



**Mackenzie Valley Land and Water Board**

7th Floor - 4910 50th Avenue • P.O. Box 2130  
YELLOWKNIFE, NT X1A 2P6  
Phone (867) 669-0506 • FAX (867) 873-6610

June 11, 2010

File: MV2010D0017  
MV2010L2-0005

Mr. Richard Edjericon  
Chair  
Mackenzie Valley Environmental Impact Review Board  
200 Scotia Center, 5102 - 50th Avenue  
Box 938  
YELLOWKNIFE NT X1A 2N7

Fax: (867) 766-7074

Dear Mr. Edjericon:

**Referral to Environmental Assessment  
Avalon Rare Metals Inc., MV2010D0017 and MV2010L2-0005 Mining and Milling -  
Thor Lake, NT**

The Mackenzie Valley Land and Water Board (MVLWB) met on June 11, 2010 to review the above noted applications. The decision was made to refer the application to the Mackenzie Valley Environmental Impact Review Board for an environmental assessment pursuant to subsection 125(1) of the *Mackenzie Valley Resource Management Act*. The Reasons for Decision and the Preliminary Screening Report are attached for your information.

If you have any questions or concerns, please telephone (867) 669-0506 or email [permits@mvlwb.com](mailto:permits@mvlwb.com).

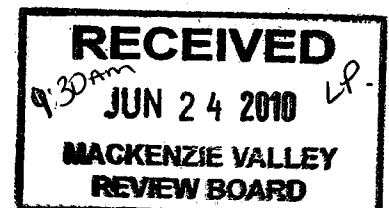
Yours sincerely,

A handwritten signature in black ink, appearing to read "Willard Hagen".

Willard Hagen  
Chair

Copied to: Mr. David Swisher, VP Operations, Avalon Rare Metals Inc.  
Marty Sanderson, A/District Manager, South Mackenzie District, INAC  
Robert Jenkins, Water Resources, INAC  
Tyree Mullaney, Regulatory Officer, MVLWB

Attachments





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**REASONS FOR DECISION**

<b>Preliminary Screener:</b>	MVLWB
<b>Reference/File Number:</b>	MV2010D0017 MV2010L2-0005
<b>Applicant:</b>	Avalon Rare Metals Inc.
<b>Project:</b>	Mining and Milling – Thor Lake NT

**DECISION from Mackenzie Valley Land and Water Board (the Board)  
 Panel Meeting of**

**June 11, 2010**

**Reasons for Decision**

Referred to the Mackenzie Valley Environmental Impact Review Board for an Environmental Assessment pursuant to paragraph 125(1)(b) of the *Mackenzie Valley Resource Management Act (MVRMA)*

**Application:**

- April 26, 2010 – applications to the Board pursuant to section 6 of the *Northwest Territories Waters Act (NWTWA)*;
- May 4, 2010 – the Board accepted the applications as complete;
- May 4, 2010 – notice was given in accordance with sections 63 and 64 of the MVRMA and section 23 of the NWTWA;
- May 28, 2010 – comments due from reviewers; and
- There was no public hearing held in association with these applications.

**Reasons for the MVLWB preliminary screening decision**

After the Board’s review of the comments made by reviewers of the applications, it was noted that many issues of environmental concern as well as public concern were raised. A number of First Nation organizations provided evidence of their concern over the impacts to the environment and their harvesting area as well as the impacts to their traditional rights and interests. Environmental concerns were also raised by the Department of Fisheries and Oceans, Environment Canada, GNWT-Environment and Natural Resources, as well as Indian and Northern Affairs Canada. Their concerns focused on water quality, wildlife, waste, and closure. Further comment and explanation can be found in the Preliminary Screening.

**Conclusion**


The Board, having due regard to the facts and circumstances, the merits of the submission made to it, and to the purpose, scope, and intent of the MVRMA and the NWTWA and Regulations has determined that MV2010D0017 and MV2010L2-0005 will be referred to the Mackenzie Valley Environmental Impact Review Board because the development proposal might have a significant adverse impact on the environment and be of public concern.

The Board’s reasons for this decision are as follows:

- It is the opinion of the Board that an environmental assessment is required to adequately assess the potential impacts regarding the operations proposed under Land Use Permit MV2010D0017 and Water Licence MV2010L2-0005.

**SIGNATURE**

Mackenzie Valley Land and Water Board  
Preliminary Screening Organization



Chair

June 11, 2010  
Date

**Preliminary Screening Report Form**

<p><b>Preliminary screener:</b> MVLWB</p> <p><b>Reference / File number:</b> MV2010D0017/MV2010L2-0005</p> <p><b>TITLE:</b> Mining and Milling, Thor Lake NT, Pine Point NT</p> <p><b>Organization:</b> Avalon Rare Metals Inc.</p> <p><b>Meeting date:</b> June 11, 2010</p>	<p><b>EIRB Reference number:</b></p>
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- Type of Development:** (CHECK ALL THAT APPLY)
- New
  - Amend, EIRB Ref. #
  - Requires permit, licence, or authorization
  - Does not require permit, licence, or authorization

**Project Summary**

The application has been summarized below for the Board:

