

Nunavut Impact Review Board

2022 June Site Visit Report

The Mary River Project

Baffinland Iron Mines Corporation

NIRB File No. 08MN053



August
2022

Report title: June 2022 Site Visit Report for the Nunavut Impact Review Board's Monitoring of Baffinland Iron Mines Corporation's Mary River Project (NIRB File No. 08MN053).

Project: Mary River Project
Project Location: Qikiqtani (North Baffin) Region, Nunavut

Project Owner: Baffinland Iron Mines Corporation
2275 Upper Middle Road East, Suite 300
Oakville, ON
L6H 0C3

Proponent Contact: Megan Lord-Hoyle, Vice President, Sustainable Development
Telephone: (416) 364-8820 ext. 5050

Visit conducted by: Cory Barker, Technical Advisor III
Guillaume Daoust, Technical Advisor II

Telephone: (867) 983-4603; cbarker@nirb.ca
(867) 983-4609; gdaoust@nirb.ca

Site visit dates: June 13-16, 2022

Last Site Visit: February 11-13, 2020

Last Site Update: August 2021 (Proponent provided Photos)

Report prepared by: Cory Barker & Guillaume Daoust

Photos by: Cory Barker & Guillaume Daoust

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1 INTRODUCTION

The Nunavut Impact Review Board (NIRB or Board) was established through Articles 10 and 12 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada (Nunavut Agreement)* and is responsible for post environmental assessment monitoring of a Project in accordance with Part 7 of Article 12 of the *Nunavut Agreement* and s. 135(4) of the *Nunavut Planning and Project Assessment Act*, S.C. 2013, c. 14 (*NuPPAA*).

This report provides the findings that resulted from the NIRB's June site visit to the Mary River Project site on June 13 - 15, 2022. The NIRB did not host a community update session. The Board was awaiting the Ministerial Decision on Baffinland's "Phase 2 Development" Proposal, and the Board was considering Baffinland's Production Increase Proposal Renewal. As such, the site visit was conducted in consideration of Project Certificate No. 005, Amendment No. 3 issued June 18, 2020.¹

1.1 Objectives & Purpose of Site Visit

The objective of the NIRB's site visit was to determine whether, and to what extent, the land or resource use in question is being carried out within the Terms and Conditions of amended NIRB Project Certificate No. 005, Amendment 3 for the Mary River Project, in accordance with Section 12.7.2(b) of the *Nunavut Agreement* and s. 135 of *NuPPAA*.

Observations resulting from this site visit shall, wherever possible, be incorporated into the measurement of the relevant effects of the Project, provide the information necessary for agencies to enforce terms and conditions of land or resource use approvals, and will be further used to assess the accuracy of the predictions contained in the project impact statements in accordance with Section 12.7.2 of the *Nunavut Agreement*, and s. 135(3) of the *NuPPAA*.

¹ Terms and conditions 179 (a) and (b) are no longer modified as they expired December 31, 2021.

2 BACKGROUND OF THE MARY RIVER PROJECT AND AMENDMENTS

The Mary River Project

The original Mary River Project was approved by the NIRB in December 2012 and involved the development of an open pit iron ore mine on northern Baffin Island. It included the use of an existing Tote Road between Milne Inlet and the Mine Site at Mary River as well as railway connecting the Mine Site to the Steensby Port ([Figure 1](#)). As originally proposed, 12 million tonnes per year (Mt/a) of iron ore would be transported from the Mine Site via a railway south to the port at Steensby Inlet. Year-round shipping of the iron ore would be through Foxe Basin and Hudson Strait to markets using purpose-built ore carriers. Since the issuance of the Mary River Project Certificate No. 005 on December 28, 2012, several elements of the original Mary River Project have not been constructed, although these remain authorized under Project Certificate No. 005, including: the port at Steensby Inlet, the railway from the Mine Site to Steensby Inlet, and the fleet of purpose-built ore carriers.

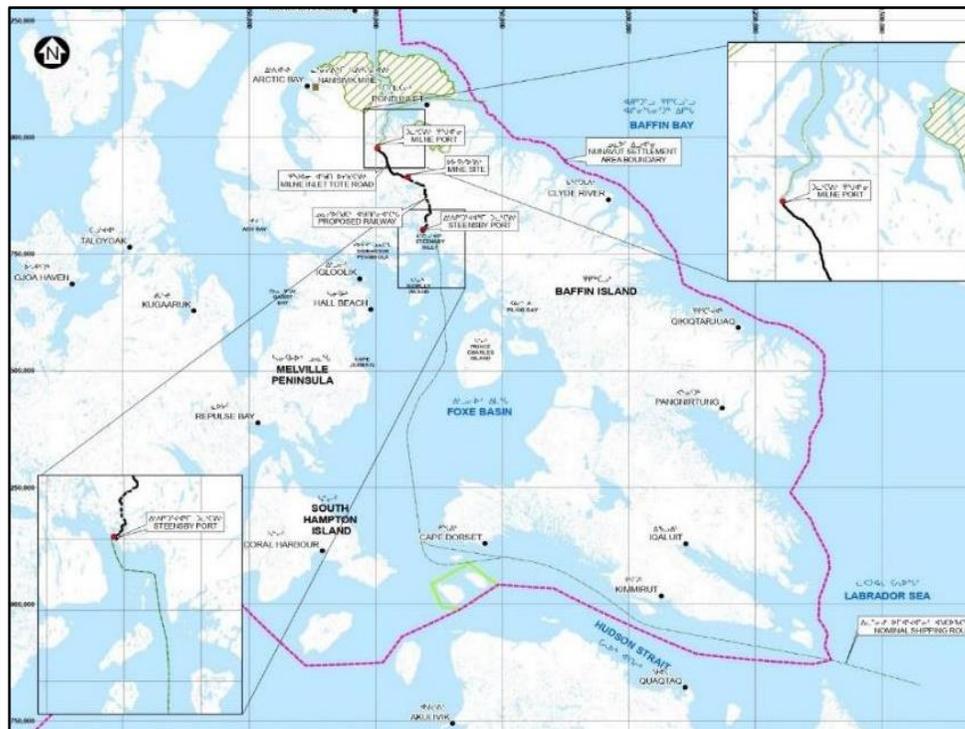


Figure 1: Project Location Map

The Early Revenue Phase Proposal (Amendment No. 1)

