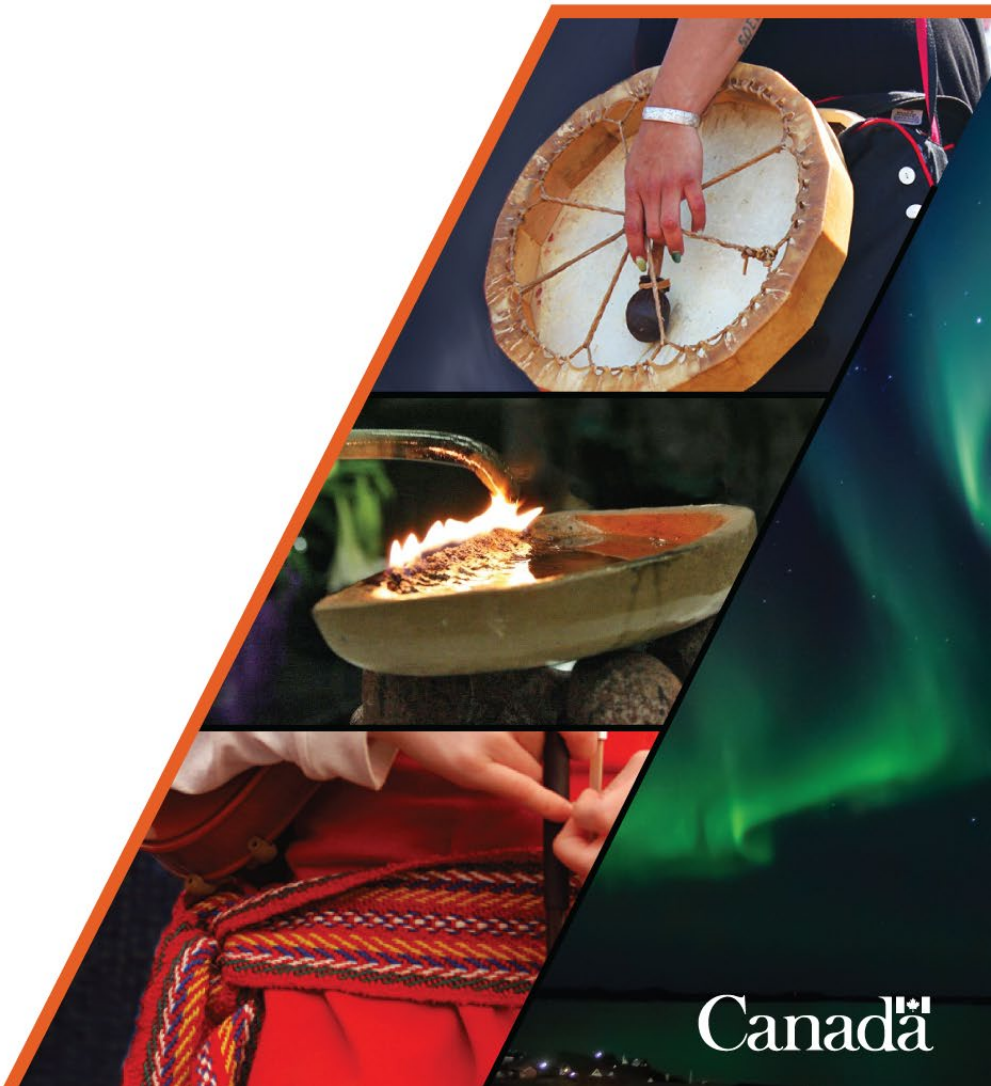
Crown-Indigenous Relations and Northern Affairs Canada
Relations Couronne-Autochtones et Affaires du Nord Canada

CIRNAC Comments to NIRB Re: Comment Request for Baffinland Iron Mines Corporation's Mary River Project 2022 Annual Report



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Your file - Votre référence
08MN053
Our file - Notre référence
GCDocs # 115272226

July 11, 2023

Cory Barker, M.Sc.
Technical Advisor III
Nunavut Impact Review Board
P.O. Box 1360
Cambridge Bay, NU, X0B 0C0
Via electronic mail to: info@nirb.ca

Re: Comment Request for Baffinland Iron Mines Corporation's Mary River Project 2022 Annual Report

Dear Cory Barker,

On May 26, 2023, as per Section 12.7.3 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty The Queen in Right of Canada* (*Nunavut Agreement*), s. 135(4) of the *Nunavut Planning and Project Assessment Act,* S.C. 2013, c. 14 *(NuPPAA)*, and the amended Mary River Project Certificate [No. 005], the Nunavut Impact Review Board (NIRB) requested parties to review Baffinland Iron Mines Corporation's (Baffinland's) 2022 NIRB Annual Report with respect to effects and compliance monitoring.

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) has conducted a review of the 2022 Annual Report and related documents in areas under its mandate pertaining to effects and compliance monitoring. On this basis, CIRNAC would like to provide the comments attached for the NIRB's consideration.

CIRNAC appreciates the opportunity to review Baffinland's Mary River Project 2022 Annual Report and looks forward to working with the NIRB and Baffinland through future reviews for this project. Should you have any questions, please do not hesitate to contact Alexandre Chaikine by email at alexandre.chaikine@rcaanc-cirnac.gc.ca.

Sincerely,

Alexandre Chaikine
Senior Environmental Assessment Specialist

1. ***Effects Monitoring***

The 2022 Annual Report has been evaluated to assess the measurable changes to the valued components/indicators under CIRNAC areas of interest, compared to the potential effects that were predicted to result from a proposed development of the Mary River Iron Mine Project, taking into account the Final Environmental Impact Statement (FEIS), previous years' monitoring reports and the requirements included in the Projects Certificates. The assessment considered the following:

a. ***Whether the conclusions reached by Baffinland in the 2022 Annual Report are valid; and,***
b. ***Any areas of significance requiring further supporting information or any changes to the monitoring program which may be required.***

Within the areas under its mandate, CIRNAC did not identify any information that would invalidate the conclusions reached by Baffinland in the 2022 Annual Report. However, CIRNAC is providing Technical Review Comments (TRCs) for the NIRB's consideration, with the following notes:

- TRC #1 – 7 incorporate ongoing recommendations from the 2021 Annual Report which, in the opinion of CIRNAC, have yet to be addressed. This conclusion is based on our review of the 2022 Annual Report.
- TRC #8 – 11 that are new for the 2022 reporting year.

