



Nunavut Impact Review Board

2018 -2019 Annual Monitoring Report

The Mary River Project

Baffinland Iron Mines Corporation

NIRB File No. 08MN053



October 2019

Report title: The Nunavut Impact Review Board's 2017-2018 Annual Monitoring Report for Baffinland Iron Mines Corporation's Mary River Project (NIRB File No. 08MN053)

Project: Mary River Project
Project Location: Qikiqtani (North Baffin) Region, Nunavut
Land Tenure: Inuit Owned Lands

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

Monitoring Officers: Cory Barker, Technical Advisor I
Solomon Amuno, Technical Advisor II

Telephone: (867) 983-4607; cbarker@nirb.ca
(867) 983-4603; samuno@nirb.ca

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Cover Photos: Cory Barker
Ship loader, Milne Port
Ore Dock Milne Port
Mary River Mine Site
Ore Stockpile, Milne Port
Deposit No. 1, Mary River Mine Site

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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*.

The purpose of the NIRB's monitoring program as outlined in Section 12.7.2 of the *Nunavut Agreement* and s. 135(3) of the *NuPPAA* are:

- (a) measure the impact of the project on the ecosystemic and socio-economic environments of the designated area;*
- (b) determine whether the project is carried out in accordance with the terms and conditions imposed under subsection 152(6) or set out in the original or amended project certificate;*
- (c) provide the information necessary for regulatory authorities to enforce the terms and conditions of licences, permits or other authorizations that they issue in relation to the project; and*
- (d) assess the accuracy of the predictions contained in the project impact statement.*

As such, this report provides findings that resulted from the Board's monitoring programs for the Mary River Project from October 2018 to September 2019.

1.1 Project History and Current Status

NIRB Project Certificate No. 005 was issued to Baffinland Iron Mines Corporation (Baffinland or the Proponent) for the Mary River Project on December 28, 2012 following a thorough environmental review process, which included community consultations and a public hearing pursuant to Section 12.5.12 of the *Nunavut Agreement*. On January 13, 2013 Baffinland informed the NIRB that it was proposing an Early Revenue Phase (ERP) that would change the schedule and specific activities associated with the Project as initially approved. The Board determined that it was appropriate to assess the potential ecosystemic and socio-economic effects of the ERP and to consider modifications to the terms and conditions of the original Project Certificate under Article 12, Section 12.8.2 of the *Nunavut Agreement*.

Following a thorough reconsideration process, on March 17, 2014, the NIRB issued its public hearing report for the ERP Proposal to the then-Minister of Aboriginal Affairs and Northern Development Canada, indicating that the proposed works and activities could be permitted to proceed subject to new and amended project-specific terms and conditions. Following the acceptance of the NIRB's report by the Minister, which included revised terms and conditions, on May 28, 2014, pursuant to Sections 12.5.5 and 12.8.2 of the *Nunavut Agreement*, the NIRB issued an *Amended Project Certificate* for the Mary River Project. The amendment allowed the Project to proceed in accordance with Terms and Conditions as contained therein. The NIRB is responsible for monitoring this Project as stipulated in Sections 12.7.1 and 12.7.2 of the *Nunavut Agreement* and as outlined within the Mary River Project Certificate.

In December 2017, Baffinland provided the NIRB with notification that anticipated its 2017 road haulage operations would meet and potentially exceed (by 5-7%) the 4.2 million tons per year (Mt/a) limit established by Term and Condition 179(b) of the Mary River Project Certificate No. 005. The NIRB acknowledged receipt of the update and noted additional reporting would be required from Baffinland once final haulage numbers for 2017 were confirmed, including an analysis of potential ecosystemic and socio-economic effects related to any exceedance of road haulage activities from those predicted or permitted. The NIRB encouraged Baffinland to submit an application to amend Term and Condition 179(b) of the Mary River Project Certificate should it identify any challenges with complying in future. Baffinland later confirmed the actual tonnage of ore hauled in 2017 was 4.54 Mt, representing an approximately 7.5% exceedance of the limit specified in the Project Certificate.

In April 2018, Baffinland submitted the “Production Increase, Fuel Storage and Milne Port Accommodations Modification Proposal” (Production Increase Proposal), to the NIRB which proposed an increase in the maximum volume of ore that would be permitted to be trucked from the Mary River site to the Milne Port via the Tote Road from 4.2 Mt/a to 6 Mt/a (requiring up to 83 round trips by ore carriers to market in the open water season), as well as 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. To accommodate these changes, Baffinland requested that the NIRB amend Conditions 179(a)¹ and 179(b)² of the Mary River Project Certificate No. 005.

On September 30, 2018 the Ministers of Intergovernmental Affairs, Northern Affairs and Internal Trade and Crown-Indigenous Relations, on behalf of the Responsible Ministers (the Ministers), accepted the Board’s recommendation to allow the fuel increase and installation of new accommodation at Milne Port without amendment to the Project Certificate. The Ministers also approved the Production Increase Proposal allowing Baffinland to increase shipping from Milne Inlet from 4.2 Mt/a to 6 Mt/a iron ore per year until the end of 2019. As a result of this approval, existing term and condition #10 (air emissions) was revised and additional new terms and conditions #179(c), #183 and #184 was added to the Project Certificate No.005 and re-issued on October 30, 2018 (Amendment No. 2) to reflect the activities associated with production increase activities. The revisions in Amendment No. 2 also established mechanisms to audit Baffinland’s delivery of benefits in the Qikiqtani Region and compliance with environmental management commitments in relation to the Tote Road and marine shipping, and also support verification of monitoring and mitigation efforts related to the potential for effects on marine mammals due to project shipping.

During the 2018-19 monitoring period, the NIRB commenced the reconsideration for the Phase 2 Development proposal of Baffinland’s the Mary River Project Certificate with the NIRB conducting the Final Hearing from November 2-9, 2019 in Iqaluit and Pond Inlet.

All documentation associated with this project is available online from the NIRB’s public registry at <http://www.nirb.ca/project/123910>.

¹ In any given calendar year, the total volume of ore shipped via Milne Inlet shall not exceed 4.2 million tonnes.

² In any given calendar year, the total volume of ore transported by truck on the Milne Inlet Tote Road shall not exceed 4.2 million tonnes.

1.2 Project Components

The Mary River Project involves exploration, construction, operation, closure and reclamation of an open pit iron ore mine at what is known as Deposit No.1 and includes mining at a rate of 18 million tonnes per year (Mt/a). There are three (3) main project locations – the Mine site, Milne Port located north of the Mine site, and Steensby Port located south of the Mine site. The Milne Port is connected to the Mine site by the Tote Road, approximately 100 kilometers (km) in length. The Project as originally proposed was to include the construction of a railway approximately 150 km in length to connect the Mine Site to Steensby Port; however, the southern railway and its associated infrastructure are yet to be constructed.

As currently approved, the extracted ore is crushed into lumps and fines is be transported by truck along the Tote Road and shipped from Milne Port during the open water season using contracted vessels. There are no concentrators, tailings, or tailings ponds associated with the production of iron ore as part of the Mary River Project. The approved Project also includes additional facilities at Milne Port, including the construction of a fixed ore dock, 4.2 Mt ore stockpile and reclaim area, 3,500 tonnes per hour ship loaders, a camp to accommodate workers, and the extension or relocation of the airstrip to the west of the proposed ore stockpile. The ERP operations are expected to continue for the duration of the mine life (i.e., 21 years), and would continue in conjunction with the Mary River Project as originally proposed, once developed.

On April 30, 2018, Baffinland submitted the “Production Increase” proposal to the NIRB. This proposal involved an increase in the maximum volume of ore that would be permitted to be trucked and shipped from the Mary River site from 4.2 million tons per year (Mt/a) to 6 Mt/a. On October 1, 2018, the “Production Increase” proposal was approved by the responsible Ministers allowing it to take effect until the end of 2019.

Baffinland reported in 2018 to the NIRB that mining and ore hauling activities from the Mine Site to Milne Port continued and that approximately 5.44 million tonnes of iron ore was mined and hauled on the Tote Road. While Baffinland indicated that no specific project activities occurred along the southern railway or at the Steensby Port site in 2018, Baffinland reported to the NIRB that the scope of the construction and site activities it undertook in 2018 included:

- Continued development and operation of the mine, ore crushing and land transportation, stockpiling and marine shipment of ore;
- The continued development and construction of infrastructure required at Milne Port, the Mine Site, and along the Tote Road;
- Ongoing operation of permitted quarry and borrow sources;
- At Milne Port, vessels carrying fuel, equipment and supplies for use at the Mine Site and Milne Port arrived during open water. Material, fuel and supplies required for operational and construction activities were transported to the Mine Site year-round via the Tote Road;
- Use of ore carrier escorts during the end of the shipping season to maximize shipping during the open water season;
- Ongoing environmental effects studies and baseline data collection will continue to support the construction and operation of the Project as well as for future engineering requirements;

- Continued environmental monitoring in accordance with the approved Project Certificate, licences, authorizations, management plans and environmental effects monitoring programs;
- Ongoing regional exploration activities including mapping, prospecting, sampling, and geophysics; and
- Replacement of accommodation camps and development of required support infrastructure for increased work force (e.g., fuel storage and water treatment).

2 MONITORING ACTIVITIES

2.1 General Reporting Requirements

On March 31, 2019 Baffinland provided the Annual Report for the Mary River project.³ The report summarized the Project activities and consultation efforts with stakeholders undertaken in 2018. It also includes a summary outlining the status of compliance, methods employed to complete work, a summary of results, trends, and next steps for each project Certificate Term and Condition.

During the 2018-2019 monitoring period Baffinland has also provided NIRB with the following Plans as required by the Project Certificate:

- Status of Project Certificate Conditions in 2018;
- 2018 Community Engagement Records;
- 2018 Working Group Meeting Notes;
- 2018 Photo Essays;
- Concordance to Recommendations;
- 2018 Socio-Economic Monitoring Report;
- 2018 Geotechnical Inspection Report; and
- Status of Proponent Commitments in 2018.

2.2 Compliance Monitoring

Compliance monitoring involves an assessment undertaken by regulators and other agencies to establish whether a project is being carried out within the legislation, regulations, instruments, commitments and agreements as such are applicable to certain project activities, and further, is a requirement of the NIRB's Post-Environmental Monitoring Program for each Project Certificate. At present, the NIRB has not yet issued Appendix A of the Mary River Project Certificate and expects to do so once sufficient permits are issued for the Project to understand the responsible authorities' operational requirements. Appendix A would provide the project-specific monitoring framework which would further define the specific reporting requirements of the Proponent and responsible authorities.

The NIRB understands that portions of the Project have still not been fully realized and that consequently some terms and conditions cannot be fully achieved until later phases of Mary River's development. The NIRB expects that planning, consultation, and collaboration will continue over the next year in order to finalize and refine management and monitoring plans.

³ Public Registry ID: 324120-324122

2.2.1 Compliance with NIRB Project Certificate No. 005

2.2.1.1 Proponent's Responses to the Board's 2018 Recommendations

On November 7, 2018 as a result of the NIRB's 2017-2018 monitoring program, the Board made 21 recommendations to Baffinland to provide guidance on how to achieve compliance with the Mary River Project Certificate. These recommendations are outlined in [Appendix I](#), which also includes updates from the Proponent regarding its direct follow-up on each of the Board's recommendations.

Of these 21 recommendations, Baffinland has completed 14 with one (1) still in progress and six (6) still outstanding. The outstanding recommendations are related to:

- Revised dustfall management plans;
- Fish passage and culvert obstruction;
- Further sediment sampling and modelling in Milne Inlet;
- Marine mammal early warning indicators; and
- Incomplete fencing around the landfill.

2.2.1.2 Compliance Achievements

[Appendix II](#) documents Baffinland's compliance achievements with the Project Certificate from 2018-2019. During this reporting period, the Proponent was successful in having met most of the requirements of the NIRB Project Certificate No. 005; however, there are several terms and conditions that the Proponent has yet to fully achieve or make progress towards achieving, specifically term and conditions: 17, 23, 24, 35, 46, 47, 48, 48(a), 52, 64, 179(c) and 184.

On April 10, 2019 the NIRB requested that authorizing agencies with a mandate or jurisdictional responsibility for the Mary River project provide comments and information with respect to compliance and effects monitoring. Specifically, comments were requested regarding the following as it pertains to compliance monitoring, and assessment undertaken by regulators and other authorizing agencies to establish whether the Project is being carried out within defined regulations, commitments and agreements:

- a. Compliance Monitoring
 - i. Provide a summary of any compliance monitoring and/or site inspections undertaken in association with the Project, including specifically:
 - a. Identify the terms and conditions from the Project Certificate which have been incorporated into any permits, certificates, licences or other government approvals issued for the Project, where applicable;
 - b. A summary of any inspections conducted during the 2018 reporting period, and the results of these inspections; and
 - c. A summary of the Proponent's compliance status regarding authorizations that have been issued for the Project.

The NIRB received comments from the following parties regarding Baffinland's 2018 Annual Monitoring Report:

- Qikiqtani Inuit Association (QIA) (NIRB Doc ID No. 325327)
- Government of Nunavut (GN) (NIRB Doc ID No. 325306)

- Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) (NIRB Doc ID No. 325323)
- Environment and Climate Change Canada (ECCC) (NIRB Doc ID No. 325624)
- Fisheries and Oceans Canada (DFO) (NIRB Doc ID No. 325325)
- Parks Canada (PC) (NIRB Doc ID No. 325324)
- Health Canada (HC) (NIRB Doc ID No. 325322)
- World Wildlife Fund Canada (WWF) (NIRB Doc ID No. 325270)

On July 12, 2019 Baffinland provided written responses to address all the comments identified by parties, and where applicable the Proponent also provided additional action plans and commitments aimed to address all the outstanding monitoring issues identified during site visits and inspections of the Mary River Project.

2.2.2 Compliance Monitoring by Agency

2.2.2.1 Qikiqtani Inuit Association (QIA)

The QIA completed five (5) site inspections between March and October 2018 to assess compliance with select terms and conditions of Commercial Lease Q13C301. In general, no major environmental concerns were observed. The following is a summary of the site visits:

1. August 2-4, 2018 – The Inspector focused on a general site inspection to assess compliance with select terms and conditions of Commercial Lease Q13C301.
2. September 6-11, 2018 – The Auditors focused on the financial security estimate for the Project as per the terms and conditions of Commercial Lease Q13C301.
3. October 2-3, 2018 – The Inspector took five samples of rock from the Waste Rock Facility; QIA and BIMC retained half of each sample. The samples retained by QIA were shipped to ALS Laboratory Ltd.'s North Vancouver laboratory for testing. All samples were analyzed for modified Sobek Acid-Base Accounting (ABA) using the siderite corrected method and total Sulphur; all were confirmed to be Non-PAG based on the site-specific criteria.

2.2.2.2 Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)

CIRNAC completed several site inspections in 2018 to review compliance with the Type 'A' Water Licence (2AM-MRY1325) associated with the Mary River Project. The site inspections occurred on May 16-18, June 22-24, and August 22-23, 2018 and a summary of their findings is outlined below:

Concerns Identified:

- A road was built over a diversion ditch on the North East side of the Waste Rock Stockpile (WRSP) leading to the waste rock sedimentation pond for containment; this blocked the flow of water to the WRSP sedimentation pond;
- Two (2) containers with hazardous waste were found to be left open and four (4) drums of hazardous waste were left outside of the facility;
- The inspector noted potential high levels of Total Suspended Solid (TSS) originating from melt water entering camp lake;
- The fence was in poor condition around the Landfill;

- Fuel module at Milne did not appear to be properly contained, this facility was lined, but the berms creating the containment area appear to have eroded away or the facility had become full of sediment causing capacity issues. Water from within the facility area appeared to be capable of flowing outside of containment area;
- The height of the outer berm wall of the ditches that surrounded the crusher pad appeared to be inconsistent in height and inconsistent with the approved design drawings;
- Iron Ore was being used as a construction material near the Crusher Pad;
- Baffinland was stockpiling Iron Ore outside the designated area highlighted in the construction drawings;
- Hazardous materials were found in the non-hazardous landfill;
- The slope of the Ore Stockpile Pad appeared to be inconsistent with the approved design drawings; and
- The Landfarm appeared to be over capacity and the licensee did not appear to be treating the soil.

Recommended Follow-up:

- The licensee is to ensure that the crusher pad and associated diversion ditches are built according to the design drawings prior to the freshet of 2019;
- The licensee is to imminently construct the containment ditches surrounding the Waste Rock stockpile as described in the document “Civil, Design criteria” and install the required ditches to divert non-contact surface water away from this facility;
- The licensee is to ensure that the Hazardous Waste Berm #5 is still capable of retaining water/waste;
- The licensee is to ensure that the slope of the ditches surrounding the Ore Stockpile Pad corresponds with the approved design;
- The licensee is to return the Western Global Fuel module at Milne Inlet to its original approved design; and
- The licensee is to correspond with the NWB and follow the required processes to install the required water management structures to prevent water from flooding the roads.