In January 2013, Baffinland applied for an amendment to the original Mary River Project, seeking to modify the project by transporting 3.5Mt/a (+/- 20% for operation flexibility up to 4.2 Mt/a) of ore along the Tote Road to Milne Port ([Figure 2](#)) for shipment during the open water season only. The southern railway, Steensby Port, and the purpose-built ore carriers are delayed until shipments through Milne Inlet had generated sufficient revenue to support their development.

Consequently, the Early Revenue Phase Proposal (ERP) changed the shipping route from Foxe Basin in the South to Eclipse Sound in the North. Following the NIRB’s impact assessment, the proposed amendment was approved to proceed, and Mary River Project Certificate No. 005 was subsequently amended and re-issued on May 28, 2014.

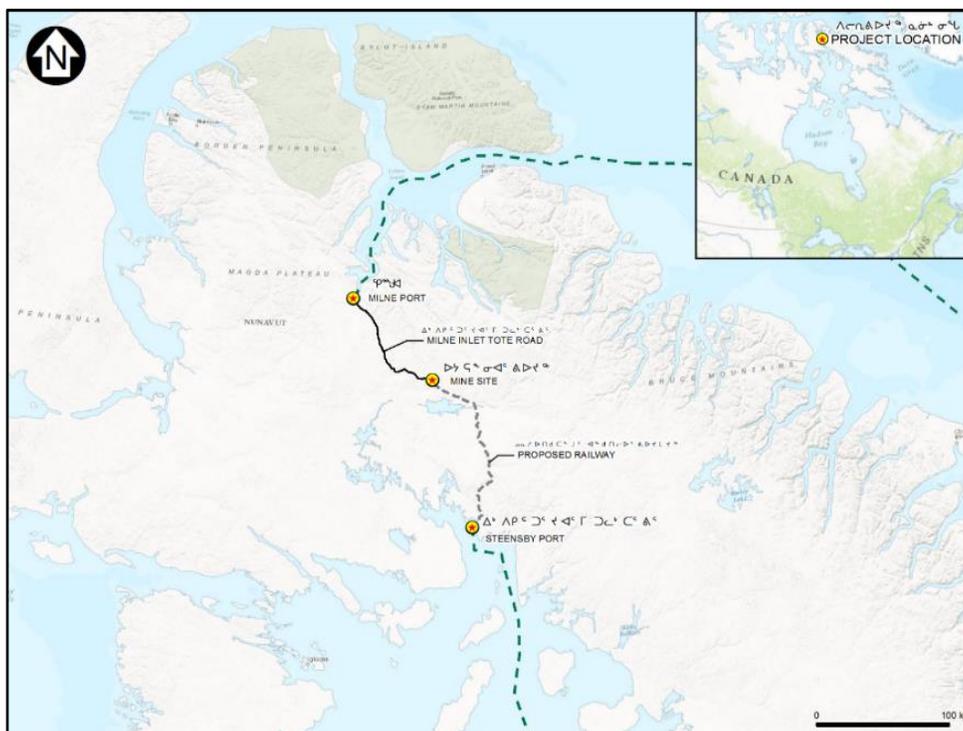


Figure 2: Early Revenue Phase of the Mary River Project

Production Increase Proposal (Amendment No. 2)

In April 2018, Baffinland submitted the “Production Increase, Fuel Storage and Milne Port Accommodations Modification Proposal” (Production Increase Proposal) to the NIRB. This proposed an increase in the volume of ore that would be trucked from Mine site to Milne Port via the Tote Road from 4.2 Mt/a to 6 Mt/a. It further included the addition of a 15 million-litre (ML) diesel fuel tank within the existing Fuel Storage Facility at Milne Port and installation of a new 380-person accommodation at Milne Port. On August 31, 2018, the NIRB issued its Reconsideration Report and Recommendations for the Production Increase Proposal to then Minister of Intergovernmental, Northern Affairs and Internal Trade (The Minister; now Minister of Northern Affairs) recommended the camp upgrades and fuel storage expansion proceed; however, the Board recommended that the increased transportation and shipping of ore not be allowed to proceed. On September 30, 2018, the Minister accepted the Board’s positive recommendations; however, the Minister varied the recommendation by allowing Baffinland to increase shipping from Milne Inlet until the end of 2019. Subsequently, the amended Project Certificate No 005 was issued on October 30, 2018.

Extension Request to the Production Increase Proposal (Amendment No. 3)

On December 6, 2019, Baffinland requested the Board to further modify Conditions 179(a) and 179(b) of the Mary River Project Certificate² as part of their “Extension Request to the Production Increase Proposal” (the Extension Request) as a result of the suspension of the Phase 2 Development Proposal Hearing. After the NIRB’s impact assessment of the potential ecosystemic and socio-economic effects of the Extension Request, on March 4, 2020, the Board provided their recommendation to the Responsible Ministers recommending approval Baffinland’s Extension Request Proposal until December 31, 2021. On May 19, 2020, then Minister of Northern Affairs wrote to the Board on behalf of the Responsible Ministers to accept the Board’s recommendation regarding Term and Conditions 179 (a) and (b) of the Extension Request. The Minister also varied Term and Conditions 179 (c) and 183 in Project Certificate No. 005, Amendment No. 3 issued on June 18, 2020, to ensure those conditions were meeting their original intent.