Comment Number:	CIRNAC #1
Subject:	**Dust Management and Monitoring**

Reference:	• Project Certificate No. 005 (Amendment 04) Terms and Conditions #10, 20, 21
	• CIRNAC Comments to NIRB Re: Comment Request for Baffinland Iron Mines Corporation's 2021 Annual Report for the Mary River Project (June 15, 2022)
	• Baffinland Iron Mines Corporation (Baffinland) 2022 Annual Report to the Nunavut Impact Review Board (NIRB) (April 30, 2023):
	  ○ Section 4.6.2 Air Quality
	  ○ Section 4.6.5 Groundwater & Surface Water
	  ○ Section 4.6.6 Vegetation
	• EDI Environmental Dynamics Inc. (EDI) 2023. Mary River Project Terrestrial Environment 2022 Annual Monitoring Report (TEAMR) (April 2023)
	• Nunami Stantec Limited and Independent Dust Audit Committee Members (Dust Audit Committee). 2023. Baffinland Dust Audit Final Recommendations Report. (February 8, 2023)

Issue/Rationale:	In reviewing the Mary River 2021 Annual Report, CIRNAC recommended that Baffinland considers including the following measures to increase the quality of monitoring activities: a) Testing the chemical composition of soil base sites for bioavailable metal loadings from the dust, resulting from contact with surface water / soil moisture (for example, acidity, leachable metals, sulphate, nitrate). This measure would address ongoing concerns regarding the generation of dust by Project components and the potential effects of dustfall on land-based ecology and aquatic receiving environments, which are reiterated in Dust Audit Committee (2023). CIRNAC recognizes that seasonal dustfall rates are provided in the 2022 TEAMR, and that sampling of the terrestrial biota was undertaken to assess metals uptake in plants/lichen from dustfall, with ongoing bulk chemistry soil sampling to assess dustfall impacts across the site (EDI 2023). While bulk chemistry (including metals) soil sampling is a good measure of the spatial extent of dustfall related to the Project Development Area (PDA), it is not an indicator of contaminant mobility within the receiving environment (i.e., land-based and aquatic environments). To characterize contaminant mobility and potential impacts on aquatic environments, CIRNAC suggests pairing bulk metal soil sampling with leachability sampling to better understand the soluble constituents in the dustfall. Characterizing the leachability would help Baffinland understand the indirect transport pathways of dissolved soluble constituents to

	aquatic receptors, as dissolved soluble constituents are generally more bioavailable to aquatic receptors. In order to visualize and evaluate the sources and extent of metals contamination within the PDA, Baffinland should consider developing a dustfall impact Conceptual Site Model (CSM). The CSM should be a living document that is used to continually evaluate the sources of contamination, direct and indirect dustfall transport pathways and identify where impacts to aquatic receptors may be occurring throughout the PDA. The CSM also would benefit from considering meteorological variables, such as air temperature, precipitation, and prevailing wind direction. Higher air temperatures could lead to increased daytime heating, enhancing convection and the uplift of dust, which may explain observations of enhanced dustfall at the mine site in 2022 (e.g., DF-M-02 and DF-M-03, Figure 4.10 of the 2022 Annual Report). This effect could be amplified if precipitation inputs are reduced, which was documented in July 2022 (i.e., Figure 4.8 in the 2022 Annual Report), minimizing the scavenging of dust particles by rain droplets.
Recommendation:	CIRNAC recommends that Baffinland considers including the following measures to increase the quality of monitoring activities: a) Develop a dustfall impact CSM. The CSM should be a living document that is used to summarize and evaluate the sources and extent of contamination and transportation pathways, while considering meteorological variables, and where impacts to receptors may be occurring within the PDA. b) Clearly indicate how dustfall rates correlate with direct or indirect contaminant loading into recipient aquatic environments. c) Undertake leachability and geochemical testing on soil and sediment samples to assess the mobility and uptake of metals, from dustfall, in the environment.

Comment Number:	CIRNAC #2
Subject:	**Dust Management and Monitoring Plan and Roads Management Plan**

Reference:	• Project Certificate No. 005 (Amendment 03) Term and Condition #10
	• CIRNAC Comments to NIRB Re: Comment Request for Baffinland Iron Mines Corporation's 2021 Annual Report for the Mary River Project (June 15, 2022)
	• Baffinland 2021 Annual Report to the NIRB (March 31, 2022)
	• Baffinland Air Quality and Noise Abatement Management Plan (AQNAMP) Rev 8 (April 31, 2021)
	• Baffinland 2022 Annual Report to the NIRB (April 30, 2023):
	  ○ Section 4.6.2 Air Quality
	  ○ Section 6 Management Plan Updates

Issue/Rationale:	The Air Quality and Noise Abatement Management Plan (AQNAMP) was updated in 2021 to include Dust Stop® and DusTreat®. Dust Stop® has since been rebranded as DUST/BLOKR®. During the review of the 2021 Annual Report, CIRNAC recommended updates to the AQNAMP to include any procedures or application protocols specifically for DusTreat® on the stockpiles, which were not included in the 2021 AQNAMP update. Additionally, CIRNAC recommended that any reference to Dust Stop® in the AQNAMP be updated to the product used, DUST/BLOKR®. The 2022 Annual Report states that the AQNAMP is currently undergoing additional revisions and will be submitted to NIRB following a public review.
Recommendation:	CIRNAC recommends that Baffinland ensure that the AQNAMP update includes procedures and protocols surrounding the application of DusTreat® on stockpiles, as well as the use of the current product name DUST/BLOKR®. CIRNAC also recommends that the updated AQNAMP be included in the 2023 Annual Report.

Comment Number:	CIRNAC #3
Subject:	**Waste Rock Facility – Identification and Management of Acid Rock Drainage / Metal Leaching Waste Rock Materials and Permafrost**

Reference:	• Project Certificate No. 005 (Amendment 04) Terms and Conditions #16, 17, 23, 24, 46
	• CIRNAC Comments to NIRB Re: Comment Request for Baffinland Iron Mines Corporation's 2021 Annual Report for the Mary River Project (June 15, 2022)
	• Baffinland 2022 Annual Report to NIRB.
	  ○ Section 4.6.4 Hydrogeology and Hydrogeology
	  ○ Section 4.6.5 Groundwater & Surface Water
	  ○ Section 4.6.7 Freshwater Environment
	• Baffinland 2022 Qikiqtani Inuit Association (QIA) and Nunavut Water Board (NWB) Annual Report for Operations (March 31, 2023)
	• Baffinland 2022 QIA and NWB Annual Report for Operations:
	  ○ Appendix E.6. Waste Rock Geochemistry Analytical Sampling Results. (March 2023).
	• Baffinland Response to Comments Received for Baffinland's Production Increase Proposal Extension 2020 Annual Monitoring Report (August 2021).

Issue/Rationale:	CIRNAC's issues #1 and #3 raised in their 2021 review of the Annual Report remains relevant for the current 2022 review: As per Section 5.3.1 and Table 5.8 of the 2022 QIA and NWB Annual Report, the proportion of potential acid-generating (PAG) waste for the year (23.5%) remains well over what was anticipated for the life of mine (LOM), warranting a comment on updated LOM tonnage estimates of PAG waste rock, and confirmation that the WRF design and mitigation measures for operation and mine closure are still appropriate. Additionally, a review of the drill blast test work data (Appendix E.6) suggests approximately 17.5% of samples (924 samples) have an x-ray fluorescence scan (XRF-S) value between 0.05% and 0.2%. If carbonate minerals are present, they are likely to be subject to significant iron alteration and thus have lower-than-expected effective neutralization potential than calcite/dolomite (noting silicate nanoparticle reacts too slowly to be effective). This renders these samples as, at least, 'Uncertain', or more conservatively, PAG, in terms of acid rock drainage (ARD) classification. This suggests all previous requests by CIRNAC, as listed below, remain relevant in terms of the 2020 Baffinland commitment to '*Further evaluation of the geochemical monitoring dataset and screening criteria*' (Baffinland Response to Comments Received for Baffinland's Production Increase Proposal Extension 2020 Annual Monitoring Report, 2021), which will be completed during the next update to the Phase 1 Waste Rock Management Plan.

