

IR Number: MVRB #1.1
To: Avalon Rare Metals Inc.
Source: DAR Section 4.8.2, Section 6.5.2.2, Avalon's response to deficiency MVRB #8
Subject: Change in Hydrometallurgical Facility Tailings

Preamble

DAR Section 4.8.2 describes the processing at the proposed HMF. DAR Section 6.5.2.2 describes the hydrometallurgical plant tailings solids (p. 726) and the tailings solution (Table 6.5-6).

Avalon's response (Part 1) to deficiency MVEIRB #8 says, in part,

As a result of Avalon's decision to complete the processing of the rare metals products produced at the Pine Point Hydrometallurgical facility at another processing plant to be located in the south, the previously identified leach residue will no longer be produced at the Pine Point Hydrometallurgical Plant site.

More specifically all of the acid-baked residue will be shipped south and there will be no leach residue in the hydrometallurgical tailings that will be directed to the L-37 Pit. ...

Regarding the anticipated concentrations of the constituents present in the hydrometallurgical tailings that will be directed to the L-37 Pit (HTF), Table 6.5-6 in the DAR summarizes the chemical properties of the water component of the tailings solution based on test work completed by SGS (2011).

The decision to modify the process at the HMF would be expected to change the chemical concentrations in the tailings and the tailings solution.

Request

Please provide updated analysis and description of the expected chemical composition of the HMF tailings and tailings solution which would be discharged to the L-37 pit.

IR Number MVRB #1.2
To: Avalon Rare Metals Inc.
Source: DAR, Section 6.3.4.2 Mine Operations, Figure 6.3-6
DAR, Section 6.4.2.5 Model Results, Table 6.4-2
DAR, Appendix C.13, Thor Lake Project – (Updated) Feasibility Study Water/Solids Balance Analysis Results, p.3, Water Management Constraints
Response to Deficiency MVEIRB #41 (Part 2)
Subject: Tailings Management Facility Tracer Concentrations

Preamble

Avalon’s response to Deficiency MVEIRB #41 states that “A key factor in the modelling is that the Thor Lake system, including Murky and Drizzle lakes, receives a large amount of freshwater from surface flows. Consequently, it was found that even after the full 20 years of mine operation, dilution of contaminants introduced in the tailings stream remained high, at a value of 1408:1.”

DAR Figure 6.3-6 shows the estimated discharge from the concentrator plant to the TMF as 360,000 m³/yr. Additional net inflows are shown in Figure 6.3-6 as only 75,100 m³/yr. Appendix C.13 says “The TB [Tailings Basin] Minimum Supernatant Pond Volume for Years 1 and 2 is the volume of Ring Lake - 179,367 m³, ...”. DAR Table 6.4-2 indicates that the concentration of the inert tracer used in the model decreases from 1 to 0.00091 within the tailings pond in Year 1.

Since the volume of water in the tailings pond plus the first year net inflow equals only about 70% of the discharge from the concentrator plant, there does not appear to be sufficient water to account for the nearly 1100:1 Year 1 dilution rate.

Clarification of this calculation or model result is necessary to assess the concentrations of metals released from the TMF into the Thor Lake system and the environmental impacts of that effluent.

Request

Please provide an explanation of the apparent discrepancy between these figures.

IR Number: MVRB #1.3
To: Avalon Rare Metals Inc.
Source: DAR Section 6.14.1, Response to Deficiency MVEIRB #46 (Part 2)
DAR, Section 6.14.1, Response to Deficiency MVEIRB #47 (Part 2)
Subject: Aquatic Effects Monitoring Plan and Adaptive Management Plan

Preamble

The DAR states that monitoring “will be carried out according to requirements of the Water License and the MMER” and will be subject to “other monitoring requirements stipulated in relevant permits and approvals”. The DAR also lists some of those monitoring requirements. These are threshold requirements and it is expected that all developers will carry out such monitoring. To assess the adequacy of Avalon’s proposed monitoring programs and management plans, project specific monitoring plans are required.

