APPENDIX E.13

RESPONSE TO OUTSTANDING 2017 ANNUAL REPORT COMMENTS

Table E.13 - Baffinland Response to Outstanding Comments on the 2017 QIA & NWB Annual Report for Operations - March 31, 2019

Comment ID and Topic	Comment	Recommendation/Request	Baffinland Response	Due Dates Assigned by NWB[1]
CIRNAC				
3. Landfarm Capacity	Baffinland states the following in the 2017 Annual Report: "Ongoing operation and the treatment in accordance with Baffinland's Operation Maintenance and Monitoring Manual (BAF-PH1-320-T07-0005) will be undertaken during the 2018 summer season to address the increasing amount of impacted soils stored at the Landfarm Facility." Table 2.8 reports that an additional 537 m3 of hydrocarbon impacted soil was deposited on the 9,900 m3 already contained in the landfarm, equalling 10,437 m3 of total soil volume in a landfarm that is designed for 9,000 m3 capacity. In the review of the 2016 Annual Report, CIRNAC noted that the landfarm was already over capacity which would make soil treatment difficult. CIRNAC recommended that Baffinland "…specify where they intend to store a new contaminated soil and how they proposed to treat or discard the soil presently at the landfarm." The 2017 Annual Report does not detail any removal or discarding of the soil previously in the landfarm, nor does it detail storage of new hydrocarbon impacted soil outside of the landfarm facility.	CIRNAC recommends that Baffinland provide the results of their soil volume review and follow through with the recommendation made by CIRNAC in the 2016 Annual Report review: "We recommend that the licensee specify where they intend to store any new contaminated soil and how they propose to treat or discard the soil presently at the landfarm."	The 2019 Work Plan includes the addition of a landfarm facility at the Mine Site to provide additional capacity at the Project for managing and treating hydrocarbon impacted soils. Soils currently stored at the Milne Port will continue to be remediated until they meet or exceed the relevant criteria for re-use at the Project. During 2018, Baffinland continued to till and remediate soils stored at the Milne Port Landfarm Facility as well as remove intermingled debris.	March 31, 2019
4. Chemical Dust Suppressant Use and Chloride (Cl^-) Monitoring	Baffinland informed CIRNAC last year that the Surface Water and Aquatic Ecosystem Management Plan was being revised and would provide clarity on the monitoring of water bodies for chloride along the Tote Road due to the addition of calcium chloride ($CaCl_2$) as a dust suppressant. This revised/updated plan was not submitted with the 2017 Annual Report.	CIRNAC recommends that the licensee provide an updated Surface Water and Aquatic Ecosystems Management Plan, which should provide detail on water protection measures for chloride.	As part of the 2018 Annual Report submission, Baffinland has provided the latest versions of the Project's Surface Water and Aquatic Ecosystem Management Plan (SWAEMP; Rev. 5) and Roads Management Plan (RMP; Rev. 7). The RMP details the water monitoring that will be conducted for construction activities at Project water crossings (Appendix C) and the routine monitoring that will be conducted along the Tote Road as part of the new Tote Road Monitoring Program (TRMP; Appendix D). The TRMP was developed by Baffinland to monitor the water quality of surface water flows at select water crossing (culverts, bridges) along the Tote Road. Data collected through the TRMP and Core Receiving Environment Monitoring Program (CREMP) will be used to further characterize and understand the potential effects of dust suppression activities on surrounding water bodies. Current mitigation measures used at the Project for dust suppression activities are discussed in Baffinland's Dust Management Protocol, provided as Attachment 7 of the Project's Air Quality and Noise Abatement Management Plan (Rev. 6).	March 31, 2019
5. Potential Cause(s) of ARD/ML Formation at Mine Site Waste Rock Facility	Baffinland identified the development of acid rock drainage/metal leaching (ARD/ML) at the Mine Site waste rock facility as one of the main operational challenges in 2017. In Appendix E.5, Golder seems to suggest that the dissolution of soluble iron sulphate minerals (e.g. melanterite) present in the waste rock is the cause of ARD/ML. However, CIRNAC notes the lack of conclusive evidence in support of this hypothesis and the lack of consideration of alternative causes. Furthermore, should Baffinland consider the presence of soluble iron sulphate minerals in waste rock as the reason for ARD/ML formation, its waste rock geochemical characterization programs and Interim Waste Rock Management Plan will need to be updated accordingly.	