Indigenous and Northern Affairs Canada
Affaires autochtones et du Nord Canada

TMAC Resources Inc.

Amendment Application No. 1 to Water Licence No. 2AM-DOH1323

Nunavut Water Board Technical Meeting
Cambridge Bay, NU

January 28-29, 2016

Canada

Outline

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1. Roles and Responsibilities

Indigenous and Northern Affairs Canada's (INAC) responsibilities, mandate, and obligations stem from the following legislation:

- *Department of Indian Affairs and Northern Development Act*
- *Nunavut Land Claims Agreement Act*
- *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the associated regulations
- *Territorial Lands Act* and the associated regulations
- INAC *Mine Site Reclamation Policy for Nunavut* (2002)

2. Contributions to the Water Licence Amendment Application Review

INAC submissions to the Nunavut Water Board (NWB):

1. September 18, 2015 Completeness Review Memorandum
2. December 8, 2015 Technical Review Memorandum
3. December 8, 2015 Independent Closure Cost Estimate
4. December 15, 2015 Geotechnical Site Inspection Report

3. Technical Review
a) Resolved

INAC TC-1: Water Quality Predictions – Source Terms for Process Water

The Proponent has provided a reasonable explanation of selection of process water effluent source terms.

INAC Submission: Dec 8, 2015
TMAC Response: Dec 21, 2015

3. Technical Review
a) Resolved

INAC TC2: Groundwater Quality Predictions

The Proponent has provided an explanation of the rationale for the absence of underground mine sources in the model.

The Proponent has provided a description of the potential for acid rock drainage (ARD) and metal leaching (ML) from mine walls, waste rock and underground tailings as well as potential impacts to mine water quality and downstream receptors.

INAC Submission: Dec 8, 2015
TMAC Response: Dec 21, 2015

3. Technical Review
a) Resolved

INAC TC5: Water Quality Predictions – Input for Ore and Waste Rock Stockpiles

The Proponent has provided adequate details regarding the basis for selecting source terms for surface waste rock and ore stockpiles and what can be expected in the future.

INAC Submission: Dec 8, 2015
TMAC Response: Dec 21, 2015

3. Technical Review
a) Resolved

INAC TC6: Tailings Impoundment Area Storage Capacity

The Proponent has provided adequate information to explain management processes and water treatment plans intended to proactively identify problems and install mitigative measures.

They have also provided a satisfactory explanation of the contingency plans in place in the event that effluent does not meet discharge criteria.

INAC Submission: Dec 8, 2015
TMAC Response: Dec 21, 2015

3. Technical Review
a) Resolved

INAC TC7: Waste Rock for Construction Use

The Proponent has provided a satisfactory explanation of the basis for criteria selection to determine whether diabase can be used for construction outside the containment area.

INAC Submission: Dec 8, 2015
TMAC Response: Dec 21, 2015

3. Technical Review
a) Resolved

INAC TC8: Monitoring Mineralized Rock

The Proponent has provided a satisfactory explanation of the basis for the waste rock segregation plan and the potential for acid rock drainage and metal leaching from "non-mineralized" rock.

INAC Submission: Dec 8, 2015
TMAC Response: Dec 21, 2015

3. Technical Review
a) Resolved

INAC TC9: Filtering Capability of the Interim Dyke

The Proponent has provided a satisfactory level of detail on how they will undertake the placement of layers on the upstream face while the Tailings Impoundment Area is in operation.

INAC Submission: Dec 8, 2015
TMAC Response: Dec 21, 2015

3. Technical Review
a) Resolved

INAC TC10: Permafrost Maintenance of Thermal Rock Pads After Closure

The Proponent has provided a satisfactory explanation of measures that will be implemented to ensure that water will not pond against the edges of the thermal rock fill pads after closure.