- Five mineral leases;
- Four claim blocks;
- Mine and mill rare earth carbonate and oxides, zirconium, niobium and tantalum oxides, and gallium;
- Two major components: (1) underground mine and flotation plant at Thor Lake Property, and (2) hydrometallurgical plant at the former Pine Point site;
- Quarry sites will be required for construction purposes;
- Components of Nechalacho Mine and Flotation Plant Site:
  - underground mine
  - flotation plant
  - water supply
  - tailings management facility
  - camp
  - power supply
  - concentrate storage and loading
  - access roads
  - air strip
  - fuel storage
  - dock facility.
- Components of the Hydrometallurgical Plant Site:
  - hydrometallurgical plant
  - water supply
  - tailings management facility
  - power supply
  - coal and limestone storage
  - use of quarries
  - haul roads
  - dock facility
- The metal concentrate will be barged across Great Slave Lake;
- Approximately 9 million tonnes will be mined from the Nechalacho deposit;
- **Nechalacho Mine and Flotation Plant**
  - Mine:
    - decline ramp will be utilized to access the ore zone approximately 200 metres in depth;
    - will be conducted with a first pass of primary stope followed by pillar extraction after the stopes have been filled;
    - will use paste backfill;
    - during the first stages, waste rock and ore will be hauled to the surface for temporary storage (75,000 tonnes);
    - ore will be crushed underground when the crusher is ready for use; it will be stored in a crushing chamber;
    - two phases for crushing: (1) underground crushing, (2) flotation plant;
    - rubber tired mechanized equipment will be utilized;
    - mine services and supplies include ventilation, mine air heating, compressed air, electric power, communications, water supply, water discharge, explosives, warning system, primary/secondary escape ways, and refuge stations;
    - primary crushing will be completed underground and crushed ore and waste rock will be conveyed to the surface;
    - when the mine is up and running, processing will consist of the following:
      - underground crushing
      - grinding
      - de-sliming
      - magnetic separation
      - dewatering
      - bulk conditioning
      - bulk flotation
      - cleaner flotation
      - gravity separation
      - concentrate dewatering
      - load out

- Flotation plant:
  - grinding, crushing, and flotation techniques will be used; and
  - production of high grade concentrate that will be barged off site for secondary processing.
- Water supply/sewage:
  - fresh and process water will come from Thor Lake; and
  - sewage will go through a packaged treatment plant, then to the tailings management facility.
- Garbage:
  - will be incinerated daily;
  - recyclable materials will be stored and shipped out for disposal;
  - waste management site will be used on site for temporary storage;
  - waste oil will be used in oil heaters throughout the facility; and
  - hazardous wastes will be transported to an approved facility.
- Tailings
  - located up slope from the flotation plant in the local catchment of Ring and Buck lakes;
  - will be discharged to a number of locations around the tailings management facility to develop a relatively flat beach and centralized pond to maximize storage;
  - will be a closed loop system
  - tailings management facility designed to protection of the environment during operations and long term to achieve effective reclamation includes:
    - permanent, secure, and total containment;
    - control, collection, and removal of free draining liquids to recycle;
    - monitoring features; and
    - construction based on federal standards.
- Camp/ buildings
  - utilize a combination of steel and prefabricated structures for surface facilities;
  - site facilities include:
    - flotation plant
    - reagent storage
    - past back fill plant
    - warehouse
    - maintenance shop and administration offices
    - camp facilities
    - dry area
    - power plant
    - explosives storage
    - loading facility
  - 150-person camp will be constructed adjacent to the flotation plant and close to the airstrip.
- Power supply
  - diesel powered generation plant; and
  - looking at using wind, biomass, and geothermal.
- Concentrate storage
  - will be located in half-height intermodal containers; and
  - will be transported to the dock to be shipped to the hydrometallurgical plant or winter storage at an area around the docking facility.
- Access roads
  - the existing roads will be utilized and upgraded to support the extra traffic and safe operation; and
  - new access will have to be constructed.
- Airstrip
  - will be upgraded to accommodate a Dash 8 and Buffalo.
- Fuel/ fuel storage
  - 14 million litres of diesel per year (storage area will be bermed);
  - transported to site by barge; and
  - once onsite, off-loaded to an area by the dock. Fuel will be transferred by tanker truck to the main storage facility near the diesel power plant.
- Dock/ dock yard
  - current facility will be upgraded;
  - seasonal;
  - 40-50 metre removable ramp;
  - lined bermed area for fuel containers;
  - area for empty containers;
  - parking area;
  - diesel pipes and pumps for fuel transfer;
  - security office;
  - diesel generation to power fuel pumps and office; and
  - dock yard will be used to store concentrate and also to handle the resupply of the mine.