2.2.2.3 Environment and Climate Change Canada (ECCC)

ECCC did not provide any information regarding any site inspections conducted at the Mary River Project site or report any concerns regarding compliance monitoring in its review of Baffinland’s 2018 Annual Monitoring.

2.2.2.4 Fisheries and Oceans Canada (DFO)

DFO indicated that the Proponent currently operates under three (3) *Fisheries Act Authorizations* (14-HCAA-00525, 06-HCAA-CA7-00084 and 18-HCAA-00160) and that no site inspections were conducted by DFO during 2018.

DFO stated that the following terms and conditions: 87, 105, 109, 110 and 121 from Project Certificate No. 005 for the Mary River Project have been incorporated into DFO’s Fisheries Act Authorization for the Milne Inlet Ore Dock (DFO file no.: 14-HCAA-00525). DFO also outlined that additional terms and conditions from the NIRB’s Project Certificate No.:005 for the Mary

River Project, while not directly incorporated, fall under DFO's mandate and overlap with conditions in Baffinland's existing Fisheries Act Authorizations as follows:

- Milne Inlet Tote Road (DFO file no.: 06-HCAA-CA7-00084): Project Certificate 005, Terms and Conditions 19, 26, 45, 47, 48(a) and
- Milne Inlet Ore Dock (DFO file no.: 14-HCAA-00525): Project Certificate 005, Terms and Conditions 45, 76, 88, 99, 101, 106, 113, 115, 123.

DFO specifically acknowledged that they cannot determine Baffinland's overall compliance status until the reviews of the requisite *Fisheries Act* have been completed.

2.3 Effects Monitoring

Effects monitoring can be described as an assessment of the measurable change to a particular environmental or socio-economic component, as compared to the potential effects that were predicted to result from a proposed development. In the case of the Mary River Project, impact predictions and mitigation measures were outlined and developed throughout the environmental review of the Project and were recorded and presented through the Proponent's Final FEIS, ERP, and other related documents. Although the NIRB is currently in the process of developing a Post-Environmental Monitoring Framework for the Mary River Project that will address in greater details the expectation of the monitoring framework, the NIRB still expects that the Proponent will continue to invest effort on impact predictions and adequacy of monitoring/mitigation plans. Baffinland has not consistently provided reporting on how the information collected compares to the predictions in the FEIS and ERP.

On April 10, 2018 the NIRB also requested that regulatory authorities with expertise or jurisdiction at the Mary River Project provide comments and information with respect to effects monitoring for the 2018 reporting period. Specifically:

- b. Effects monitoring
 - ii. Whether the conclusions reached by Baffinland in the Mary River Project 2018 Annual Monitoring Report are valid; and
 - iii. Any areas of significance requiring further supporting information or any changes to the monitoring program which may be required.

2.3.1 Effects Monitoring - Authorizing Agencies

Table 1 below lists some of the significant issues received from various authorizing agencies regarding compliance monitoring of the Mary River Project in the 2018 reporting period. On July 12, 2019, Baffinland provided written responses to address all the comments identified by parties, and where applicable the Proponent also provided additional action plans and commitments aimed to address all the outstanding monitoring issues identified during site visits and inspections of the Mary River Project. Baffinland's response to comments is summarized in the following sections for each commenting party.

Table 1: General summary of comments received on 2018 Annual Monitoring Report

Party	Summaries of comments received
QIA	<ul style="list-style-type: none"> ▪ Insufficient responsiveness to the Marine, Terrestrial and Socio-economic working group recommendations; ▪ A variety of exceedances in traffic levels on the Tote Road, dust deposition, water quality and quantity, vessel speeds and degradation of permafrost; ▪ Proponent self-assessment results; ▪ Insufficient integrations of Inuit in Project Monitoring; ▪ Gaps in the current monitoring programs; ▪ Confirmation of Project predictions in relation to the human environment; ▪ Uncertainty around which monitoring triggers action by Baffinland; ▪ Continued concerns regarding the failures of the sedimentation pond at the Waste Rock Facility; and ▪ Despite the re-negotiated IIBA in October 2018, Baffinland is yet to achieve its commitment for Inuit employment on site.
GN	<ul style="list-style-type: none"> ▪ Questioned the effectiveness of vegetation monitoring programs; ▪ Lack of confidence in the dust fall monitoring report; ▪ Noted consistent deviations from the nominal shipping route; ▪ Insufficient monitoring of caribou on the Project Site; and ▪ Underestimating jet fuel requirements.
CIRNAC	<ul style="list-style-type: none"> ▪ Ineffective dust suppressions measures; ▪ Recommended that effluent monitoring be improved during freshet; ▪ Requested Baffinland to provide groundwater monitoring data from the landfill at the Mine site; ▪ Improvements to the Waste Rock source tracking and placement information; ▪ Improvements to the Permafrost Protection and Monitoring Plan as well as Erosion Management plan; ▪ Recommended that Baffinland consider actively reclaiming the problematic borrow sources; ▪ Recommended that Baffinland supply information regarding the equipment and methods regarding protection from invasive species in the marine environment; ▪ Suggested Baffinland implement their rapid response mitigation measures to mitigate future freshet related TSS exceedances along the Tote Road and Mine site; ▪ Suggested Baffinland implement ideas to further reduce interactions between the Project and wildlife; and ▪ Recommended that Baffinland summarize its efforts to engage and consult with the North Baffin communities on project monitoring.

ECCC	<ul style="list-style-type: none"> ▪ Requested figures and tables containing the ambient air quality data being compared to the Nunavut and Canada wide Ambient Air Quality Standards; ▪ Requested that the Proponent provide a discussion around the causes of the large number of untreated sewage spills on site in 2018; ▪ Recommended that the groundwater monitoring report provide both analysis and interpretation of the results; ▪ Requested further identification of the taxa included in the Metal sensitive Chironomids group during the Benthic Invertebrate Community Data analysis; ▪ Recommended that the Proponent discuss any changes in mining activity in the Sheardown watershed that would explain the increase in sulphate and manganese; and ▪ Recommended that the Proponent consider whether increased frequency of benthic invertebrate surveys in the effluent-exposed upper reaches of Tributary-F might provide additional information on potential mine-related effects in the environment.
DFO	<ul style="list-style-type: none"> ▪ Noted that although Baffinland did produce the Ship-based Observer Program in 2018, that the program was not conducted throughout the entire shipping season, potentially creating information gaps for periods of the season; ▪ Requested explanations regarding the ship-track deviations, specifically the ship that travelled through Navy Board Inlet. DFO also noted that this was not included in Baffinland's conclusions; ▪ Required further efforts to identify the species found during the aquatic invasive species sampling; ▪ Recommended that all crossings with fish passage concerns should be targeted for repair in 2019; and ▪ Recommended that Baffinland develop a response plan for absent juvenile Arctic Char and propose additional measures to ensure that juveniles return and can use the downstream of crossing culvert BG-50.
PC	<ul style="list-style-type: none"> ▪ Recommended that Baffinland replace the term "Ice-management vessel" with the proper classification of "Ice-Breaking" when discussing the MSV Botnika; ▪ Expressed concerns regarding the lack of consistency regarding the marine monitoring programs. Parks Canada would like to see more robust, repetitive and well-designed monitoring programs applied to the project to allow for better understanding of potential project effects; ▪ Requested further explanations for instances where ships exceeded the 9-knot speed limit; and ▪ Requested explanation for how observational data was corrected for the difference in observation dates performed over multiple years of the Ship-based Observer Program. Parks Canada does not see this as a reliable source of monitoring given the challenges comparing data on different dates each year regarding temporally sensitive marine mammals.
HC	<ul style="list-style-type: none"> ▪ No comments available from Health Canada due to the lack of quantitative data available for examination within the report.

WWF	<ul style="list-style-type: none"> ▪ Noted the lack of adaptive management including development of indicators and thresholds for the marine environment; ▪ Lack of comprehensive science relating to marine mammals monitoring program; ▪ Insufficient incorporation of community feedback on potential project related effects to marine mammals; and ▪ Requested for updated on the Monitoring Framework for the Mary River Project and the list of outstanding issues not addressed in Annual Reports.
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2.3.1.1 Summary of Baffinland's Response to Comments Received from QIA:

- With respect to providing a summary of the suggestions/ recommendations provided by MEWG and TEWG groups, Baffinland felt that they have accurately captured the input provided by these groups through the meeting minutes and notes which were circulated to parties for approval post meeting. In the June 2019 meetings, Baffinland committed to modifying the format for the minutes to better capture recommendations.
- Regarding QIA's suggestion that Baffinland's self-assessment of compliance is inaccurate and based on opinion rather evidence, Baffinland committed to clarifying in future years that the compliance section is based on self-assessment and will better capture this in future years.
- Regarding QIA's concerns about exceedances in traffic and dust along the Tote Road, Baffinland committed to monitoring dust generation along the Tote Road. In 2019, they will be testing and implementing a new dust suppression product to help further reduce dust emissions along the road.
- Regarding the recommendation that the Proponent increase its caribou monitoring efforts, Baffinland is working with the GN to develop a memorandum of understanding to provide deeper collaboration and efforts regarding regional caribou monitoring.
- With respect to QIA's suggestion to develop co-managed and independent monitoring with increased Inuit participation, Baffinland highlighted several examples of how local Inuit knowledge was incorporated into the Project and used to develop the adaptive management of the Project. For example, reduction of vessels speeds based on Mittimitalik Hunter's and Trappers Organization (MHTO) feedback and installation of six (6) additional dust-fall stations based on community feedback.
- With respect to QIA's concerns regarding Project noise and its effects on wildlife, Baffinland indicated that they have several protocols in place to monitor noise levels on site and that wildlife are also monitored with respect to disturbance on site. Baffinland also noted that it is rare for wildlife to show signs of disturbance and reports of caribou and other wildlife on site support this. Baffinland also stated that they have several community-based monitoring programs through the Wildlife Monitoring Fund.

2.3.1.2 Summary of Baffinland's Response to Comments Received from GN:

- In response to the request that the Proponent develop a revegetation plan according to Terms and Conditions 39 and 40, Baffinland noted that they are currently developing a reclamation study and will be setting up plots in 2019. The initial results of this will be made available once it is complete. Baffinland will endeavor to include improved

discussion on effectiveness of impact mitigation and adaptive management in its reports and Baffinland reiterate that no impacts beyond the initial predictions have been reported to date.

- Regarding concerns that the current dust fall monitoring program, Baffinland noted that they have had several conversations with the GN regarding this topic and responses were provided during the TEWG conference call on April 24, 2019 and is unclear as to why the GN is submitting these comments again. Baffinland has also adjusted the dust fall monitoring stations to increase monitoring downwind of high dust generating sites such as the ore stockpile and the crusher.
- With respect to the GN's concerns regarding deviations from the shipping route; Baffinland maintains that no significant shipping route deviations occurred based on the current understanding of the term "significant" in the Project Certificate.
- In response to the request that the Proponent improve its monitoring of Project effects on caribou, Baffinland doubled the survey effort in both the height-of-land and snow track survey programs in 2019. Baffinland also noted that they contribute to regional monitoring programs led by the GN, ECCC, and the Canadian Wildlife Service.
- Regarding the GN recommendation for Baffinland to develop a fuel use forecast communication protocol, Baffinland noted that the current Project Certificate does not require fuel use forecasting and that they are within their projections for expected number of flights. However, Baffinland remains open to discussing potential resolutions with the GN outside of the NIRB annual report.

2.3.1.3 Summary of Baffinland's Response to Comments Received from CIRNAC:

- With respect to CIRNAC's request to re-evaluate current measures and implement alternative dust control technologies, Baffinland noted that several new shrouds have been installed at the crusher facility and that they tested a new dust suppression product on the Tote Road in summer 2019 with hopes of full implementation upon a successful test.
- With respect to CIRNAC's recommendation to discuss current effluent and watercourse monitoring during freshet, Baffinland indicated that this is addressed through their Spill Contingency Plan and Baffinland has adequate spill mitigation measures for post spill clean-up and reporting. Baffinland committed that they will continue daily monitoring of watercourse.
- In response to the request to provide the groundwater data from the landfill, Baffinland noted that due to the limited data collected in 2019, they would be of little use; however, after a 2019 field season, they will release the data to CIRNAC and other interested parties.
- Regarding CIRNAC's recommendation to reclaim problematic borrow-sources, Baffinland committed to consider reclaiming unused borrow sources.
- In response to CIRNAC's request for confirmation regarding invasive species and the use of off-site equipment, Baffinland stated that it contractually requires contractors to clean equipment before its arrival on site and Baffinland staff conduct an inspection of the equipment upon its arrival.
- With respect to CIRNAC's recommendation that Baffinland should implement their rapid response mitigation measures to further mitigate future freshet related TSS exceedances, Baffinland notes that it plans to implement rapid response measures and lessons learned in previous years to improve response and mitigation in the future.

- In response to recommendations that Baffinland should minimize interaction between the Project and wildlife, Baffinland stated that their waste is segregated and deposited into the proper waste stream. Baffinland also noted that waste sorting compliance is inspected weekly and a program will begin in 2019 to address building skirtings that required repair.

2.3.1.4 Summary of Baffinland’s Response to Comments Received from ECCC:

- In response to the request that the Proponent provide figures and tables containing ambient air quality data and compare this to CAAQS and Nunavut’s AAQS, Baffinland noted that they publicly disclose emissions through ECCC National’s Pollutant Release Inventory and GHG portals. Baffinland further noted that it would consider revising the documentation provided in future Annual Reports although it remains unclear why the use of Nunavut’s AAQS are not considered sufficient.

2.3.1.5 Summary of Baffinland’s Response to Comments Received from DFO:

- In response to the recommendation to lengthen the Ship-based Observer Program, Baffinland noted that the longer program on board the ice-breaker vessel was not possible due to logistical reasons; however, the data collected by other programs (e.g., Passive Acoustic Monitoring and Bruce Head Shore Based Program) would cover the data discrepancies.
- In response to the recommendation for Baffinland to further discuss the shipping route deviation through Navy Board Inlet, Baffinland noted the vessel that travelled through Navy Board Inlet was not under contract with Baffinland at the time of deviation. It was under contract to deliver goods to other communities and Baffinland had no responsibilities for this vessel.
- With respect to comments to further the efforts to identify species found during the AIS sampling, Baffinland notes that it will work closely with DFO to provide information on newly recorded species.
- Regarding DFO’s suggestion that all damaged or obstructed fish bearing water crossings be targeted for repair in 2019, Baffinland indicated that in 2019 it plans to continue the implementation of surface water improvements as outlined in the Tote Road Earthworks Execution Plan.
- In response to DFO’s recommendation that the Proponent develop a response plan to absent juvenile Char downstream of culvert BG-50, Baffinland noted that it would continue to engage with the DFO in 2019 to develop and implement corrections for fish passage concerns such as the ones at culvert BG-50. Baffinland also noted that it will provide an update to DFO once the works are completed.

2.3.1.6 Summary of Baffinland’s Response to Comments Received from PC:

- With respect to the recommendation that the Proponent replace the term “Ice-Management Vessel” with “Ice-Breaker”, Baffinland noted that the *MSV Botnika* is an ice-breaking vessel used by Baffinland to escort ore carriers on the shoulder shipping seasons. Baffinland also stated that its intentions for that vessel in the 2019 season were similar to those of 2018.

- Regarding observations that some ships exceeded the 9-knot speed limit, Baffinland stated that 2018 was the first year where all vessels were required to follow this speed limit. Further instructions have been given to vessels to emphasize the need to conform to these limits, throughout 2019 Baffinland would investigate non-compliance to maximize adherence to these restrictions.
- In response to recommendations that Baffinland produce a tracking table detailing the changes in each monitoring program, how statistical analysis has accounted for these changes and EIS compliance has been determined, Baffinland stated that the requested information is already provided in the Annual Monitoring Reports and the MEWG meeting minutes. Baffinland expressed that an extra table would be redundant and is not warranted at this time.

2.3.1.7 World Wildlife Fund (WWF)

WWF provided comments regarding the 2018 Annual Report as indicated in [Table 1](#) and further expressed its concerns regarding the absence of an adaptive management framework to identify and appropriate mitigate impacts to the marine mammals and terrestrial wildlife. WWF also stressed the importance of having a Project Monitoring Framework in place for the Mary River Project to guide the development of indicators and thresholds for marine effects, which would in turn inform adaptive management of the Project.

Summary of Baffinland's Response to Comments Received from WWF:

- With respect to the concerns regarding a lack of adaptive management plan, Baffinland acknowledged that the reported narwhal abundance in 2018 may not be temporary and has scaled up their monitoring in 2019 in order to evaluate the observed change. Baffinland stated that they have provided a draft list of early warning indicators to the MEWG.
- Regarding WWF's request for the Proponent to outline how MEWG input has been factored into monitoring Programs, Baffinland indicated that MEWG input has been incorporated and caused several changes to methodologies used such as: geographical expansion of Aquatic Invasive Species monitoring program, use of new protocols for seabird surveys. Baffinland also noted that further examples were in the NIRB 2018 Annual Report.
- In response to recommendation for the Proponent to outline its marine mammal monitoring plans up to five (5) years in advance to ensure that consistent monitoring is undertaken, Baffinland stated that their monitoring plans are living documents so that they can be adjusted and changed as new information becomes available. Baffinland reported that these programs are updated in consultation with the QIA, MHTO and the MEWG and this approach is necessary to allow for flexibility in the approaches taken.

