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Aboriginal Affairs and Northern Development Canada (AANDC)

Public Hearing Presentation

Avalon Rare Metals Incorporated

Thor Lake Rare Earth Element Project

MVEIRB EA1011-001

Yellowknife, NWT

February 18-22, 2013

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Presentation Outline

Three main areas of concern discussed in AANDC Technical Report:

1. Site Specific Water Quality Objectives (SSWQOs)
2. Aquatic Effects Monitoring
3. Closure and Reclamation

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Site Specific Water Quality Objectives

- SSWQOs are the “standard” for water at an assessment boundary. They define the level of protection afforded a waterbody downstream of a development.

SSWQOs

Recommendation:

AANDC recommends that the Report of EA should include narrative statements that describe the level of protection to be afforded to the aquatic receiving environment in Thor Lake. These statements could include:

- ***Water quality changes due to mining activities will not significantly affect benthic macro-invertebrate and plankton abundance, taxonomic richness or diversity.***
- ***Water quality changes due to mining activities will not significantly alter fish abundance or diversity or fish consumption at current levels.***
- ***Water quality changes due to mining activities will not negatively affect areas utilized as traditional drinking water sources.***
- ***Water quality changes due to mining activities will not significantly affect mammals or wildfowl using the area as a drinking water, food source or habitat, or the current ability for people to harvest these animals.***

Site Specific Water Quality Objectives

- Effluent discharge is expected to be 321,300 m^3/yr which will be released to Drizzle Lake.
- The concentration of contaminants and the volume of discharge determines total loadings.
- Drizzle Lake is small; average depth is 2 metres (total volume is 622,734 m^3).
- Drizzle Lake dilution capacity will be reduced over time.

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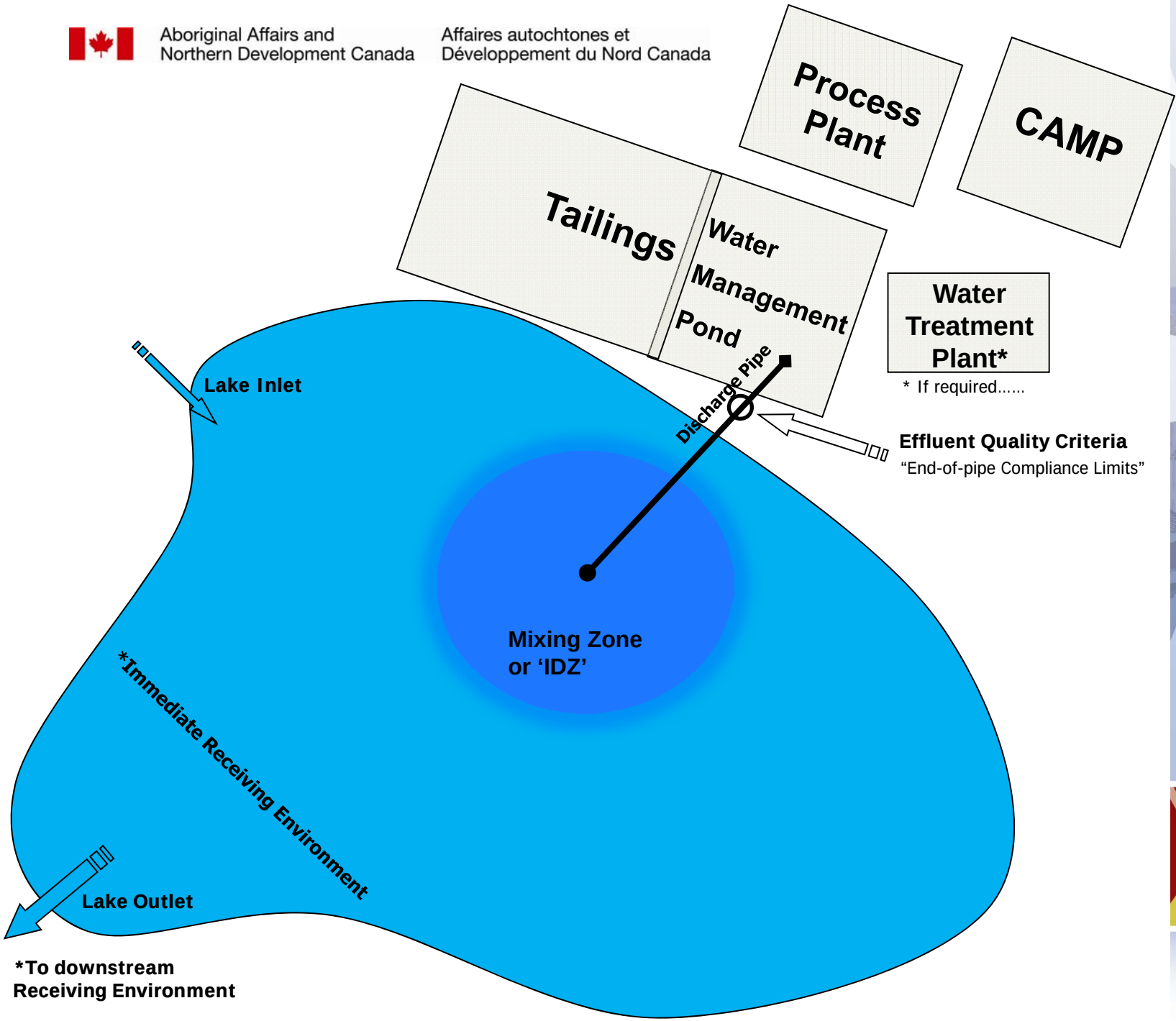