- **Hydrometallurgical Plant**
  - Plant
    - use steel and prefabricated structures;
    - includes acid baking, caustic cracking, water washing, filtration, caustic regeneration/evaporation, double salt precipitation, solvent extraction, and product drying facilities.
    - reagents to be used:
      - limestone;
      - lime;
      - nitrogen sulphate;
      - sulphuric acid;
      - hydrochloric acid; and
      - sodium hydroxide.
    - structures
      - cracking facility, administration offices;
      - leach/neutralization facility;
      - solvent extraction facility;
      - precipitation and packaging facility;
      - temporary product storage;
      - acid plant and storage;
      - limestone grinding and kiln;
      - temporary concentrate storage; and
      - thaw shed.
  - Water supply
    - nearby open pit quarry, treated on site.
  - Waste management sections
    - Tailings;
    - sewage and greywater; and
    - site, solid, and hazardous waste.
  - Hydrometallurgical tailings facility
    - engineered facility with the existing Pine Point facility.
  - Concentrate storage and loading
    - containers will be unloaded from the trucks and moved into the storage building to thaw if required;
    - product will be trucked to Hay River railhead for transportation south; and
    - Will work with CN to see if there could be a facility on CN property for the temporary storage of the product.
  - Power supply
    - NTPC power grid; and
    - backup generators.
  - Coal and limestone storage
    - coal required to produce the balance of the heat required for acid bake and caustic crack methods;
    - coal will be shipped from the south via railway and trucked to the plant;
    - limestone will be used to neutralize the waste stream prior to discharge to the tailings management facility; and
    - coal will be stockpiled near the plant.
  - Haul roads
    - existing roads will be upgraded;
    - upgrading of road will utilize material that is available on site; and
    - construction of road to dock.
  - Dock facilities
    - floating dock and marshalling yard;
    - used for annual resupply.
  - Quarry material
    - will utilize established quarry sites at the Pine Point location.
  - Fuel storage
    - fuel used for vehicles and other machinery;
    - small fuel storage area will be located adjacent to the plant;
    - design of storage will be 110 percent of the largest container; and
    - 10-20,000 litres resupplied from Hay River as needed.
  - Coal and limestone storage
    - coal will be shipped from the South via railway;
    - stockpiled at site in an open stockpile sloped and lined to prevent water intrusion or seepage;
    - any water pools will be collected and recycled for dust control;
    - crushed limestone will be supplied by local sources and stockpiled in a designated area; and
    - because limestone is a neutralizer, no special storage is required.

## Scope

To use water, dewatering the underground mine for the purpose of mining, and disposal of waste for industrial undertakings in rare earth metal mining production as outlined in the Project Description Report, submitted by Avalon Rare Metals Inc. on April 26, 2010 and summarized below:

- The extraction of waste rock and ore through underground mining;
- The development and operation of site facilities at both locations;
- The storage of fuel at both sites;
- The development of waste rock piles, including the deposition of tailings;
- The reclamation of the sites;
- The construction of site roads and lay down areas;
- The construction of docks and associated facilities;
- The quarrying of materials from specified areas;
- The construction and maintenance of roads; and
- The use of water for processing and domestic uses.

### Nechalacho Mine and Flotation Plant

Minimum latitude 62°03'54" N Maximum latitude 62°08'00" N

Minimum longitude 112°32'30" W Maximum longitude 112°39'30" W

### Hydrometallurgical Plant

Minimum latitude 60°51'48" N Maximum latitude 60°58'24" N

Minimum longitude 114°21'48" W Maximum longitude 114°27'42" W

Land Use Eligibility - Section 18 Mackenzie Valley Land Use Regulations

Type of Disposition	Disposition Number(s)
<input type="checkbox"/> Mineral Claims	
<input type="checkbox"/> Prospecting Permit (s)	
<input checked="" type="checkbox"/> Mineral Leases	3178,3179,3265,3266 and 3267
<input type="checkbox"/> Oil and Gas: EL/SDL/PL	
<input type="checkbox"/> Quarry Permit	
<input type="checkbox"/> Timber Permit	
<input type="checkbox"/> Other:	

### Principal Activities (related to scoping)

(CHECK ALL THAT APPLY)

<input checked="" type="checkbox"/> Construction	<input checked="" type="checkbox"/> Exploration	<input checked="" type="checkbox"/> Decommissioning
<input checked="" type="checkbox"/> Installation	<input checked="" type="checkbox"/> Industrial	<input checked="" type="checkbox"/> Abandonment
<input checked="" type="checkbox"/> Maintenance	<input type="checkbox"/> Recreation	<input checked="" type="checkbox"/> Aerial
<input type="checkbox"/> Expansion	<input type="checkbox"/> Municipal	<input type="checkbox"/> Harvesting
<input checked="" type="checkbox"/> Operation	<input checked="" type="checkbox"/> Quarry	<input checked="" type="checkbox"/> Camp
<input type="checkbox"/> Repair	<input checked="" type="checkbox"/> Linear / Corridor	<input type="checkbox"/> Scientific/
<input type="checkbox"/> Research	<input checked="" type="checkbox"/> Sewage	<input checked="" type="checkbox"/> Solid Waste
<input checked="" type="checkbox"/> Water Intake		
<input type="checkbox"/> Other:		