2.3.1.8 NIRB's Review of Baffinland's 2018 Annual Report

The NIRB has reviewed Baffinland's 2018 Mary River Project Annual Report and provides the following comments.

Baffinland has also provided a summary of its compliance with terms and conditions pertaining to the Mary River Project Certificate, but in general the Proponent has not fully and consistently reported on how the current environmental and socio-economic effects of the Mary River Project compare to the impacts as predicted in the FEIS, ERP, and the Production Increase for most of the key ecosystemic and socio-economic parameters associated with the Project for the following subjects:

- Aquatic/Freshwater Environment
- Marine Environment and Monitoring
- Terrestrial and Wildlife Monitoring
- Noise
- Air Quality and Climate Change
- Permafrost
- Socio-economic impacts

The NIRB agrees with QIA, GN, CIRNAC, ECCC, PC and WWF that the main document of the 2018 Annual Report contains inconsistencies in monitoring programs, insufficient responsiveness to Marine, Terrestrial and Socio-economic Working Group. The NIRB also agrees that the report produces questions regarding the effectiveness of vegetation, caribou and dust monitoring programs. The NIRB would like to advise Baffinland that future Annual Reports should summarize, interpret, and discuss the results of all environmental monitoring as required in the Project Certificate in the main document of the Annual Report. Detailed data, results, and analysis can be presented within appendices; however, the reader should be able to understand the results, the accuracy of impacts that were predicted in the FEIS and the effectiveness of migration measures upon reading the main document. Without these general discussions and summaries, it is difficult for the Board and other reviewers to ascertain whether or not impacts are being observed as a result of the Mary River Project and to determine whether observed impacts or reported data are in line with the predictions provided within the FEIS and whether or not additional monitoring or mitigation needs to be proposed.

Please also note that in future Annual Reports monitoring results should be compared to FEIS/amendment predictions and applicable permit and license requirements. Management Plans and program summaries should provide a summary of activities that occurred during the reporting year applicable to management plans/programs in place, and the annual report should make recommendations on the following:

- How existing impacts will be resolved or minimized;
- How non-compliance and/or impacts will be avoided in the future;
- Whether the monitoring program is still sufficient and effective; and
- How to enhance the monitoring program, if required.

The NIRB notes that Baffinland has submitted most of their required plans, however, these are often included as appendices to Annual Reporting documents. For Parties to be able to find the desired plans to assess compliance, these documents should be submitted as separate documents to ease accessibility.

- The NIRB requests Baffinland submit any updates to their monitoring plans and reports NIRB's Public Registry, as well as providing copies to other interested parties.

3 NIRB SITE VISITS- MARCH AND AUGUST 2019

As an integrated part of the NIRB's continuous monitoring program of the Project, the NIRB visited the Mary River site between March 26-28, 2019 (Winter Site Visit) and August 6-9, 2019 (Summer Site Visit). For a comprehensive review of the NIRB's 2019 site visits and observations, please refer to the NIRB's 2019 Mary River Site Visit Reports (Winter⁴ and August⁵). The NIRB also conducted an information sessions Igloolik after the August site visit to provide updates to community members regarding the results of the Board's monitoring program for the Mary River Project. The concerns and issues expressed by community members during this meeting has been included Summer Site Visit Report. The following specific observations were noted during the 2019 site visits.

Terrain Stability Issues

While on site, the Monitoring Officers noted several instances where terrain appeared visibly unstable and was eroding potentially due to permafrost degradation. The first instance was along the Tote Road where the road embankment near kilometers 29-32. The second location with erosion concerns is the sewage outfall area. The hill where the outfall pipes are located has also begun to degrade and will require corrective action. The third instance of noticeable erosion is at the borrow source #2 at KM 97. Additionally, Monitoring Officers recommended that rip-rap be installed at the sewage discharge in order to minimize safety risk and prevent further degradation of the land.

Steensby Camp

During the 2016 summer NIRB site visit, the NIRB viewed the Steensby camp which has been placed into temporary long-term closure. The NIRB returned to the Steensby site in 2018 and noted that and several seacans had been removed since the NIRB's last visit. However, it was observed that several of the accommodation buildings were torn and the insulation was being blown onto the tundra. Further, Monitoring Officers noted that site Weatherhavens and seacans were left open and appeared to contain chemicals and garbage bags which can be an animal attractant. Baffinland noted to NIRB staff that this site is now largely used as a fuel cache for Ege Bay exploration activities (NIRB File No. 18EN026).

Dust Emissions

During the NIRB's August 2019 site visit, staff noticed an improvement in the amount of dust produced from the crusher area as well as the ship loader. Based on previous NIRB

⁴ NIRB Public ID No.: 326537

⁵ NIRB Public ID No.: 327052

recommendations, Baffinland has installed a series of shrouds along the crusher belts and bellows at the mouth of crusher and has extended the ship loader shoot further into the hull of the ships. Together, this has greatly reduced the amount of dust emissions generated from the vicinity of the crusher area. However, while on site the Monitoring Officers observed consistent large dust plumes on both the Haul and the Tote Roads and did not observe any application of dust suppression.

Waste Management

During the NIRB's August 2019 site visit, it was again noted that solid waste materials were generally properly contained within the landfill, although the incomplete fencing of the landfill continues to be a recurring issue and this lack of fencing does not meet the requirements of Term and Condition 64 of the amended Project Certificate.

Baffinland staff stated that additional chain-link fencing was being shipped and would arrive during the 2019 sealift; however, fencing would only be used on the north and west sides of the landfill given the prevailing wind conditions. The fence has been partially installed in a 300 metre segment only along the west side of the landfill.

On August 8, 2019 during the site close out meeting, the Monitoring Officers recommended that Baffinland provide updated information on how to address the recurring fencing issues. The Monitoring Officers discussed that the information should include details on Baffinland's progress made to date on the fence, along with a plan outlining dates for when the landfill will be permanently enclosed. Baffinland committed to supplying this information by August 23, 2019. The NIRB received Baffinland's response on August 26, 2019 ([Appendix B](#); of the NIRB's August site visit report) along with information related to other topics discussed during the site visit including dust suppression, Steensby Camp update, Incinerator Building status, Tote Road and effluent line stability, and landfarm update.

The NIRB received a second memo on September 27, 2019 which included further follow-up information from Baffinland including follow-up photos and an interim landfill enclosure plan.

In January 2019, NIRB staff conducted a tour of the seven (7) North Baffin communities to collect community thoughts on Baffinland's "Phase 2 Development" proposal. During this tour, NIRB also collected general feedback regarding the monitoring of the Mary River Project and these comments can be found in the Community Information Sessions Summary Report⁶; however, the NIRB has considered them throughout the monitoring report.

4 AREAS REQUIRING FURTHER STUDY

The NIRB would like to highlight some items that would assist the Proponent in moving towards achievement with its project certificate. These items are either chronic concerns that have been

⁶ NIRB Public ID No.: 324849

noted through biannual site visits, or unsatisfied items from previous years Board recommendations.

Steensby Camp

During the NIRB's 2019 August site visit the NIRB observed that several of the accommodation buildings at Steensby were torn open and that insulation was being blown onto the tundra. Further, NIRB staff noted that some of the accommodation camp doors seacans were left open and appeared to contain chemicals and waste bags. Under Baffinland's Interim Closure and Reclamation Plan, Steensby Inlet is considered a long-term temporary closure site due to inactivity of more than one year. As part of this plan, Baffinland committed to maintain the site and keep the area in a secure condition and any wastes should be removed.

- The NIRB is requesting Baffinland manage the Steensby site as per the long-term temporary closure policy under its Interim Closure and Reclamation Plan. This shall include ensuring that the accommodations buildings are kept in a manner that they do not disturb the surrounding tundra, all chemicals and wastes are removed from the buildings, any wind-blown debris is removed from the tundra and the all seacans on site are closed to prevent animal attraction. The NIRB is requesting an update on the clean-up of this site in Baffinland's 2019 Annual Report.

Reportable Spills

Pursuant to Terms and Conditions 17, 24, and 46 of the Project Certificate, Baffinland is required to ensure that all Project effluent should satisfy discharge requirements of the relevant regulatory authority as outlined in their Fresh Water Supply, Sewage and Wastewater Management Plan as well as the Metals and Diamond Effluent Regulations Emergency Response Plan prior to discharge. As noted in their 2018 Annual Report, Baffinland stated had several exceedances in their effluent from fuel storage run-off areas, the Waste Rock Facility and several other large sewage and fuel related spills outlined in Table 4.3 of their 2018 Annual Report. Baffinland stated when it reported these 44 reportable items that protocols from Baffinland's Sewage and Waste Water Management Plan as well as their Spill Contingency Plan were followed to minimize environmental impacts.

- The NIRB is requesting that Baffinland clarify what each of the events were listed in the table and whether there was a discharge or a batch exceedance as it processed the effluent and it did not meet discharge criteria. It is requested that the volumes be reported in litres vs cubic meters for readers. Information related to each of these events, how they were handled and how Baffinland has addressed the issue through changes to site practices, new operations or new equipment remains unclear to the NIRB. Therefore, the NIRB is requesting an update on the 2018 Effluent exceedances as well as any preventative actions taken or adaptive management in plans related to these 44 spills within 30 days of receiving this report and that Baffinland include this information within all its annual reports in the future.

Helicopter Flights

Term and Conditions 59 and 71 of the Project Certificate requests the Proponent to require all project related aircraft to maintain minimum altitudes to minimize impacts to wildlife and Inuit harvesters. In their 2018 Annual Report, Baffinland indicated that they contracted pilots to complete flight logs after each flight detailing any deviations from the minimum altitudes or restricted areas (bird sanctuaries or walrus haul outs). Baffinland indicated that compliance with these restrictions was 92% in 2018; however, low altitude helicopter flights and their effects on wildlife remain an outstanding concern for the GN through both their review of the 2018 Annual Report and discussions during TEWG meetings.

- The NIRB suggests Baffinland continue to closely monitor and record flight logs as well as investigate any deviations in flight altitude or location to further document these deviations and justifications. The NIRB is requesting that the 2019 Annual Report include not only the percent of compliance met, but also a justification for any low-altitude flights recorded by pilots. Further, a year over year comparison of the flights to demonstrate to the reader the progress Baffinland's success is required.

Terrain Stability Issues

During the commenting period on the 2018 Annual Report the NIRB received comments from QIA and CIRNAC regarding the status of borrow pits, Tote Road, and site infrastructure related to the impacts of permafrost thaw. The NIRB observed these areas and had similar concerns and all parties agree that it is important to have Tetrattech Engineering continue to include these in the monitoring program. However, CIRNAC commented specifically that permafrost does not appear to be a priority through the geotechnical program as there appears to be no review or comments on available ground temperature monitoring data. QIA commented that it was not aware of how permafrost was monitored and what localized permafrost degradation along the Tote Road and Mine Haul Road do not include any information related to location or investigations. As the maintenance of Permafrost integrity is of utmost importance for the site reclamation, it is important to understand Baffinland's approach to permafrost monitoring.

- The NIRB requires Baffinland develop maps and tables indicating the location and degree of permafrost degradation and submit them to the NIRB within 30 days of receipt of this report.
- Further, if it does not exist, the NIRB requests a timeline to develop a permafrost monitoring plan or inform the NIRB where the information can be found on permafrost monitoring at the Mary River Mine Site. This program should include, but is not limited to, a program to collect data from ground temperature cables installed at the mine site and port site in order to monitor conditions in constructed infrastructure. The NIRB expects either the information or the timeline to develop a permafrost monitoring program within 30 days of receipt of this report.

5 FINDINGS

The objectives of the NIRB's monitoring program as indicated in Section 12.7.2 of the Nunavut Agreement include:

- a) To measure the relevant effects of projects on the ecosystemic and socio-economic environments of the Nunavut Settlement Area;
- b) To determine whether and to what extent the land or resource use in question is carried out within the predetermined terms and conditions;
- c) To provide the information base necessary for agencies to enforce terms and conditions of land or resource use approvals; and
- d) To assess the accuracy of the predictions contained in the project impact statements.

During the 2018–2019 monitoring period, Baffinland demonstrated compliance with most of the reporting requirements as contained in the Project Certificate, and as applicable to the current phase of the Mary River project; however, the Board notes several deficiencies with respect to some monitoring items as pertaining to terrestrial and marine environments including mitigation measures across the Project site. Pursuant to the NIRB's 2018 Recommendations to the Proponent, the Board has identified several outstanding items requiring follow-up action by Baffinland in order to ensure that Baffinland achieves full compliance with the Mary River Project Certificate in 2019. The Board recommendations requiring further follow up:

DUST

At the time of the August 2019 site visit, the NIRB staff noted that dust emissions, including visible dust plumes generated from the crusher plant were significantly reduced in comparison to previous monitoring years. Proper engineering designs and controls have been implemented by Baffinland and have reduced emissions at the crusher plant as well as the addition of chutes to further enclose particles during ship loading. During the March 2019 site visit, NIRB staff noted significant dust deposition around the site and on the sea ice at Milne Inlet resulting from Ore stockpiling activities; however, in August of 2019 as much as the sea ice was melted prior to the visit, dust around the site appeared to be reduced with notable reduction in dust being disbursed by ship-loading activities. However, dust at Milne Port and along the Tote Road continue to be an ongoing concern.

During the commenting period for the 2018 Annual Report, the Qikiqtani Inuit Association, the Government of Nunavut, and Crown-Indigenous Relations and Northern Affairs Canada expressed concerns related to the dust program at the Mary River site. In the subsequent written response to items discussed during the 2019 August site visit, Baffinland stated it had conducted a micro trial of Dust Stop in August 2019 on the Mine Site and Tote Road from km 103.5 to 97 to determine efficacy of the product on site. Baffinland observed improved dust suppression through the application zones and Dust Stop also showed signs of water shedding during rain events supporting road sealant and application lifespan. In September 2019 once additional Dust Stop was received, Baffinland stated it would be implementing an expanded trial in order to assess success in a larger area and if deemed successful, Baffinland would procure more to be delivered in the 2020 sealift.

Fish Passage and Sampling

Pursuant to Term and Condition 47 of the Project Certificate, Baffinland is required to ensure that all Project infrastructure in watercourses are designed and constructed in such a manner that they do not unduly prevent and limit the movement of water in fish bearing streams or rivers. In their 2018 Annual Report, Baffinland has noted that 2 crossings (CV-111 and BG-29) contained physical obstructions and a total of seven (7) culverts were perched. Of those seven (7), one (BG-50) prevented fish passage. Board Recommendation #8 from 2018 relates to concerns regarding fish crossing at that same culvert (BG-50), despite receiving an update from Baffinland referencing general repairs of crossings to fish bearing streams, culvert BG-50 remains an outstanding concern.

Term and Condition 48(a) requires Baffinland to provide plans to conduct additional surveys for the presence of Arctic char in freshwater bodies and implement ongoing monitoring of Arctic char health in areas affected by the Project in consultation with the Mittimatalik Hunters and Trappers Organization (MHTO). While Baffinland noted a significant effort to capture and assess the health of Arctic char in associated water bodies through its 2018 Annual Report and has methodologies outlined in its Aquatic Effects Monitoring plan, there has been little indication of this work being performed in consultation with the MHTO.

Marine Mammal Monitoring Protocol

Baffinland is required pursuant to Terms and Conditions 110 and 111 of the Mary River Project Certificate to develop a monitoring protocol to prevent impacts to marine mammals from Project shipping activities in consultation with the Marine Environment Working Group (MEWG), and to determine appropriate early warning indicators that will ensure rapid identification of negative impacts along the shipping routes. Baffinland has several marine monitoring programs outlined in their Shipping and Marine Wildlife Management Plan as well as their 2018 Annual Report; however, none of these documents clearly outline the required protocol and the 2018 Annual Report does not include any information regarding the timeline to complete the plan nor how feedback from the MEWG would be incorporated into any marine plans. In the meeting minutes that Baffinland included in the 2018 Annual Report, it is noted that several MEWG meeting discussions have revolved around this topic of early warning indicators for marine mammal health and development of thresholds; however, to date, no definitive conclusions have been provided.

Survey of Baseline Metal Levels in Foraging Caribou

Term and Condition 35 requires that Baffinland undertake monitoring of baseline metal levels in organ tissue from caribou harvested within the local study area prior to commencing operations. In their 2018 Annual Report as well as the Terrestrial Environment Mitigation and Monitoring Plan, Baffinland indicated that due to the low population of caribou near the Project, they deem that this condition is not applicable to the current monitoring period. In respect of the current limitations imposed on caribou hunting by the Government of Nunavut since January 1st, 2015, the Board still expects that once the ban is lifted, these experiments and participation from either regulatory agencies or the Terrestrial Environmental Working Group be completed.