INAC Submission: Dec 8, 2015
TMAC Response: Dec 21, 2015

3. Technical Review
a) Resolved

INAC TC12: Sewage Treatment

The Proponent has referenced its 2014 Doris North Wastewater Management Plan and demonstrated that licence criteria are being met prior to any discharge of treated effluent to the receiving environment.

INAC Submission: Dec 8, 2015
TMAC Response: Dec 21, 2015

3. Technical Review
a) Resolved

INAC TC13: Water Treatment

The Proponent has provided adequate information to explain management processes and water treatment plans intended to proactively identify problems and install mitigative measures.

They have also provided a satisfactory explanation of the contingency plans in place in the event that effluent does not meet discharge criteria.

INAC Submission: Dec 8, 2015
TMAC Response: Dec 21, 2015

3. Technical Review
b) Outstanding

INAC TC3: Groundwater Quality Post-Closure

- Potential for impacts on groundwater quality due to mine flooding after operations, and

- Potential for groundwater discharge to Doris Lake after mine closure.

Awaiting further information the Proponent is to provide at the NWB Technical Meeting.

INAC Submission: Dec 8, 2015
TMAC Response: Dec 21, 2015
Next:

3. Technical Review
b) Outstanding

INAC TC4: Water Quality Predictions – Input for Exposed Tailings Beaches

Awaiting further information to be provided by the Proponent at the NWB Technical Meeting.

INAC Submission: Dec 8, 2015
TMAC Response: Dec 21, 2015
Next:

3. Technical Review
b) Outstanding

INAC TC11: Tailings Management Strategies

The Tailings Management Plan should be revised to include the use of environmentally suitable chemical dust suppressants.

INAC Submission: Dec 8, 2015
TMAC Response: Dec 21, 2015
Next:

4. Completeness Review
a) Resolved

INAC IR1: Water Quality

The Proponent has provided satisfactory detail on the methodology and rationale on how the improved water predictions can be verified if on-site water quality monitoring laboratory is not required.

INAC Submission: Sept 18, 2015
TMAC Response: Oct 8, 2015

4. Completeness Review
a) Resolved

INAC IR2, IR3 & IR4: Water Quality

The Proponent indicated that the document requested was incorrectly referenced in the application and had been replaced with a document that had already been included in the application.

INAC Submission: Sept 18, 2015
TMAC Response: Oct 8, 2015

4. Completeness Review
a) Resolved

INAC IR5: Water Quality

The Proponent indicated which document in the application contained the study describing the groundwater inflow predictions to the mine, including inflows from Doris Lake and groundwater.

INAC Submission: Sept 18, 2015
TMAC Response: Oct 8, 2015

4. Completeness Review
a) Resolved

INAC IR6: Water Management and Treatment

The Proponent, as requested, specified which document in the application contained information that described how the losses from Doris Lake will be determined, and explained what will happen to the lake as a result of these losses.

INAC Submission: Sept 18, 2015
TMAC Response: Oct 8, 2015

4. Completeness Review
a) Resolved

INAC IR7: Water Management and Treatment

The Proponent has provided a satisfactory analysis of variable hydrological conditions.

INAC Submission: Sept 18, 2015
TMAC Response: Oct 8, 2015

4. Completeness Review
a) Resolved

INAC IR8: Water Management and Treatment

The Proponent has provided a satisfactory description of processes that will be in place to help ensure that sufficient early warning signals are built into the applicable management plans such that the need for treatment, if required, can be pro-actively identified and installed before water quality criteria failure.

INAC Submission: Sept 18, 2015
TMAC Response: Oct 8, 2015

4. Completeness Review
a) Resolved

INAC IR9: Report Presentation

The Proponent has provided a satisfactory response for the inclusion of the Module B.

INAC Submission: Sept 18, 2015
TMAC Response: Oct 8, 2015

4. Completeness Review
a) Resolved

INAC IR15: Interim Closure and Reclamation Plan

The stated percentages for reclaiming the Overburden Dump are acceptable for this level of design (conceptual).