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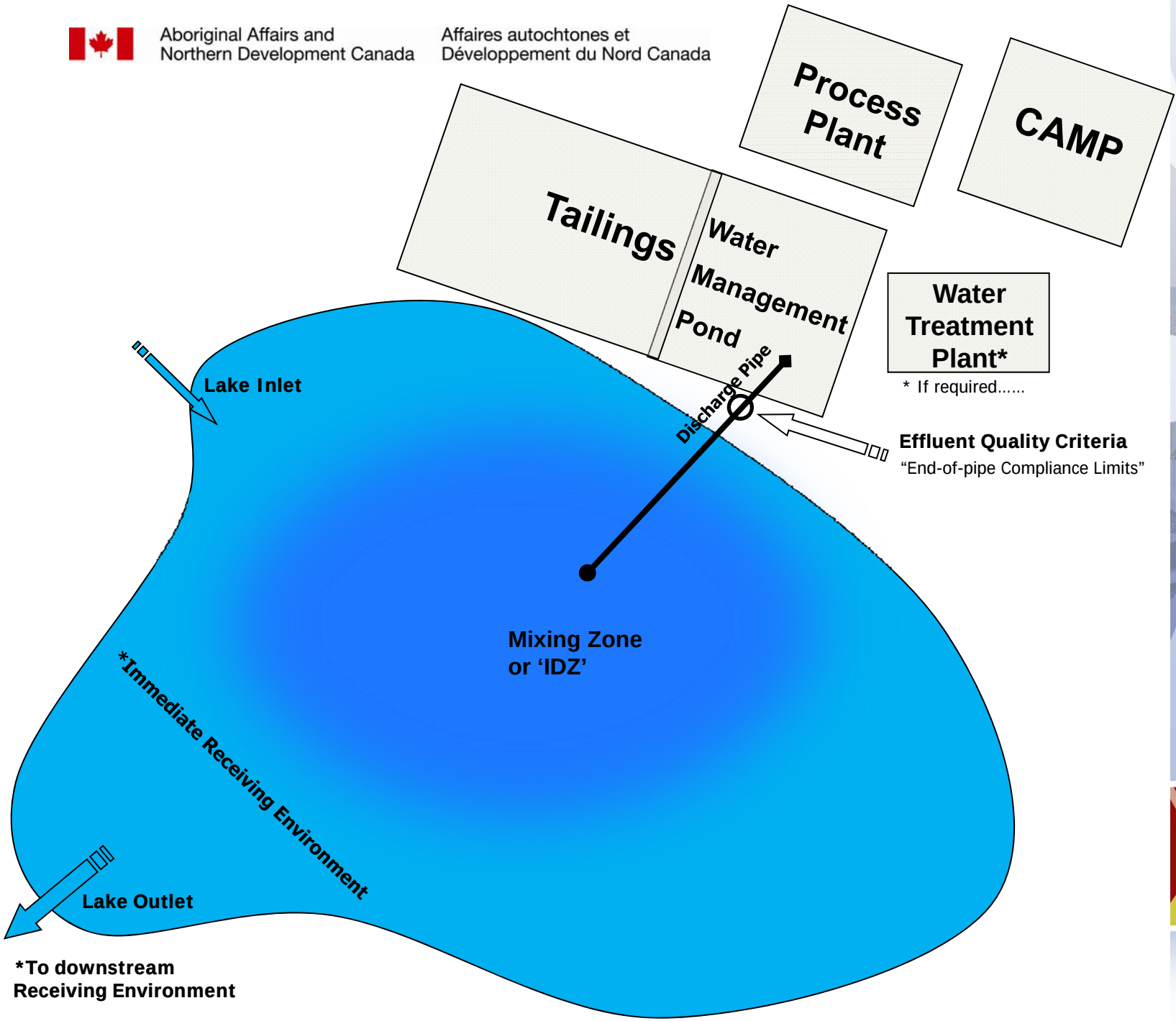