Groundwater Management

Term and Condition 17, 20, and 23 of the Project Certificate states that Baffinland is required to develop and implement a Groundwater Monitoring and Management Plan to monitor, prevent and/or mitigate the potential effects of the Project on groundwater resources. In the 2018 Annual Monitoring Report, Baffinland indicated that a groundwater monitoring program was implemented at various Mine Site locations and select water samples collected downstream of active quarries showed elevated levels of ammonia and nitrate levels when compared to baseline measurements and furthermore that the 2018 groundwater monitoring sample sizes were very low resulting in a limited data set and a limited ability to identify long-term trends. To date, the management plan has not been completed nor has there been any timeline presented by Baffinland to complete this plan and groundwater monitoring has not been that successful to date. The Plan should include a consistent, site-wide groundwater monitoring program for all major project facilities likely to affect groundwater resources (mining, landfill, etc.) as well as increased sampling efforts for the Groundwater Monitoring Program as currently it is not able to identify any trends.

Waste Management

During the March and August 2019 NIRB site visits, it was observed again that the current fence at the landfill was insufficient in containing wind-blown debris and not sufficient to eliminate carnivore access to the area. Pursuant to condition 64, Baffinland is required to have complete fencing around their landfill unless it can present an alternative to a fence to the Board for consideration. The Board notes that the Waste Management Plan (2018) submitted to the NIRB stated that the landfill only required a fence for windblown debris which does not match the project certificate requirements for this Project. The NIRB staff on the 2019 site visits noted that the condition of the fencing around the landfill had not improved compared to previous years as Baffinland has yet to install a complete long-term fence as recommended by the NIRB in 2014, 2015, 2016, 2017 and 2018. Further in 2019 NIRB staff observed wildlife (e.g., foxes) scavenging within the landfill and noted it in the 2019 August Site Visit Report. NIRB staff discussed during the site visit the lack of a fence and Baffinland committed to submitting plans for the construction of a fence to enclose the landfill and commence construction as materials were on the 2019 sea lift; on August 26, 2019 Baffinland submitted the plans for a full fence around the landfill in its written response to the NIRB following the site visit.

Cross- Cultural Training

During the Final Hearing for the original Mary River Project in 2012, the Board expressed concerns regarding the lack of cross-cultural training provided to non-Inuit staff as Baffinland was not certain where the majority of the staff for the site would be coming from.⁷ Since the project was originally approved, NIRB continues to be concerned about the ongoing frustration from Nunavut communities resulting from Baffinland not meeting its local hiring targets in addition to challenges with retention of these local hires. The Board would like to stress the importance of cross-cultural training provided by Baffinland to non-Inuit staff to ensure an inclusive work environment for all employees.

⁷ NIRB Final Hearing Report for Baffinland's Mary River Project (September 14, 2019); ID No. 286425

Withholding Recommendation on Project Certificate Audit

Term and Condition 179c was added to the Mary River Project Certificate in October 2018 as required by the Minister of Intergovernmental and Northern Affairs and Internal Trade, representing several other Responsible Ministers, when they temporarily approved the production increase amendment “to ensure that all commitments made by the proponent with respect to the 2018 production increase and delivery of benefits to Inuit are adhered to, and, can be determined through a body of evidence”. In addition, the audit was to be completed biannually. The NIRB did not receive the third-party audit within the 2018-2019 reporting period as it was received October 2, 2019, which did not allow sufficient time for review and incorporation of these materials into this current monitoring report and associated Board recommendations.

6 SUMMARY

Baffinland commenced construction of the Mary River Project in May 2013, and to date the Project is being conducted as committed to in the Final Environmental Impact Statement for the Early Revenue Phase and Production Increase Addendum. Since issuance of the original NIRB Project Certificate in December 2012 and the amended certificate on May 28, 2014 and October 30, 2018, Baffinland has continued to work towards compliance with the Terms and Conditions of the Project Certificate that apply to the current phase of the development of the Mary River project. However, several issues noted during the NIRB’s site visits, and as discussed throughout this report remain outstanding, which require Baffinland’s attention as well as corrective actions. These issues are further addressed in the Board’s 2019 Recommendations issued to the Proponent.

Despite the current review process for the “Phase 2 Development” proposal by Baffinland, the Board expects that Baffinland devote sufficient time and attention to addressing the recommendations accompanying this monitoring report to ensure full compliance with Project Certificate No. 005 is achieved. Pursuant to *Nunavut Agreement* Sections 12.7.2, 12.7.3 and s. 112(1) of the *Nunavut Planning and Project Assessment Act (NuPPA)*, the NIRB will continue to work with Baffinland and other authorizing agencies to undertake the required evaluation of Project information, conduct and coordinate monitoring efforts, and to review results and Project compliance in accordance with the requirements set out in the Mary River Project Certificate No. 005.

Prepared by: Cory Barker, M.Sc.
Title: Technical Advisor I
Date: October 25, 2019
Signature:

Handwritten signature of Cory Barker in blue ink.

Reviewed by: Kelli Gillard
Title: Manager, Project Monitoring
Date: October 25, 2019
Signature:

Handwritten signature of Kelli Gillard in blue ink.

Appendix I: BAFFINLAND’S FOLLOW-UP TO 2018 BOARD RECOMMENDATIONS

No.	NIRB Comment	NIRB Recommendation	Baffinland Response	Concordance to 2018 Annual Report
1	<p><u>Climate Change Strategy</u></p> <p>Baffinland is required pursuant to Condition 3 of the Project Certificate to provide interested parties with evidence of continued initiatives undertaken to reduce greenhouse gas (GHG) emissions from the Project area. Within its 2017 Annual Monitoring Report to the NIRB, Baffinland reported that it calculated the annual GHG emissions from the Project site; however, the NIRB notes that the Proponent did not include any information or documents substantiating how it has implemented site-specific initiatives to reduce GHG emissions. Further, the NIRB’s 2017 Board Recommendation #2, the Board requested that Baffinland provide updates within the 2017 Annual Report regarding its climate change strategy noting any specific activities it has undertaken to reduce GHG emissions from the Project sites. The NIRB reminds the Proponent that the reporting requirement for site-specific initiatives for GHG reduction has not diminished in importance and continues to be a requirement for the Early Revenue Phase of the Mary River Project.</p>	<p>The Board requires that Baffinland report on its development and implementation of a climate change strategy for the Early Revenue Phase of the Mary River Project, and discuss any additional efforts made to comply with Project Certificate Term and Condition 3 of the Project Certificate to date. Recognizing that significant deferral or delay in implementing a climate change strategy and greenhouse gas (GHG) emissions reduction measures for the Project could result in a finding of non-compliance, Baffinland is encouraged to describe any ongoing activities or planned initiatives outside of a formal strategy or plan designed to reduce greenhouse gas emissions from the Project.</p> <p>It is requested that Baffinland provide its report to the Nunavut Impact Review Board within 90 days.</p>	<p>Baffinland provided NIRB with a copy of the Baffinland Climate Change Strategy on February 8, 2019. Information regarding initiatives undertaken by Baffinland to date to comply with the objectives of PC No. 3 were also provided in the covering letter to NIRB that accompanied submission of the Climate Change Strategy. A description of these initiatives has also been provided in the NIRB Report.</p>	PC Conditions No. 2, 3 and 4
2	<p><u>Dust Management</u></p> <p>In reviewing Baffinland’s 2017 Annual Monitoring Report to the NIRB, the Qikiqtani Inuit Association (QIA) specifically noted that the annual terrestrial dustfall exceeded the predicted threshold levels at all but one of the monitoring sites at Milne Port and within 30 metres (m) and 1000 m on either side of the Tote Road. Further, the QIA noted that modelling predictions in the 2013 Final Environmental Impact Statement (FEIS) Addendum for the Early Revenue Phase (ERP) of the Mary River Project underestimated dustfall levels. Although Baffinland clarified that these exceedances occurred despite dust suppression efforts using applications of water and calcium carbonate, the QIA noted that the amount of dust entering the aquatic receiving environments directly as dustfall and in runoff from surrounding areas is unknown, and that there is no information available regarding how the potential for increased dustfall levels and applications of calcium carbonate dust suppressants influence aquatic sedimentation rates and affect aquatic biota along the Tote Road and in Philips Creek. Further, the QIA also commented that Baffinland’s 2017 annual reporting did not provide information on the quantity of dust entering the aquatic environment or its effects.</p>	<p>The Board requires that Baffinland revise the dustfall modelling predictions presented within the 2013 Final Environmental Impact Statement (FEIS) Addendum for the Early Revenue Phase (ERP) of the Mary River Project with data collected from site-wide monitoring programs to date and reassess the potential impacts of dust on the aquatic receiving environment to inform ongoing dust management efforts onsite. Further, the Proponent is directed to implement long-term monitoring programs for dustfall and specifically assess potential sediment deposition, impacts on water quality, impacts to biota at fish-bearing streams and lakes along the Tote Road (including at Phillips Creek), and in the marine environment downstream of the creek outlet.</p> <p>It is requested that Baffinland report back on its implementation of these items within the Proponent’s 2018 Annual Report to the Nunavut Impact Review Board.</p>	<p>Baffinland acknowledges that fugitive dust emissions for the Project have exceed predictions presented in the FEIS. The intent of the monitoring program is to assess Project effects against the predictions included in the FEIS. Updating the predictions does not improve the understanding of the effects assessment – instead actual data collected will determine if the potential effects have occurred as a result of the observation of levels above predictions.</p> <p>To date, Baffinland has implemented a robust dustfall monitoring network at the Mine Site, Milne Port and along the Tote Road. Baffinland has included sediment deposition sampling as part of the Aquatic Effects Monitoring Program (AEMP) at the Mine Site, and the Marine Environment Effects Monitoring Program (MEEMP) at Milne Port. Results of the AEMP are used to represent broader trends that could be occurring in and near the Project site, where effects are less acute (i.e. If effects are negligible at the Mine Site, it is expected that they will be even less prominent at other Project locations where fugitive dust emissions are less substantive). Results of the MEEMP are used to assess the trends associated with the influence of Phillips Creek and the project activities (i.e. stockpiling and shiploading) at Milne Port.</p> <p>In 2019 Baffinland will be implementing the Tote Road Monitoring Program to assess water quality at select fisheries crossings, areas of recent construction, and areas historically prone to sedimentation events. This program was designed in consultation with QIA throughout 2018 to formalize and improve upon the existing water quality monitoring conducted on the Tote Road.</p>	PC Conditions No. 10, 21, 46, 54 and 58

No.	NIRB Comment	NIRB Recommendation	Baffinland Response	Concordance to 2018 Annual Report
3	<p><u>Dust Management</u></p> <p>In reviewing Baffinland’s 2017 Annual Monitoring Report to the NIRB, the Qikiqtani Inuit Association (QIA) specifically noted that the annual terrestrial dustfall exceeded the predicted threshold levels at all but one of the monitoring sites at Milne Port and within 30 metres (m) and 1000 m on either side of the Tote Road. Further, the QIA noted that modelling predictions in the 2013 Final Environmental Impact Statement (FEIS) Addendum for the Early Revenue Phase (ERP) of the Mary River Project underestimated dustfall levels. Although Baffinland clarified that these exceedances occurred despite dust suppression efforts using applications of water and calcium carbonate, the QIA noted that the amount of dust entering the aquatic receiving environments directly as dustfall and in runoff from surrounding areas is unknown, and that there is no information available regarding how the potential for increased dustfall levels and applications of calcium carbonate dust suppressants influence aquatic sedimentation rates and affect aquatic biota along the Tote Road and in Philips Creek. Further, the QIA also commented that Baffinland’s 2017 annual reporting did not provide information on the quantity of dust entering the aquatic environment or its effects.</p>	<p>The Board requests that Baffinland revise the dust isopleth model using existing dustfall collection data and make revisions to the existing Dust Management and Roads Management Plan to include “specific adaptive management measures” to be implemented should monitoring observations confirm that dust deposition from the Project is greater than initially predicted.</p> <p>It is requested that Baffinland highlight revisions to the dust isopleth model within the Proponent’s 2018 Annual Report to the Nunavut Impact Review Board.</p>	<p>Baffinland continues to apply dust suppression and mitigation measures to minimize fugitive dust emissions as a result of the Project to the fullest extent possible. Furthermore, in 2017 and 2018 Baffinland observed decreases in dustfall at the Project site, which may be partially or wholly attributed to increased dust suppression measures implemented by Baffinland.</p> <p>Dust mitigation measures were implemented in 2018 and six (6) additional remote dustfall sites were installed along the Tote Road in consultation with QIA and the MHTO and will be monitored for additional information on dustfall in 2019. Additionally, in 2019 Baffinland will be implementing the Tote Road Monitoring Program to assess water quality at select fisheries crossings, areas of recent construction, and areas historically prone to sedimentation events. This program was designed in consultation with QIA throughout 2018 to formalize and improve upon the existing water quality monitoring conducted on the Tote Road.</p>	<p>PC Conditions No. 10, 21, 46, 54 and 58</p>
4	<p><u>Noise and Vibration Monitoring</u></p> <p>Condition 14 of the Project Certificate requires Baffinland to conduct noise and vibration monitoring at Project accommodations during all phases of the Project, particularly during the summer and winter seasons. In Baffinland’s 2017 Annual Monitoring Report to the NIRB, the Proponent stated that in June 2017, one (1) room at the Mine Site and two (2) rooms at the Milne Port site were tested for noise and vibration levels. Baffinland further reported that due to equipment malfunction and availability issues that could not be resolved before the end of 2017 it was unable to conduct the scheduled winter noise and vibration monitoring during the 2017 period. The NIRB’s 2017 Board Recommendation #5 had specifically requested that Baffinland improve its noise and vibration monitoring program across Project sites; however, during the current reporting year the NIRB noted that the recommended changes to the noise and vibration monitoring program has yet to be fully implemented and is still data deficient. The NIRB also questions the validity of Baffinland’s conclusion regarding the seasonal variation of noise/vibration levels between the two (2) sites as indicated in the 2017 Annual Report due to the relatively low sample size (Mine site=1; Milne Port=2) and lack of consideration for seasonal changes in noise/vibration levels across the project sites.</p>	<p>The Board requires that Baffinland develop an action plan to comply with Project Certificate Term and Condition 14 by improving noise and vibration monitoring at site through improved seasonal sampling and increased sample sizes and frequency of monitoring of noise and vibration levels, particularly at the Mine site and Milne Port accommodation facilities. The action plan must highlight measures designed to ensure that noise and vibration levels continue to be monitored across the Project and the safety of workers maintained in the event of additional equipment malfunctions in future. Baffinland must also provide an analysis of any observed seasonal variation in noise and vibration levels (summer vs. winter) and a discussion of the implication of such variations (if any) on workers’ health and safety onsite.</p> <p>It is requested that this action plan be provided within 30 days’ receipt of the Board’s recommendations.</p>	<p>Adaptive management measures employed in 2018 to reduce noise and vibration near the accommodation complexes included:</p> <ul style="list-style-type: none">• Implementing quiet work hours;• Limiting operation of equipment in the vicinity of accommodation complexes where practicable; and• Relocation of the helicopter landing zone at the Mine Site further away from accommodation complexes during the morning and evening hours of the day. <p>In May and December 2018, accommodations at the Mine Site Complex (MSC), Weatherhaven Camp, and Port Site Complex (PSC) were tested for noise and vibration. During both the summer and winter sampling periods, the average noise levels and maximum vibration exposures for workers were consistently less than the exposure limits set forth in the Mine Health and Safety Act and the European Physical Agents Vibration Directive¹.</p> <p>Baffinland plans to continue its annual Noise and Vibrational testing in 2019 with two seasonal sample events (winter and summer) at five locations per site, and will continue to report the results in the NIRB annual reports. A discussion of seasonal differences will be provided, where applicable.</p>	<p>PC Condition No. 14</p>

¹ Since the Mine Health and Safety Act does not provide specific numerical limits, 8-hour equivalent vibration criteria are taken from the European Physical Agents Vibration Directive – 2002/44/EC.