Detailed design for closure should include contour plans and an assessment that considers grain size of the surface soils, slope length and runoff velocity, to refine the overall percentage of slope that requires erosion protection.

INAC Submission: Sept 18, 2015
TMAC Response: Oct 8, 2015
INAC Response: Dec 8, 2015
TMAC Response: Dec 21, 2015

4. Completeness Review
b) Outstanding

INAC IR10: Groundwater Management

The Proponent has explained why materials impacted by Ammonium Nitrate Fuel Oil and hydrocarbon substances will not be remediated on surface (e.g., landfarmed) or removed to a hazardous waste management facility.

INAC Submission: Sept 18, 2015
TMAC Response: Oct 8, 2015

4. Completeness Review
b) Outstanding

INAC IR11: Water Management Plan

Regulatory authorities need to determine how to authorize the discharge of Tailings Impoundment Area effluent, as well as saline groundwater to the marine environment.

INAC Submission: Sept 18, 2015
TMAC Response: Oct 8, 2015
INAC Response: Dec 8, 2015
TMAC Response: Dec 21, 2015
Next:

4. Completeness Review
b) Outstanding

INAC IR12: Waste Rock and Ore Management Plan

Adequate volume calculations have been provided on the available space for backfilling of waste rock and tailings.

The outcome of the Nunavut Impact Review Board Project Certificate amendment application review must be considered as it relates to this issue.

INAC Submission: Sept 18, 2015
TMAC Response: Oct 8, 2015
INAC Response: Dec 8, 2015
TMAC Response: Dec 21, 2015
Next:

4. Completeness Review
b) Outstanding

INAC IR13: Impact of Backfilled Material to Groundwater

Awaiting further information to be provided at the NWB Technical Meeting:

- Evaluation of water quality in the reflooded mine, and the potential flux of groundwater into Doris Lake.

INAC Submission: Sept 18, 2015
TMAC Response: Oct 8, 2015
INAC Response: Dec 8, 2015
TMAC Response: Dec 21, 2015
Next:

4. Completeness Review
b) Outstanding

INAC IR14: Tailings Management Plan

A Tailings Impoundment Area final cover system design should be provided to the Nunavut Water Board for approval prior to its construction.

Any progressive reclamation should be documented through the submission of engineering design drawings.

INAC Submission: Sept 18, 2015
TMAC Response: Oct 8, 2015
INAC Response: Dec 8, 2015
TMAC Response: Dec 21, 2015
Next:

4. Completeness Review
b) Outstanding

INAC IR16: Madrid Advanced Exploration Project

Decision to include the scope of the Madrid Advanced Exploration Project in the Doris North Gold Mine's type A Water Licence requires a decision by the Nunavut Impact Review Board and the Nunavut Water Board.

INAC Submission: Sept 18, 2015
TMAC Response: Oct 8, 2015
INAC Response: Dec 8, 2015
TMAC Response: Dec 21, 2015
Next:

5. Reclamation Cost Estimate

Major Assumptions

- 18 month period of interim care and maintenance (ICM).
- Site closure will take 3 years.
- TMAC Quantities assumed to be correct.
- All equipment, personnel and camp facilities will need to be provided for ICM and closure activities.
- 5 years water management activities after completion of closure activities.
- 10 years post closure monitoring.
- 20% contingency.

5. Reclamation Cost Estimate (continued)

- Direct Costs

  $20.8M ($19,7M - Proponent Estimate)

- Indirect Costs

  $27.0M ($9.2M – Proponent Estimate)

- Total Costs

  $47.8M ($28.9M – Proponent Estimate)

Major Differences:

– ICM costs

– Mobilization / demobilization costs

– Post closure monitoring and maintenance costs

6. Conclusion

INAC notes that the following must be resolved or occur before holding a Nunavut Water Board Pre-Hearing Conference:

- The issuance of a Nunavut Impact Review Board Project Certificate Amendment

INAC will work with TMAC Resources to resolve outstanding concerns before the NWB Public Hearing.


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