



Fisheries and Oceans
Canada

Pêches et Océans
Canada

Fish Habitat Management
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Gestion de l'Habitat du Poisson
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Your file *Votre référence*
EA1011-001

Our file *Notre référence*
11-HCAA-CA6-0126

December 14, 2011

Mackenzie Valley Environmental Impact Review Board
#200 Scotia Centre
5102-50th Avenue
Yellowknife, NT
X1A 2N7

Via e-mail to:
chubert@reviewboard.ca

RE: Fisheries and Oceans Canada - Information Request for the Avalon Rare Metals Inc.'s proposed Thor Lake Rare Earth Metal Project.

Fisheries and Oceans Canada is pleased to provide the Mackenzie Valley Environmental Impact Review Board with our information request in response to the Developers Assessment Report for the Thor Lake Rare Earth Metal Project.

If you have any questions, please feel free to contact Sarah Olivier at (867) 669-4919, by fax (867) 669-4940, or email at Sarah.Olivier@dfo-mpo.gc.ca.

Sincerely,

Larry Dow
A/Area Director
Western Arctic Area
Fisheries and Oceans Canada

cc Bev Ross, Fisheries and Oceans Canada
Corrine Gibson, Fisheries and Oceans Canada
Rick Walbourne, Fisheries and Oceans Canada
Pete Cott, Fisheries and Oceans Canada

**Avalon Rare Metals Inc.
Thor Lake Mine**

Fisheries and Oceans Information Request

IR Number: DFO_1
Source: Fisheries and Oceans Canada
To: Avalon Rare Metals Inc.
Subject: Ring, Ball and Buck Lakes – Tailings Management Facility
DAR Section: 2.8, 6.6.3.2, 6.6.4
ToR Section: 3.2.4(10), 3.3.5(4)

Preamble:

Ring, Ball, and Buck lakes are within the footprint of the proposed Tailings Management Facility (TMF) and according to the Developer's Assessment Report (DAR) are not likely to be fish frequented. A summary of fisheries baseline is included in Table 2.8-8 of the main DAR and references the following report: "*Stantec Inc. 2010c. Thor Lake Rare Earth Metals Baseline Project Environmental Baseline Report: Volume 3 – Aquatics and Fisheries. Final Report. Report prepared for Avalon Rare Metals Inc., Toronto, ON*". This document, dated January 2010, only includes the aquatics baseline information up to 2009. Table 2.8-8 refers to 2010 field data as well as Section 2.8.3 which states that aquatics field programs were also conducted in April, June, September and October 2010. This information has not been provided in the DAR. There is also mention of a 1989 report (*Melville G., R. Godwin, D. Russell, and J. Polson. 1989. Thor Lake Area (NWT) Environmental Baseline Survey. Saskatchewan Research Council Publication E-901-1-E-89*) outlining work in 1988 that has also not been provided.

DFO has informed Avalon, in meetings as well as in our comments during the preliminary screening and on the Terms of Reference, that additional baseline information is required in order to make a determination on the fisheries status of those lakes within the footprint of the proposed TMF, and thus if there is a requirement for any of these lakes to be considered for addition to schedule 2 of the *Metal Mining Effluent Regulations* (MMER). This information includes, but is not limited to, fisheries assessment methods and effort, seasonal variability in fish presence, connectivity with surrounding lakes, and winter water chemistry data. It should be noted that DFO will consider an area to be fish habitat if it is seasonally used by fish, such as migratory corridors or flood-plains used during spring freshet.

Request:

DFO requires the following information in order to adequately assess Avalon's claim that the lakes within the footprint of the proposed TMF are non fish frequented:

- An updated report on all fisheries assessments conducted to date including 2010 field data. The report should include information on seasonal connectivity between lakes, as well as information on fishing methods and catch effort in each lake;
- Details from any aquatic assessments done in 2010 including parameters such as winter dissolved oxygen levels to determine if the lakes could support over-wintering fish populations;
- Provide a copy of *Melville et al., 1989* (referenced above) with historical data on Ring Lake.

IR Number: DFO_02
Source: Fisheries and Oceans Canada
To: Avalon Rare Metals Inc.
Subject: Drizzle Lake and connectivity with other lakes
DAR Section: 2.5.2, 2.8, 4.3.3
ToR Section: 3.2.4 (10) (11)

Preamble:

Water from the Tailings Management Facility (TMF) is proposed to be released to Drizzle Lake and will comply with the requirements of the Mackenzie Valley Land and Water Board as well as the federal Metal Mining Effluent Regulations.

In Table 2.8-9 called "*Fish Bearing Status and Designation Criteria*" (referenced to Stantec 2010c) it states that Drizzle Lake is fish bearing while in Section 4.3.3 it is stated that Drizzle Lake is not fish bearing. Furthermore, in Section 2.8.5.3 it is stated that "Drizzle Lake is technically considered to be a fish habitat due to its seasonal connection to Murky Lake through a defined channel."