No.	NIRB Comment	NIRB Recommendation	Baffinland Response	Concordance to 2018 Annual Report
5	<p><u>Groundwater Monitoring</u></p> <p>Project Certificate Term and Condition 23 requires that Baffinland develop and implement a Groundwater Monitoring and Management Plan to monitor, prevent, and/or mitigate the potential effects of the Project on groundwater within the Project area. In the 2017 Annual Monitoring Report, Baffinland indicated that a pilot groundwater monitoring program was implemented, and specifically involved the establishment of shallow groundwater wells up-gradient of the landfill facility. Baffinland further clarified that groundwater was detected and sampled at three (3) monitoring wells down-gradient and one (1) monitoring well located up-gradient of the landfill facility. While the 2017 Annual Monitoring Report noted all the efforts made by the Proponent to implement a groundwater monitoring program near the vicinity of the landfill, the NIRB requests that the Proponent continue to develop a site-wide groundwater monitoring program, and implement a Groundwater Monitoring and Management Plan to monitor, prevent, and/or mitigate the potential effects of the Project on groundwater within the Project area.</p>	<p>The Board requests that Baffinland implement a consistent site-wide groundwater monitoring program which addresses other key project facilities beyond the landfill, likely to affect groundwater resources. Baffinland must develop a Groundwater Monitoring and Management Plan to monitor, prevent, and/or mitigate the potential effects of different Project facilities on groundwater resources within the Project area, as noted in its Surface Water and Aquatic Ecosystem Management Plan approved by the Nunavut Water Board (NWB).</p> <p>It is requested that Baffinland provide an update on its compliance with Project Certificate Term and Condition 23 in the 2018 Annual Report to the Nunavut Impact Review Board.</p>	<p>During 2018, Baffinland continued the pilot groundwater monitoring program initiated in 2017 to confirm program feasibility. During September 2018, Baffinland installed shallow groundwater wells up-gradient and down-gradient of the Mine Site Non-Hazardous Waste Landfill (Landfill Facility) using drive point piezometers. Groundwater wells were established to the depth of permafrost (approx. 1 - 1.5 metres) and water samples were collected at well locations where groundwater was detected. Groundwater was detected at three monitoring wells down-gradient and two monitoring wells up-gradient of the Landfill Facility, although the data set remains too limited to adequately characterize natural groundwater chemistry and hydrogeology or identify any trends, including potential impacts as a result of Project activities of infrastructure at this juncture.</p> <p>Baffinland intends to continue the groundwater monitoring program at the Landfill Facility in 2019 using a methodology consistent with the pilot program implemented in 2018. It is expected that future years of monitoring data will serve to determine the feasibility and utility of the monitoring program and value of the expanding the program to areas beyond the Landfill Facility.</p>	PC Condition No. 23
6	<p><u>Permafrost Degradation</u></p> <p>Baffinland is required pursuant to Project Certificate Term and Conditions 28 to monitor the effects of the Project on the permafrost around the mine development area and implement effective preventative measures to ensure that the integrity of the permafrost is maintained throughout the Project Development Area. In addressing this condition, Baffinland indicated within its 2017 Annual Report to the NIRB that the biannual geotechnical inspections it completed at the Mine Site and Milne Port revealed that the Mary River Polishing/Waste Stabilization Ponds (PWSPs) 1, 2, and 3 have experienced minor overall settlements of the structures and that this minor settlement was restricted to the berms. Additional inspections by Crown-Indigenous Relations and Northern Affairs Canada and Environment and Climate Change Canada staff further identified concerns with respect to seepages flowing from the Waste Rock Sedimentation Pond at the Mine site. Previous site visits by the NIRB noted terrain instability issues around the waste water effluent outflow area at the Mine site area. Evidence of site actions and improvements were noted in these locations during the NIRB site visits, and the Proponent has further indicated that it has retained a third-party consultant to remediate specific permafrost degradation areas during 2017. Despite this effort, the NIRB notes that some historic and localized permafrost degradation areas along the Tote Road and Mine Haul Road have yet to fully benefit from preventative and mitigation measures where they are related to direct project activities.</p>	<p>The Board requires that Baffinland take appropriate steps to address all historic and localized permafrost degradation issues along the Tote Road and Mine Haul Road, including identified terrain instability adjacent to the waste water effluent outflow area.</p> <p>It is requested that Baffinland provide an update on its compliance within the 2018 Annual Report to the Nunavut Impact Review Board.</p>	<p>Project’s activities have led to localized permafrost degradation along the Tote Road that are addressed on an individual basis for optimal remedial efforts. In 2019, Baffinland will continue to address permafrost degradation at the Km 97 Borrow Source. Baffinland plans to continue implementing the borrow source’s progressive reclamation and rehabilitation plan outlined in Appendix B of the borrow source’s approved management plan titled Borrow Source Management Plan – Kilometre 97.</p> <p>To improve historical permafrost degradation issues along the Tote Road, Baffinland will continue to develop and prioritize preventative and mitigation measures to minimize the impacts of the Project’s activities and infrastructure on landforms along the Tote Road. These activities are reflected in Baffinland’s 2019 Work Plan (Baffinland, 2019).</p> <p>Specific permafrost degradation areas adjacent to the Tote Road and Borrow locations were targeted during 2018 through general road maintenance programs and through the continuance of Tote Road Earth Works Execution Plan and original 2013 Hatch designs. Unstable and slumping slopes adjacent to the Tote Road were targeted and remediated with armour stone and slope redesigns. Results from geotechnical investigations conducted in 2018 will be used to support the design of future Project infrastructure.</p> <p>As identified in previous years, Project’s activities have led to localized permafrost degradation along the Tote Road that are addressed on an individual basis for optimal remedial efforts. In 2019, Baffinland will continue to address permafrost degradation at the Km 97 Borrow Source. Baffinland plans to continue implementing the borrow source’s progressive reclamation and rehabilitation plan outlined in Appendix B of the borrow source’s approved management plan titled Borrow Source Management Plan – Kilometre 97.</p>	PC Condition No. 25 and 28

No.	NIRB Comment	NIRB Recommendation	Baffinland Response	Concordance to 2018 Annual Report
7	<p><u>Freshwater Aquatic Environment – Setbacks</u></p> <p>Term and Condition 42 of the Project Certificate requires that the Proponent adhere to setbacks to mitigate impacts of runoff into freshwater aquatic habitats. Within the 2017 Annual Monitoring Report, Baffinland noted that during inspections in 2017, there were instances of construction development within 30 metres of a waterbody. Specifically, the Board notes that in 2017 an incident occurred in Milne Inlet, when a construction pad was built over top of a non-fish bearing stream during winter months, an activity that resulted in a directive from Crown-Indigenous Relations and Northern Affairs Canada for the Proponent to stop work. Although Baffinland noted that it has developed a new ditching system to covey the stream around the pad and subsequently received the appropriate approvals from the Nunavut Water Board, the NIRB reminds the proponent that strict adherence to the requirement to maintain a 30-metre naturally-vegetated buffer between the mining operation and adjacent water bodies continues to be a requirement for the approved project.</p>	<p>The Board requests that Baffinland provide an update on its protocol for educating all contractors and workers on site of the requirement to adhere to a 30 metre (m) buffer zone or setback distance from local waterbodies, including any enhancements made in reaction to recent violations of this requirement. Baffinland is further directed to highlight any instances of development within 30 m of a water body within future reporting to the NIRB, with a discussion of associated follow-up.</p> <p>It is requested that this update be included within the 2018 Annual Report to the Nunavut Impact Review Board.</p>	<p>Baffinland continues to perform bi-weekly inspections to ensure all Project-related operations are at a distance greater than 30 metres from any water body, except where authorized under the Type A Water License and DFO Letters of Advice. If infractions are discovered, responsible departments for development areas are actioned to remove materials or infrastructure, and to reclaim the developed area. New proposed development areas must be approved by the Baffinland Site Environment Department to ensure the area has a setback of 30 metres from the high water mark of natural water bodies. Consultants preparing design drawings for new infrastructure are also made aware of the requirement. Baffinland conducts annual training on the Environmental Protection Plan (EPP) for superintendents and managers, and orientation training on the EPP for new contractors. The presentation provides an overview of key Project activities and the required natural vegetation buffers to any waterbodies.</p> <p>During internal inspections in 2018, temporary laydown of equipment was sited within 30 m of a water body and responsible departments were actioned to address these issues. Baffinland Site Environment Department followed up with further inspections to ensure that infrastructure was relocated or material was reclaimed.</p>	PC Condition No. 42
8	<p><u>Restrictions to Fish Passage</u></p> <p>Baffinland is required pursuant to Project Certificate Term and Condition 47 to ensure that all Project infrastructure in watercourses are designed and constructed in such a manner that they do not unduly prevent and/or limit the movement of water in fish bearing streams and rivers. Baffinland further observed issues with fish passage and/or habitat at twelve (12) crossings, with three (3) of them showing some form of physical obstruction to fish that was subsequently removed during, or shortly after, completion of the July survey. Baffinland specifically reported that perching or hanging culverts were noted at five (5) crossings and in one case, BG-50, prevented passage of fish. Baffinland further identified four (4) crossing with apparent passage issues as evidenced by damaged culverts that were blocking, or had the potential to block, fish passage. The NIRB notes that the migration of fish species (both upstream and downstream) can be restricted by perched or hanging culvert and may prevent all life stages and all species from passing through the culvert during flows, which may further reduce habitat connectivity by blocking fish access to important spawning and rearing areas such as the mainstream, tributaries, ponds, and lakes.</p>	<p>The Board requires that Baffinland ensure connectivity for fish species is maintained for watercourses and tributaries intersecting with project roads, trails, or other infrastructure. Baffinland must ensure that all existing culverts, particularly those located in fish bearing streams, are properly maintained to enable fish passage. It is further requested that Baffinland provide a summary of its engagement with Fisheries and Oceans Canada to update its fish habitat monitoring program to address issues related to culvert perching and fish passage problems along the Tote Road.</p> <p>It is requested that the Proponent provide this updated information within the 2018 Annual Report to the Nunavut Impact Review Board.</p>	<p>During 2018, Baffinland continued to repair and upgrade water crossings at the Project to improve fish passage and surface water drainage, including five (5) fish bearing water crossings. Baffinland continues to routinely inspect fish bearing water crossings at the Project and address identified concerns. Additional works to address concerns identified in the 2018 assessments are planned for 2019. Remedying fish passage concerns at water crossings remains a top priority for Baffinland to ensure compliance with the Project’s Tote Road Fisheries Act Authorization (NU-06-0084; DFO, 2007). Assessments of fish bearing water crossings will be continued in 2019 as part of the Project’s fish habitat monitoring program.</p>	PC Condition No. 47
9	<p><u>Ballast Water Discharge and Impact Predictions</u></p> <p>Within its 2017 Annual Monitoring Report to the NIRB, Baffinland indicated that it was “partially compliant” with Term and Condition 86 of the Project Certificate which requires that the Proponent use more detailed bathymetry collected from Steensby Inlet and Milne Inlet to model the anticipated ballast water discharges from ore carriers and utilize results of this modeling to update ballast water discharge impact predictions. Baffinland further noted that ballast water dispersion modelling was undertaken in 2014 prior to the start of commercial shipping of iron ore at Milne Port and that the modelling results were used to inform the location of sampling sites for Baffinland’s Aquatic Invasive Species monitoring program which has been undertaken annually between 2014 and 2017. Baffinland stated in its annual report to the NIRB that supplementary oceanographic data collected post-modelling (2014 to present) was not yet used to update or further validate the original dispersion model.</p>	<p>The Board requests that Baffinland utilize all the oceanographic and bathymetric data collected between 2014 and 2017 to develop an updated ballast water dispersion model for the current Project operations, independent of the assessment of the Phase 2 proposal.</p> <p>It is requested that Baffinland provide this updated information within the 2018 Annual Report to the Nunavut Impact Review Board.</p>	<p>As part of the 2019 marine monitoring program, oceanographic data collected in 2018 will be used to validate the improved ballast water dispersion model reflective of current Project operations. This includes the 2018 oceanographic data (extended time series of current and Conductivity-Temperature-Depth (CTD) measurements) (collected in 2018 near Milne Port and Bruce Head, not previously available, as well as additional water level data at the Port and CTD profiles collected throughout Milne Inlet as part of the MEEMP.</p>	PC Condition No. 86

No.	NIRB Comment	NIRB Recommendation	Baffinland Response	Concordance to 2018 Annual Report
10	<p><u>Ballast Water Discharge and Impact Predictions</u></p> <p>Within its 2017 Annual Monitoring Report to the NIRB, Baffinland indicated that it was “partially compliant” with Term and Condition 86 of the Project Certificate which requires that the Proponent use more detailed bathymetry collected from Steensby Inlet and Milne Inlet to model the anticipated ballast water discharges from ore carriers and utilize results of this modeling to update ballast water discharge impact predictions. Baffinland further noted that ballast water dispersion modelling was undertaken in 2014 prior to the start of commercial shipping of iron ore at Milne Port and that the modelling results were used to inform the location of sampling sites for Baffinland’s Aquatic Invasive Species monitoring program which has been undertaken annually between 2014 and 2017. Baffinland stated in its annual report to the NIRB that supplementary oceanographic data collected post-modelling (2014 to present) was not yet used to update or further validate the original dispersion model.</p>	<p>The Board requests that Baffinland actively monitor ballast water discharged from Project vessels to determine the efficacy of exchange and treatment methods and use resulting data to update the invasive species risk analysis and inform adaptive management measures designed to prevent invasive species introductions.</p> <p>It is requested that Baffinland provide an update on efforts undertaken to meet this recommendation within the 2018 Annual Report to the Nunavut Impact Review Board.</p>	<p>Baffinland has developed a comprehensive, stand-alone Ballast Water Management Plan (BWMP) for the Project (available at www.baffinland.com). The BWMP includes a Standard Operating Procedure (SOP) which provides detailed instructions for salinity testing of ballast water tank on carriers calling at Milne Port, including directives for accessing on-board ballast tanks, selecting ballast tanks for testing, equipment set-up and deployment, detailed sampling and data entry procedures, guidance on instrument calibration, maintenance and storage, and reporting requirements.</p> <p>In 2018, all bulk carriers that called at Milne Port during the shipping season were boarded by a Baffinland environmental representative that conducted salinity testing of the ship’s ballast water before it was approved for release in Milne Port and before loading of the carrier could begin. In these instances, a single ballast tank on the vessel was tested for salinity concentration using a calibrated water quality meter (i.e. YSI Pro 30) to confirm that ballast water salinity levels were above 30 ‰ (parts per thousand), prior to being authorized by the port captain to discharge in Milne Port. Salinity levels were consistent with mid-ocean exchange requirements for vessels conducting a transoceanic voyage (salinity of mid-Atlantic seawater, where open-water exchange takes place, is typically in the range of 34-35 ‰).</p> <p>To date, ship ballast water has not been tested for biological composition (e.g. taxonomic screening, # of organisms, indicator microbes). The D-2 standard (treatment) specifies a maximum number of organisms and indicator microbes that are allowed to be discharged to the receiving marine environment according to the schedule set by the International Maritime Organization (IMO). As of March 2019, sampling and analysis methodologies to test for compliance with the D-2 standard have not been fully developed by the IMO yet. It is acknowledged in the IMO guidelines that although significant technical advances and refinements have been made in this area since the adoption of the Convention, there are still numerous issues to be resolved. Administrations are still undertaking research to define the most appropriate methods to test for compliance, and the best way to collect, handle and analyze samples. However, it is expected that in due course, appropriate guidance will become available once full compliance testing regimes are developed and the applicable regulators have had time to gain experience and develop best practice in ballast water sampling and analyses.</p>	PC Condition No. 89

No.	NIRB Comment	NIRB Recommendation	Baffinland Response	Concordance to 2018 Annual Report
11	<p><u>Shoreline Effects and Sediment Redistribution</u></p> <p>Term and Condition 83(a) of the Project Certificate requires that the Proponent identify potential for and conduct monitoring to identify effects of sediment redistribution associated with construction and operation of the Milne Port. Within the 2017 Annual Monitoring Report to the NIRB, Baffinland indicated that the sampling in 2017 suggested there was a significant increase in the percentage of fine sediment at far-field sampling stations (500 meter (m), 1,000 m, and 1,500 m) along the West Transect from 2014 to 2017 and further noted that this change was associated with alluvial depositions from Philips Creek.</p>	<p>The Board requires that Baffinland conduct sediment sampling in 2018 and subsequent years to further evaluate temporal trends and monitor annual sediment transport via Phillips Creek into Milne Inlet, as well as to learn how alluvial transport may be affecting sediment deposition and composition near the head of Milne Inlet.</p> <p>It is requested that Baffinland provide an update on its compliance within the 2018 Annual Report to the Nunavut Impact Review Board.</p>	<p>In 2017, as part of the MEEMP, an increase in fine sediments was reported along the West Transect (extending westward from the existing ore dock towards the mouth of Phillips Creek). In 2018, following the collection of an additional year of data, and a refinement of the model, it was concluded that no persistent increases occurred at the West Transect throughout the 2013-2018 sampling period. The 2018 MEEMP and AIS Monitoring Report presents sediment sampling results over five consecutive years of environmental effects monitoring at Milne Port. Fines content was shown to remain stable between the five years of sampling on the West and East transects, with no consistent between-year increases. On the Coastal Transect, there was an observed increase in sampled percent fines at the 1,000-m and 1,500-m distances between 2013 and 2016. This increase was reflected in the modeled estimates. However, the 2018 data and model results showed no consistent increase relative to the 2014-2017 data collected at the transect. On the North Transect, a significant increase in percent fines was estimated at transect origin between 2014 and 2015, followed by a small decline in 2016 and no further changes throughout 2017-2018. Overall, there were no significant changes in percent fines between 2014 and 2018 on any of the four transects.</p> <p>Aerial imagery shows a delta extending outwards from the mouth of Phillips Creek approximately 500 m into Milne Inlet. This suggests that Phillips Creek plays a role in the geomorphology and sediment transport regime at the head of Milne Inlet. However, additional imagery indicates that sediment deposits are present both to the east and west of the ore dock along the shoreline at the head of Milne Inlet. These sediment deposits indicate that longshore sediment transport occurs, likely driven by freshwater discharge and physical processes in Milne Inlet (i.e. waves and currents) and that this longshore transport also plays a role in the geomorphology and sediment transport regime of Milne Inlet.</p> <p>As a response to Board Recommendation No. 11, Baffinland is considering to conduct a desktop review of available data to evaluate the hydrological, geomorphological and sediment transport regime at the Project site. The desktop-based review will also include a forensic analysis of historical sediment data collected in Milne Inlet in terms of the relation of the sampling periods and the sediment results to freshet events, tidal cycles, open water wind/wave events and similar physical forcing processes.</p>	<p>PC Condition No. 83(a)</p>

