Indigenous and Northern Affairs Canada
Affaires autochtones et du Nord Canada

Water Resources
Nunavut Regional Office
P.O. Box 100
Iqaluit, NU, X0A 0H0

Your file - Votre référence
2AM-MRY1325

January 22, 2016

Our file - Notre référence
CIDM#1021001

Licensing Department
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU, X0A 1J0

Re: 2AM-MRY1325 – Mary River Project – Baffinland Iron Mines Corporation – Aquatic Effects Monitoring Plan

Thank you for Ms. Beaulieu's November 15, 2015 invitation for written representations on the above referenced Aquatic Effects Monitoring Plan (AEMP).

Indigenous and Northern Affairs Canada (INAC) has conducted a technical review of the AEMP submitted by Baffinland Iron Mines Corporation and the results of our review are presented in the attached memorandum for the Nunavut Water Board's consideration.

Comments have been provided pursuant to INAC's mandated responsibilities for the enforcement of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Department of Indian Affairs and Northern Development Act*.

INAC appreciates the opportunity to participate in this review. If there are any questions or concerns, please contact me at (867) 975-3876 or by e-mail at sarah.forte@aandc-aadnc.gc.ca.

Sincerely,

Sarah Forté
Water Management Coordinator

cc. Scott Burgess, Manager, Mary River Project Team, AANDC
Erik Allain, Manager of Field Operations, AANDC

Canada

Technical Review Memorandum

To: Licensing Department, Nunavut Water Board

From: Sarah Forté, Water Management Coordinator, Water Resources Division, INAC

Date: January 22, 2016

Re: Review of Baffinland Iron Mines Corporation's Aquatic Effects Monitoring Plan for Type A Water Licence #2AM-MRY1325

Applicant: Baffinland Iron Mines Corporation
Project: Mary River Project
Region: Qikiqtani

A. BACKGROUND

On November 15, 2015, the Nunavut Water Board (NWB or Board) provided notification of Baffinland Iron Mines Corporation's (the licensee or Baffinland) submission of an updated Aquatic Effects Monitoring Plan (AEMP) (BAF-PH1-830-P16-0039 Rev 1) and a letter addressing comments received on the previous version of the plan.

The AEMP is a monitoring plan for the Mary River Project designed to:

- Detect short-term and long-term effects of the Project's activities on the aquatic environment resulting from the Project.
- Evaluate the accuracy of impact predictions.
- Assess the effectiveness of planned mitigation measures.
- Identify additional mitigation measures to avert or reduce environmental effects.

The NWB requested interested parties review the plan and make representations by January 15, 2016. Following a request, this deadline was extended to January 22, 2016.

B. RESULTS OF REVIEW

Indigenous and Northern Affairs Canada (INAC) thanks Baffinland for the responses it provided to the comments we submitted on November 21, 2014 and June 26, 2015 regarding the aquatic effects monitoring plan. We appreciate the changes in the revised plan. Most of the concerns the Department has with the present version of the AEMP have to do with when updates will be made to the environmental effects monitoring

(EEM) and core receiving environment monitoring (CREM) programs. We also have questions regarding hydrological monitoring and a few other minor comments.

1. Timing of integration of comments and new data

Reference:

- Aquatic Effects Monitoring Plan (BAF-PH1-830-P16-0039 Rev 1), October 30, 2015
- Aquatic Effects Monitoring Plan (BAF-PH1-830-P16-0039 Rev 0), June 27, 2014
- 2014 Qikiqtani Inuit Association (QIA) and Nunavut Water Board (NWB) Annual Report Rev 0, March 31, 2015, appendix E.10

Comment:

In the previous version of the AEMP (Rev 0), there were recommendations in both appendices B and C that further data collection was needed to define baseline concentrations and finalize EEM and CREM program benchmark values.

INAC notes that these modifications, though presented in appendix E.10 of the 2014 annual report, have not been integrated into the revised AEMP. An example is the sediment quality benchmarks. Those presented in Table 5.3 of both versions of the AEMP are identical, yet in the 2014 annual report, new benchmarks that take into account sample data measured in 2014 are proposed in appendices C and D of appendix E.10.

The appendices for Rev 1 are the same as for Rev 0, which had led to a lack of coherence between the main body of the AEMP and the appendices. Revisions made to section 5.2 of the text addressing statistical analyses of data with non-normal distributions are not reflected in sections 2.45 and 2.55 of appendix A, where the statistical analyses were made.