Current Assessment

Phase 2 Development Proposal

During the 2021-2022 monitoring period, the NIRB continued the reconsideration for the “Phase 2 Development Proposal” by hosting the community roundtable November 1-6, 2021, and on January 28, 2022, formally closed the Public Hearing Record. On May 13, 2022, the Board issued their Reconsideration Report and Recommendations to the Minister of Northern Affairs after due consideration and an extensive Public Hearing Record. The Board concluded that the Phase 2 Development Proposal has the potential to result in significant adverse ecosystemic effects on marine mammals, fish, caribou, and other terrestrial wildlife along with vegetation and freshwater ecosystems which could lead to adverse socio-economic effects on Inuit. The Board further expressed that the proposal poses the potential for transboundary effects on marine mammals, fish, and the marine environment generally. As a result of these findings, the Board remains concerned that these adverse effects would not be able to be mitigated through adaptive management and monitoring programs and consequently recommended that the Proposal should not be allowed to proceed as this time. The final decision on the Proposal is currently with the Minister.

Production Increase Proposal Renewal

On June 13, 2022, while waiting for the Ministers Decision on the Phase 2 Development Proposal, Baffinland requested modifications to Conditions 179(a) and 179(b) of the Mary River Project Certificate³ to maintain production levels to reduce the risk of adverse socio-economic impacts

² Baffinland letter to the NIRB regarding their Extension Request to the Production Increase Proposal (Doc. ID No. 327657).

³ Baffinland letter to the NIRB regarding their Extension Request to the Production Increase Proposal (Doc. ID No. 327657).

from employee lay-offs due to uncertainty around the Phase 2 Development Proposal. Baffinland requested that that Board consider the “Production Increase Proposal Renewal” (PIPR) which proposes continued trucking and shipping of 6Mt/a of iron ore from the Mine Site to Milne Port using the continued transportation and shipping corridors until December 31, 2022. At the time of publishing this report, the Board has solicited comments from Interested Parties regarding the potential process for assessing the Production Increase Proposal Renewal; and no process map has been issued.

3 PREPARATIONS FOR THE SITE VISIT

In preparation for the site visit, the Monitoring Officers reviewed the following items: Mary River Project Certificate No. 005 Amendment No. 3, previous NIRB 2019-2021- Site Visit Reports, NIRB 2021-2022 Site Update Reports, 2021 NIRB Monitoring Report and 2021 Board Recommendations, and additional follow-up correspondence relevant to the monitoring of the approved Mary River Project.

4 SITE VISIT

On June 13, 2022, NIRB’s Monitoring Officers Cory Barker and Guillaume Daoust flew from Cambridge Bay to the Mary River mine site via NIRB chartered aircraft, NIRB staff were guided by Baffinland’s Environmental Superintendent, Mr. Connor Devereaux. The weather included snow, rain, and some fog and NIRB staff were able to observe the spring freshet throughout the site visit.

The first afternoon, NIRB staff met with Baffinland to discuss plans and objectives for the coming days. Following the meeting, NIRB and Baffinland staff took a helicopter flight from the Mine site to Steensby Inlet to observe the closed camp buildings and storage facilities. On the return trip, staff circled Deposit 1 and the Mine Site infrastructure to take updated aerial photos.

On June 14, 2022, NIRB staff traveled north via the Tote Road to Milne Port. While at Milne Port (Photo 1), observations were made of the:

- Accommodations complex,
- Hazardous waste storage area,
- Ore dock and ship loader facility,
- Sedimentation ponds,
- Ore stockpile,
- Landfarm,
- Phase 2 and ongoing laydown areas,
- Incinerator and waste management facility,
- Quarry, and
- Spill response equipment storage.

Along the return trip of the Tote Road, stops were made to observe:

- the emergency shelters,
- dust suppression activities,
- various culverts and water crossings,
- dust collection equipment,
- erosion control measures, and
- snowmobile and all terrain vehicle crossings.

On June 15, 2022, NIRB staff toured the Mary River Mine Site (Photo 2) observing the following:

- Crusher plant,
- Deposit No. 1,
- Water Management Dam at the base of the Deposit,
- Waste Rock Storage Area,
- Landfill,
- Incinerator and Waste Management Facilities,
- Fuel Tank Farm,
- Maintenance shops,
- Borrow Source Pit at km 97, and
- Sewage Outfall Area.

Upon completion of the site visit, NIRB staff met with Baffinland staff from various on-site departments to discuss the site visit observations and made follow-up plans. This allowed NIRB staff to discuss specific areas of the operation as water management on the roads, dust levels on site, general site clean up and monitoring activities.



Photo 1: Aerial View of Milne Port, August 2019.



Photo 2: Aerial View of Mary River Mine Site, August 2019.

4.1 General Observations for Mary River Mine Site

The following are general observations made during the site visit and do not pertain specifically to any terms or conditions of the Mary River Project Certificate:

4.1.1 Mary River Mine Site

4.1.1.1 Waste Rock Storage Facility, Sedimentation Pond and Wastewater Treatment Facility

The waste rock storage facility (WRF) is an open area where potentially acid generating rocks are stored (Photo 3). Weather conditions did not allow NIRB staff to obtain good ground level photos of the WRF and sedimentation ponds, but aerial photos were taken via helicopter June 13, 2022. NIRB staff observed that the WRF was beginning to expand as per the *Waste Rock Management Plan* and the NIRB will observe further progression in subsequent site visits.