In addition, Figure 2.8-11 states that connection between Egg and Drizzle is "to be determined" however this is not consistent with other parts of the DAR that state the "outlet stream from Egg Lake was investigated in May 2010 and found to drain mainly through the ground and consequently has no connectivity for fish passage to Drizzle Lake" (DAR Section 2.8.5.3) and that Egg Lake "has no surface connectivity to Drizzle Lake" (DAR Section 2.5.2). If Egg Lake is potentially connected to Drizzle Lake, and Egg Lake is found to be fish-frequented, there is a potential that fish from Egg Lake could move into Drizzle Lake.

Request:

1. DFO requests that Avalon provide clarification on the inconsistent statements found within the DAR relating to fish being present in Drizzle Lake.
2. DFO requests that Avalon provide clarification on information gathered to date relating to the potential connectivity between Egg Lake and Drizzle Lake and relating to the assessment of the fisheries potential of Egg Lake.

IR Number: DFO_03
Source: Fisheries and Oceans Canada
To: Avalon Rare Metals Inc.
Subject: Emergency Overflow Spillway
DAR Section: 4, 6
ToR Section:

Preamble:

Various figures throughout the DAR (such as Figure 4.7-6) show an “emergency overflow spillway” from the polishing pond area of the TMF into Drizzle Lake however no details have been provided on the design or operation of this structure.

Request:

DFO requests that Avalon provide specific details on the intent, design, and operation of the “emergency overflow spillway” between the polishing pond and Drizzle Lake.

IR Number: DFO_04
Source: Fisheries and Oceans Canada
To: Avalon Rare Metals Inc.
Subject: Murky Lake Bypass
DAR Section: 6.6.3.2
ToR Section: 3.3.5(8)

Preamble:

In Section 2.7.5.1 of the original project description report submitted to the Mackenzie Valley Land and Water Board in April 2010 there is mention of a potential “Murky Lake bypass” which would direct water from Drizzle Lake directly into Thor Lake. The section states:

“As a contingency for impact mitigation, a decant intake and pipeline has also been included to transfer excess water from Drizzle Lake to Thor Lake.”

In contrast, Section 6.6.3.2 of the DAR states “all water from the TMF will return to Thor Lake via Drizzle and Murky lakes. No water bypass is contemplated in this design, thereby maintaining flow through all natural waterbodies downstream of the TMF”.

Request:

DFO requests that Avalon confirm the status of the “Murky Lake bypass” as a component of the final project design.

IR Number: DFO_05
Source: Fisheries and Oceans Canada
To: Avalon Rare Metals Inc.
Subject: Water Intake
DAR Section:
ToR Section: 3.2.5 (2) (32)

Preamble:

Based on information presented in the DAR, a water intake is proposed to be installed in Thor Lake, which is known to be habitat for northern pike, lake cisco, and lake whitefish. Installation of a water intake requires in-water works which have the potential to impact fish and fish habitat. As well, permanent structures installed below the high water mark have the potential to impact fish habitat within its direct footprint.

Request:

DFO recommends that Avalon provide conceptual designs of the water intake structure including precise location, installation methods, overall footprint, and a fish habitat assessment of the area, in order to assist in making any determination of potential impacts to fish and fish habitat.

IR Number: DFO_06
Source: Fisheries and Oceans Canada
To: Avalon Rare Metals Inc.
Subject: Decant Structure
DAR Section: 4,6
ToR Section: 3.2.5(2)

Preamble:

In various figures (i.e. 2.7-4, 2.7-5) presented in the original project description report submitted to the Mackenzie Valley Land and Water Board in April 2010, a diffuser is proposed to be placed within Drizzle Lake. In contrast, various figures in the DAR (i.e. 4.5-1, 6.3-3) show a decant pipe discharging to land to the west of Drizzle Lake. From the information provided it is unclear as to the exact location and details of the decant pipe or whether a diffuser is still a component of the final project design.

Request:

DFO requests that specifications of the decant pipe/diffuser should be provided in detail to assist in determining potential impacts to fish and fish habitat.

If there are any proposed in-water works for the decant pipe/diffuser, DFO requests that Avalon provide conceptual designs of the structure including precise location, installation methods, discharge velocity, overall footprint, a fish habitat assessment of the area, and mitigation for potential impacts to fish and fish habitat.

If the decant pipe is restricted to land, DFO requests that Avalon provide information of distance from Drizzle Lake, discharge velocity, and erosion and sediment control measures related to both the construction and operation of the pipe.