Section 4.1.5 of the AEMP stated the EEM program was to be updated in December 2015 and we understand it could not be included in this plan which was submitted two months prior. We also understand that after the first three years of data gathering during mining operation, the AEMP will be revisited. We are concerned that the 2014 data has not been integrated because it forms part of the baseline data and has an impact on benchmark concentrations, which will require different actions are to be undertaken if and when these concentrations are measured in the field.

Recommendation:

INAC recommends that the licensee clarify why it has not integrated some of the revisions available into the plan and provide a timeline for doing so.

2. Hydrological monitoring

Reference:

- Baffinland responses to regulator comments received re: Aquatic Effects Monitoring Plan Rev 0, October 30, 2015
- Aquatic Effects Monitoring Plan (BAF-PH1-830-P16-0039 Rev 1), October 30, 2015, Section 4.1
- 2014 Qikiqtani Inuit Association (QIA) and Nunavut Water Board (NWB) Annual Report Rev 0, March 31, 2015, appendix E.10

Comment:

INAC appreciates the efforts made by Baffinland to gather hydrological data and to share it through reports included in the appendices of the 2014 annual report. The data is critical in characterising stream flow and will be important in determining acceptable water withdrawals when they become necessary to fill the mine pit.

In section 3.3 of the AEMP, Baffinland states it "*is committed to maintaining and operating all the hydrometric stations to Water Survey of Canada (WSC) standards whenever possible.*" This statement is ambiguous as to whether they will maintain and operate the stations whenever possible or whether the operation is a firm commitment and the use of WSC standards is "*whenever possible*."

Quality assurance and quality control as well as data compilation are an integral part of collecting hydrometric data. The data and discussion on rating curves presented in the 2014 Hydrometric Monitoring Program Report (appendix A of appendix E.10) is helpful in allowing us to evaluate confidence levels for data. The report stated that for some stations more stage-discharge measurements were necessary to update rating curves that had shifted or were poorly defined at high flows.

In reviewing the data provided in the appendix B of appendix E.10 of the 2014 annual report, Stream Flow Data for Type A Water Licence Sites, we noted inconsistencies in the streams presented in Figure 1. Sometimes streams cross and certain streams, such as the one on which stations MS-C-A and MS-C-B are found, go both up and down the contour lines.

Recommendation:

INAC recommends that Baffinland clarify:

a) Its commitment for operating monitoring stations.

b) How the hydrological data is being compiled and if corrections for shifted rating curves are being applied to previous years' data.

3. Project description

Reference:

Aquatic Effects Monitoring Plan (BAF-PH1-830-P16-0039 Rev 1), October 30, 2015, Section 2.1

Comment:

The Project is described as including four major components: Milne Port, Mine Site, Railway and Steensby Port.

It is surprising that Tote Road is not included as a major component because it has the possibility of impacting watercourses in similar way as the railway.

4. Indoor crushing facilities

Reference:

Aquatic Effects Monitoring Plan (BAF-PH1-830-P16-0039 Rev 1), October 30, 2015, Section 2.1

Comment:

This section includes a sentence stating: "*At each of the ore handling locations, crushers and screens will be installed inside buildings, and conveyors will be covered and equipped with wind ventilation hoods to reduce wind exposure and the potential for dust generation.*"

No buildings for the crushers were observed on site nor are we aware of any plans for such buildings. The covered conveyors have been observed.

Recommendation:

INAC recommends that the statement above be modified to reflect crusher installations as they are planned.

5. Typos

Two inconsistencies were noted that appear as if they may be typos.

c) Total chromium site-specific water quality objective (SSWQO) on page 25 of Appendix B (page 224 of 921 page pdf file):

In the text of section 2.5.3.3, the SSWQO for Cr(total) is **0.0047** mg/L and in table 2.5 it is **0.047** mg/L.

d) Criteria of sediment for depositional zones on page C-3 of Appendix C (page 517 of 921 page pdf file):

Section C-2.2.1 discusses that sediment from depositional zones should be used for determining benchmarks and one of the criteria for non-depositional zones is total organic carbon **(TOC) concentrations < 60%** and sand content of > 80%. The Knight Piésold 2014 Water and Sediment CREMP Monitoring Report provided in appendix C of appendix E.10 of the 2014 annual report refers to a cut-off with **< 0.6% TOC** and > 80% sand.