Photo 3: Waste Rock Storage Pile and Sedimentation Ponds.

NIRB staff also observed the wastewater treatment facility adjacent to the waste rock sedimentation pond (Photo 4) where wastewater was collected prior to treatment, testing, and discharge to the tundra. The building for this facility was upgraded from a soft-shelled structure to a hard-shelled structure for easier maintenance and operations. This system initially began treating the water in spring 2020 and uses both chemical and physical treatments along with a bladder system to treat the waste rock water.



Photo 4: Wastewater Treatment Facility.

4.1.1.2 Deposit No. 1

NIRB staff visited the Deposit No.1 pit and noted that ore extraction and mining activities were ongoing. Since the last site visit in 2020, NIRB staff observed the active mining location within the pit had changed. As a result, Baffinland has moved the Mine site haul road to be closer to the active face to ensure safe access and shorter distances for haul trucks to travel.



Photo 5: Aerial View of Deposit No. 1



Photo 6: Deposit No. 1 Mine Pit June 2022.



Photo 7: Deposit No. 1 Mine Pit June 2022 (with truck for scale comparison).

4.1.1.3 Water Management Dam at Deposit No. 1

While at Deposit No.1 NIRB staff were able to visit the newly constructed dam located at the base of Deposit No. 1 (Photo 8 & 9). This dam allows for water running down the deposit to be captured in a sedimentation pond where suspended solids in the water can settle prior to the water being pumped with other effluent, after meeting release requirements, into creeks. The dam was completed in 2022 to mitigate any potential accumulation of total suspended solids in run-off water which may lead to impacts on the freshwater environment if left untreated.



Photo 8: Deposit No. 1 Dam Sedimentation Pond



Photo 9: Deposit No. 1 Dam Sedimentation Pond

4.1.1.4 Ore Haul Road to Deposit No. 1

While driving to the deposit, NIRB staff noted that due to the rain even over the past several days, the condition of the Ore Haul Road had deteriorated (Photos 10 & 11). In previous site visits, the road was dry or frozen resulting in a hard packed surface; however, with the rain it had become soft, and Ore Haul trucks were pulled from the road for nearly 24 hours due to dangerous driving conditions. Once the rain stopped, grater operators performed road maintenance to create safe driving conditions and open the road.



Photo 10: Ore Haul Road Conditions During a Rain Event.



Photo 11: Ore Haul Road Conditions During a Heavy Rain Event.

4.1.1.5 Crusher Plant and Sedimentation Pond

NIRB staff viewed the crusher facility (Photo 12, 13 & 14) by truck due to muddy conditions, to follow-up on the implementation of proper engineering designs and controls as directed by the Board to reduce fugitive dust emissions from the crusher plant. Baffinland stated they had installed additional hoods, shrouds, and bellows across all three (3) crusher systems.

NIRB staff noted a reduction in dust production while the equipment was in operation; however, due to freshet and recent rain events the site overall was subject to wet conditions which would assist in total reduction of fugitive dust emissions for the Project. NIRB staff observed a new sedimentation pond constructed adjacent to the Crusher Plant (Photo 15) where water is actively pumped to allow sediment to settle at the bottom prior to water being released after appropriate testing.



Photo 12: Hoods Present at Crusher Conveyor.



Photo 13: General Crusher Conveyor System Equipment.



Photo 14: Bellows on Crusher Conveyor System.



Photo 15: Crusher Facility Sedimentation Pond.

4.1.1.6 Landfill and Landfarm

NIRB and Site staff visited the landfill site to view Baffinland's ongoing waste management practices as described in the *Waste Management Plan*. NIRB staff observed that pertaining to Term and Condition 64, Baffinland has maintained the permanent fence around their landfill which can be altered to expand the landfill according to the *Waste Management Plan* as the need arises (Photos 16 & 17). This decreases the risk for waste to be dispersed across the tundra and limits access of animals to the landfill. NIRB staff were satisfied with the status of the fence at the landfill and provided feedback on this progress during the close-out meeting on June 16, 2022.

NIRB staff also viewed the landfarm (Photos 18 & 19) which had been discussed with Board staff in February 2020 and was constructed in accordance with plans submitted to the Nunavut Water Board. Baffinland currently has soil and material stored in Cell 1 of the landfill; however, this material remains in quadrex bags until the landfarm becomes fully operational.



Photo 16: Fence at Mary River Landfill.



Photo 17: Gate at Mary River Landfill.



Photo 18: Cell 1 of Mary River Landfarm.



Photo 19: Cell 2 of Mary River Landfarm.

4.1.1.7 Snow Management

As part of Baffinland snow management, Monitoring Officers noticed piles of snow (Photo 20) which melt during summer months. Most of the piles have some waste mixed with it but NIRB Staff were informed that Baffinland employees have a weekly clean-up around the pile.



Photo 20: Snow Pile Near Weatherhaven Camp

4.1.1.8 Incinerator Facility

The incinerator facility at the Mary River Mine Site (Photo 21) remains well maintained and organized for dispensing of oils and other maintenance fluids (Photo 22). Most waste materials were observed to be segregated into labelled bins (Photo 23 & 24) for incineration or for backhaul off site.



Photo 21: Incinerator Building at Mary River Mine Site.



Photo 22: Oil Storage at Incinerator Building at Mary River Mine Site.



Photo 23: Waste Segregation at Incinerator Building at Mary River Mine Site.



Photo 24: Waste Sorting at Incinerator Building at Mary River Mine Site.