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	There have been no further updates to the Waste Rock Facility (WRF) instrumentation after 2019 despite CIRNAC's recommendation for Baffinland to use additional instrumentation and monitoring, and update the thermal analysis, including heat and oxygen balances across the WRF. CIRNAC notes that the expanded footprint and/or volume of the WRF was provided back at that time, but there are no plans noted for additional thermal instrumentation. More-than-expected PAG materials are still reporting to the WRF, and Baffinland has now reported dysfunctional instrumentation and any assessment of performance by an external consultant is still forthcoming (2022 QIA and NWB Annual Report). Additionally, Baffinland still continues to limit its performance monitoring commentary in both Section 9.6.3 (2022 QIA and NWB Annual Report) and Section 4.6.5 (2022 NIRB Annual Report) to pH values and discharge compliance. As such, the comments for additional instrumentation, monitoring, and updates seem to be more and more critical to identifying and managing project activities. Key markers of acid rock drainage include many parameters, including: pH, acidity, sulphate, aluminum, iron, manganese, and other dissolved metals and metalloids of environmental concern, such as cadmium, chromium, copper, lead, mercury, nickel, lead, selenium and zinc. Both surface water and groundwater monitoring locations in the immediate vicinity of, not just the WRF, but all potential ARD point sources for the project (e.g., open pit, quarries and ore stockpiling and haulage routes) should have collection of this dataset in the associated watershed. Furthermore, all temporal trends above laboratory reporting limits should be presented to identify ARD issues and/or validate the performance of the WRF and other ARD point sources. This is further supported by Table E.6.6 of the 2022 QIA and NWB Annual Report where several surface water samples around the WRF have reported total sulphur in water (which is most likely present as sulphate) in the hundreds of mg/L. This alone suggests sulphide oxidation is occurring in the WRF waste rock profile and thus a more comprehensive surface water and groundwater monitoring and performance monitoring data evaluation process is warranted.
Recommendation:	CIRNAC recommends that Baffinland: a) Provide an updated LOM estimation of PAG tonnages and confirmation that the WRF design and contingencies for closure are still appropriate. b) Provide the external consultants evaluation of the WRF performance. This report should include thermal analysis, including heat and oxygen balances across the WRF and an evaluation of temporal trends in key ARD markers in surface and groundwater. c) Adhere to the 2020 Baffinland-NIRB response commitment to '*Further evaluation of the geochemical monitoring dataset and*

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	screening criteria which will be completed during the next update to the Phase 1 Waste Rock Management Plan.' As part of that request, the following should be considered: ○ Review the 0.2% total sulphur threshold as an analogue for an neutralization potential ration (NPR) of 2, based on further geochemical test work and data review, to consider the implications of an absence of calcium or magnesium carbonate mineral content and the associated neutralization potential in the waste rock. ○ Perform a sensitivity analysis around the effect of uncertainty in the 0.2% total sulphur threshold and expected tonnages of PAG and NAG rock and implications in the design and operation of the WRF. d) Comment on all surface and groundwater monitoring data evaluation associated with all potential ARD point sources for the project (e.g., open pit, quarries and ore stockpiling and haulage routes) in relation to the degree to which they may be exerting an adverse influence as a result of ARD. e) Collect, evaluate, and provide a discussion on temporal and spatial trends for dissolved fractions above reporting limit for the following key markers of ARD, including: pH, acidity, sulphate, aluminum, iron, manganese and other dissolved metals and metalloids of environmental concern, such as cadmium, chromium, copper, lead, mercury, nickel, lead, selenium and zinc.

Comment Number:	CIRNAC #4
Subject:	**Groundwater Monitoring and Management Plan**
Reference:	• Project Certificate No. 005 (Amendment 04) Term and Condition 23 • CIRNAC Comments to NIRB Re: Comment Request for Baffinland Iron Mines Corporation's 2021 Annual Report for the Mary River Project (June 15, 2022) • Baffinland. 2022 Annual Report to NIRB (April 30, 2023): ○ Section 4.6.5 Groundwater & Surface Water • Knight Piesold Consulting (Knight Piesold). 2023a. 2022 Groundwater Monitoring Program Report (March 2023) • Knight Piesold. 2023b. 2022 Groundwater Monitoring Program Assessment (March 2023) • Minnow Environmental Inc (Minnow). 2023. Mary River Project 2022 Core Receiving Environmental Monitoring Program (CREMP) Report (March 2023)
Issue/Rationale:	Baffinland continues to implement the Groundwater Monitoring and Management Plan to monitor, prevent and/or mitigate the potential effects of the Project on groundwater within the Project area (Knight Piesold 2023a). In reviewing the 2021 Annual Report for the Mary River Project, CIRNAC recommended that the program be expanded to include the WRF in 2022. CIRNAC notes that two shallow test pits were advanced in the 2022 program in the WRF area. CIRNAC is of the opinion that this is a small sample size given the geographic extent of the WRF. The two test pits are not representative of the WRF area; therefore, the data collected from the two test pits is insufficient to adequately assess the extent and direction groundwater transport in the watershed. Knight Piesold (2023a) reported that groundwater levels measured in 2022 indicated a groundwater flow direction towards Sheardown Lake, and leachate was identified in all test pits excavated through the waste within the Landfill Facility. The Knight Piesold (2023a) report is consistent with the Minnow Environmental (2023) CREMP results, indicating an increasing trend in metal accumulation documented in Sheardown Lakes, which lists groundwater as a potential source. In the Knight Piesold (2023b) assessment of the Groundwater Monitoring Program, a risk-based screening criteria was used to assist with determining threshold for implementing groundwater monitoring at 15 facilities within the Mine Site. The risk-based screening criteria indicates that any facility with an overall score greater than 12 should be classified as high-risk. Low risk facilities scored between 5 and 7. Medium-risk facilities scored between 8 and 12. The maximum score for the rating criteria is 18. The risk-based screening indicated in Table 3.1 that the Crusher Pad Facility (score of 12), WRF (score of 8), and Run of Mine (ROM) Ore Storage Area at KM 106 (score of 9) were considered medium, as they

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	have water collection systems; however, CIRNAC notes that these facilities are not lined with an impermeable barrier. In the absence of an impermeable barrier, shallow groundwater in the active zone can bypass the trenches and potentially reach the aquatic receiving environment. Furthermore, in the absence of groundwater data, the mine features were given a score of 1. If the mine feature lacks data to account for the uncertainty and low confidence in the direction, extent, and magnitude of groundwater transport, and potential metal leaching into groundwater, CIRNAC notes that a more conservative score (higher score) could be warranted. The Explosives Magazine Area had a total score of 13 but is classified as medium risk. CIRNAC notes that this classification under-rates the area, as per their stated groundwater risk-based screening score.
Recommendation:	CIRNAC recommends that Baffinland: a) Implement the recommendations described in the Knight Piesold (2023b). b) Investigate groundwater migration between the ROM Temporary Ore storage / Crusher Facility and the receiving waters of Sheardown Lake. c) Expand the groundwater monitoring program to include the additional testing in the WRF area and other potentially significant sources of groundwater contamination at the mine in 2023 and future years, to gain a better understanding of the groundwater levels, stratigraphy characterization, permeability, groundwater quality, and groundwater flow direction. d) Undertake additional investigations to determine if shallow groundwater is migrating from the core mining areas.