### Principal Development Components (related to scoping)

<input checked="" type="checkbox"/> Access Road	<input checked="" type="checkbox"/> Waste Management
<input checked="" type="checkbox"/> construction	<input checked="" type="checkbox"/> disposal of hazardous waste
<input checked="" type="checkbox"/> abandonment/removal	<input checked="" type="checkbox"/> waste generation
<input checked="" type="checkbox"/> modification e.g., widening, straightening	<input checked="" type="checkbox"/> sewage
<input checked="" type="checkbox"/> Automobile, Aircraft or Vessel Movement	<input checked="" type="checkbox"/> disposal of sewage
<input checked="" type="checkbox"/> Blasting	<input type="checkbox"/> Geoscientific Sampling
<input checked="" type="checkbox"/> Building	<input checked="" type="checkbox"/> Trenching
<input checked="" type="checkbox"/> Burning	<input type="checkbox"/> Diamond drill
<input type="checkbox"/> Burying	<input type="checkbox"/> Borehole core sampling
<input checked="" type="checkbox"/> Channelling	<input type="checkbox"/> Bulk soil sampling
<input checked="" type="checkbox"/> Cut and Fill	<input type="checkbox"/> gravel
<input checked="" type="checkbox"/> Cutting of Trees or Removal of Vegetation	<input type="checkbox"/> hydrological Testing
<input checked="" type="checkbox"/> Dams and Impoundments	<input checked="" type="checkbox"/> Site Restoration
<input checked="" type="checkbox"/> construction	<input type="checkbox"/> fertilization
<input checked="" type="checkbox"/> abandonment/removal	<input type="checkbox"/> grubbing
<input checked="" type="checkbox"/> modification	<input checked="" type="checkbox"/> planting/seeding
<input checked="" type="checkbox"/> Ditch Construction	<input type="checkbox"/> reforestation
<input checked="" type="checkbox"/> Drainage Alteration	<input type="checkbox"/> scarify
<input checked="" type="checkbox"/> Drilling other than Geoscientific	<input type="checkbox"/> spraying
<input type="checkbox"/> Ecological Surveys	<input checked="" type="checkbox"/> re-contouring
<input checked="" type="checkbox"/> Excavation	<input checked="" type="checkbox"/> Slashing and removal of vegetation
<input checked="" type="checkbox"/> Explosive Storage	<input type="checkbox"/> Soil Testing

- Fuel Storage
- Topsoil, Overburden or Soil
  - fill
  - disposal
  - removal
  - storage

- Stream Crossing/Bridging
- Tunnelling/Underground
- Other:

**NTS topographic map sheet numbers:**  
85/2

**Latitude / longitude and UTM system:**  
Nechalacho Mine and Flotation Plant  
Minimum Latitude 62°03'54" N Maximum Latitude 62°08'00" N  
Minimum Longitude 112°32'30" W Maximum Longitude 112°39'30" W

Hydrometallurgical Plant  
Minimum latitude 60°51'48" N Maximum latitude 60°58'24" N  
Minimum longitude 114°21'48" N Maximum longitude 114°27'42"

**Nearest community and water body:**  
Yellowknife, Great Slave Lake

**Land Status (consultation information)**

- Free Hold/Private
- Commissioners Land
- Federal Crown Land
- Municipal Land

**Transboundary/Transregional Implications**

- British Columbia
- Nunavut
- Wek'èezhii
- Alberta
- Wood Buffalo National Park
- Gwich'in
- Saskatchewan
- Inuvialuit Settlement Region
- Sahtu
- Yukon
- Nahanni National Park

**Type of transboundary implication:**  Impact / Effect  Development

Public concern: \_\_\_\_\_  
(Describe.)

**Physical - Chemical Effects**

<i>Impact</i>	<i>Mitigation</i>	<i>Location of condition</i>
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1) **Ground Water**

- water table alteration
- water quality changes

**Identified by Board Staff:**

- There is the potential for fuel spills to infiltrate to the ground water if not properly cleaned.

**Identified by Environment Canada**

EC is of the opinion that the above-noted project might have significant adverse impacts on the environment and therefore recommends an environmental assessment of the proposal. This advice is based on both the scale of the proposed project and the anticipated environmental impacts. We have identified a number of technical and environmental aspects of the proposed project, falling under the department's mandate, which should be reviewed and assessed for environmental impacts. These include:

- **Water management and treatment;**
- Air quality;
- Disposal of waste rock;
- Waste management plans;
- Development of site closure and remediation plans;
- Presence of SARA-listed species in the area and potential effects on these species and their habitat; and
- Migratory birds in the area and potential effects on these species and their habitat.

**Identified by Indian and Northern Affairs Canada**

INAC anticipates the project will be referred to Environmental Assessment and does not have any objection to such a referral. The following is a list of general issues that are of concern to INAC:

- **Water Management and Quality;**
- Tailings and Wastewater Containment Areas;
- Waste Management Plans and Contingencies; and
- Closure and Reclamation Plan.



infiltration changes

other:

N/A

**Impact**

**2) Surface Water**

flow or level changes

water quality changes

**Mitigation**

**Identified by the Proponent:**

- Reduction in water discharges from Thor Lake due to losses in the tailings management facility resulting from capture within tailings voids, evaporation, and escape to groundwater;
- Annual flow increases of 6-12 times through Drizzle and Murky lakes compared with pre-development base flows;
- Spring discharge increases of 10-20 times through Drizzle and Murky lakes compared with pre-development base flows; and,
- Potential free water drawdown in Thor Lake during winter in excess of regulatory limits.

**Mitigation from Proponent:**

- Compliance with MVLWB water licence terms and conditions;
- Conformance with DFO Protocol for Winter Water Withdrawal in the NWT; and,
- Recycling of water to reduce process water requirements from Thor Lake, and hence, potential effects on the existing hydrologic regime. Increases in the level of recycling beyond the 50% that has initially been proposed will be investigated and will likely further reduce these effects.

**Identified by Katlodeeche First Nation:**

- Barging of the mined concentrate across Great Slave Lake could cause issues with water quality.

**Identified by Environment Canada**

EC is of the opinion that the above noted project might have significant adverse impacts on the environment and therefore recommends an environmental assessment of the proposal. This advice is based on both the scale of the proposed project and the anticipated environmental impacts. We have identified a number of technical and environmental aspects of the proposed project, falling under the department's mandate, which should be reviewed and assessed for environmental impacts. These include:

- **Water management and treatment;**
- Air quality;
- Disposal of waste rock;
- Waste management plans;
- Development of site closure and remediation plans;
- Presence of SARA-listed species in the area and potential effects on these species and their habitat; and
- Migratory birds in the area and potential effects on these species and their habitat.