4.1.1.9 Sewage Outfall Area

During the NIRB's June 2022 site visit, staff visited the sewage outfall area (Photo 25), where treated wastewater from solid and liquid waste is discharged. In past site visits, NIRB staff noted challenges in maintaining the slope due to erosion and permafrost stability, and Baffinland hired consultants to assess slope stability regularly and apply active management of the slope. During this visit, newly installed ripraps appear to be functioning effectively (Photo 26) in maintaining stability of the area.

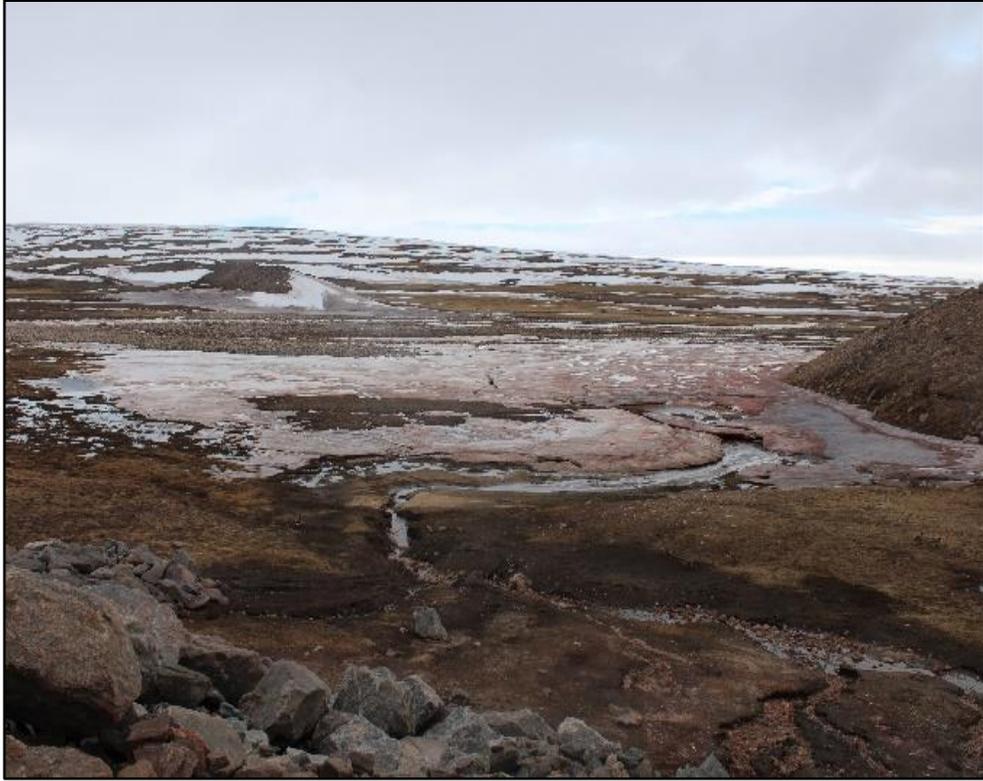


Photo 25: Sewage Outfall Area.



Photo 26: Slope and Ripraps of Sewage Outfall Area Embankment.

4.1.1.10 Mary River Maintenance Shops and Generator Stations

NIRB staff also visited various vehicle and equipment maintenance shops on site where regular maintenance is performed on everything from light vehicles to Ore Haul Trucks and Mining Vehicles (Photo 27). NIRB Staff were also able to observe the new, more energy efficient diesel generators that were installed on site to replace the previous aging generators (Photo 28) as Baffinland has been transitioning to new generators. The shops and generator buildings were clean, well-organized, and generally well maintained.



Photo 27: Inside of Maintenance Shop at Mary River Mine Site.



Photo 28: Indoor Diesel Generators Installed at Mary River Mine Site.

4.1.1.11 Mary River Fuel Tank Farm and Spill Response Equipment

While touring the site, NIRB staff observed the fuel tank farm and the secondary containment facilities in place for Baffinland staff to fuel up vehicles (Photo 29). Baffinland employees were in the process of managing the meltwater and the Tote Road was a priority for water management during the freshet. Baffinland's spill response equipment stored near the Emergency Response Team garage for quick access in case of a spill (Photo 30).



Photo 29: Mary River Mine Site Fuel Tank Farm.



Photo 30: Mary River Mine Site Spill Response Trailer.

4.1.2 Tote Road

On June 14, 2022, NIRB staff drove along the Tote Road to Milne Port, the day consisted of a steady rain which allowed a firsthand account of the road and water management challenges that Baffinland faces when conditions are wet. During the stops at Milne Port, road conditions became soft, and the road was closed to Ore Haul Trucks due to the excessive weight of these trucks when loaded with ore. The road remained safe and operational for light vehicles (Photo 31); however, conditions were reduced compared to previous site visits. Through discussions with Baffinland staff, NIRB learned that freshet season causes the greatest number of delays and road closures due to the challenges in maintaining the road under wet conditions.

On the return trip, NIRB staff made several stops along the road to observe the condition of emergency shelters (Photo 33), water passage through various culverts (Photos 34 & 35). At culvert CV-059, NIRB staff were able to observe a culvert that was still frozen, blocking the flow of water (Photo 36). As a result, Baffinland staff had installed a temporary diversion to allow water to continue flowing and prevent road washouts (Photo 37). NIRB staff also observed various dust fall stations which were installed at multiple heights (Photo 38 & 39) to reflect discussions from the Terrestrial Environment Working Groups on capturing a better estimate of dust accumulation on ground level.



Photo 31: Tote Road Maintenance Activities.



Photo 32: Tote Road Bridge and Resurfacing.



Photo 33: Inside of Emergency Shelter at KM 66.



Photo 34: Culvert CV-104 Along the Tote Road.



Photo 35: Culvert BG-29 Along the Tote Road.



Photo 36: Culvert CV-059 Along the Tote Road Blocking Water Passage.