CIRNAC recommends that Baffinland undertake a comprehensive investigation to identify the cause(s) of the ARD/ML issue and based on the findings, update its waste rock geochemical characterization programs and waste rock management plan accordingly. Prior to that, Baffinland should update its waste rock geochemical characterization programs and waste rock management plan by including soluble iron sulphate minerals in waste rock as a source of acid drainage.	As documented in the latest version of the Project's Interim Waste Rock Management Plan (Golder, March 2019), Baffinland continues to investigate the cause of the ARD/ML at the Waste Rock Facility. As part of the ongoing investigation in 2018 and early 2019, a field program was undertaken from December 2018 to February 2019 to characterize the WRF and assess its thermal performance. The field program included the installation of thermistors and oxygen sensors to monitor the WRF thermal condition and for presence of oxygen consuming reactions (i.e. oxidation of PAG waste rock). Samples of waste rock were also collected from the thermistor installation boreholes for geochemical analysis. Total sulphur content of the borehole samples ranged from 0.02 to 0.53 wt. % as S. Sulphide-sulphur content ranged from <0.02 to 0.25 wt. % as S while sulphate-sulphur ranged from <0.02 to 0.28 wt. % as S. The preliminary geochemical results appear to support that dissolution of soluble sulphate minerals may be a key source of the acidic drainage currently observed from the WRF. The presence of soluble sulphate minerals, particularly in the PAG waste rock material, will need to be considered as part of the ongoing and future deposition plan for the WRF. For a complete discussion of interim results of the field program and the ongoing plans for further investigation, refer to the Interim Waste Rock Management Plan (Golder, March 2019).	March 31, 2019
6. Uncertainty in Estimate of Tonnages of PAG Waste Rock from Deposit No. 1	CIRNAC notes significant uncertainty in the estimate of the tonnages or proportions of PAG (Potentially Acid Generating) waste rock generated from Deposit No. 1. In the Phase 1 Waste Rock Management Plan, Baffinland predicted that based on its waste rock geochemical characteristic program, approximately 11% of the Life of Mine in-pit waste rock was estimated to be PAG. On the other hand, Table 2.9 of the Annual Report provided the monthly and annual quantities of waste rock generated from Deposit No. 1 in 2017. Among a total of 1,205,666 tonnes of waste rock generated, 348,772 tonnes were classified as PAG, representing about 29%, almost three times the initial estimate. Although Golder has hypothesised that soluble iron sulphate minerals (e.g. melanterite) was the cause of ARD/ML formation at the waste rock facility, the quantity of soluble iron sulphate minerals was not considered in the estimate by the tonnages of PAG to be generated from Deposit No. 1 from February 2018 to April 2019; only sulphide content and NPR (Neutralization Potential Ratio) were considered. Table 1 of Appendix E.5 summarized the prediction: out of total of 3,690,503 tonnes of waste rock to be generated, about 765,246 tonnes would be PAG, about 20.7% which is significantly lower than what was observed in 2017.	CIRNAC recommends that Baffinland update its estimate of the tonnage of PAG waste rock from Deposit No. 1 by also considering soluble iron sulphate minerals in the PAG/Non-PAG classification. CIRNAC would like to see this updated estimate reflected in the updated Waste Rock Management Plan and in next year's Annual Report.	Current waste rock estimates for 2019 are presented in the latest version of the Project's Interim Waste Rock Management Plan (Golder, March 2019). The preliminary geochemical results appear to support that dissolution of soluble sulphate minerals may be a key source of the acidic drainage currently observed from the WRF. The presence of soluble sulphate minerals, particularly in the PAG waste rock material, will need to be considered as part of the ongoing and future deposition plan for the WRF. The preliminary geochemical results from the borehole investigation appear to support the current PAG classification using a total sulphur cut-off value of 0.20 wt.% as S. Additional investigation into the presence of soluble sulphate minerals, with an emphasis on NPAG waste rock, is part of the planned 2019 geochemical program to further assess presence and potential implications of soluble sulphate minerals within the WRF. The results of the 2019 geochemical program will be used to evaluate and potentially revise the current geochemical analysis and PAG classification process and the sequencing schedule.	March 31, 2019