**Identified by Indian and Northern Affairs Canada**

INAC anticipates the project will be referred to Environmental Assessment and does not have any objection to such a referral. The following is a list of general issues that are of concern to INAC:

- **Water Management and Quality;**
- Tailings and Wastewater Containment Areas;
- Waste Management Plans and Contingencies; and
- Closure and Reclamation Plan.

**Identified by the Proponent:**

- Reduction in water discharges from Thor Lake due to losses in the tailings management facility resulting from capture within tailings voids, evaporation, and escape to groundwater;
- Annual flow increases of 6-12 times through Drizzle and Murky lakes compared with pre-development base flows;
- Spring discharge increases of 10-20 times through Drizzle and Murky Lakes compared with pre-development base flows; and,
- Potential free water drawdown in Thor Lake during winter in excess of regulatory limits.

**Location of condition**

**Mitigation from Proponent:**

- Compliance with MVLWB water licence terms and conditions;
- Conformance with DFO Protocol for Winter Water Withdrawal in the NWT; and,
- Recycling of water to reduce process water requirements from Thor Lake, and hence, potential effects on the existing hydrologic regime. Increases in the level of recycling beyond the 50% that has initially been proposed will be investigated and will likely further reduce these effects.

water quantity changes

**Identified by the Proponent:**

- Reduction in water discharges from Thor Lake due to losses in the tailings management facility resulting from capture within tailings voids, evaporation, and escape to groundwater;
- Annual flow increases of 6-12 times through Drizzle and Murky lakes compared with pre-development base flows;
- Spring discharge increases of 10-20 times through Drizzle and Murky lakes compared with pre-development base flows; and,
- Potential free water drawdown in Thor Lake during winter in excess of regulatory limits.

**Mitigation from the Proponent:**

- Compliance with MVLWB water licence terms and conditions;
- Conformance with DFO Protocol for Winter Water Withdrawal in the NWT; and,
- Recycling of water to reduce process water requirements from Thor Lake, and hence, potential effects on the existing hydrologic regime. Increases in the level of recycling beyond the 50% that has initially been proposed will be investigated and will likely further reduce these effects

drainage pattern changes

temperature

wetland changes/loss

other:

N/A

**Impact**

3) Noise

**Mitigation**

**Location of condition**

noise in/near water

**Identification by Board Staff:**

- With the use of the barge system, there will be an increase in noise in the water; and
- With water being drawn from the lakes in the surrounding area, there is the potential for the noise from the pumps to affect the levels of noise.

noise increase

**Issue identified by the Proponent:**

- The Nechalacho Mine and Flotation Plant will have several components that may affect air quality or ambient noise levels. These effects will be mainly related to the construction phase, power generation, and traffic. Aside from fuel combustion for power generation, vehicles, and other mine equipment, (which will produce most of the carbon dioxide and monoxide, sulphur dioxide, nitrous oxides and particulates), the majority of potential effects on air quality will be associated with the generation of particulates (dust) relating to transportation activities.

**Mitigation from the Proponent:**

- Avalon is committed to employing an adaptive management approach including a number of mitigation measures. To minimize potential effects on local and regional air quality and the existing noise environment, and to control greenhouse gas emissions, mitigation measures that will be employed will include:
  - Full compliance with Land Use Permit and Water License and license conditions if issued by the MVLWB;
  - Conformance with the Guidelines for Ambient Air Quality Standards in the NWT;
  - Use of low sulphur diesel fuel and regular equipment and engine maintenance;

- Conformance with GNWT Guideline for Dust Suppression through the application of dust suppressants - e.g. water or approved dust suppressant products;
- Conformance with GNWT and WCB standards for mine air quality; and
- Disposal of all hazardous wastes in an approved manner.

other:

N/A

**Impact**  
4) Land

**Mitigation**

**Location of condition**

geologic structure changes

soil contamination

**Identification by Board Staff:**

- There is the potential for the soil to become contaminated from the use of hydrocarbons, accidental spill of fluids required for machinery, and the mass storage of fuel.

**Identified by Environment Canada**

EC is of the opinion that the above noted project might have significant adverse impacts on the environment and therefore recommends an environmental assessment of the proposal. This advice is based on both the scale of the proposed project and the anticipated environmental impacts. We have identified a number of technical and environmental aspects of the proposed project, falling under the department's mandate, which should be reviewed and assessed for environmental impacts. These include:

- Water management and treatment;
- Air quality;
- **Disposal of waste rock;**
- **Waste management plans:**
- Development of site closure and remediation plans;
- Presence of SARA-listed species in the area and potential effects on these species and their habitat; and
- Migratory birds in the area and potential effects on these species and their habitat.

**Identified by Indian and Northern Affairs Canada**

INAC anticipates the project will be referred to Environmental Assessment and does not have any objection to such a referral. The following is a list of general issues that are of concern to INAC:

- Water Management and Quality;
- **Tailings and Wastewater Containment Areas;**
- **Waste Management Plans and Contingencies;** and
- Closure and Reclamation Plan.

buffer zone loss

soil compaction and settling

**Identified by Board Staff:**

- With the use of heavy machinery the soil will become compact in areas; and
- The construction of the road ways, marshalling yards, and other infrastructure may affect the soil.