Photo 37: Temporary Water Pumping to Continue Flow.



Photo 38: Dust Fall Station Heights.



Photo 39: Dust Fall Station Collection Containers.

4.1.3 Milne Port

4.1.3.1 Landfarm Area

NIRB staff visited the landfarm facility and with it being early in the spring Baffinland had yet to turn over the soil for 2022. NIRB staff will follow-up during the summer site visit to observe progress made to the facility in accordance with Baffinland's *Hazardous Materials and Hazardous Waste Management Plan* management plans (Photo 40).



Photo 40: Landfarm at Milne Port.

4.1.3.2 Ore Dock and Stockpile Area

NIRB staff toured the Ore Stockpile (Photo 41) and the Ship Loader Facility (Photo 42). The Ore Dock and Ship Loader were not in operation at the time of the visit; however, Baffinland staff had started working on them for the upcoming shipping season. During ore stockpiling activities, there was noticeable dust produced from the transfer point between the conveyor and the stockpile (Photo 43), resulting in dust being blown into the environment.

Due to the long-term concern of dust emissions at site, this was discussed with Baffinland staff at the close out meeting. Baffinland confirmed that the dust concerns at site are ongoing and Baffinland is routinely exploring mitigation options to reduce dust production. NIRB staff encouraged Baffinland to focus their mitigation efforts on outstanding areas such as this to minimize the dust emissions into the environment. NIRB staff observed that there is a variation in lump ore being produced (Photo 44).



Photo 41: Ore Stockpile.



Photo 42: Ore Dock.



Photo 43: Ore Stockpiling Activities.



Photo 44: Ore Stockpile Lumps Close Up.

4.1.3.3 Milne Port Sedimentation Ponds

NIRB staff also observed the sedimentation ponds that are adjacent to the ore stockpile (Photo 45) where contaminated water is stored, allowed to settle before being treated and tested for release. With the weather beginning to warm-up on site and these sedimentation ponds beginning to thaw, and NIRB staff were able to observe Baffinland's Environment Team performing grab sampling to test the water from the ponds (Photo 46).



Photo 45: Sedimentation Ponds at Milne Port.



Photo 46: Baffinland's Environment Team Sampling Water at the Milne Port Sedimentation Ponds.

4.1.3.4 Milne Port Incinerator and Waste Management Facility

NIRB staff visited the Incinerator and Waste Management Facility at Milne Port and noted that the facility appeared to be following appropriate waste segregation practices (Photo 47) and to be clean and well-maintained (Photo 48).



Photo 47: Waste Sorting at the Milne Port Incinerator Facility.



Photo 48: Oil dispensing Area at the Milne Port Incinerator Facility.

4.1.3.5 Phase 2 Materials Laydown Areas

While touring the Milne Port, NIRB staff observed the laydown area currently being used to store materials and equipment for the Phase 2 Development Proposal. As the NIRB corresponded on July 25 2019⁴, Baffinland has shipped and stored these materials at their own risk; should the Phase 2 Development not be allowed to proceed, Baffinland would be responsible for the demobilization of these materials. The laydown area was noted to be well organized and contained materials included but not limited to: Prefabricated Rail Car Building (Photo 49), Crusher (Photo 50) and Ore Screening buildings (Photo 51), and enclosed Conveyor Belt Systems for ore transport (Photo 52).

⁴ NIRB letter to Baffinland regarding their Notice of Upcoming Sealift (Doc. ID No. 326057).



Photo 49: Phase 2 Development Rail Car Building.



Photo 50: Phase 2 Development Crusher Building.



Photo 51: Phase 2 Development Screening Building.



Photo 52: Phase 2 Development Enclosed Conveyor System.

4.1.3.6 Milne Port Fuel Tank Farm and Hazardous Waste Storage Area

NIRB staff visited the Fuel Tank Farm and noted that the facility appeared to be well maintained and organized (Photo 53); however, there was water ponding in the berm and this is expected during freshet and would be removed once tested. At the same time, the NIRB staff also observed the Hazardous Waste Storage Area (Photo 54). The area is surrounded by a berm, has spill response equipment available and is fully lined in case of any spills. The area is also a fenced and gated to provide control over access to the storage of hazardous waste and to ensure that fluids are stored properly prior to back-hauling.



Photo 53: Milne Port Fuel Tank Farm.



Photo 54: Milne Port Hazardous Waste Storage Area.

4.2 Observations Based on NIRB Project Certificate No. 005

Appendix A summarizes observations made during the site visit that pertain specifically to observable terms and conditions during a winter site visit of Project Certificate No. 005 relevant to the construction and operation phase of the Mary River Project.

4.2.1 Air Quality –Dust Management and Monitoring Plan

Dust management and monitoring plans were followed up on during the site visit pursuant to Terms and Conditions 10 and 58 pursuant to the NIRB's Project Certificate No. 005. During the drive along the Tote Road, NIRB staff observed several dust-fall monitoring stations (Photo 55).

Dust emissions have been an ongoing issue at the Mary River site since 2014 and continuous efforts have been made to lower the amount of dust being generated. For example, hoods, shrouds, and bellows have been added to the crusher system and various liquid products applied to the Tote Road and Ore Stockpile in an effort to contain but success has been limited, especially with regards the ore stockpile area at Milne Inlet. The amount of both road dust and ore dust was considerably lower than previous site visits; however, it was raining during the June 2022 site visit. NIRB staff anticipate that the wet conditions helped to reduce dust at the time of the visit and the NIRB will complete follow-up observations to obtain a more accurate indication of dust emissions on site in August 2022.



Photo 55: Dust Fall Monitoring Stations Located Along the Tote Road.