Comment Number:	CIRNAC #5
Subject:	**Borrow Pit / Quarry / Source Management**

Reference:	• Project Certificate No. 005 (Amendment 04) Terms and Conditions 25, 26, 28, 30, 41, 42, 43, 44, 46 and 60
	• Baffinland 2022 Annual Report to NIRB:
	  ○ Section 4.6.5 Groundwater & Surface Water
	  ○ Section 4.6.7 Freshwater Environment
	  ○ Section 4.6.8 Terrestrial Environment
	• CIRNAC Comments to NIRB Re: Comment Request for Baffinland Iron Mines Corporation's 2021 Annual Report for the Mary River Project (June 15, 2022)
	• Baffinland 2022 QIA and NWB Annual Report for Operations:
	  ○ Section 9.5 Summary of Geochemical Analysis for Operated Quarries
	  ○ Appendix E.7 Quarry Geochemistry Analytical Sampling Results (Table E.7.1 to Table E.7.3)

Issue/Rationale:	There are no non-compliance issues in relation to the operation of the borrow and quarry pit sites. In addition, CIRNAC agrees that the Potential Acid Generating (PAG) / Non-Acid Generating (NAG) classifications of the blast hole samples appear consistent with the current quarry management plans; however, CIRNAC maintains that there is a significant benefit to the addition of markers of Acid Rock Drainage/Metal Leaching (ARD/ML) beyond pH (for example, sulphate) to the set of measured parameters and data evaluation in quarry water license monitoring. Expansion of markers could aid in the identification of any emerging water quality issue in the watershed that may require mitigation during operations and prior to closure and rehabilitation. Test work to confirm that disturbed quarry rock is NAG alone will not enable the identification of any emerging water quality issue. Additionally, Baffinland should present temporal and spatial trends for dissolved fractions above the reporting limit in future annual reports, in addition to comparing the monitoring results to Final Environmental Impact Statement (FEIS) Addendum predictions and or compliance criteria. In that manner, spatial and temporal trends can be best used to assess performance and mitigation requirements. This will assist, not just in the identification of ARD/ML problematic materials that may be inappropriate for construction purposes, but also the requirements for the eventual remediation/rehabilitation of the quarry areas.
Recommendation:	CIRNAC recommends that in future annual reports Baffinland: a) Evaluate all surface and groundwater monitoring data associated with quarry operations to discuss the degree to which they may be exerting an adverse influence as a result of ARD.

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	b) Collect, evaluate, and provide a discussion on temporal and spatial trends for dissolved fractions of both surface and groundwater for the following key markers of ARD, including pH, acidity, sulphate, aluminum, iron, manganese, and other dissolved metals and metalloids of environmental concern, such as cadmium, chromium, copper, lead, mercury, nickel, lead, selenium, and zinc. c) Expand the comparison of monitoring results to show and discuss temporal and spatial trends for dissolved fractions above any reporting limits.

Comment Number:	CIRNAC #6
Subject:	**Aquatic Effects Monitoring Plan and Dustfall Monitoring**

Reference:	• Project Certificate 005 (Amendment 04) Term and Condition 21
	• Baffinland. 2022 Annual Report to NIRB:
	  ○ Section 4.6.4 Hydrology and Hydrogeology
	  ○ Section 4.6.5 Groundwater & Surface Water
	  ○ Appendix G.4 Freshwater Environment Monitoring Reports
	• CIRNAC Comments to NIRB Re: Comment Request for Baffinland Iron Mines Corporation's 2021 Annual Report for the Mary River Project (June 15, 2022)
	• EDI Environmental Dynamics Inc. (EDI) 2023. 2022 TEAMR
	• Minnow. 2023. Mary River Project 2022 CREMP (March 2023)
	• Baffinland. 2022. Aquatic Effects Monitoring Plan (Rev 2) (March 31, 2022)

Issue/Rationale:	CIRNAC anticipates that dustfall monitoring results reported in the 2022 TEAMR would support validating the effectiveness of Baffinland's approved Aquatics Effects Monitoring Plan (AEMP). Incorporating dustfall results from the 2022 TEAMR into the reporting for the Core Receiving Environment Monitoring Program (CREMP) and Lake Sedimentation Monitoring Program (Appendices G.4.1 and G.4.2) would support validating the effectiveness of the respective monitoring activities, taking an adaptive management approach to identify the need for added protection measures, adaptations to the monitoring programs, and updates to the AEMP.
Recommendation:	CIRNAC recommends that Baffinland consider adapting TEAMR dustfall monitoring results or any reported emerging dustfall trend into the reporting for the CREMP and Lake Sedimentation Monitoring Program, to facilitate adaptive management of these activities, and to identify added measures to mitigate for dustfall from operations.

Comment Number:	CIRNAC #7
Subject:	**Performance of New MS-11 Surface Water Management Pond at KM105**

Reference:	• Project Certificate 005 (Amendment 04) Term and Condition 16, 17, 22, 24, 25, 28 and 29
	• Baffinland. 2022 Annual Report to NIRB:
	  ○ Section 3 Operations Overview
	  ○ Section 4.3 Summary of 2022 Compliance with Terms and Conditions
	  ○ Section 4.5.1.3 ECCC Inspections
	• Baffinland. 2022. Annual Geotechnical Inspections – 2022 Report 1 and 2022 Report 2. (August 21, 2022 and November 1, 2022)
	• NWB. 2013. NWB Type "A" Water Licence No. 2AM-MRY1325
	• NWB. 2015. NWB Type "A" Water Licence No. 2AM-MRY1325, Amendment No. 1
	• Baffinland. 2021. Surface Water and Ecosystem Management Plan (Rev 7) (March 31, 2021)
	• Baffinland 2022 QIA and NWB Annual Report for Operations:
	  ○ 7.3.6 Mine Site KM105 Surface Water Management Pond
	  ○ Appendix C.1.2 Construction Summary Report - KM 105 Sedimentation Pond (January 2023)
	  ○ Appendix C.1.2. Knight Piesold (2022). KM Sedimentation Pond Northwest Embankment Remediation – Site Visit Summary
	• Knight Piesold. 2021. Mary River Project – Mine Site Water Management Plan. June 30. Ref: NB102-181/63/2, Rev 2.