7. Metals Concentrations in Non-Compliant Discharges from Waste Rock Facility	On page 17 of the 2017 Annual Report, Baffinland stated: "During August 2017, the pH of runoff collected in the Waste Rock Facility surface water management pond (WRF pond) dropped below the pH discharge criteria outlined in the MMER and Type A Water Licence. Observations indicated the decrease in pH may have been the result of potential ARD. The pond was subsequently batch treated with sodium carbonate in mid-August 2017 to increase the pH within the permissible range for discharge. Although the batch treatment was initially successful in raising the pH of runoff contained with the pond, subsequent active discharges from the WRF pond during late August and September resulted in several exceedances of the MMER and Type A Water Licence discharge criteria for pH and total suspended solids (TSS). Exceedances for the non-compliant discharges were reported to the relevant regulators and are documented in NT-NU Spill Reports 17-289, 17-312, 17-328 and 17-361." ARD is generally associated with high metal content. In fact, in data included in the Follow-up to the #17-312 update reported on September 27th, 2017 Mary River Project – Water Licence No. 2AM-MRY1325, total nickel concentrations were reported to be 0.634 and 0.674 mg/L for samples taken October 9th and 17th, 2017, respectively, which are above the water licence discharges criterion (i.e. 0.5 mg/L). It is apparent that metal leaching (ML) is also a concern.	CIRNAC recommends that Baffinland acknowledge the metal leaching issue associated with the ARD formation from the Mine Site waste rock facility in an updated Waste Rock Management Plan, and design and implement appropriate management procedures to mitigate this issue.	Baffinland acknowledges that observations to date at the Waste Rock Facility are indicative of Acid Rock Drainage and Metal Leaching (ARD/ML). In 2018, Baffinland mobilized and operated a Water Treatment Plant (WTP) to mitigate the release of non-compliant runoff to the receiving environment. Implementation of the WTP resulted in no non-compliant controlled discharges from the Waste Rock Facility in 2018 under the Metal and Diamond Mining Effluent Regulations (MDMER), and only one (1) minor exceedance for TSS under the Type 'A' Water Licence. Baffinland will continue to implement the WTP mitigation measure while evaluating alternative long term mitigation measures and strategies for the management and monitoring of ARD/ML and waste rock at the Mine Site Waste Rock Facility, as outlined in the most recent version of the Project's Interim Waste Rock Management Plan (Golder, March 2019), appended to the Project's 2018 QIA & NWB Annual Report for Operations.	March 31, 2019
QIA				
4. Interim Waste Rock Management Plan – Geochemical Evaluation Program	N/A	Provide the scope and, when available, the outcomes of the Geochemical Evaluation Program mentioned in the Interim Waste Rock Management Plan.	Please refer to Section 10 of the 2018 Annual Report submission and the most recent version of the Interim Waste Rock Management Plan (Golder, March 2019).	March 31, 2019
5. Update to Interim Waste Rock Management Plan	N/A	Provide timelines for updating the Waste Rock Management Plan from interim status.	Please refer to Section 10 of the 2018 Annual Report submission and the most recent version of the Interim Waste Rock Management Plan (Golder, March 2019).	March 31, 2019
6. Update to Life-of-Mine Rock Management Plan		Provide when the Life of Mine Waste Rock Management Plan will be updated to reflect the Interim Waste Rock Management Plan	Please refer to Section 10 of the 2018 Annual Report submission and the most recent version of the Interim Waste Rock Management Plan (Golder, March 2019).	March 31, 2019
NWB				
8. Waste Rock Facility Water Treatment Plant – Operation Manual	Appendix E.5, Section 4.4 designates that the water treatment system operator to follow the manual but lists the manual as "under development".	Develop the manual and update relevant management plans.	The manual for the Waste Rock Facility Water Treatment Plant is appended to the Revision 6 of the Project's Fresh Water Supply, Sewage and Wastewater Management Plan, provided with the 2018 Annual Report submission.	March 31, 2019

Notes:

[1]NWB. (2018) Licence No. 2AM-MRY1325 Type "A"; Mary River Project, Baffinland Iron Mines Corporation; 2017 Annual Report Review