**Mitigation:**

- No mitigation required for project development.

destabilization/erosion

**Identified by Board Staff:**

- With the construction of new access roads, marshalling areas, and the erection of infrastructure, there is the potential for the soil to erode or become unstable.

permafrost regime alteration

**Identified by Board Staff:**

- The underground mining may affect the permafrost in the area; and
- The development of new access roads, marshalling yards, and other infrastructure may affect the permafrost.

explosives/scarring

**Identified by Board Staff**

- There will be the use of explosives on site. There is the potential for there to be effects to the land, vegetation, and possibly water.

other:

N/A

**Impact**

**5) Non-renewable natural resources**

**Mitigation**

**Location of condition**

resource depletion

other:

N/A

**Impact**

**6) Air/climate/atmosphere**

**Mitigation**

**Location of condition**

other:

**Identified by Environment Canada**

EC is of the opinion that the above noted project might have significant adverse impacts on the environment and therefore recommends an environmental assessment of the proposal. This advice is based on both the scale of the proposed project and the anticipated environmental impacts. We have identified a number of technical and environmental aspects of the proposed project, falling under the department's mandate, which should be reviewed and assessed for environmental impacts. These include:

- Water management and treatment;
- **Air quality;**
- Disposal of waste rock;
- Waste management plans;
- Development of site closure and remediation plans;
- Presence of SARA-listed species in the area and potential effects on these species and their habitat; and
- Migratory birds in the area and potential effects on these species and their habitat.

N/A

**Biological Environment**

**Impact**

**1) Vegetation**

**Mitigation**

**Location of condition**

species composition

**Identified by the Proponent:**

- Disturbance and removal of ecosystems and vegetation in areas proposed for Nechalacho Mine and Flotation Plant infrastructure;
- Alteration of soil and permafrost conditions, particularly in the vicinity of the proposed site footprint, resulting in effects that could result in changes to ecosystem structure and species composition;
- Changes to ecosystem composition due to fugitive dust deposition originating primarily from Nechalacho Mine and Flotation Plant road traffic; and,
- Changes to ecosystem composition due to the release and deposition of air emissions that may include nitrogen oxides, sulphur dioxide, potential acid inputs, particulate matter, and carbon monoxide.

**Mitigation from Proponent:**

- Compliance with MVLWB land use permit and water licence terms and conditions if issued;
- Minimization of proposed site development footprint area;
- Avoidance of development on rare ecosystem types (none are anticipated to be present);
- Implementation of erosion control measures if and as warranted;
- Application of dust suppressants (e.g. water or approved dust suppressant products);
- Utilization of low-sulphur diesel fuel, and state-of-the-art process plant and;
- Energy reduction technologies.

species introduction

toxin/heavy accumulation

other:

N/A

**Impact**

**2) Wildlife and Fish**

effects on rare, threatened or endangered species

fish population changes

**Identified by Board Staff:**

- Transporting goods across Great Slave Lake via barge has the potential to introduce new species to the areas; and
- Material being shipped via railway has the potential to carry seeds of invasive species.

**Mitigation**

**Identified by Environment Canada**

EC is of the opinion that the above noted project might have significant adverse impacts on the environment and therefore recommends an environmental assessment of the proposal. This advice is based on both the scale of the proposed project and the anticipated environmental impacts. We have identified a number of technical and environmental aspects of the proposed project, falling under the department's mandate, which should be reviewed and assessed for environmental impacts. These include:

- Water management and treatment;
- Air quality;
- Disposal of waste rock;
- Waste management plans;
- Development of site closure and remediation plans;
- **Presence of SARA-listed species in the area and potential effects on these species and their habitat; and**
- **Migratory birds in the area and potential effects on these species and their habitat.**

**Identified by the Proponent:**

- Changes in flow volumes and patterns that could result in increased flushing of water from small upstream lakes through to Thor Lake, with potential effects on water quality and aquatic organisms;
- Changes to input/output volumes in Thor Lake could affect lake level, with consequent effects on available fish habitat;
- Exceedance of water withdrawal volumes permitted under the DFO Protocol for Winter Water Withdrawal in the NWT (2005);
- Direct habitat loss due to the establishment of the tailings management facility over the present location of Ring and Buck lakes *if* further investigation reveals these to be frequented by fish;
- Indirect habitat alterations or disruptions due to changes in flow volumes or patterns, obstruction of fish habitat, erosion and sedimentation, blasting, or loss of riparian vegetation;
- Use of a seasonal barge-dock system for loading concentrate containers onto barges and the installation of associated dolphins may result in temporary or small-scale disruptions to fish habitat; and
- Water quality (other than sediment) in known fish-bearing water bodies may be affected by the discharge of tailings or by inadvertent spills or leaks of concentrate, fuels, or lubricants.

**Mitigation from Proponent:**

- Maximization of water recycling to reduce water requirements from Thor Lake and discharges from the tailings management facility. Flow volumes and lake levels will need to be monitored to identify significant changes from background levels and to make adjustments as may be necessary;
- Construction and seasonal use of a pipeline from Drizzle Lake to Thor Lake to supplement winter water levels in Thor Lake and to reduce high storm event discharges through Murky Lake and the Murky Lake outflow stream;
- Possible aeration of water piped in winter from Drizzle Lake, since it is likely that water under the ice in Drizzle Lake may be anoxic;
- Utilization of a seasonal barge-dock arrangement for loading and off-loading concentrate is designed to minimize the disruption of fish habitat in the littoral zone of Great Slave Lake. The installation of mooring dolphins to permit barge tie-up will be carried out using appropriate Best Management Practices and mitigation measures to minimize sediment releases and habitat losses;

**Location of condition**

- Application of available guidelines and Best Management Practices to avoid or minimize risks to water quality and aquatic resources including:
- Land Development Guidelines for the Protection of Aquatic Habitat (Chilibeck et al., 1993);
- GNWT Guidelines for Dust Suppression; and
- Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters (Wright and Hopky, 1998).