Issue/Rationale:	MS-11 surface water management pond at KM 105 (KM105 pond) is a part of the first phase of the implementation of the Mary River Project - Mine Site Water Management Plan (Knight Piesold 2021) to address erosion and sedimentation at the Mine Site. KM105 pond collects surface water runoff from the main mine Deposit No. 1 that was operational in 2022. MS-11/KM105 pond represents a monitoring station under Schedule I of the NWB Type "A" Water Licence and *Metal and Diamond Mining Effluent Regulations* (MDMER). Total suspended sediment (TSS) settling was expected to be met after three days of retention, according to the pond design; however, exceedances of TSS were detected during two events in June as a result of freshet conditions, prompting a warning letter from ECCC. As per Term and Condition 24, Baffinland shall monitor, as required, the relevant parameters of the effluent generated from Project activities and facilities, and shall carry out treatment, if necessary, to ensure that discharge conditions are met at all times. In response to the ECCC letter, a third-party design consultant, Knight Piesold, was contacted to evaluate remediation measures to address the containment failure of MS-11/KM105 pond. Their analysis of data provided from site investigations and observations indicates the seepage likely originated immediately upstream of the northwest embankment

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	geomembrane tie-in trench, at the area where the trench transitions from the upstream embankment to the abutment slope (Knight Piesold 2022). A seepage remediation plan was developed and implemented in consultation with the third-party design engineer (Knight Piesold), which included the use of a bentonite mixture to fill voids. The remediation work was completed in October 2022. The design included a protective thermal covering placed over the liner to add additional thermal protection for the underlying ice rich soils. This design feature is relevant to Term and Condition 28, which specifies that the Proponent shall monitor the effects on permafrost along the railway and all other Project affected areas and must implement effective preventive measures to ensure that the integrity of the permafrost is maintained. CIRNAC notes that no formal thermal analysis of the embankment was provided to verify the thermal protection was performing as intended. Water treatment for TSS removal is planned to be implemented at the MS-11/KM105 Pond prior to freshet 2023, to meet the conditions of the MDMER and Type "A" Water Licence Discharge Criteria. Term and Condition 24 relates to water treatment for TSS removal. Additionally, the MS-11/KM105 pond containment embankments have a Canadian Dam Association dam hazard classification of "high hazard potential" structures, which refer the presence of a downstream population at risk, where the failure of the facility would result in the potential loss of life due to the downstream presence of workers. The failure of this facility represents the largest disturbance and its all-time proper functioning is important, as uncontrolled water release and unintended ponding of water elsewhere may have continuous aggravating effects on disturbing the thermal regime and promoting the landmass wasting process.
Recommendation:	CIRNAC recommends that Baffinland: a) Verify the effectiveness of the thermal covering, as per Term and Condition 28. The design involves a protective thermal covering; however, no reference to any thermal analysis of the containment embankments was included. b) Confirm that the TSS removal will be in place by freshet of 2023 and provide the results of MS-11/KM105 pond monitoring in the 2023 Annual Report as per Term and Condition 24 and 25. c) Provide details of the finding of containment failure and remedial measures, including as-built details, as per Term and Condition No. 29 (Landforms, Geology and Geomorphology – Design Plans). This should include evidence that the Engineer of Record of the MS-11/KM105 pond revisit the design to ensure it

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	meets the design intent of containing of the surface runoff, and specifying the party assigned with responsibility of the facility post seepage remedial works.

Comment Number:	CIRNAC #8
Subject:	**Climatic and Seismicity Design of Infrastructure**

Reference:	• Project Certificate 005 (Amendment 04) Term and Condition 25, 28
	• Baffinland. 2022 Annual Report to NIRB:
	  ○ Section 1.3 Existing Project Overview
	  ○ Section 3 Operations Overview
	• Canadian Commission on Building and Fire Codes. 2022 National Building Code of Canada: 2020. Volume 1. (15th Edition):
	  ○ Appendix C Climatic and Seismic Information

Issue/Rationale:	The National Building Code of Canada (NBCC) has updated their guidelines, published in 2020. These guidelines have updated climatic and seismic design parameters, which are relevant to Baffinland infrastructure. Most of the project infrastructure was designed to NBCC 2015 or earlier standards.
	
	To aid in prevention of potential ecosystemic impact, the design validity of all infrastructure should be reviewed in consideration of updated climatic and seismic design parameters. The stability of Baffinland's infrastructure may be significantly impacted as a result of evolving climate change scenarios.
	
	CIRNAC notes the updated guidelines are relevant to the following Terms and Conditions:
	  ○ Term and Condition 25 which states that Baffinland "undertake geotechnical investigations to identify sensitive landforms, modify engineering design for Project infrastructure, develop and implement preventive and/or mitigation and monitoring measures to minimize the impacts of the Project's activities and infrastructure on sensitive landforms.
	  ○ Term and Condition 28 which states that Baffinland "shall monitor the effects of the Project on permafrost along the railway and all other Project affected areas and must implement effective preventive measures to ensure that the integrity of the permafrost is maintained."

Recommendation:	CIRNAC recommends that Baffinland examine these changes and the Engineer of Record validate the design of these structures to the most recent building codes.

Comment Number:	CIRNAC #9
Subject:	**Surface Water Management Ponds**

Reference:	• Project Certificate 005 (Amendment 04) Term and Condition 17 and 24
	• Baffinland. 2022 Annual Report to NIRB:
	  ○ Table 4.3 List of Reported Spills and Unauthorized Discharges – 2022
	  ○ Section 4.6.4 Hydrology and Hydrogeology
	• Baffinland 2022 QIA and NWB Annual Report for Operations
	• Baffinland. 2020. Metal and Diamond Mining Effluent Regulations (MDMER) Emergency Response Plan. (December 16, 2020) Rev 3

Issue/Rationale:	Several discharge events were reported in 2022. Three of the discharge events occurred from the Milne Port surface water management pond (MP-05), the Mine Site Crusher Facility Pond (MS-06) and the Mine Site KM105 surface water management pond (MS-11). All discharge events appear to be associated with snow melt in June, causing sediment-laden water to enter the surface water management ponds. In some cases, the discharge events triggered the need to initiate a controlled discharge to lower the effluent level in the pond. The repeated need to discharge from containment facilities using the emergency response plan indicates an insufficient factor of safety in the containment facility capacity. The storage capacities should be increased to allow for more storage at freshet given the high frequency of discharge reported events in 2022. The 2022 QIA-NWB Annual Report Table 5.4 indicates that 2,555.4 m^3 of water was discharged between the June 8 and July 13, 2022 from MP-05 following the collection of a discharge sample with TSS above the discharge criteria outlined in the NWB Type “A” Water License. There was no indication that the discharge from MP-05 was initiated as per the MDMER Emergency Response Plan. CIRNAC seeks clarification from Baffinland for the active discharge event following the collection of a discharge sample above the TSS criteria, which does not seem to be consistent with the MDMER Emergency Response Plan.
Recommendation:	CIRNAC recommends that Baffinland: a) Evaluates the adequacy of the storage capacities for the surface water management ponds, based on current site activity and topography, future planned activities, and post-closure, and provide a path forward on addressing these discharges.

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	b) Provide a yearly discharge trend analysis to support an evaluation of the adequacy of storage capacities for the surface water management ponds. c) Reviews their procedures and provide staff and contractor training on the MDMER and NWB Type “A” Water Licence discharge criteria.