IR Number: DFO_07
Source: Fisheries and Oceans Canada
To: Avalon Rare Metals Inc.
Subject: Crossings
DAR Section: 4.7.5.6, 6.6.1.2
ToR Section: 3.2.5(13), (22)

Preamble:

As stated in the Review Board's Deficiency List letter from August 25th, 2011, very little information was provided on the access road and watercourse crossings within the DAR. In Avalon's *Response to the Deficiency List for Thor Lake Rare Earth Element Project Developer's Assessment Report: Part 2* dated September 2011, there was additional information on the access road however no discussion of watercourse crossings.

The DAR only mentions a crossing at the outlet of Cressy Lake that was identified as non-fish bearing and not providing a migratory connection between Cressy and Fred lakes. During a visit to the Thor Lake site on August 17, 2010, DFO staff were taken to a crossing location between Thor Lake and Long Lake. It was stated at that time that the current crossing was built to accommodate a drill rig but that a larger access road may be required for mine operations. Thor Lake and Long Lake both support year round fish populations.

Request:

DFO requests additional details on all water course crossings, including any upgrades and/or proposed new crossings. This includes information on proposed designs, potential fish habitat impacts and mitigation.

IR Number: DFO_08
Source: Fisheries and Oceans Canada
To: Avalon Rare Metals Inc.
Subject: Docks
DAR Section: 6.6; 6.11
ToR Section: 3.3.5 (10)

Preamble:

Section 6.11 of the DAR provides a brief description of the barging/docking facilities to be used in support of Avalon's proposed mine. It is unclear from information provided (such as within Figure 4.8.8) as to the extent of work that will be completed below the high water mark.

In the Review Board's Deficiency List letter from August 25th, 2011 additional information was requested related to the dock area, however the information requested was limited to the footprint of the container laydown area and the total *terrestrial* project footprint at the dock facility.

Request:

DFO requests that Avalon provide detailed information on the precise location, footprint, and installation methods for the dock facilities at both sites including the extent of work to be completed below the high water mark.

IR Number: DFO_09
Source: Fisheries and Oceans Canada
To: Avalon Rare Metals Inc.
Subject: Sediment and Erosion Control
DAR Section: 6.6.2.1, 6.6.4
ToR Section:

Preamble:

On p. 735 of the DAR it states that “erosion and sediment control” will be implemented, and on p.742 that “riparian vegetation clearing and erosion control” will be conducted according to the Land Development Guidelines for the Protection of Aquatic Habitat. These guidelines were developed by DFO in collaboration with the Ministry of Environment, Lands and Parks in British Columbia and apply to a broad range of development activities. While some of the concepts presented in these guidelines may be applicable to Avalon’s proposed project, it should be noted that some measures may not be relevant or applicable in the northern context.

Request:

DFO requests that Avalon provide a conceptual erosion and sediment control plan as well as describe what aspects of the “Land Development Guidelines” it proposes to use, and how these guidelines are applicable in the Northwest Territories.

IR Number: DFO_10
Source: Fisheries and Oceans Canada
To: Avalon Rare Metals Inc.
Subject: SARA species (Shortjaw Cisco)
DAR Section:
ToR Section: 3.2.4 (13), 3.3.6

Preamble:

In correspondence dated December 7th, 2010, the Review Board requested that DFO “*assist in determining the likelihood of adverse effects of the proposed project on Shortjaw Cisco and/or its critical habitat*” due to its designation as Threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and being considered for listing under the federal *Species at Risk Act* (SARA).

On December 10th, 2010 DFO requested that the proponent provide information on any threatened or endangered aquatic species that may occur in the study area as part of the Terms of Reference for the DAR. Avalon has not identified shortjaw cisco as being present or potentially impacted by the project.

It is DFO’s understanding that the shortjaw cisco is a deep-water species usually found in lakes ranging in depth from 20m to 180m and most often found in deeper waters of large lakes. The deepest lakes found within the project area are Thor Lake which has a maximum depth of 16m and Great Slave Lake. Given the depths of Thor Lake and its watershed as well as the lack of connection between this watershed and Great Slave Lake, it is unlikely that shortjaw cisco would be found in lakes near the mine site. The shortjaw cisco has been documented in Great Slave Lake but is usually found in deeper water. It is unlikely that the dock structures for this project would impact shortjaw cisco or its habitat. DFO would still recommend that mitigation measures be incorporated for any works in Great Slave Lake in order to protect all fish and fish habitat, including shortjaw cisco. More information on the shortjaw cisco can be found at:
http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=82

Request:

DFO requests that, with the latest fisheries assessments from 2010 (see DFO_01), Avalon consider the likelihood of the project to impact shortjaw cisco and its habitat, with particular focus on the dock structures within Great Slave Lake. Please also provide details on mitigation measures, if needed.