4.2.2 Terrestrial Wildlife and Habitat

Terrestrial Wildlife and Habitat management and monitoring plans were followed up on during the site visit pursuant to Terms and Conditions 53 and 61 pursuant to the NIRB's Project Certificate No. 005. During the site visit, NIRB staff did not observe any caribou around the Project area; however, various geese species (Photo 56), and foxes (Photo 56) were observed along the Tote Road and the road to Deposit No. 1. In addition, NIRB staff noted that wildlife logs were posted at the main camp buildings for staff to report on wildlife encounters or observations around Mary River Site, Milne Port, and along the Tote Road. Baffinland staff noted that there had been observations of a caribou along the Tote Road and a Polar Bear sighting near Steensby Inlet prior to the NIRB's arrival.



Photo 56: Various Geese Species Present Along the Tote Road.



Photo 57: Red Fox Along the Road to Deposit No. 1 Magazine Storage Area.

4.2.3 Prevention of impacts to water bodies from Mine Site Effluent

The prevention of impacts to water bodies from Mine generated effluent was followed up on during the site visit pursuant to Terms and Condition 17 of the NIRB's Project Certificate No. 005. During the site visit the NIRB and Baffinland discussed effluent testing protocols with Baffinland staff to improve understanding of how effluent and local streams are monitored for impacts from the Mine. NIRB staff took photos of the Camp Lake Creek (Photo 58) and the Environment Team collecting samples to monitor for total suspended solids during freshet (Photo 59). The sediment area at Deposit 1 is another new effort to assist with managing contact water during freshet and high rainfall events.



Photo 58: Camp Lake Creek, Upstream Where Grab Samples are Taken.



Photo 59: Baffinland's Environment Team Collecting Grab Samples from Camp Lake Creek.

4.2.4 Quarry and Borrow Site Management

In order to observe the Proponents compliance with Term and Condition 30 of the NIRB's Project Certificate No. 005, NIRB staff visited the quarry at Milne Port (Photo 60). There were no issues of note as they were ramping up for summer use and the equipment had not been fully commissioned for 2022. NIRB staff will observe the area during the summer 2022 site visit.



Photo 60: Milne Port Quarry Site.

4.2.5 Waste Management and Carnivore Deterrents

In order to observe compliance with Term and Condition 64 of the NIRB's Project Certificate No. 005 as well as the Board's 2018-2019 Recommendation #7, NIRB staff visited the landfill. NIRB staff noted the complete fence around the cell of the landfill and has held up well to several years of use. The construction of the fence was completed in the fall of 2019 and its border will be expanded as Baffinland expands into the other cells of the landfill as per their Waste Management Plan.

5 RECOMMENDATIONS AND DIRECTION

Based on the observations made during the site visit, the NIRB Monitoring Officers note that the site appeared to be well managed and maintained with adequate environmental protection measures and procedures in place. Several improvements were observed across the Project area in relation to:

- The Waste Rock Storage Facility has a new water treatment plant building which is now a permanent structure and easier to maintain through the seasons;
- The completed fence and gate around the landfill and the newly constructed landfarm at the Mine Site; and
- The construction of a new water run-off dam at the base of Deposit No. 1 to help settle and treat contact water from the deposit.

In order to fully meet the requirements of the Project Certificate terms and conditions and address Community Member's concerns related to terrestrial, marine, and socio-economic environments; and to ensure that potential adverse impacts to the environment are adequately mitigated, the NIRB Monitoring Officers have identified minor issues of concern during the June site visit.

5.1 Dust Emissions

Dust emissions on site have been a historical ongoing concern brought forward by community members and stakeholders of the Project for several years. In response to these concerns, Baffinland has been working on mitigations for both iron dust produced by vehicles on the Tote Road and at the crusher and ore stock piles. Along the Tote Road, Baffinland has implemented a dust suppressant called *Dust Stop* through the summer season and states that it has noted a significant reduction in dust produced along the Tote Road.

At the crusher facility, NIRB staff have observed the effectiveness of hoods, shrouds, and bellows to reduce the dust emission from the crusher. These mitigations have had mixed success in the past with Baffinland needing to ensure these mitigations are properly re-installed after maintenance; however, when installed, they are effective at reducing dust.

At the Ore Stockpile, in the past year, Baffinland has been using *Dust Treat* along the finished faces of the stockpile to help create a crust and stop wind blown dust along the surrounding area. As evidenced in photo 61 and 62, NIRB staff observed dust accumulation along the sea ice near the ore stockpiles and as noted in [section 4.1.2.2](#) of this report, there appears to be continued release of dust while the stockpile is being built using the conveyor. NIRB staff encourage Baffinland to continue exploring mitigation options to reduce dust produced from this source.



Photo 61: Dust Collecting on Milne Port Sea Ice
(Broad View)



Photo 62: Dust Collecting on Milne Port Sea Ice
(Close-up View)

5.2 Water Management

Monitoring Officers observed ongoing water management challenges along the Tote Road, Ore Haul Road to Deposit No. 1, and more generally across site. Typically, the site visit is completed during winter months or during late summer and this site visit was completed during the freshet, leading to wet site conditions and NIRB staff observed that the Tote Road can become very muddy and unstable (Photos 10, 11, 32, & 33) and the road was closed. Monitoring Officers observed during the drive along the Tote Road and throughout site, that water pooled both on and adjacent to the road creating wash outs. Monitoring Officers discussed the ongoing road and site maintenance challenges with Baffinland staff at the close out meeting and Baffinland staff committed to provide the Board with follow-up photos to show the improved road conditions labelled with estimated number of hours since the closure to demonstrate the effects this has on operations and the amount of time it takes to return the road to safe conditions. Once received, NIRB will post this update on its Public Registry.