Comment Number:	CIRNAC #10
Subject:	**Surface Water – Elevated Nitrate in Mary River Tributary**
Reference:	• Project Certificate 005 (Amendment 04) Term and Condition 17 and 20 • Baffinland. 2022 Annual Report to NIRB (April 30, 2023): ○ Section 4.6.5 Groundwater & Surface Water • Knight Piesold. 2023a. 2022 Groundwater Monitoring Program Report (March 2023) • Knight Piesold. 2023b. 2022 Groundwater Monitoring Program Assessment (March 2023) • Minnow. 2023. Mary River Project 2022 CREMP (March 2023)
Issue/Rationale:	As part of the Mary River surface water monitoring program, an increase in nitrate was observed in samples collected from the Mary River Tributary (F0-01) during the operation period between 2015 to 2022 (Minnow 2023). Ammonium nitrate is one of the ingredients used in the manufacturing of explosives. Upstream of F0-01 is the Waste Rock Facility (WRF) Treatment Plant (MS-08) and the Explosives Magazine Area. The highest nitrate concentration (2.64 mg/L) in samples collected from F0-01 was observed in the 2022 summer sample. The elevated concentration of nitrate appears to be associated with effluent discharging from the WRF Treatment Plant (MS-08), which was discharging effluent with nitrate concentrations in samples of 13.5 mg/L and 15.8 mg/L in August 2022. Minnow (2023) states that since “no changes in concentrations of AEMP benchmark parameters occurred relative to background...no management response is required for Mary River.” CIRNAC notes that no discussion was provided on the increasing trend or elevated concentration of nitrate in the Mary River Tributary. The Mary River tributary summer sample collected from F0-01, with a concentration of 2.64 mg/L, is more than double the previously observed sample maximum and is approaching the AEMP benchmark of 3 mg/L. Baffinland’s environmental management process have relied on the principles of adaptive management, which requires that trends in changes of key variables be addressed in a timely manner. The Explosives Magazine Area is upstream of the Mary River Tributary (F0-01) and is rated as a high-risk facility in accordance with the groundwater risk-based screening criteria developed by Knight Piesold (2023b). The screening criteria were implemented to determine the need for groundwater monitoring at the Mine Site facilities. The facility was rated as having high contaminant mobility and a high hydraulic gradient; however, the facility was not recommended for groundwater monitoring because containment is present. CIRNAC also notes that the Explosives Magazine Area has source material that includes nitrogen-containing material (i.e., nitrate, nitrite,

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	ammonia) and is within 50 meters of a receptor. Implementing groundwater monitoring at this facility would support source contaminant characterization of the Mary River Tributary. Additionally, as per Term and Condition 20, the Proponent shall monitor the effects of explosives residue and related by-products from Project-related blasting activities, as well as develop and implement effective preventative and/or mitigation measures, including treatment, if necessary, to ensure that the effects associated with the manufacturing, storage and transportation and use of explosives do not negatively impact the Project and surrounding areas.
Recommendation:	CIRNAC recommends that Baffinland: a) Conduct additional monitoring and source contaminant characterization along the Mary River Tributary. b) Implement groundwater monitoring at the areas identified as high-risk, including the Explosives Magazine Area. c) Update any management plans (e.g., Aquatic Effects Monitoring Plan, Phase 1 Waste Rock Management Plan, Surface Water and Aquatic Ecosystems Management Plan), to mitigate any potential impacts, if elevated concentrations of nitrogen are found, particularly with respect to discharge from the WRF Treatment Plant.

Comment Number:	CIRNAC #11
Subject:	**Removal of Dustfall Monitoring Stations and Monitoring of Changes to Soil and Aquatic Receiving Environments**
Reference:	• Project Certificate 005 (Amendment 04) Term and Condition 21 • Baffinland. 2022 Annual Report to NIRB (April 30, 2023): ○ Section 4.6.5 Groundwater & Surface Water • EDI Environmental Dynamics Inc. (EDI) 2023. 2022 TEAMR (March 2023) • Minnow. 2023. Mary River Project 2022 CREMP (March 2023) • Dust Audit Committee. 2023. Baffinland Dust Audit Final Recommendations Report. (February 8, 2023) • Baffinland. 2018. Interim Closure and Reclamation Plan BAF-PH1-830-P16-0012. Revised Draft – Rev 5. (October 30, 2018).
Issue/Rationale:	Baffinland plans to remove dustfall monitoring at 10 locations, due to the 2022 TEAMR showing no statistically significant difference between the regular and short monitors (EDI 2023). In 2022 TEAMR Section 8.3.4: *"No statistically significant difference was found in the dustfall measured at the standardized height of 2.0 m and the QIA-requested monitoring stations closer to the ground (0.5 m).* *To meet the assumptions of normality, one sample was dropped from the analysis (DF-M-01: short dustfall collector = 2.96 mg/dm²·day, tall dustfall collector = 0.57 mg/dm²·day; sample collected on November 18, 2022)."* Baffinland mentions only 6 short monitors at the mine; therefore, the rationale for discontinuing dustfall monitoring at 10 locations is unclear. CIRNAC notes that non-parametric tests (e.g., Wilcoxon test) could be applied to the entire dataset, rather than removing data points, if the dataset does not follow a normal distribution. The statistical result may not impact the overall relationship between short and tall dust monitors; however, the result would be more inclusive and conservative. Baffinland mentions dustfall exceeds the FEIS predictions at select locations, but states that dustfall is within a range observed in previous years. Baffinland states that dust does not have a measurable impact on environmental media (freshwater quality, soil quality, vegetation, etc.); however, Figure C.11 of the 2022 CREMP Report suggests that dustfall may be contributing to metal accumulation in Camp and Sheardown Lakes: *"Concentrations of aluminum and molybdenum were detectable in dustfall captured at the passive dustfall collector located nearest to the Sheardown lake basins (Station DF-M02) that is monitored under the Mary River Project dustfall monitoring*

	program (EDI 2023), suggesting dustfall may have also contributed to elevated aqueous concentrations of these parameters in the Sheardown basins." The Dust Audit Committee (2023) cites that the effects dustfall and associated metals contamination has been frequently identified as a concern for land users and the impacted communities, particularly in relation to its effects on harvesting, wildlife, and water. The Dust Audit Committee provided a list of dust reduction measures that could aid in the prevention of dust deposition near the site.
Recommendation:	CIRNAC requests that Baffinland provide the following: a) Data to support the decision to remove 10 dustfall monitors. b) Locations of the 10 dustfall monitors planned to be removed from the program and justification for those chosen locations. c) Documentation to show dustfall is not accumulating metals at concentrations that approach or exceed the Canadian Council of Ministers of the Environment (CCME) soil quality guidelines (agricultural), to support the closure criteria specified in the Baffinland Interim Closure and Reclamation Plan regarding the removal of chemical contaminant sources from the site. d) Documentation to show that the dust-impacted soil is not leaching metals to receiving water environments. CIRNAC recommends that Baffinland implement dust reduction measures identified by the Dust Audit Committee to cover loads to minimize fugitive dust while hauling, enclose the Crusher Facility and continue dust suppression. Covering loads will reduce impacts of dustfall to environmental media (freshwater quality, soil quality, vegetation, etc.).

2. ***Compliance Monitoring***

a. *Provide a summary of any compliance monitoring and/or site inspections undertaken in association with the project, including specifically:*

i. *Identify the terms and conditions from the Project Certificate which have been incorporated into any permits, certificates, licenses or other approvals issued for the Project, where applicable.*

CIRNAC has a broad mandate for the co-management of water resources and the management of Crown land in Nunavut under the following applicable acts and regulations:

- The *Department of Crown-Indigenous Relations and Northern Affairs Act;*
- The *Nunavut Land Claims Agreement Act* and the *Nunavut Agreement;*
- The *Arctic Waters Pollution Prevention Act* and *Regulations;*
- The *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and *Regulations; and*
- The *Territorial Lands Act* and *Regulations.*

In terms of water management in Nunavut, CIRNAC has a number of different responsibilities. The Minister of Northern Affairs has a decision-making role with regards to the Nunavut Water Board's (NWB) issuance of Water Licences associated with any project. Furthermore, CIRNAC participates as an intervenor in the water licensing process, providing advice and expertise.

