



May 8, 2012

Fisheries and Oceans Canada
301-5204 50th Ave.
Yellowknife, NT, X1A 1E2

Attention: Mr. Rick Walbourne, Habitat Biologist

Subject: Response to Questions

Dear Mr. Walbourne,

Avalon Rare Metals Inc. (Avalon) is pleased to provide you with a response to your email sent April 28, 2012. Avalon appreciates the opportunity to provide clarification on its previously submitted responses to information requests prior to the technical sessions, and looks forward to working collaboratively with Fisheries and Oceans Canada (DFO) to resolve any potential concerns.

For clarity, we have included the original question and statements from your email (shown in **bolded italics**) with our response following the statement.

DFO #3 - We had requested specific details on the intent, design, and operation of the "emergency overflow spillway" located between the polishing pond and Drizzle Lake. In your response it was stated that the TMF will be designed for a 1 in 25-yr event and that during various phases the spillway channel will be designed to "safely pass the Inflow Design Flood plus a freeboard allowance for wave run-up" with IDF's ranging from 1:100 to 1:1000 events. While the channel will be designed to convey flood events, it appears from this description that any flood-event over 25-years will overflow the TMF into the spillway channel which will result in an input of untreated mine water and potentially sediment into Drizzle Lake during these flood events. Could Avalon confirm if this interpretation is accurate or is a more detailed description of the spillway required?

The TMF will be operated to maintain a minimum available capacity to contain the Environmental Design Storm (EDS), equivalent to the 1 in 25 year event. However, the minimum capacity conditions (i.e. maximum operating levels) are only expected to occur when the facility is nearing its overall capacity (i.e. toward the end-of operations) or possibly during an exceptionally high runoff year. Typically over the life of the operations there will be available capacity to retain storm events in excess of the EDS and possibly in excess of the IDF at times (1 in 1000 year event). The EDS criteria have been established to ensure that there is an absolute minimum capacity for a storm event retention at all times throughout the life of the facility. In the case when only the minimum required capacity is available (i.e. maximum operating levels achieved), the spillways would be activated for events greater than the EDS.

Corporate Office:
130 Adelaide St. W., Suite 1901, Toronto, ON M5H 3P5
Tel: (416) 364-4938 Fax: (416) 364-5162

Operations Office:
Unit 330 – 6165 Hwy 17, Delta, BC V4K 5B8
Tel: (604) 940-3800 Fax: (604) 940-3808



The ultimate spillway will be designed to safely pass the 1 in 1000 year event, plus a freeboard allowance for wave run-up, etc. For added conservatism, the spillway will be designed assuming that the water level is at the spillway invert elevation just prior to the storm and therefore capable of safely passing the full volume of the IDF. In reality the spillway would only be required to pass 30 to 40 percent of the IDF given that a portion of the IDF would be contained by the available capacity of the EDS. Over the planned 20 year operating life it is highly unlikely that the spillway would ever be required for emergency discharge.

The supernatant water in the TMF is considered to be non-deleterious in nature and is currently not expected to require treatment prior to controlled discharge to the environment (EBA/Avalon). Under the rare circumstances where emergency discharge through the spillway is required, increased dilution from the additional precipitation associated with the storm event would further improve the water quality. The spillway and downstream outlet channel will be designed to prevent sediment from being mobilized in the event of their use.

DFO #6 - DFO requested information on the decant pipe. Avalon has confirmed that an in-water diffuser is not anticipated. As discussed further in your response, there is a potential for an on-land discharge to create sediment and erosion issues in nearby Drizzle Lake. Avalon has also stated that the drainage ditch will be inspected and maintained to ensure its integrity during operations. DFO is available to review final plans and mitigation measures related to the decant pipe prior to construction to ensure conformity with the Fisheries Act. No further information is requested at this time.

Avalon appreciates DFO's offer to review the final plans and mitigation measures and will pursue that option once the final plans and mitigation measures are prepared.

DFO #7 - DFO requested additional information on all crossings. Avalon has provided a design for the Fred Lake crossing and noted that the Thor-Long crossing would also employ an arch culvert. DFO requests that final plans are made available prior to construction to ensure that works are completed outside the high water mark and that flows are maintained. No further information is required at this time.

Avalon will be pleased to provide a copy of the final plans to DFO for review and comment prior to implementation.

DFO#8 - DFO requested additional information on the docking structures including the extent of work to be done below the High Water Mark. Regarding the Thor Lake dock, Avalon's response states that mooring will be completed via 4 deadman anchor's located ashore as opposed to Section 6.11.1.2 of the DAR which referenced mooring dolphins which would be pile driven into the gravel substrate. Please confirm that in-water pile-driving at the Nechalacho dock site is no longer required. Regarding the Pine Point dock, Avalon's response describes 12 dolphins to be pile-driven into the substrate. It is still unclear as to the size of these dolphins or the total footprint resulting from their installation. DFO



requests that Avalon provide information on the areal extent of in-water works. This can entail an estimate of disturbance, final designs are not required at this time.

Subsequent to the submission of the Avalon DAR, the method for securing barges at the Thor Lake Project Great Slave Lake site has changed, as indicated in the January, 2012 Information Responses to DFO. The barge will be moored parallel to shore and secured by lines extending to four dead men onshore anchors. At this writing, there are no plans to drive piles or dolphins at the Nechalacho site.

At Pine Point, the shallow nature of the approach to shore necessitates on-off loading of barges off shore. The draft of cargo barges is approximately 1.93 m; a water depth of two metres occurs approximately 194 metres from shore. As such, dock barges would be positioned perpendicular to shore and secured by installing 12 dolphins. At present, the final design of the dolphins has not been determined. However, assuming that three steel piles, each with a diameter of 45.7 cm (18 inches), would be used to construct a dolphin, the total footprint of each dolphin would be 0.5 m², and the total footprint for the 12 dolphins would be 6.0 m². The size of the piles is guided by the Best Management Practices for Pile Driving and Related Operations, prepared by the BC Marine and Pile Driving Contractors Association (March 2003). According to that document, the installation of piles up to 45.7 cm would not result in shock waves in excess of 30 kPa, a level that results in minimal or no effects on fish or their habitat.

As the Project evolves, Avalon will be pleased to consult with DFO regarding any design changes that may necessitate a further modification of the barging infrastructure at Thor Lake and Pine Point.

DFO#9 - Avalon has provided a conceptual erosion and sediment control plan. Of note, once a final plan is implemented, all activities/structures should be included such as the decant pipe, emergency spillway, mooring structures, etc. Information was provided in Avalon's IR responses in this regard however it was not reflected in the conceptual plan. No further information is required at this time.

Avalon will be pleased to provide a copy of the final erosion and sediment control plan to DFO, which will include information on the decant pipe, emergency spillway, mooring structures, etc. prior to implementation.

Please do not hesitate to contact me in the future if you have further questions or require additional clarification.

Yours truly,

A handwritten signature in blue ink, appearing to read "David Swisher".

David Swisher
VP Operations
Avalon Rare Metals Inc.