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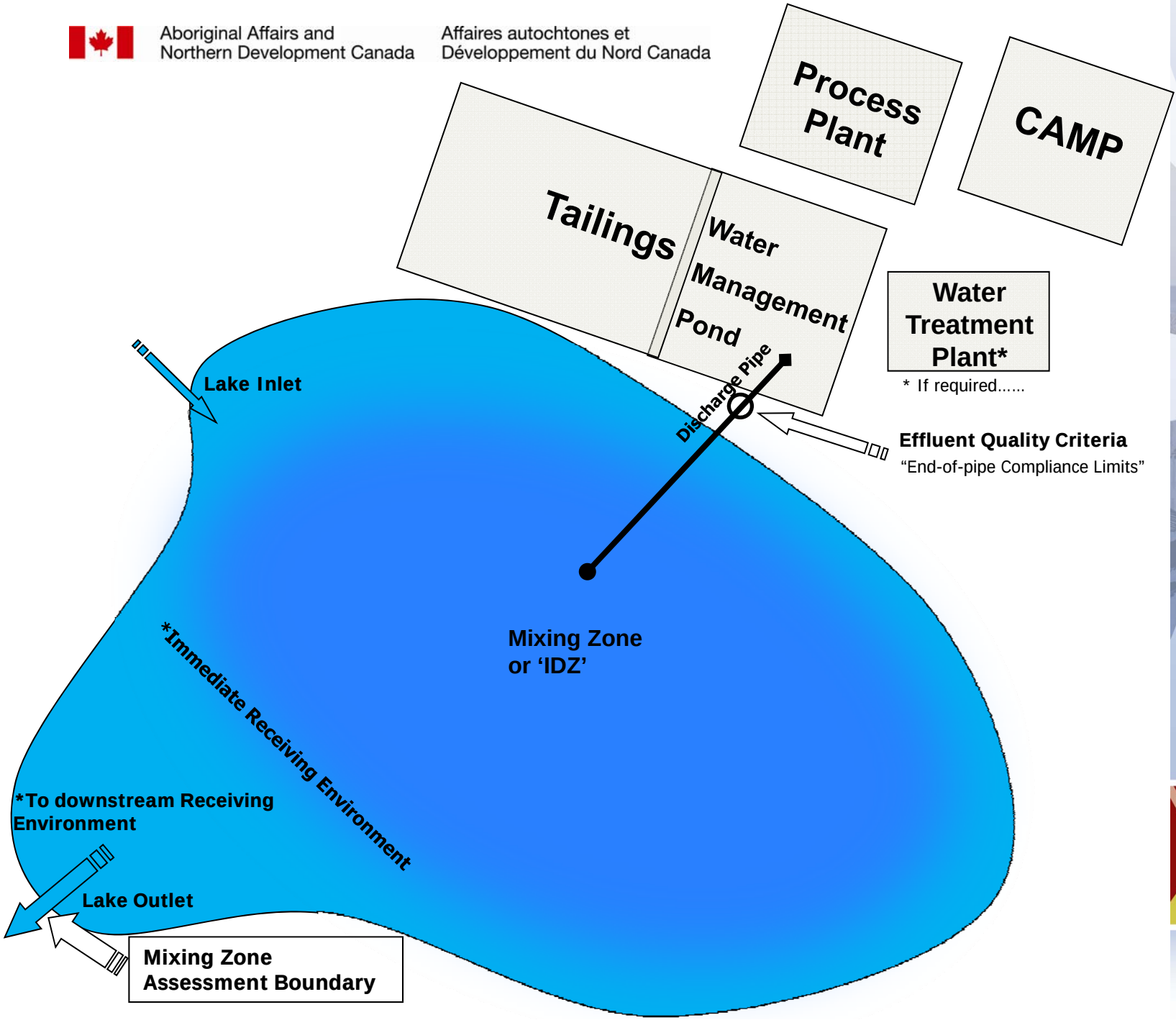

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SSWQOs

Recommendations:

AANDC recommends that the outlet of Drizzle Lake should be the assessment boundary or initial dilution zone boundary. All SSQWOs should be met at this location.

AANDC recommends that water quality in the TMF, Drizzle Lake and Murky Lake be monitored year round to assess the average conditions and trends during open water and under ice. Comparisons should be made to Environmental Assessment concentrations and predictions to assess changes in water quality. If trends indicate the proposed SSWQOs will not be achieved, water treatment options should be implemented.

AANDC recommends that dissolved oxygen and metal concentrations under ice must be regularly assessed to ensure they do not become harmful to aquatic life in Drizzle, Murky and/or Thor Lake.