**Identified by Department of Fisheries and Oceans**

DFO is unable to fully evaluate the impacts of the proposed project on fish and fish habitat. Because of this uncertainty—and because the project lacks adequate baseline information, in particular related to the two lakes proposed for the deposit of tailings—DFO is of the opinion that the project, as presently described, has the potential for significant adverse impacts on the environment and recommends that the project undergo a more detailed environmental assessment review.

- waterfowl population changes
- breeding disturbance
- population reduction
- species diversity change
- health changes
- behavioural changes
- habitat changes / effects
- game species effects

**Identified by Proponent:**

- Direct loss or degradation of habitat due to the proposed site footprint, construction and longer term operation of the Nechalacho Mine and Flotation Plant;
- Dust generation due to proposed site construction and operation, including access and haul roads;
- Physical and behavioural disturbance;
- Displacement and habituation;
- Attraction of wildlife to food wastes; and
- Increased hunting in the Nechalacho Mine and Flotation Plant site area.

**Mitigation from Proponent:**

- Compliance with MVLWB land use permit and water licence terms and conditions if issued;
- Minimization of proposed site development footprint area;
- Avoidance of development on rare ecosystem types (none are anticipated to be present);
- Implementation of erosion control measures if and as warranted;
- Application of dust suppressants (e.g. water or approved dust suppressant products);
- Implementation of no hunting policy for all site employees and contractors;
- Adoption of a cooperative approach involving First Nations and wildlife regulators, to effectively protect wildlife populations;
- Staff training and effective food waste management to mitigate potential wildlife attraction and habituation; and
- Effective reclamation, including re-contouring, scarification, and re-vegetation of the development footprint surface during future closure.

- toxins/ heavy metals
- forestry changes
- agricultural changes
- other:
- N/A

**Interacting Environment**

**Impact**

**1) Habitat and Communities**

- predator-prey
- wildlife habitat/ecosystem composition changes

- reduction/removal of keystone or endangered species

- removal of wildlife corridor or buffer zone

- other:

- N/A

**Impact**

**2) Social and Economic**

- planning/zoning changes or conflicts
- increase in urban facilities or services use
- rental house
- airport operations/capacity changes
- human health hazard
- impair the recreational use of water or aesthetic quality
- affect water use for other purposes

**Mitigation**

**Identified by Environment Canada**

EC is of the opinion that the above noted project might have significant adverse impacts on the environment and therefore recommends an environmental assessment of the proposal. This advice is based on both the scale of the proposed project and the anticipated environmental impacts. We have identified a number of technical and environmental aspects of the proposed project, falling under the department's mandate, which should be reviewed and assessed for environmental impacts. These include:

- Water management and treatment;
- Air quality;
- Disposal of waste rock;
- Waste management plans;
- Development of site closure and remediation plans;
- **Presence of SARA-listed species in the area and potential effects on these species and their habitat; and**
- **Migratory birds in the area and potential effects on these species and their habitat.**

**Identified by Environment Canada**

EC is of the opinion that the above noted project might have significant adverse impacts on the environment and therefore recommends an environmental assessment of the proposal. This advice is based on both the scale of the proposed project and the anticipated environmental impacts. We have identified a number of technical and environmental aspects of the proposed project, falling under the department's mandate, which should be reviewed and assessed for environmental impacts. These include:

- Water management and treatment;
- Air quality;
- Disposal of waste rock;
- Waste management plans;
- Development of site closure and remediation plans;
- **Presence of SARA-listed species in the area and potential effects on these species and their habitat; and**
- **Migratory birds in the area and potential effects on these species and their habitat.**

**Location of condition**

**Location of condition**

affect other land use operations

quality of life changes

public concern

**Identified by Katlodeeche First Nation:**

- Cumulative effects of the two proposed mining operations at the Pine Point Mine Site with Tamerlane and Avalon.

**Identified by Katlodeeche First Nation**

Due to significance of the project it should be subject to an Environmental Assessment.

**Identified by Yellowknives Dene First Nation**

Strongly recommend that this project be referred to Environmental Assessment.

**Identified by Deninu Kue First Nation**

We would like to see this application and proposed development to be referred to an Environmental Assessment due to the fact that this is a very large scale project and the impacts from this type of development will be significant to all aspects of the respected values of the Akaitcho Dene of Deninu Kue First Nation, environmentally, socially, culturally, and economically.

**Identified by Lutsel K'e Dene First Nation**

Significant impacts upon the practice of Akaitcho First Nation treaty and Aboriginal rights, and therefore is of significant concern to the First Nations. Also wants to stress that the barge transport of ore across Great Slave Lake is of particular concern, and something that the First Nation resisted strongly when Highwood Resources tried to mine beryllium at the site.