No.	NIRB Comment	NIRB Recommendation	Baffinland Response	Concordance to 2018 Annual Report
12	<p><u>Traffic Log and Shipping Information</u></p> <p>Pursuant to Term and Condition 105 of the Project Certificate, Baffinland is required to ensure that measures to reduce the potential for interaction with marine mammals, particularly in Hudson Strait and Milne Inlet, are identified and implemented prior to commencement of shipping operations. The NIRB Project Certificate specifically indicates that such measures could include reduced shipping speeds where ship-marine mammal interactions are most likely, including changes in the frequency and timing of shipping as well as identification of alternate shipping routes. Within the 2017 Annual Monitoring Report to the NIRB, Baffinland indicated that some vessels exceeded the speed of 10 knots when transiting in the Project area and that it is committed to ensuring that in 2018 cargo and fuel vessels will be provided with instructions on how to approach Milne Inlet with speeds between 7-10 knots.</p>	<p>The Board requests that Baffinland update the Bruce Head Shore-based Monitoring Program to study the response of narwhals to vessels at varying speeds in Milne Inlet. The Board further requires that Baffinland report on steps taken to ensure that captains and crews of all Project vessels are provided with advance instruction to approach Milne Inlet with speeds limited to 7-10 knots.</p> <p>It is requested that Baffinland provide an update on its compliance within the 2018 Annual Report to the Nunavut Impact Review Board.</p>	<p>Studying narwhal response to Project vessels travelling at different speeds along the shipping corridor has not been possible to date as Baffinland requires all Project vessels to restrict speeds along the shipping route to 9 knots. Although some vessel speed exceedances were recorded near Bruce Head in 2017 and 2018, the overall number of exceedances was too low to allow for ‘vessel speed’ to be included as a control variable in the integrated analysis.</p> <p>A visual-based behavioural monitoring program at Bruce Head (shore-based monitoring) is being considered by Baffinland for 2019, and if implemented, would look at ways to incorporate a vessel speed component to the study design. This would need to involve some level of coordination with a sub-set of ship operators instructing them to deliberately operate at a set increased and/or decreased ship speed while transiting the study area.</p> <p>As described in PC No. 120, The Shipping and Marine Wildlife Management Plan (SMWMP) and Standing Instructions to Masters provide guidance on ship speeds and ship tracks that should be followed by all Project vessels contracted by Baffinland. The requirements are provided to all vessels procured by Baffinland prior to entry to Eclipse Sound.</p>	PC Conditions No. 105, 120

No.	NIRB Comment	NIRB Recommendation	Baffinland Response	Concordance to 2018 Annual Report
13	<p><u>Shipboard Observer Program</u></p> <p>Baffinland reported to the NIRB that the ship-based surveillance monitoring was discontinued in 2016 due to safety concerns arising from the on-boarding of the observers, and the general lack of success of observers on ships to observe marine mammals during ship voyages. The NIRB notes that Baffinland’s 2017 Annual Report provided no updates on any alternative programs it was considering for monitoring vessel interactions with marine mammals and seabirds during the year; however, Baffinland indicated that a shipboard observer program committee was formed in 2017 with the goal to identify feasible alternatives. Recognizing that an alternative has not yet been identified which has resulted in restrictions to implementation of monitoring for impacts of shipping to marine mammals, while Baffinland continues to seek approvals for increased marine shipping from Milne Inlet, the Board is aware of the potential for increased public concern over unidentified impacts to marine mammals; therefore, the Board encourages Baffinland to prioritize achieving compliance to this recommendation.</p>	<p>The Board requires that Baffinland provide a detailed update regarding the alternative strategy being used to prevent, limit, and monitor for vessel interactions with marine mammals and seabirds. Baffinland must demonstrate that Project vessels are implementing early warning indicators that will ensure rapid identification of negative impacts to marine wildlife along Project shipping routes. This update must include a discussion of comments and concerns provided through the Marine Environmental Working Group when designing and implementing the alternative monitoring strategy, including the selected indicators.</p> <p>It is requested that this update be provided to the Nunavut Impact Review Board within 60 days.</p>	<p>Baffinland described in its response to reviewer comments on the 2017 Annual Report that the shipboard observer program would be reinstated in 2018. Baffinland confirms that the program was implemented as described and split into in two sessions. The first leg of the program was active from July 28 to August 7 and included one technical consultant observer and two Inuit observers. The second leg of the program ran from September 29 to October 17, and included one technical consultant observer and three Inuit observers. The program included conducting marine mammals and seabird counts and any recordable behavioural responses to Project-shipping activities.</p> <p>Consultation on the design of the shipboard observer program occurred with the Marine Environment Working Group (MEWG) meetings held in advance of the field season, including:</p> <ul style="list-style-type: none">• May 17, 2018 – Ship-based observer program planning committee call (included invitations to all members of the MEWG);• June 6, 2018 – MEWG Meeting with members and observers of the MEWG;• June 7-8, 2018 – Pre-shipping season meeting with Hunters and Trappers Organization in Pond Inlet; and• July 12, 2018 –Meeting in Pond Inlet. <p>Subsequent to the June 7-8 meetings, a letter of support for this program was provided by the Mittimatalik Hunters and Trappers Organization.</p> <p>Baffinland also produced a fact sheet, which summarized marine environmental monitoring programs planned for the 2018 season, including an overview of the Ship-based observer program.</p> <p>A one-day training program for Inuit Ship-board observers was held in Pond Inlet on July 18, 2018 in advance of the start of the program.</p> <p>Other vessel management practices implemented in 2018 to minimize potential negative effects to marine wildlife along the Project shipping route included:</p> <ul style="list-style-type: none">• Reducing ship speed to 9 knots from 10 knots along Shipping Corridor;• Ensure vessels follow the shipping route, avoiding key areas such as Koluktoo Bay and the western shoreline near Bruce Head;• Use AIS monitoring system to track vessel speed and movements; and• Improve QA/QC for ballast water sampling.	<p>PC Conditions No. 106, 107, 108 and 123</p>

No.	NIRB Comment	NIRB Recommendation	Baffinland Response	Concordance to 2018 Annual Report
14	<p><u>Marine Environment – Ship Noise</u></p> <p>Baffinland is required pursuant to Project Certificate Terms and Conditions 110 and 111 to develop a monitoring protocol to prevent impacts to marine mammals from Project shipping activities and expected to work with the Marine Environment Working Group (MEWG) to determine appropriate early warning indicator(s) that will ensure rapid identification of negative impacts along the southern and northern shipping routes. In addressing these Terms and Conditions, Baffinland indicated in its 2017 Annual Report to the NIRB that no threshold have been developed for determining if negative impacts due to vessel noise are occurring. The NIRB is aware that the Proponent is currently investigating options to conduct acoustic/visual monitoring program (vessel-based pilot study) near Bruce Head to further evaluate the response of narwhals to shipping.</p>	<p>The Board requires that Baffinland provide a detailed update regarding the alternative strategy being used to prevent, limit and monitor for vessel interactions with marine mammals and seabirds. Baffinland must demonstrate that Project vessels are implementing early warning indicators that will ensure rapid identification of negative impacts to marine wildlife along Project shipping routes. This update must include a discussion of comments and concerns provided through the Marine Environmental Working Group when designing and implementing the alternative monitoring strategy, including the selected indicators.</p> <p>It is requested that this update be provided to the Nunavut Impact Review Board within 60 days</p>	<p>Baffinland described in its response to reviewer comments on the 2017 Annual Report that Baffinland and the MEWG have been holding ongoing discussions related to the development of early warning indicators (EWI) during the:</p> <ul style="list-style-type: none">• November 29 and 30, 2017 MEWG Meeting; and• June 6, 2018 MEWG Meeting. <p>A copy of these meeting minutes are provided as Attachment 5. Baffinland created and distributed an EWI framework development template (Attachment6) to the Working Group and next steps at the September 13, 2018 MEWG meeting.</p> <p>Subsequent information was provided in the form of the EWI template from Parks Canada (PC) and Fisheries and Oceans Canada (DFO).</p> <p>Baffinland also held a consultation session with the Pond Inlet Hunter and Trappers (MHTO) on EWIs on November 29, 2018. Specific information sought from MHTO members was related to how body condition and calving rates are assessed by hunters, what other factors (e.g. killer whales) influence year-to-year population levels of narwhals and monitoring programs that could provide information on EWIs.</p> <p>A preliminary screening of indicator species was discussed during the December 10, 2018 MEWG Meeting based on feedback received from PC, DFO and MHTO. During discussions, it was noted that the development of EWIs was a very difficult exercise and that a confluence of monitoring programs would be necessary to fully define what would be considered an appropriate EWI, and for which species. To aid in upcoming discussions, Baffinland drafted and shared an information sheet with potential indicators and monitoring programs to the Working Group during Q1 of 2019. This information sheet will be used to facilitate ongoing discussions related to EWI development with the MEWG early in 2019.</p> <p>Additional details regarding progress made on the development of key EWIs have been provided in PC No. 110-112.</p>	<p>PC Conditions No. 101, 105, 110, 111 and 112</p>
15	<p><u>Survey and Monitoring of Arctic Char</u></p> <p>Project Certificate Term and Condition 48(a) requires Baffinland to provide plans to conduct additional surveys for the presence of arctic char in freshwater bodies and implement ongoing monitoring of arctic char health in areas affected by the Project. While Baffinland noted that char monitoring activities was described in marine areas at the Port and freshwater near the mine, the QIA specifically noted that the extent of char monitoring in fresh water along the Tote Road in 2017 remain unclear.</p>	<p>The Board requires Baffinland to report on electrofishing efforts undertaken and catches at stream crossings along the Tote Road, including a discussion of survey outcomes and monitoring of arctic char presence, condition, and health.</p> <p>It is requested that this information be incorporated in the 2018 Annual Monitoring Report to the Nunavut Impact Review Board.</p>	<p>In 2018, Baffinland conducted monitoring at fish-bearing crossings along the Tote Road. The emphasis of the 2018 monitoring program was to assess the presence of fish, habitat quality and fish passage success at all fish-bearing sites and to identify any potential impacts from upgrades or general road maintenance.</p> <p>Habitat surveys involved observations of substrate, flow characteristics and potential fish use along 50 m reaches upstream and downstream of each applicable crossing. Fish presence was determined through visual surveys and the use of an electrofisher.</p> <p>Fish were captured or observed at all known fish-bearing crossing in 2018, with the exception of crossings CV-115 and BG-50. The fish-bearing stream at crossing CV-115 is considered marginal habitat and was dry in 2018 and did not contain fish at the time of the survey in early July, which is consistent with observations since monitoring began in 2009. The fish-bearing stream at crossing BG-50 provided important habitat, but fish were not captured or observed in the right channel. This is the second consecutive year in which juvenile char were not captured directly downstream of the culverts. Causes of their absence in 2017 and 2018 are not known, but it may be a result of decreased us of the branch in response to perched culverts. It should be noted that upstream habitat was still accessible and fish observed in the left channel at the bridge crossing.</p>	<p>PC Conditions No. 47 and 48(a)</p>

No.	NIRB Comment	NIRB Recommendation	Baffinland Response	Concordance to 2018 Annual Report
16	<p><u>Marine Environment – Vessel Fouling Monitoring</u></p> <p>Pursuant to Project Certificate Term and Condition 91, Baffinland is required to develop a detailed monitoring plan for Steensby Inlet and Milne Inlet for vessel fouling and includes sampling areas on ships where antifouling treatment is not applied such as the areas where non-native species are most likely to occur. Within its annual reporting to the NIRB, Baffinland indicated that in discussion with the Marine Environmental Working Group it was considering an alternative monitoring tool for hull biofouling, which would involve use of an underwater video mounted on a remotely operated underwater vehicle. Baffinland further reported that no fouling monitoring has taken place on vessel hulls in 2017, and that no trends in fouling in the marine environment of Milne Inlet have been reported based on the 2014 and 2015 data.</p>	<p>The Board directs Baffinland to develop an action plan to address required monitoring of fouling on the hulls of project vessels, as required by Project Certificate Term and Condition 91. Baffinland must further coordinate with the Marine Environment Working Group to implement a suitable alternative monitoring tool for hull biofouling, such as underwater video captured with a remotely operated vehicle. Baffinland must provide results on annual basis for completed surveys for detection of fouling on vessel hulls moored at Milne Port.</p> <p>It is requested that an action plan to address required monitoring of fouling on the hulls of project vessels be provided to the Nunavut Impact Review Board within 60 days and that updates be incorporated into the 2018 Annual Monitoring Report to the Nunavut Impact Review Board.</p>	<p>Previous attempts were made in 2017 to address this condition. A SCUBA-based vessel hull biofouling survey of Project-vessels anchored in Milne Port was proposed. However, after completing a site assessment and options analysis, Baffinland determined that the risk to the safety of the sampling crew was extremely high, as lock out protocols could not be implemented to ensure the safety of the dive team. Baffinland described in its response to reviewer comments on the 2017 Annual Report that in 2018 Baffinland would be implementing an alternative monitoring tool for hull biofouling using a remotely operated vehicle (ROV) system for underwater video surveys.</p> <p>The proposed alternative ROV monitoring did indeed occur in 2018, with three (3) ore carrier hulls being surveyed during the program. It is noted however there was no accessible epifaunal growth available for sample collection, nor has Baffinland commissioned any purpose-built vessels for the Project to date. Baffinland will continue the use of ROV systems in 2019, including the use of upgraded high definition video equipment, and evaluate potential alternative methodologies to complete sampling.</p>	PC Condition No. 87 and 91
17	<p><u>Shipping Route Deviations</u></p> <p>The Qikiqtani Inuit Association (QIA) indicated that Baffinland’s 2017 Annual Monitoring Report noted that some vessels deviated at least 15 kilometers (km) northward into Navy Board Inlet and others southward about 15 km into Eclipse Sound and further requested that the Proponent clarify the types of vessels that deviated from the shipping route and provide a revised map with vessel types. Further, the QIA also requested that the Proponent clarify what constituted a significant course of deviation in the waters west of Baffin Bay, and why these deviations occurred.</p>	<p>The Board directs Baffinland to clarify the types of vessels that deviated from the approved shipping route and provide a revised map with vessel types shown, and with a detailed discussion of why these deviations occurred.</p> <p>It is requested that this update be included within the 2018 Annual Report to the Nunavut Impact Review Board.</p>	<p>The ship track by vessel type transiting Milne Inlet in 2018 have been presented as part of the summary for PC Condition No. 103 in the 2018 Annual Report. As described in the Annual Report, there were no significant deviations from the nominal shipping route in 2018 by Project ore carriers.</p>	PC Condition No. 103, 104 and 120
18	<p><u>Caribou Survey</u></p> <p>The Government of Nunavut (GN) noted it had concerns regarding the method employed by the Proponent in conducting the caribou height of land surveys and the amount of time employed for survey effort and the results of the surveys, which showed that no caribou was detected around the project site during the surveys in 2017. The NIRB notes that the result of this current survey was consistent with the results from the past four (4) years confirming no observation of caribou around the Mary River Project. Further, the GN also questioned the validity of the current study design and the level of survey efforts adopted by the Proponent noting that the survey method employed does not offer the power to distinguish whether the caribou observation was influenced by the general low population density or caused by avoidance behavior/deflection of caribou from the Project infrastructure. The GN indicated that the study design relied on behavioral observations to indicate how caribou might be interacting with Project infrastructure and that the study approach will only be effective in instances of high caribou population density, which is not the case in the North Baffin region, particularly around the Project area. The NIRB expects the Proponent to continue working closely with the GN and the Terrestrial Environment Working Group in developing and/or modifying mitigation and monitoring programs for caribou and other terrestrial wildlife species around the Project site.</p>	<p>The Board requires Baffinland to report on its engagement with the Terrestrial Environment Working Group (TEWG) and efforts to address feedback received with the objective of developing improvements for caribou surveys and monitoring programs for the Project. Baffinland must specifically address feedback received from the Government of Nunavut regarding areas that are considered inadequate in the current Wildlife Management Plan and the Terrestrial Environmental Monitoring Program for the Project.</p> <p>It is requested that this update be included within the 2018 Annual Report to the Nunavut Impact Review Board.</p>	<p>In 2018, the TEWG held meetings on March 22, June 5, September 20 and December 11. The TEWG provides a valuable forum for ongoing Project communication and reporting between Baffinland and other interested parties. The TEWG also serves as an advisory group to provide recommendations on appropriate management approaches related to the Project.</p> <p>The TEWG has guided the development of the Terrestrial Environment Effects Monitoring Plan (TEEMP; Baffinland, 2016j). The program is reviewed annually and adjustments are made to the monitoring program as needed following guidance from the group. The TEWG reviews the annual terrestrial environment monitoring report and provides comments to Baffinland for consideration in the final version. Baffinland will continue to work with the TEWG to review and guide monitoring programs on an annual basis and develop mitigation measures or action plans as and when needed.</p> <p>Baffinland, with support from the QIA and other members of the TEWG, has put a strong emphasis on continuing the existing monitoring programs and developing more diverse community-based monitoring initiatives. Additional details are provided in the 2018 Terrestrial Annual Report and the 2018 Annual Report to NIRB.</p>	PC Condition No. 49

