



Water Resources Division
Resource Management Directorate
Nunavut Regional Office
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Your file - Votre référence
2AM-MRY1325
Our file - Notre référence
CIDM# 1286066

June 24, 2020

Robin Ikkutisluk
Licensing Administrator
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU, X0B 1J0
E-mail: licensing@nwb-oen.ca

**Re: Crown-Indigenous Relations and Northern Affairs Canada Review Comments
for the Quarry D1Q2 Closure Memo at the Mary River Project, Water Licence
No. 2AM-MRY1325 – Amendment No. 1**

Dear Ms. Ikkutisluk,

Thank you for your June 10, 2020 invitation to review the referenced Quarry D1Q2 Closure Memo for the Mary River Project, Water Licence No. 2AM-MRY1325 – Amendment No. 1, submitted by Baffinland Iron Mines Corporation.

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) examined the response pursuant to CIRNAC's mandated responsibilities under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Department of Crown-Indigenous Relations and Northern Affairs Act*. Comments have been provided in the attached Technical Memorandum.

If there are any questions or concerns, please contact me at (867) 975-4282 or bridget.campbell@canada.ca.

Sincerely,

Bridget Campbell,
Water Resources Coordinator



Technical Review Memorandum

Date: June 24, 2020

To: Robin Ikkutisluk – Licensing Administrator, Nunavut Water Board

From: Bridget Campbell – Water Management Coordinator, CIRNAC

**Subject: Crown-Indigenous Relations and Northern Affairs Canada Review
Comments for the Quarry D1Q2 Closure Memo at the Mary River
Project, Water Licence No. 2AM-MRY1325 – Amendment No. 1**

Region: ☐ Kitikmeot ☐ Kivalliq ☒ Qikiqtani

A. BACKGROUND

Baffinland Iron Mines Corporation (BIMC) currently operates the Mary River iron ore mine in Nunavut, Canada. The current approved project allows a total iron ore production rate of 22.2 million tonnes per annum (Mtpa). Waste rock is stored at the Waste Rock Storage Facility. BIMC notified the Nunavut Water Board (NWB) in summer 2019 of their plans to move the Run of Mine (ROM) stockpile from Km 107 to Km 106. The Deposit 1 Quarry 2 (D1Q2) exists at the Km 107 location currently. Before the ROM Stockpile can be built at the Km 107 location, quarry D1Q2 will need to be closed.

The Mary River Project is licensed under Nunavut Water Board Licence No. 2AM-MRY1325 – Amendment No. 1. Closure criteria are outlined under Part J of the licence.

BIMC submitted a letter to the NWB notifying them of BIMC's intention to close the quarry D1Q2. The letter was accompanied by an Inspection and Review Summary for Closure of D1Q2 (Closure Memo) and supporting analytical data.

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) reviewed this submission. A summary of the subjects of recommendations can be found in Table 1. A summary of the documents reviewed can be found in Table 2 of Section B. Detailed technical review comments are provided in Section C. References are listed in Section D.



Table 1: Summary of Recommendations

Recommendation	Subject
R-01	Implementation of Knight Piésold Ltd. Recommendations
R-02	Screening Criteria for Acid Drainage and Metal Leaching
R-03	Sample Analyses for the Toxicity Characterization Leaching Procedure

B. DOCUMENTS REVIEWED

The following table (Table 1) provides a summary of the documents reviewed.

Table 2: Documents Reviewed

Document Title	Author, File No., Date
Letter to the Nunavut Water Board Re: Quarry D1Q2 Closure Memo	Christopher Murray, Baffinland Iron Mines Corporation, 2020-06-04
Attachment 1: D1Q2 Inspection and Review Summary for Closure	Knight Piésold Consulting Ltd., NB102-00181/57-A.01, 2020-03-30
Attachment 2: Supporting Analytical Data	Baffinland Iron Mines Corporation, ALS Canada Ltd, Various Dates

C. REVIEW COMMENTS

1. Implementation of Knight Piésold Ltd. Recommendations

Comment:

Knight Piésold Ltd. (KP) was retained by Baffinland Iron Mines Corporation (BIMC) to undertake an inspection of the D1Q2 quarry to determine its physical, chemical, and thermal stability for quarry closure. KP recommended that BIMC resolve issues of physical stability and rock fall hazard on page 3 by undertaking the following measures:

- The quarry walls be buttressed with coarse, free draining Non-Potentially Acid Generating (Non-PAG), Non-Metal Leaching (Non-ML) and clean fill materials;
- The backfill be placed at 1.5H:1V slopes and be graded to provide adequate drainage of surface water;
- If the appropriate backfill material is not currently available, control access to the area until the buttress is completed;



- If work in close proximity to the walls is required prior to the completion of the buttress, an inspection of the slopes be completed by qualified technical personnel before work commences and at regular intervals while work is progressing; and
- Loose material be scaled from the face prior to the commencement of work.

The quarry is not intended to be fully closed and remediated at this time; rather the quarry will be repurposed as the site will partly serve as the location for the new Run of Mine (ROM) Stockpile location. In their cover letter, BIMC states on page 1 that the areas of quarry D1Q2 displaying physical instability, as indicated by KP, "... will be remediated throughout the construction of the ROM Stockpile..." It is not clear from this letter whether the recommendations made by KP will be implemented in during the construction of the ROM Stockpile, or once the ROM stockpile is decommissioned for final closure.

Recommendation:

(R-01) CIRNAC recommends that BIMC clarify which of KP's recommendations will be implemented, when they will be implemented, and how they will be implemented.

2. Screening Criteria for Acid Drainage and Metal Leaching

Comment:

Specific closure criteria for the site have not yet been established, as BIMC states in their memo. The KP report compares TCLP analytical results from eight samples with three different criteria:

- Table 10 in water licence 2AM-MRY1325 amendment 1: Discharge Limits for Open Pit, Stockpiles, and Sedimentation Ponds
- Canadian Council of Ministers of the Environment (CCME, 2014) Water Quality Guidelines for the Protection of Aquatic Life (PAL) (Freshwater)
- Metal and Diamond Mining Effluent Regulations (MDMER)

They conclude that metal leaching is likely not a concern because there were no exceedances in CCME-PAL Freshwater guidelines or in MDMER. KP flagged a single exceedance for total lead with respect to the water licence discharge criteria.

Using effluent criteria for a closed site where runoff would not be controlled and with limited monitoring is not sufficiently conservative. Depending on the volumes and distance from water, criteria closer to CCME-PAL might be more relevant.

CIRNAC found the analysis detection limits made it difficult to meaningfully compare the data presented with CCME-PAL guidelines. Moreover, where we were able to make



comparisons, we noted exceedances. The long term guideline for total lead is 0.001 to 0.007 mg/L depending on water hardness, and the four samples with detectable concentrations (>0.05 mg/L) had concentrations at least 10 times higher than the long term guideline. The two samples with detectable concentrations of total cadmium (>0.005 mg/L) also had concentrations higher than the long term guideline.

Recommendation:

(R-02) CIRNAC recommends that BIMC initiate discussions on appropriate run-off criteria in their Interim Closure and Reclamation Plan prior to concluding metal leaching or acid drainage will not be a concern at closed sites.

3. Sample Analyses for the Toxicity Characterization Leaching Procedure

Comment:

The Toxicity Characterization Leaching Procedure (TCLP) is generally used to measure inorganic and semi-volatile organic contaminants by simulating leaching through a landfill. It is unclear why this test was chosen to test metal leaching on the quarry, and whether the samples were taken in proximity to the D1Q2 quarry, from the seepage water, or directly from the D1Q2 rock material.

Recommendation:

(R-03) CIRNAC recommends that BIMC clarify the rationale for using the TCLP and identify the locations where the eight samples were taken.

D. REFERENCES

Works Cited

Canadian Council for Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines, Water Quality Guidelines for the Protection of Aquatic Life (<http://sts.ccme.ca/en/index.html>, accessed in June 2020).

Government of Canada, 2019. Metal and Diamond Effluent Regulations. June 25. SOR/2002-222.

Nunavut Water Board. Type “A” Water Licence No. 2AM-MRY1325 – Mary River Iron Mine Project; Amendment No. 1. Signed by Thomas Kabloona, Nunavut Water Board, for Baffinland Iron Mines Corporation. Gjoa Haven, NU: July 31, 2015.