**Environment Canada letter dated May 28, 2010**

EC is of the opinion that the above noted project might have significant adverse impacts on the environment and therefore recommends an environmental assessment of the proposal. This advice is based on both the scale of the proposed project and the anticipated environmental impacts. We have identified a number of technical and environmental aspects of the proposed project, falling under the department's mandate, which should be reviewed and assessed for environmental impacts. These include:

- Water management and treatment;
- Air quality;
- Disposal of waste rock;
- Waste management plans;
- Development of site closure and remediation plans;
- Presence of SARA-listed species in the area and potential effects on these species and their habitat; and
- Migratory birds in the area and potential effects on these species and their habitat.

**Department of Fisheries and Oceans letter dated May 28, 2010**

DFO is unable to fully evaluate the impacts of the proposed project on fish and fish habitat. Because of this uncertainty, and because the project lacks adequate baseline information, in particular related to the two lakes proposed for the deposit of tailings, DFO is of the opinion that the project, as presently described, has the potential for significant adverse impacts on the environment and recommends that the project undergo a more detailed environmental assessment review.

**GNWT- Environment and Natural Resources letter dated May 28, 2010**

ENR is of the opinion that due to the scale of the proposed project and the information provided in the Project Description and supporting documents, a higher level of detail and review is required in order to fully evaluate the potential impacts of this project.

**Indian and Northern Affairs Canada**

INAC anticipates the project will be referred to Environmental Assessment and does not have any objection to such a referral. The following is a list of general issues that are of concern to INAC:

- Water Management and Quality
- Tailings and Wastewater Containment Areas
- Waste Management Plans and Contingencies
- Closure and Reclamation Plan.



other:

N/A

**Impact**

**3) Cultural and Heritage**

**Mitigation**

**Location of  
condition**

effects to historic property

increased economic pressure  
on historic properties

change to or loss of historic  
resources

change to or loss of  
archaeological resources

**Identified by GNWT-Education, Culture, and Employment**

Recommends that the Proponent conduct an archaeological impact assessment of the project prior to the commencement of development activities. The scope of the AIA must include all components of the Nechalacho Mine and Flotation Plant Site, and any areas of new ground disturbance associated with the proposed Hydrometallurgical Plant Site, including the proposed dock facility/marshalling yard and up-grades to the haul roads.

increased pressure on  
archaeological sites

change to or loss of  
aesthetically important sites

effects to aboriginal lifestyle

other:

N/A

**Notes:**

**Consultation**

- Pursuant to subsection 1.6, paragraphs (a) and (b) of the **Akaiicho Territory Dene First Nations (ATDFN)** Interim Measures Agreement, the MVLWB has determined that written notice was given to the ATDFN, and that a reasonable period of time was allowed for ATDFN to make representations with respect to the Application.
- Pursuant to Schedule 4.1 of the **Northwest Territory Métis Nation (NWTMN)** Interim Measures Agreement, the MVLWB has determined that written notice was given to the NWTMN, and that a reasonable period of time was allowed for NWTMN to make representations with respect to the application.

Preliminary Screener / Referring Body Information

**Aboriginal organizations**

Salt River First Nations
Smith Landing First Nation
Yellowknives Dene First Nation (Dettah)
Yellowknives Dene First Nation (Ndilo)
Yellowknives Dene FN, Land & Environment
Lutselk'e Dene First Nation
Deninu K'ue First Nation
Tli Cho Lands Protection Environment
Dene Nation
Akaiicho Treaty #8 Tribal Corporation
Fort Smith Métis Council
Northwest Territory Métis Nation
Fort Resolution Métis Council
North Slave Métis Alliance
West Point First Nation
Katloodeeche First Nation
Hay River Métis Government Council

**Communities**

Town of Hay River
Deninoo Community Council
City of Yellowknife
Town of Fort Smith

**Government – GNWT**

GNWT – PWNHC
GNWT - ENR
Gnwt_ea@gov.nt.ca
GNWT - HEALTH
GNWT - MACA
WCSS
GNWT – ITI
GNWT – DOT

**Government – Federal**

South Mackenzie District Office – INAC
Head, Regulatory and Science Advice - Water Resources - INAC
Mineral & Petroleum Resources Directorate - INAC
Manager / Aboriginal and Territorial Relations - INAC
Intergovernmental Affairs – INAC
Environment and Conservation – INAC
Environment Canada
DFO

**Others**

Barrenground Caribou Outfitters
MVEIRB
Blachford Lake Lodge

<b>Preliminary Screening Decision</b>	
<input checked="" type="checkbox"/>	<b>Outside Local Government Boundaries</b>
<input checked="" type="checkbox"/> <input type="checkbox"/>	The development proposal might have a significant adverse impact on the environment, <i>refer it to the EIRB.</i> <i>Proceed with regulatory process and/or implementation.</i>
<input checked="" type="checkbox"/> <input type="checkbox"/>	The development proposal might have public concern, <i>refer it to the EIRB.</i> <i>Proceed with regulatory process and/or implementation.</i>
	Please see attached Reasons for Decision
<input type="checkbox"/>	<b>Wholly Within Local Government Boundaries</b>
<input type="checkbox"/> <input type="checkbox"/>	The development proposal is likely to have a significant adverse impact on air, water or renewable resources, <i>refer it to the EIRB.</i> <i>Proceed with regulatory process and/or implementation.</i>
<input type="checkbox"/> <input type="checkbox"/>	The development proposal might have public concern, <i>refer it to the EIRB.</i> <i>Proceed with regulatory process and/or implementation.</i>

**Preliminary Screening Organization**

Mackenzie Valley Land and Water Board

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June 11, 2010

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**Signatures**

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