No.	NIRB Comment	NIRB Recommendation	Baffinland Response	Concordance to 2018 Annual Report
19	<p><u>Used Tires</u></p> <p>During the 2018 site visits, it was noted that used tires are a significant waste stream across the Project sites, particularly around the Mine site and Milne Port, and as noted in the 2016 and 2017 site visits. During the August 2018 site visit, NIRB staff noted that several of the used tire piles are now removed and stored in seacans for shipping and disposal offsite. In general, the state of tire disposal has significantly improved during the site visits in 2018.</p>	<p>The Board requires Baffinland to provide continued reporting regarding how it has implemented measures within its Tire Management Plan for re-treading, reuse, or offsite disposal of tires generated from the site. Baffinland must implement an organized method of storing and relocating tire piles across the Project consistently moving forward.</p> <p>It is requested that an update regarding this recommendation be provided within the next 30 days to the Nunavut Impact Review Board.</p>	<p>Baffinland continued to make significant progress on used tire management in 2018. Starting in mid-2017 the current used tire stream is organized and stored in designated seacans at the Mine Site and Milne Port tire shops. These seacans are then sent offsite for disposal during sealift backhaul activities.</p> <p>As planned and committed to do in 2017, the vast majority of historical tire piles at Milne Port were processed and organized into seacans in 2018.</p> <p>Approximately 11,700 of both used and historical tires were backhauled from Milne Port in 2018.</p> <p>Baffinland is currently developing an action plan to process the historical tire pile in Mary River for backhaul offsite during the open water season in 2019. Where possible, Baffinland uses and repurposes tires for barriers, berms and ballasts across the site.</p>	<p>Not Applicable. Issue has been resolved.</p>
20	<p><u>Waste Landfill</u></p> <p>During both the April and August 2018 NIRB site visits, it was noted that all of the protective mesh around the landfill area were completely removed from the supporting poles similar to previous site visit observations in 2014, 2015, 2016, and 2017, and the newly installed wooden fence around the facility was observed to be insufficient to contain the landfill footprint, thereby increasing the risk of wind-blown debris from the facility. The NIRB further notes that the condition of the fencing around the landfill during the 2018 site visits have not significantly improved compared to previous years. Further, the NIRB’s 2017 Board Recommendation #31 requested that Baffinland continue to evaluate its need for an upgraded litter fence around the active areas of the landfill in the light of changing environmental conditions at site.</p>	<p>The Board directs Baffinland to improve the quality of fencing around the perimeter of landfill sites to reflect industry best practices for these operations. Landfill litter fences must be of sufficient quality and height and encircle the entire landfill area to ensure that waste materials are not dispersed offsite. Baffinland must include evidence of this issue being satisfactorily addressed within its annual reporting in future. It is requested that an update regarding implementation of this direction be provided within the next 30 days to the Nunavut Impact Review Board, and with updates included within the Annual Reports to the Nunavut Impact Review Board moving forward.</p>	<p>The design and installation of the perimeter fence has been a priority action item for Baffinland. Throughout 2017 and into early 2018 Baffinland proposed a number of different designs for the landfill fence and had several conversations with NIRB monitoring officers on the development of the designs. Following a final design criteria taking into consideration future expansion of the landfill, all materials were ordered in early 2018.</p> <p>In September 2018, Baffinland completed the installation of a perimeter fence downwind of the active portion of the landfill. Construction commenced on August 20 and was completed on September 18, 2018. The installed fence is 215 meters in length, eight feet tall and made up of two-inch galvanized chain link heavy gauge meshing with a tire base (see Photo 1 and 2).</p> <p>Baffinland intends to expand the fence progressively with the landfill expansion of additional cells and will provide further updates in subsequent annual reports to the NIRB as relevant.</p>	<p>Not Applicable. Issue has been resolved.</p>

No.	NIRB Comment	NIRB Recommendation	Baffinland Response	Concordance to 2018 Annual Report
21	<p><u>Dust Management</u></p> <p>During the April 2018 site visit, NIRB staff observed dust emissions, including visible dust plumes generated from the crusher plant, which continues to be an ongoing issue at the crusher facility. Specific parts of the crusher and screening plant were also noted to lack appropriate sealing or dust containment system, resulting in the release and dispersion of fugitive dust to the surrounding environment as was observed during previous site visits. Proper engineering designs and controls is required to address the increased dust emissions from the crusher plant.</p>	<p>The Board requires Baffinland to improve the effectiveness of its management of ore dust exposure to workers, particularly for crusher operations. Baffinland must report on improvements made and provide evidence to support that dust levels are kept within acceptable levels to ensure the safety of workers on site.</p> <p>It is requested that this update be included within the 2018 Annual Report to the Nunavut Impact Review Board.</p>	<p>In 2017, following a site inspection, the Workers’ Safety and Compensation Commission (WSCC) provided Baffinland with a directive to establish a crushing and screening plant work-zone area, and to ensure that every person must wear suitable respiratory protection at all times when in the work-zone of an active crusher. This directive was addressed, and PPE requirements have been established and are enforced when the crusher is running.</p> <p>In 2018, Baffinland continued implementing mitigation measures to minimize fugitive dust emissions resulting from the crusher. Mitigation measures included:</p> <ul style="list-style-type: none">- Installation of dust hood covers on all conveyors- Installation of dust hoods on surge bin transfer points- Installation of dust hoods on transfer points <p>RWDI was retained by Baffinland to complete occupational health and safety monitoring of noise, vibration and air quality. On-site sampling was conducted by a senior air quality specialist from May 24 to 30, 2018. The crusher was included as a sample site for inhalable particulate and silica, with three key receptors identified:</p> <ol style="list-style-type: none">1) Bobcat Operator2) Loader Operator3) Yardman <p>Results of the air quality testing was compared to their respective time weighted average (TWA) limits as defined under the Occupational Health and Safety Regulations R-003-2016, as amended, for the worker exposure sampling by the Government of Nunavut. The TWA is the average of the airborne concentrations of a biological and/or chemical agent determined from air samples of airborne concentrations to which a worker is exposed in a typical day. The TWA values were prorated to reflect a longer working shift, as Baffinland employees typically work a 12-hour day.</p> <p>Results of the monitoring demonstrate that for all receptors at the crusher site, exposure was well within the acceptable range of the TWA.</p> <p>For 2019, Baffinland has retained SPI Health and Safety to conduct occupational health and safety for air quality. There will be four sampling events for 2019, starting in April 2019, to account for how, if at all, seasonal variation could influence magnitude of exposure events. Occupational health and safety requirements will continue to be addressed by Baffinland with the WSCC.</p>	<p>Not Applicable. Worker health and safety for the Project is regulated by the Workers’ Safety and Compensation Commission.</p>

Appendix II: NIRB'S ASSESSMENT OF BAFFINLAND'S PROJECT CERTIFICATE COMPLIANCE

NIRB's Evaluation of PC Conditions for the Mary River Project (NIRB File No. 08MN053)

PC Condition No.	Summary of Condition Requirement	NIRB Evaluation	NIRB Comment
Climate			
1	GPS/tidal gauge monitoring of sea levels and storm surges	Partial Compliance	Related to T&C 83. Baffinland collected data in 2014 and removed the gauges for 2015 and 2016. Baffinland has re-installed the tidal gauge system at Milne Port during the 2017 and 2018 open-water season. The gauge was in place from June to October and collected data on water levels, temperature and conductivity. Steensby is still considered inactive and as such Baffinland has not installed any tidal gauges there. Baffinland committed to redeploying the tidal gauge in 2019 following the Tidal Gauge Monitoring Plan (2018) as current data (2014, 2017 and 2018) is inconclusive.
2	Validation and update of climate change impacts of the project on the LSA and RSA.	Partial Compliance	Baffinland indicated that this term and condition was not applicable in 2018. Baffinland committed to including regular updates regarding the status of these activities in the annual report to the NIRB. The NIRB reminds the Proponent that the assessment to validate and update climate change impact predictions should be viewed as a priority for the approved Mary River project and not limited to the scope of the proposed Phase 2 expansion project.
3	Exploring and implementing steps to reduce GHGs.	Partial Compliance	In 2018, BIM replaced all diesel-powered lighting at the crusher with high efficiency LED lights. This is a fuel savings of approximately 30,000L/year. They have also developed an Idling Policy. There were also mechanical adjustments at the crusher facility which reduced the number of frost fighter heaters by 7, resulting in an additional fuel savings of 33,000L/year. Baffinland plans to implement more fuel efficient generators over the 2019 year and committed to continue to update the NIRB in its annual report. Baffinland observed between 2015 and 2017 that even though rates of ore hauled on the Tote road increased by 246% GHG only increased by 27%. Baffinland is encouraged to develop a strategy and/or plan related to the reduction of greenhouse gas emissions.

4	Engage Inuit in climate change related research and studies.	Partial Compliance	Baffinland has submitted a climate change strategy to the NIRB in February 2019 and this strategy is committed to implementing scientific data and IQ in Baffinland's climate change strategy. The NIRB looks forward to implementation in the 2019 report.
5	Reasonable measures to ensure that Project-site weather related information is publicly available.	In Compliance	Baffinland makes the weather for the Mary River Project locations publicly available on their website at www.baffinland.com and through the Weather Network.
6	Provide results of SO2, NOX, and GHG emissions calculations using fuel consumption or other relevant criteria.	In Compliance	See 2018 Annual Report. The NIRB reminds Baffinland that they are expected to include clearly and succinctly in the relevant section of the annual report a comparison of monitoring data that has been collected to date so readers can view the direct comparison to the FEIS and any subsequent amendment.

Air Quality

7	Update AQ and noise abatement plan to include continuous SO2 and NO2 monitoring at port sites to capture operations phase ship-generated emissions for several seasons.	In Compliance	In 2017, Baffinland re-installed the air quality monitoring systems and they remained installed and functioning through 2018. The overall SO2 levels at both Mary River and Milne Inlet were very low. Generally, NO2 levels were also very low with some minor exceedances observed at the Mary River Site. Air Quality and Noise Abatement Management Plan (March 2016). The NIRB reminds Baffinland that they are expected to include clearly and succinctly in the relevant section of the annual report a comparison of monitoring data that has been collected to date so readers can view the direct comparison to the FEIS and any subsequent amendment.
8	Demonstrate through SO2 and NO2 monitoring at the mine site and ports that emissions remain within predicted levels. Provide rationale and mitigation measures for exceedances.	In Compliance	see 2018 annual report. The overall SO2 levels at both Mary River and Milne Inlet were very low. Generally, NO2 levels were also very low with some minor exceedances observed at the Mary River Site. Air Quality and Noise Abatement Management Plan (March 2016). The NIRB reminds Baffinland that they are expected to include clearly and succinctly in the relevant section of the annual report a comparison of monitoring data that has been collected to date so readers can view the direct comparison to the FEIS and any subsequent amendment.
9	Provide calculations of GHG emissions at the port sites and other Project sources including Project associated aircraft.	In Compliance	See 2018 Annual Report. Total calculated GHG emissions were 152,000 t-CO2 eq. The NIRB reminds Baffinland that more than one year of data should be presented in this section (i.e., a year by year comparison) when available.

10	Update to dust management plan to include monitoring and management plans	Partial Compliance	See 2018 Annual Report. Baffinland reported that their dust management and monitoring was incorporated into the Air Quality and Noise Abatement Management Plan (March 2017) and the Roads Management Plan (April 2017). Dust management and mitigation protocols were also performed in 2018. A new product is planned for testing and use in 2019 to further reduce dust emissions and the NIRB looks forward to the results and receiving copies of the updated Roads Management Plan and Air Quality and Noise Abatement Management Plan.
11	Develop and implement Incineration Management Plan.	In Compliance	Baffinland adheres to the process for batch waste incineration as outlined by Environment Canada including conducting waste audits at both the Milne Port and Mary River Facilities. Air Quality and Noise Abatement Management Plan (2016) Waste Management Plan which includes the Incinerator Operation Procedure (2018)
12	Conduct at least one stack test immediately following commissioning new incinerators.	In Compliance	Stack testing was performed in 2013 when the incinerators were commissioned and it has not been carried out since. However, there are plans to stack test in 2019 to address recommendations from the 2017 NIRB annual report. Air Quality and Noise Abatement Management Plan (2016) Waste Management Plan (2018)

Noise and Vibration

13	Work with Fisheries and Oceans Canada to select overpressure threshold applied to explosives for the protection of fish and aquatic life.	In Compliance	No blasting occurred in 2018 within setback distances detailed by the DFO as detailed in Baffinland 2018 Annual Report. Surface Water and Aquatic Ecosystem Management Plan (2019) Environmental Protection Plan (2016) Quarry Blasting Operations Management Plan (2013)
14	Conduct noise and vibration monitoring at Project accommodations in summer and winter during all phases of the project.	In Compliance	See 2018 Annual Report. Baffinland indicated that it employed adaptive management to reduce noise and vibration near the accommodation complexes. Equipment use was limited near accommodation complexes and the helicopter landing pad was relocated further away from the accommodations.

14a	Demonstrate appropriate adaptive management practices during construction for activities with the potential to disrupt marine mammals.	In Compliance	Baffinland reported that in 2018, there was no construction activities in the marine environment. However, in previous Annual Reports, Baffinland has indicated their adaptive management strategies for marine construction. BIM Environmental Protection Plan (2016) Baffinland committed to developing a construction Environmental Management Plan prior to any future construction in the Marine Area.
14b	Demonstrate appropriate adaptive management practices for project activities with the potential to disrupt terrestrial wildlife and Project site users.	Partial Compliance	Baffinland indicated in their 2018 Annual Report that noise levels are monitored in relation to worker health and safety, therefore mitigation measures to reduce noise and sensory disturbance are implemented with respect to human safety. Wildlife effects are awaiting currently further recommendations by the TEWG as adaptive management strategies are still under consideration. Air Quality and Noise Abatement Management Plan (Baffinland, 2016)
15	Collaborate with the QIA and local Hamlets when undertaking consultation with communities regarding railway, tote road and marine shipping operations. Provide visuals and discuss safety considerations.	In Compliance	As detailed in their 2018 Annual Report, Baffinland continues to work with local communities and the QIA regarding safety considerations for those interacting with the Project. Through the established Mary River Community Group, safety considerations are being evaluated regularly.
Hydrology or Hydrogeology			
16	Ensure that water related infrastructure is consistent with FEIS and FEIS addendum.	In Compliance	Water related infrastructure and facilities constructed to date have been consistent with those proposed in the FEIS and FEIS Addendum for the ERP and Production Increase Proposal in terms of type, location, and scope. Baffinland reported in their 2018 Annual Report that any new approved construction will continue to be consistent with the FEIS.

17	Develop and implement measures to ensure that all effluent satisfies discharge criteria established by relevant regulatory authorities.	Non-Compliance	<p>In 2018, there was a single event at each of the Mine Site (MS-01), the Waste Rock Facility (MS-08) and at the mobile Mine Site Containment Area (MS-MRY-6) where exceedances were measured. These were minor exceedances to water quality under the Type "A" Water license issues by the Nunavut Water Board and these were also reported to CIRNAC, the NWB and the QIA. NIRB staff has recommended that Baffinland produce a Groundwater Management Plan to mitigate future exceedances.</p> <p>Fresh Water Supply, Sewage and Wastewater Management Plan (2019) Metals and Diamond Mining Effluent Regulations Emergency Response Plan (2019) Sampling Program - Quality Assurance and Quality Control Plan (2017)</p>
18	Confirm and update, as needed, the approximate fill time of the mine lake pit identified in the FEIS.	In Compliance	Current mining operations have not yet developed a pit at Deposit No. 1; however, Baffinland has developed an Interim Closure and Reclamation Plan (2018) should it become necessary.
19	Develop and implement adequate water infrastructure monitoring to ensure that natural water flow is not significantly hindered. Monitor and report water withdrawal rates and water use for domestic and industrial purposes.	In Compliance	<p>During the 2018 Annual Report, Baffinland noted that they continued to monitor water crossings to ensure that surface water flows were undisrupted. Reports were submitted to the QIA and NWB. There were several exceedances noted throughout 2018, 4 related to daily water withdrawal from Camp Lake and several others were noted in the summer of 2018 for use of dust suppression measures. The mitigations outlined in the Aquatic effects monitoring plan were followed.</p> <p>Environmental Protection Plan (2016) Fish Habitat Monitoring - 2018 Annual Report - Early Revenue Phase - Tote Road Upgrades (2018) Roads Management Plan (2016) Surface Water and Aquatic Ecosystem Management Plan (2019)</p>
Groundwater and surface waters			
20	Monitor the effects of explosive residue and by-products from Project related blasting. Implement measures to ensure explosives do not negatively effect the surrounding area.	Partial Compliance	Select water samples showed elevated levels of Ammonia and nitrate in comparison to baseline measurements. See the Aquatic Effects Monitoring plan (2015) and Sampling Program - Quality Assurance and Quality Control Plan (2017).