Monitoring Officers also observed there was more water pooling in general areas around site and discussed active management strategies and pumping of this water to sedimentation ponds nearby and encourages Baffinland to continue working to reduce the amount of pooling water specifically around equipment and facilities. The NIRB also looks forward to observations and/or any improvements Baffinland made during this freshet and any required updates in site plans in the 2022 Annual Report.

6 CONCLUSION

Throughout the June 2022 site visit, NIRB and Baffinland staff discussed how the Mary River Project is being operated through Project Certificate No. 005 Amendment No. 3. Baffinland appears to have a well-managed and well-maintained site including adequate environmental protection measures and procedures in place as per the Project Certificate and their Management Plans. However, Monitoring Officers highlighted some areas of concern (i.e., Dust and Water Management) that Baffinland should work to monitor and address moving forward. The NIRB looks forward to completing the next site visit in August 2022.

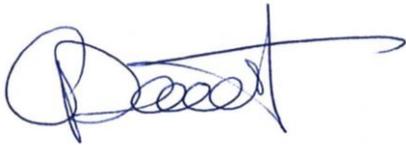
Prepared by: Cory Barker, M.Sc.
Title: Technical Advisor III
Date: August 19, 2022
Signature:



Reviewed by: Kelli Gillard
Title: Manager, Project Monitoring
Date: August 19, 2022
Signature:



Prepared by: Guillaume Daoust
Title: Technical Advisor II
Date: August 19, 2022
Signature:



Appendix A: JUNE 2022 SITE VISIT OBSERVATIONS FOR SELECT TERMS AND CONDITIONS FOR THE MARY RIVER PROJECT

T&C No.	Topic	Site Observation
Air Quality		
10	Monitoring for dust fall	Dust fall monitoring stations were observed at the mine site, the Tote Road, and Milne Port (Section 4.1.1 & Section 4.2.1).
11	Incinerator	NIRB Staff visited the Incinerator facilities at both the Mine Site and Milne Port to follow up on previous observations of cleanliness and organization of the facilities (Section 4.1.1.8 and Section 4.1.2.6).
Hydrology and Hydrogeology		
17	Prevent impacts to water bodies from effluent	Related to T&C 24 and 46 Effluent testing protocols were observed at Camp Lake (Section 4.1.1.1), the Ore Deposit (Section 4.2.3) and at the dam in the Deposit (Section 4.1.1.3).
Groundwater/Surface Water		
21	Monitor dust/deposition rates in water bodies along the Tote Road	Related to T&C 10 Dust fall monitoring stations were observed throughout the site, see section 4.1.2 and 4.2.1 .
24	Monitoring Effluent	Related to T&C 17, 43, and 46 Observed at the Membrane Reactor Facility and various grab samples at Mine Site (section 4.1.1.9) and Milne Port (section 4.1.2.3).
Landforms, Geology and Geomorphology, Soils and Permafrost		
26	Erosion Management	Related to T&C 43 NIRB staff noted several instances where rip raps were installed along the Tote Road and at the Sewage outflow area to maintain the slope stability (Section 4.1.1.9) Baffinland also noted that they continue to retain a 3 rd party consultant to identify areas needing remediation.
30	Quarry or borrow site management	NIRB staff toured both the quarry at Milne Inlet (section 4.2.4) and the Borrow Source pit at KM 97. Both quarries appeared organized.
Freshwater Aquatic Environment including Biota and Habitat		
46	Effluent and discharge requirements	Related to T&C 17 and 24 Effluent testing was observed at the MBR Facility and various grab samples at Mine Site and Milne Port (section 4.1.3.3).

T&C No.	Topic	Site Observation
51	Coordination of monitoring effort	Related to T&C 35 Monitoring programs were ongoing and with teams completing water sampling (section 4.1.3.3).
59	Aircraft disturbances	Related to T&C 71 and 72 Fixed-wing and rotary-wing aircraft were observed operating on site to transport staff and materials. Baffinland has indicated that flight restrictions regarding altitude and animal disturbances are written into their aviation contracts; however, fixed-wing aircraft do not have the same variability in their flight patterns. NIRB staff further observed pilots using GPS to avoid designated migratory bird areas and maintaining minimum flight altitudes.
Terrestrial Wildlife Habitat and Waste Management		
64	Waste management – carnivore deterrents	Observed well maintained skirting placed all camp buildings including the Sailivik Camp, Mine Site Complex, Milne Port accommodations Camp and a completed fence around the landfill. In the Board’s 2018-2019 Monitoring Report, they recommended that Baffinland install a fully enclosed fence around the landfill to minimize the possibility of wind-blown debris and wildlife interaction at the facility (Section 4.1.1.6).
Birds and Flight Altitude Restrictions		
72	Aircraft Logs	Related to T&C 59 and 71 Baffinland has indicated that pilot logs are required by contract on all helicopter flights; however, helicopters do not operate in the winter.
Marine Environment, Marine Water/Ice and Sediment Quality		
92	Spill response equipment on site	Equipment was observed at Milne Port and near Tank Farms at Mine Site (section 4.1.1.11).
Marine Wildlife and Marine Habitat		
101	Shore-based narwhal behavior monitoring in Milne Inlet	Due to the weather and seasonal monitoring inactivity discussed Baffinland’s plans for the upcoming year.
Socio-Economic Terms and Conditions		
143	Use of technology to maintain contact with family and/or home	Landline telephones are installed in all private rooms free of charge to Baffinland staff and visitors.
Culture, Resources and Land Use		
165	Emergency shelters	Observed along the Tote Road (section 4.1.2) and appeared heated and well maintained.

NOTES: *PC = NIRB Project Certificate No. 005 Amendment 3 (June 18, 2020)