When a proposed project is approved to proceed, CIRNAC is responsible for inspecting and enforcing any Terms and Conditions contained within any Water Licence associated with the project. The NWB ensures that Project Certificate Terms and Conditions are incorporated in Water Licences.

CIRNAC issued the following authorizations for BIMC's Mary River Project:

- Land use permit N2019Q0011
- Land use permit N2019J0010
- Land use permit N2019C0009
- Surface lease O47H16001

CIRNAC has reviewed the Type 'A' Water Licence associated with the Mary River Project with respect to Project Certificate [No. 005] and has included a concordance table (Appendix A) that outlines how these T&Cs have been incorporated into the Water Licence.

In 2021, the project activities and monitoring were conducted under the following Water Licences:

- Type 'A' Water Licence 2AM-MRY1325
- Type 'B' Water Licence 2BE-MRY1421

ii. A summary of any inspections conducted during the 2022 reporting period, and the results of these inspections.

CIRNAC's Water Resource Officers (Inspectors) conducted two inspections of the Mary River Mine, once on June 29, 2022 and once on October 5, 2022. Two further site inspections were planned, but, due to logistical constraints, the Inspectors were not able to conduct the planned site inspections.

A summary of the concerns identified in the inspection reports is presented below for NIRB's consideration.

June 29, 2022

The Inspector examined the following sites: the Waste Rock Facility, Laydown Area, Discharge Location Pond MS07, MS11 Laydown Area at km 104, Crusher Area adjacent to the pond discharge and sampling location, Power Generators, MSC Wastewater Treatment Plant, Tamativiik Waste Treatment Plant, Incinerator site, Open Burn Pit at km 98, the Camp Withdrawal intake lake, landfill, landfill laydown, four tank fuel farm, airport fuel storage.

The Inspector noted, and requested corrections for, several facilities and road signs that were either not visible, not present, or not posted in all the official languages of Nunavut. The Inspector also requested corrective measures for construction debris to be secured, and to ensure visible copies of the water licences at some facilities were readily available for reference. Lastly, the Inspector noted that one damaged culvert on the road to the airport, previously identified as damaged in prior inspections, was required to be repaired.

October 5, 2022

The Inspector examined the following sites: Fuel storage MP03, hazardous waste storage MP-HWB-01, Waste water treatment facility, water treatment plant, incinerator, west ore pad sediment pond MP06, Effluent discharge line, east ore pad sediment pond MP05, quarry Q01, land farm MP04, KM 34 water intake lake.

The Inspector had no major concerns from this inspection, noting that there was one plastic tote outside of the prescribed berms, which was to be removed and its contents verified.

Baffinland Response to Inspection

Baffinland provided a written response to the June 29 inspection report. In these responses, Baffinland provided the updates and photos for confirmation that actions were taken and provided a timeline for action on culvert repairs.

Detailed inspection reports, and Baffinland's responses to the inspections, can be accessed through the NWB Public Registry:

ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-MRY1325%20BIMC/3%20TECH/0%20SCOPE%20ENFORCE%20(A)/1%20INSPECTION/

iii. A summary of Baffinland's compliance status with regard to authorizations that have been issued for the project.

Although some issues were identified in 2022, CIRNAC is generally satisfied with Baffinland's response to the concerns raised by the Inspectors in 2022. CIRNAC will continue to work with

Baffinland to ensure compliance with all water licence requirements associated with Mary River project.

Appendix A: Mary River Project Certificate Terms and Conditions incorporated into any permits, certificates, licences or other approvals issued for the Project

Project Certificate 005 Term & Condition		Implemented in NWB water licence 2AM-MRY1325 Amendment #1	Implemented in CIRNAC's land use permit
10	The Proponent shall update its Dust Management and Monitoring Plan to address and/or include the following additional items: a. Outline the specific plans for monitoring dust along the first few kilometres of the rail corridor leaving the Mary River mine site. b. Identify the specific adaptive management measures to be considered should monitoring indicate that dust deposition from trains transporting along the rail route is greater than initially predicted. c. Outline specific plans for monitoring dustfall at intervals along and in the vicinity of the Milne Inlet Tote Road to determine the amount and extent of dustfall. d. Identify the specific adaptive management measures to be considered if monitoring indicates that dust deposition from traffic on the Milne Inlet Tote Road is greater than initially predicted.		**N2019Q0011**, Part 31(1) (m) 48
11	The Proponent shall develop and implement an *Incineration Management Plan* that takes into consideration the recommendations provided in Environment Canada's Technical Document for Batch Waste Incineration (2010).	Part F, Item 7 (requirement to test and dispose bottom ash and record analysis results and volumes of ash)	
14	The Proponent shall conduct noise and vibration monitoring at Project accommodations sites located at the Mary River mine site, Steensby Inlet Port site, and Milne Inlet Port site. Sampling shall be undertaken during the summer and winter months during all phases of Project development. (b) The Proponent, through coordination		**N2019Q0011**, Part 31 (1) (m) 49

Project Certificate 005 Term & Condition		Implemented in NWB water licence 2AM-MRY1325 Amendment #1	Implemented in CIRNAC's land use permit
	with the TEWG as may be appropriate, shall demonstrate appropriate adaptive management for project activities during operations which have the potential to produce noise and sensory disturbance to wildlife and other users of project areas.		
16	The Proponent shall ensure that the water related infrastructure or facilities that are designed and constructed, including the modification of culverts, diversion of watercourses, and diversion of runoff into watercourses along the railway, access roads, the Milne Tote Road, and other areas of the Project site, are consistent with those proposed in the FEIS in terms of type, location, and scope and that the requirements of all relevant regulatory authorities are satisfied advance of constructing those facilities.	Part D	
17	The Proponent shall develop and implement effectives measures to ensure that effluent from project-related facilities and/or activities, including sewage treatment plants, ore stockpiles, and mine pit, satisfies all discharge criteria requirement established by the relevant regulatory agencies prior to being discharged into the receiving environment.	Parts F and I	
18	The Proponent shall carry out continued analyses over time to confirm and update, accordingly, the approximate fill time for the mine pit lake identified in the FEIS	Part F, Item 3	
19	The Proponent shall ensure that it develops and implement adequate monitoring and maintenance procedures to ensure that the culverts and other conduits that may be prone to blockage do not significantly hinder or alter the natural flow of water from areas associated with the proposed mine. In addition, the Proponent shall monitor, document and report the withdrawal rates for water removed and utilized for all	Parts B, D, Item 23, E Item 23, and I	

