility of materials to be sampled need to be considered in the design of a sampling program".

With respect to metal leaching potential it should be noted that Tailings are composed of the rock types described in the Geochemistry, Geology and Soils TSD as further discussed in a letter to Canadian Malartic Corporation in response to MOE-NR-GW-02, which can be found in the Supplemental Information package of the Geochemistry, Geology and Soil TSD. Only gold is removed in the process, thus the tailings and rock are essentially the same. For all rock types expected to be encountered in the tailings ample information is provided with respect to that as indicated in the EIS Guideline in Section 10.2.3.2 and in Section 9.1.1 Geology and Geochemistry.

The leachate concentrations determined for tailings are based on a composite sample which considers the latest process design as available at the time of sampling and testing. The leachate concentrations are generally consistent with those of the waste rock, as would be expected for a deposit of this type.

Due to material availability limitations, additional testing of tailings cannot be undertaken until processing of ore is underway, at which point confirmation samples will be collected, however the overall facility is designed to be sufficiently robust such that a seepage collection system is included in the design, and is available to direct seepage to treatment if necessary.

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Based on the entirety of the information available on tailings, and waste rock sample rock types that make up tailings, it is considered that the tailings samples produced are reasonable for the purpose of the Final EIS/EA report, and that the results of testing of these samples are appropriately conservative with respect to water quality predictions for the site (as discussed in our meeting of June 4, 2014, and as described in the Site Water Quality TSD; Geochemistry, Geology, and Soils TSD). Further detail showing the similarity of the geochemistry of the rock types and tailings is provided in the *attached* memorandum entitled 'Water Quality Background Information', *which is also provided in Part D of the Addendum to the Version 3 EIS/EA as Attachment 4 of the Final EIS/EA Report Addendum.*