Avalon’s response to Deficiency #46 says, in part, “The comprehensive Aquatic Effects Monitoring Plan (AEMP) for the Avalon Project will be guided by ... “ indicating that the AEMP was not complete at the time of the response.

The DAR alludes to adaptive management planning for “furbearers, waterfowl, large ruminants and large carnivores” but makes no similar statement about aquatic effects. Avalon’s response to Deficiency #47 (which addresses adaptive management planning for aquatic effects) says, in part, “Avalon will therefore prepare contingency plans in the event that trends point toward potential negative changes in environmental indicators.”

The purpose of adaptive management *planning* is to have procedures in place to deal with foreseeable but unexpected project impacts. The Review Board will need a draft Aquatic Effects Monitoring Plan with associated Adaptive Management Plan in order to determine whether impacts to the aquatic environment can be addressed for unexpected events during mine operations.

Request

Please submit a draft Aquatic Effects Monitoring Program that includes an Adaptive Management Plan for aquatic impacts.

IR Number: MVRB #1.4
To: Avalon Rare Metals Inc.
Source: DAR Section 6.5.1.3 Estimated Groundwater Inflow, Figure 6.5-1
Subject: Drawdown at minesite

Preamble

The modeling and analysis of groundwater flow into the mine does not address the impact or other effects of drawdown on the local and regional hydrogeology. DAR Figure 6.5-1 shows the extent of the predicted groundwater drawdown. The drawdown exceeds 10 meters in some areas, but the text does not describe what effects the drawdown would have on the area – especially surface water bodies, wetlands, permafrost and active layers. The interaction of surface water and groundwater response to the mine inflow is also not addressed.

Request

Please quantify and describe the effects the drawdown at the mine site may have on the surface water bodies, wetlands, permafrost, and active layers.

IR Number: MVRB #1.5
To: Avalon Rare Metals Inc.
Source: DAR Section 9.2 Tailings Dam Failure; Figure 4.7-8
Subject: Tailings Management Facility – Dam Failure

Preamble

The DAR very briefly discusses the potential impacts of a dike failure on the discharge side of the tailings management facility (p.890), and does not consider the impacts of a failure of the dike on the upstream side at all.

Request

Please describe the potential for and quantify the potential impacts of a failure of the dike along the upstream (northwest) side of the TMF. The discussion should include the volume of a potential breach, the material characteristics of the outflow, and the path and destination of the lost material.

IR Number: MVRB #1.6

To: Avalon Rare Metals Inc.

Source: DAR Section 4.7.3.3 Flotation Plant Tailings; Tailings Delivery and Distribution, p.498

DAR Section 4.8.3.1 Hydrometallurgical Plant Tailings, p. 520

Subject: Tailings Delivery Pipeline Failure

Preamble

The DAR does not include any discussion of the potential impacts of the tailings delivery pipelines freezing, leaking, or rupturing. Freezing or failure of the flotation plant tailings delivery pipeline could cause uncontrolled slurry loss anywhere along the pipeline route at up to nearly 53 m³ per hour, including several locations uphill from and close to Fred, Cressy, and Thor Lakes.

Request

Please describe the engineering safety features and operational controls designed to prevent or minimize the consequences of the tailings delivery pipeline freezing or failing. Please also describe the foreseeable potential impacts of a pipeline failure on the streams, wetlands, or surface water bodies along the routes of both the flotation plant and the hydrometallurgical plant tailings delivery pipelines.

IR Number: MVRB # 1.7
To: Avalon Rare Metals Inc.
Source: DAR 9.0 – Accidents and Malfunctions; Appendix L
Subject: Impacts from Spills

Preamble

The DAR discusses mitigation measures to prevent and to minimize the consequences of accidental spills, but does not assess the impacts if such a spill were to occur.

Request

Please quantify the residual impacts to water quality, fish and fish habitat from major spills of process chemicals and/or concentrate at either project site, and also specifically at both minesite and hydrometallurgical loading/unloading open-water areas on Great Slave Lake.