SSWQOs

Recommendations:

AANDC recommends that if conditions during operations become detrimental to aquatic organisms (particularly during winter), mitigation options must be implemented. Potential mitigations should include but not be limited to effluent treatment, additional water storage to curtail winter discharge volume and rates, and/or aeration of downstream lakes.

AANDC recommends that SSWQOs for cadmium, iron, zinc and mercury should be set based on background concentrations and, where appropriate, including seasonality. SSWQOs for Rare Earth Elements should be set at the limits proposed by the company unless further investigation and assessment of toxicity is available. SSWQOs for other parameters should be provisionally based on CCME Guidelines.

AANDC recommends that loading limits be evaluated, and if necessary established, if impacts to the downstream environment are driven by both concentration and loadings.

Aquatic Effects Monitoring

- The Developer is responsible for monitoring and assessing the impacts of their project on the aquatic environment, and adapting their project to minimize impacts. AANDC has developed the Guidelines for Designing and Implementing Aquatic Effects Monitoring Programs for Development Projects in the Northwest Territories (2009).

- Avalon has indicated that the monitoring program will follow the requirements of the water licence and the Metal Mining Effluent Regulations.

- Avalon has proposed to initiate engagement activities with interested parties and stakeholders.

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Aquatic Effects Monitoring

Recommendation:

AANDC recommends that Avalon be required to follow the "Guidelines for Designing and Implementing Aquatic Effects Monitoring Programs for Development Projects in the Northwest Territories, June 2009" in the development of its Aquatic Effects Monitoring Program, effects levels, action levels or triggers, and related Management Response Framework for the Thor Lake Rare Earth Element Project.

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Closure and Reclamation

- AANDC developed the Mine Site Reclamation Policy for the Northwest Territories in response to a number of instances where the Crown assumed environmental liability of a site due to insolvency and subsequent abandonment of a mining property.

- The Policy contains a number of principles, including:
  - Mining companies or their future owners should continue to be responsible for remediation of a site;
  - Reclamation security will be equal to the total outstanding reclamation liability; and
  - Mine sites should be returned to viable and self sustaining ecosystems compatible with a healthy environment and with human activities.

Closure and Reclamation

- AANDC has also developed the Mine Site Reclamation Guidelines as a companion document to the Reclamation Policy.

- A key concept of the Reclamation Guidelines is to:
  - "Design for Closure and Reclamation"

- The main intent of the Policy and Guidelines is:
  - "Ensuring that the site is left in a condition which will minimize or eliminate long-term care and maintenance requirements."

Closure and Reclamation

- Closure is to be "...conducted in accordance with the terms and conditions of the future MVLWB Land Use Permit and Water License, the Mine Site Reclamation Policy for the Northwest Territories and the Mine Site Reclamation Guidelines...". (Commitment #64)
- AANDC's concerns relate to post-closure water quality and cover stability (long term physical and chemical stability).
- Work must be undertaking during regulatory phase and in the early years of mine operation to confirm post-closure water quality, closure strategies and long-term stability of tailings covers.
- Post-closure monitoring and performance assessments are required to confirm post-closure objectives are achieved.

Closure and Reclamation

Recommendations:

AANDC recommends that the closure goal for the Nechalacho Mine Site and Pine Point Hydrometallurgical Site be based on the 1994 Whitehorse Mining Initiative definition: returning mine sites and affected areas to viable and, wherever practicable, self sustaining ecosystems that are compatible with a healthy environment and with human activities.

AANDC recommends that the company be required to place tailings covers during the winter and design them sufficiently to maintain long-term stability, including during summer thaw periods, for both the Nechalacho and L-37 tailings facilities.

Closure and Reclamation

Recommendations:

AANDC recommends that the company be required to monitor tailings during operations within the L-37 tailings facility to confirm saturation levels and ensure trafficability for closure and placement of a cover.

AANDC recommends that the company be required to implement monitoring during operations to verify the modeling predictions of the effluent plume downgradient of the L-37 tailings facility, assess the modeling parameters and initiate mitigation, if required.

AANDC recommends that the proponent be required to conduct post closure monitoring and maintenance until such time as closure goals, objectives and criteria are achieved and maintained.

Concluding Remarks

- The proposed Thor Lake Rare Earth Element Project is one of a kind in the NWT and in North America. The project is proposing two separate development properties on the Northern and Southern shores of Great Slave Lake.

- Any effects of the proposed project during operation and post-closure should be limited such that they do not significantly impact traditional and non-traditional use of the lake and development areas.

- AANDC's recommendations relate to minimizing potential impacts of this proposed development both in magnitude (size) and temporal extent (time), with the goal of minimizing or eliminating impacts from the development.

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Thank you.

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