Project Certificate 005 Term & Condition		Implemented in NWB water licence 2AM-MRY1325 Amendment #1	Implemented in CIRNAC's land use permit
	domestic and industrial purposes.		
20	The Proponent shall monitor the effects of explosives residue and related by-products from project-related blasting activities as well as develop and implement effective preventative and mitigation measures, including treatment, if necessary, to ensure that the effects associated with the manufacturing, storage, transportation and use of explosives do not negatively impact the Project and surrounding areas.	Part E, Item 24, Part I, Item 23, and Part D, Item 18, g	
21	The Proponent shall ensure that the scope of the *Aquatic Effects Monitoring Plan* (AEMP) includes, at a minimum, monitoring of nonpoint sources of discharge, selection of appropriate reference sites, measures to ensure the collection of adequate baseline data and the mechanisms proposed to monitor and treat runoff, and sample sediments.	Part I	
22	The Proponent shall develop a detailed *Sediment and Erosion Management Plan* to prevent and/or mitigate sediment loading into surface water within the Project area.	Part D	
23	The Proponent shall develop and implement a *Groundwater Monitoring and Management Plan* to monitor, prevent and mitigate the potential effects of the Project on groundwater within the Project area.	Part I, Item 14 (requirement to conduct opportunistic monitoring on any observed seepage)	
24	The Proponent shall monitor as required the relevant parameters of the effluent generated from Project activities and facilities and shall carryout treatment if necessary to ensure that discharge conditions are met at all times.	Part E and F.	
25	The Proponent shall undertake the additional geotechnical investigations to identify sensitive landforms, modify engineering design for Project infrastructure and develop mitigation and	Part D, Item 19 and Part I, Item 12 (for water infrastructure)	

Project Certificate 005 Term & Condition		Implemented in NWB water licence 2AM-MRY1325 Amendment #1	Implemented in CIRNAC's land use permit
	monitoring measures to minimize the impacts of the Project's activities and infrastructure on sensitive landforms.		
26	The Proponent shall develop and implement a comprehensive erosion management plan to prevent or minimize the effects of destabilization and erosion that may occur due to the Project's construction and operation.	Parts D, E, and F (requirement to prevent or minimize erosion)	N2019Q0011, part 31 (1) (m) 50
28	The Proponent shall monitor the effects of the Project on the permafrost along the railway and all other Project affected areas and must implement effective preventative measures to ensure that the integrity of the permafrost is maintained.	Part D, Item 10 (requirement to minimize disturbance to permafrost around the site, including railway corridor)	
29	The Proponent shall provide to the respective regulatory authorities, for review and acceptance, for-construction engineering design and drawings, specifications and engineering analysis to support design in advance for constructing those facilities. Once project facilities are constructed, the Proponent shall provide copies of the as-built drawings and design to the appropriate regulatory authorities	Part D, Item 2 and Part E, Item 23	
30	The Proponent shall develop site-specific quarry operation and management plans in advance of the development of any potential quarry site or borrow pit.	Part D, Item 5	**N2019Q0011**, Part 31 (1) (m) 51
31	The Proponent shall ensure that Project activities are planned and conducted in such a way as to minimize the Project footprint.	A general requirement	
33	The Proponent shall include relevant Monitoring and Management Plans within its Environmental Management System, Terrestrial Environment Management and Monitoring Plan (TEMMP)	Part J, Item 2	
39	The Proponent shall develop a progressive revegetation program for disturbed areas that are no longer required for operations, such program to incorporate measures for the use of test	Part J, Item 11 (requirement to implement progressive reclamation	

Project Certificate 005 Term & Condition		Implemented in NWB water licence 2AM-MRY1325 Amendment #1	Implemented in CIRNAC's land use permit
	plots, reseeding and replanting of native plants as necessary. It is further recommended that this program be directly associated with the management plans for erosion control established for the Project.	including revegetation)	
40	The Proponent shall include revegetation strategies in its Site Reclamation Plan that support progressive reclamation and that promote natural revegetation and recovery of disturbed areas compatible with the surrounding natural environment.	Part J, Items 10 and 11	
41	Unless otherwise approved by regulatory authorities, the Proponent shall maintain a minimum 100-metre naturally-vegetated buffer between the high-water mark of any fishbearing water bodies and any permanent quarries with potential for acid rock drainage or metal leaching.	Part D, Items 13 and 14	
42	The Proponent shall maintain minimum a 30- metre naturally-vegetated buffer between the mining operation and adjacent water bodies.	Parts D, E, F, and H	
43	Prior to the start of construction, the Proponent must submit a Site Drainage and Silt Control Plan to the appropriate regulatory authorities for approval.	Part D, Item 2	
44	The Proponent shall meet or exceed the guidelines set by Fisheries and Oceans Canada for blasting thresholds and implement practical and effective measures to ensure that residue and by-products of blasting do not negatively affect fish and fish habitat.	Part E, Item 24	
46	The Proponent shall ensure that runoff from fuel storage and maintenance facility areas, sewage and wastewater other facilities responsible for generating liquid effluent and runoff meet discharge requirements	Part F	
47	The Proponent shall ensure that all Project infrastructures in watercourses are designed and constructed in such a manner that they do not unduly prevent	Part E, Item 23	**N2019Q0011**, Part 31 (1)(f) 16.

Project Certificate 005 Term & Condition		Implemented in NWB water licence 2AM-MRY1325 Amendment #1	Implemented in CIRNAC's land use permit
	and limit the movement of water in fish bearing streams and rivers		
48	The Proponent shall engage with Fisheries and Oceans Canada and Qikiqtani Inuit Association in exploring possible Project specific thresholds for blasting that would exceed the requirements of Fisheries and Oceans Canada's Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (D.G. Wright and G.E. Hopky, 1998).	Part E, Item 24 (requirement to submit Blasting Management Plans)	
53	The Proponent shall demonstrate consideration for the following: a. Steps taken to prevent caribou mortality an injury as a result of train and vehicular traffic, including operational measures meant to maximize the potential for safe traffic relative to operations on the railway, Milne Inlet tote road and associated access roads. b. Monitoring and mitigation measures at points where the railway, roads, trails and flight paths pass through caribou calving areas, particularly during caribou calving times. c. Evaluation of the effectiveness of proposed caribou crossings over the railway, Milne Inlet tote road and access roads as well as the appropriate number. d. Development of a surveillance system along the railway corridor to identify the presence of caribou in proximity to the train tracks and operational protocols for the train to avoid collisions and enable caribou to cross the train tracks unimpeded. e. Protocols for documentation and reporting of all caribou collisions and e. mortalities, as well as mechanisms for adaptive management responses		**N2019Q0011,** Parts 31 (1) (h) 36-38, and 31 (1) (m) 52

Project Certificate 005 Term & Condition		Implemented in NWB water licence 2AM-MRY1325 Amendment #1	Implemented in CIRNAC's land use permit
	designed to prevent further such interactions.		
64	The Proponent shall ensure that its Environment Protection Plan incorporates waste management provisions to prevent carnivores from being attracted to the Project site(s). Consideration must be given to the following measures: a. installation of an incinerator beside the kitchen that will help to keep the food waste management process simple and will minimize the opportunity for human error (i.e. storage of garbage outside, hauling in a truck (odours remain in truck), hauling some distance to a landfill site, incomplete combustion at landfill, fencing of landfill, etc.). b. installation of solid carnivore-proof skirting on all kitchen and accommodation buildings (i.e., heavy-duty steel mesh that would drop down from the edge of the buildings/trailers and buried about a half meter into the ground to prevent animals from digging under the skirting).	Part F, Item 7	**N2019Q0011,** Part 31 (1) (g) 27
92	The Proponent shall ensure that it maintains the necessary equipment and trained personnel to respond to all sizes of potential spills associated with the Project in a self-sufficient manner.	Part H, Item 5	**N2019Q0011,** Part 31 (1) (g) 30, 31