21	Ensure that the scope of the Aquatic Effects Monitoring Program (AEMP) is consistent with the requirements in the condition.	In Compliance	The current revision of the Project's AEMP (2015) meets the requirements of the intended score and has been approved by the NWB. Baffinland has been working on an update to the AEMP since 2016 and plans to submit a revised Revision 2 of the AEMP to the NWB in 2019 for review and final approval before submission to the NIRB. The NIRB reminds Baffinland that they are expected to include clearly and succinctly in the relevant section of the annual report a comparison of monitoring data that has been collected to date so readers can view the direct comparison to the FEIS and any subsequent amendment.
22	Develop a Sediment and Erosion Management Plan.	In Compliance	A sediment and Erosion Management Plan is incorporated into Baffinland's Surface Water and Aquatic Ecosystem management Plan (SWAEMP, 2019). An early version of this was submitted to the NWB prior to the beginning of the ERP. The NIRB reminds Baffinland that they are expected to include clearly and succinctly in the relevant section of the annual report a comparison of monitoring data that has been collected to date so readers can view the direct comparison to the FEIS and any subsequent amendment.
23	Develop and implement Groundwater Monitoring and Management Plan.	Non-Compliance	Ground water commenced in 2017. During 2018, groundwater was sampled at 3 monitoring wells, due to the limited data set, further monitoring is required to improve the understanding of groundwater chemistry. A greater effort needs to be made in order to be deemed compliant. Surface Water and Aquatic Ecosystem Management Plan (2019) The NIRB reminds Baffinland that they are expected to include clearly and succinctly in the relevant section of the annual report a comparison of monitoring data that has been collected to date so readers can view the direct comparison to the FEIS and any subsequent amendment. Further, this includes any methodology for sampling so it is available to all parties for review.
24	Ensure that effluent discharge conditions are met all times	Non-Compliance	There were effluent discharge chemical exceedances at : MS-01, MS-08 and MS-MRY-6. Mitigations were carried out as per the Sewage and Wastewater Management Plan. Fresh Water Supply, Sewage and Wastewater Management Plan (2019) Metals and Diamond Mining Effluent Regulations Emergency Response Plan (2019) Sampling Program - Quality Assurance and Quality Control Plan (2017)

25	Identify sensitive landforms and develop and implement measures to minimize Project impacts on identified landforms.	Partial Compliance	Geotechnical surveys conducted in 2018 indicate that there has been little to no erosion at the major locations on site. Details of geotechnical investigations are located in appendix G of Baffinland's 2018 Annual Report. There remain a number of erosion issues on site; however, these are not at identified sensitive landforms by the geotechnical engineers. Erosion is mitigated using protocols established in Baffinland's Roads Management Plan. Borrow Source Management Plan - Kilometer 97 (2014)
26	Develop and Implement Erosion Management Plan.	Partial compliance	An erosion management plan is included in the Project's Surface Water and Aquatic Ecosystem Management Plan (2019). Erosion and terrain stability issues remain at various locations along the Tote Road. Baffinland mitigates erosion issues through the Roads Management Plan (2016).
27	Record notes on impacts to the aesthetic value of the Project area heard in public consultations.	In Compliance	Baffinland indicates that no significant public concerns were noted. They provided a table including all public consultations and provide details questions and answers in Appendix B of the 2018 Annual Report. Environmental Protection Plan (2016) Surface Water and Aquatic Ecosystem Management Plan (2019)
28	Monitor Project effects on permafrost and ensure its integrity.	Partial Compliance	Localized permafrost degradation has been identified in years prior to 2018 and in 2018 there were minor issues noted around the Mary River Polishing/ Waste Stabilization Ponds; however, this damage was restricted to berms. Erosion is mitigated using protocols established in Baffinland's Roads Management Plan.
29	Provide construction design and drawings for review and acceptance by relevant authorities. Provide as-built drawings to authorities following construction.	In Compliance	See 2018 Annual Report
30	Develop site-specific quarry operation and management plans before the development of any potential quarry site or borrow pit.	Partial Compliance	Baffinland has developed a Borrow Source Management Plan for the borrow source located at kilometer 93. Otherwise, no further borrow sources or quarries were created in 2018.

Vegetation

31	Ensure that Project activities are planned and conducted to minimize the Project footprint.	In Compliance	Baffinland has currently completed all of the required construction activities for the Project Development Area. No unauthorized land disturbance occurred in 2018 and all disturbed land is reported in the 2018 Terrestrial Environment Annual Monitoring Report. Environmental Protection Plan (2016) Terrestrial Environment Mitigation and Monitoring Plan (2016)
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32	Ensure that all supplies brought to site are clean of soil that could contain plant seeds not naturally occurring in the area. Inspect vehicle tires prior to initial use in Project area.	In Compliance	Inspections of vehicles were carried out in 2018 prior to offload and no exotic plants were identified. See the 2018 Terrestrial Environment Annual Monitoring Report.
33	Include relevant monitoring and management plans within the TEMMP.	In Compliance	TEMMP is regularly updated and included required plans. Any revisions to the plan would be expected to be submitted to the NIRB. Terrestrial Environment Mitigation and Monitoring Plan (2016)
34	Conduct soil sampling to determine levels of metals in soils where berry producing plants are, near any potential development area prior to commencing operations.	In Compliance	Baseline metal concentrations were sampled from 2012 to 2016 and all sites were below Project thresholds; However, no sampling was conducted in 2018 and will continue monitoring every 3-5 years as part of the vegetation and soil base metals monitoring program. See 2012-2016 Baffinland Annual Reports. Terrestrial Environment Mitigation and Monitoring Plan (2016)
35	Monitor baseline metal levels in organ tissue of caribou harvested within the local study area, prior to commencing operations.	Non-Compliant	The North Baffin Caribou herd is at extremely low population estimates and there are currently very low numbers being harvested. A sampling protocol is yet to be developed in conjunction with the GN, local HTO's and the TEWG.
36	Establish an on-going monitoring program of vegetation used as caribou forage near project development areas, prior to commencing operations.	In Compliance	Annual vegetation surveys were conducted in 2014-2018; however, no evidence of changes in vegetation abundance was determined. See the 2018 Terrestrial Environment Annual Monitoring Report.
37	Incorporate methods to evaluate the potential introduction of invasive plant species into the Terrestrial Environment and Monitoring Plan. Report non-indigenous plant species to the Government of Nunavut.	In Compliance	No exotic invasive species surveys were conducted in 2018 as part of the exotic invasive vegetation and natural regeneration monitoring program. Surveys were conducted in 2014 and the protocols are included in the Terrestrial Environment Annual Monitoring Report. Terrestrial Environment Mitigation and Monitoring Plan (2016)
38	Review and adjust all monitoring information and management plans annually and adjust as needed to prevent/reduce adverse project effects on vegetation.	In Compliance	There were inconsistent trends found among the vegetation survey data in 2018. Baffinland plans to continue this monitoring in accordance with the TEMMP and guidance by the TEWG in 2019. Terrestrial Environment Mitigation and Monitoring Plan (2016)

39	Develop a progressive revegetation program for disturbed areas no longer in use.	In Compliance	<p>The 2018 Mary River Project Vegetation Reclamation Plan has been developed providing methods for re-vegetation with methods adapted and adjusted from other northern mines such as: Polaris, Nanisivik, Red Dog, Hope Bay Doris North, Meadowbank, Diavik Diamond, Ekati Diamond, Gaucho Kue and Con Mines. Interim Closure and Reclamation Plan (Baffinland 2018)</p> <p>2018 Mary River Project Vegetation Reclamation Plan (2019) provides methods for revegetation and outlines options for future reclamation/revegetation trials in the Project area to ultimately refine Baffinland's proposed reclamation practices. In 2019 Baffinland will be organizing a Mine Closure Working Group to evaluate the implementation and results of reclamation research programs and progressive reclamation projects at Mary River. Baffinland will discuss the findings of the 2018 Mary River Project Reclamation Plan with the Mine Closure Working Group and evaluate study design for the development of representative test plots.</p>
40	Include revegetation plans in the Site Reclamation Plan that promotes progressive reclamation compatible with the surrounding environment.	In Compliance	<p>Provided in the 2018 Mary River Project Vegetation Reclamation Plan. A Mine Closure Working group will be established in 2019 to further these discussions.</p>
41	Maintain a 100-m naturally vegetated buffer between the high water mark of any fish-bearing water bodies and permanent quarries with the potential for acid rock drainage, unless otherwise approved.	In Compliance	<p>No new quarries were developed in 2018 and existing quarries maintained a 100 metre buffer from the high water mark to any fish bearing bodies. New quarry developments will continue to be tested for Acid Rock Drainage and metal leaching using the protocol for the Assessment for the Potential for Acid Rock Drainage (Borrow Pit and Quarry Management Plan) and 100 metre buffer from the high water mark to any fish bearing water bodies will be maintained.</p> <p>Borrow Pit and Quarry Management Plan (2014)</p> <p>Q1 Quarry Management Plan (2017)</p> <p>QMR2 Quarry Management Plan (2017)</p>

42	Maintain a 30-m naturally vegetated buffer between the mining operation and adjacent water bodies.	In Compliance	<p>During a site inspection in 2018, a temporary laydown and equipment were located within 30 metres of a water body; however, after the inspection, Baffinland departments moved the equipment.</p> <p>Surface Water and Aquatic Ecosystems Management Plan (2019)</p> <p>Environmental Protection Plan (2016)</p> <p>Terrestrial Environmental Management and Monitoring Plan (2016)</p> <p>During internal inspections in 2018, temporary laydown of equipment were sited within 30 m of a water body and responsible departments were actioned to address these issues. Baffinland Site Environment Department followed up with further inspections to ensure that infrastructure was relocated or material was reclaimed.</p>
43	Submission of a Site Drainage and Silt Control Plan to the relevant authorities prior to the start of construction.	In Compliance	Drainage plans for Project sites and silt/sediment control measures used at the Project are outlines in the Project's Surface Water and Aquatic Ecosystem Management Plan (2019).
44	Meet or exceed guidelines for blasting thresholds set by Fisheries and Oceans Canada for the protection of fish and fish habitat.	In Compliance	No blasting occurred in 2018 within the required setback distances established by the DFO.
45	Adherence to the No-Net-Loss principle at all phases of the Project.	In Compliance	The 2018 Annual Report submitted to DFO summarizes the assessments made by the third party Professional Fisheries Biologists as well as the corrective actions taken. 25 of 36 water crossings observed no fish passage of habitat issues. The remaining 11 passages were blocked by a physical barrier which has since been addressed.

46	Ensure runoff from fuel storage and maintenance facility areas, sewage and wastewater other facilities generating liquid effluent and runoff meet discharge requirements.	Non-Compliant	<p>During freshet 2018, several TSS exceedances were noted under the Type A water license and unauthorized releases of sediment were also reported to ECCC, CIRNAC, NWB and the NT-NU Spill Line. These are also documented in the NT-NU spill reports. There were also mitigative actions and detailed in the NWB and QIA annual Report for Operations. In January 2018, a treated sewage effluent sample collected from the Mine Site exceeded the discharge criteria for Total Phosphorous and Total Suspended Solids. See 2018 Annual Report for more detail. The NIRB reminds Baffinland that it expects more information available in the Annual Report than a table summarizing the spills related to any of the plans and would expect a year over year comparison to ensure that any trends can be identified and addressed promptly.</p> <p>Dust Mitigation Action Plan (2016) Fresh Water Supply, Sewage and Wastewater Management Plan (2019) Metal Mining Effluent Regulations Emergency Response Plan (2019) Sampling Program - Quality Assurance and Quality Control Plan (2017) Sedimentation Mitigation Action Plan (2016) Surface Water and Aquatic Ecosystem Management Plan 2019) Tote Road Earthworks Execution Plan (2017)</p>
47	Design and construct all Project infrastructure so as they do not prevent or limit the movement of water in fish bearing streams.	Non-Compliant	<p>In 2018, assessment of Project fish bearing water crossings were performed on all known water crossings with the exception of CV-115 and BG-50. CV-115 was not observed because it had noticeably low flow and BG-50 had perched culverts which impacted fish crossing. The NIRB would encourage Baffinland to develop a prioritization list of items that needs to be repaired along the Tote Road including the flow in the culverts as per the DFO recommendations.</p> <p>Fish Habitat No Net Loss and Monitoring Plan (2007)</p>
48	Engage with Fisheries and Oceans Canada and the QIA to explore Project specific thresholds for blasting that would exceed guidelines.	Non-Compliant	<p>Baffinland reported that no blasting occurred in 2018 within the required setback distances established by the DFO. Baffinland ensures that they follow the required setback distances detailed in the DFO guidance document titled "Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters" (Wright and Hopky, 1998). The NIRB requests Baffinland clarify where the thresholds have been incorporated into site Management Plans.</p>

48(a)	Conduct additional surveys for the presence of arctic char in freshwater bodies and ongoing monitoring of arctic char health where applicable, within watersheds proximal to the mine, tote road and Milne Inlet Port project development areas, including but not limited to, Phillips Creek, Tugaat and Qurluktuk. Consult with MHTO re: the design, timing, and location of proposed surveys and ongoing monitoring.	Non-Compliant	Baffinland has documented in the 2018 CREMP Monitoring Report that no adverse mine-related affects have been found regarding arctic char. Although there had been arctic char data collected, there is little evidence of consultation with the MHTO for this work as noted during the Marine Workshop in Pond Inlet. CREMP plan found within the XX report.
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Terrestrial Environment

49	Establish a Terrestrial Environment Working Group (TEWG) to serve as an advisory body.	Partial Compliance	The TEWG was established in 2013. Baffinland notes no known reports of VEC regional trends required for 58(a), or caribou in area for 58(b). 2018 Annual report documents all TEWG meetings and rough transcripts. Development of updated Terms of Reference anticipated by end of 2019.
50	Develop and implement a Project specific terrestrial monitoring plan.	In Compliance	In 2018, the TEWG held multiple meetings to discuss and advise Baffinland on a project specific monitoring plan. Terrestrial Environment Mitigation and Monitoring Plan (2016)
51	Consider and, where appropriate, cooperate with relevant regional and/or community-based monitoring initiatives that raise issues or produce information pertinent to mitigating project-induced impacts. Give special consideration for supporting regional studies of population health and harvest programs for North Baffin caribou.	In Compliance	Baffinland has aided the GN in performing caribou surveys of the North Baffin region. This support was noted in the 2018 Annual Report and will continue through the 2019 season and onward in order to understand potential project related effects on caribou. Terrestrial Environment Mitigation and Monitoring Plan (2016)
52	Initiate and develop a timeline to test and implement deterrence mechanisms for caribou near hazardous areas, within 3 months of issuances of the project certificate. Report information back to the Terrestrial working group.	Non-Compliant	Baffinland has initiated a stop work policy when wildlife is present in order to reduce hazardous conditions. Other mechanisms have been discussed in the TEWG meeting December 2013. Otherwise, little has been done to prevent the interaction between caribou and the project. Terrestrial Environment Mitigation and Monitoring Plan (2016)

53	Proponent shall demonstrate all measures outlined in the condition to mitigate impacts to caribou.	In Compliance	Throughout various surveys, no caribou were seen in the project development area in 2018. Measures are in place and carried out whether caribou are observed or not. See 2018 Terrestrial Environment Annual Monitoring Report. Terrestrial Environment Mitigation and Monitoring Plan (2016)
54	Provide an updated Terrestrial Environment Monitoring Plan which includes all aspects included in the condition.	In Compliance	The TEMMP is reviewed and updated as needed annually. See 2018 Annual Report. Terrestrial Environment Mitigation and Monitoring Plan (2016)
55	Develop an adaptive management plan applicable to wolves and wolf habitats in collaboration with the Government of Nunavut.	In Compliance	No significant wolf population in project area (the 2018 Terrestrial Environment Annual Monitoring Report). Terrestrial Environment Mitigation and Monitoring Plan (2016)
56	Develop a progressive strategy for the recovery of terrestrial wildlife habitat that is consistent with the Nunavut Wildlife Act. To ensure progressive reclamation of disturbed wildlife habitat.	In Compliance	No results provided, although Baffinland indicated that an Interim Mine Closure and Reclamation Plan (2018) was in place to support the rehabilitation of affected areas to viable and self-sustaining ecosystems/habitat that are functional. Baffinland is currently planning for the establishment of a Mine Closure Working Group to provide an opportunity for local communities, QIA, and other interested
57	Report annually on terrestrial environment monitoring efforts including information included in the condition.	In Compliance	2018 Annual Report. No trends reported except the increase in vehicle traffic due to production increase. Terrestrial Environment Mitigation and Monitoring Plan (2016)
58	Incorporate a review section in the NIRB annual report including the information outlined in the condition.	In Compliance	Complete. Baffinland notes no known reports of VEC regional trends required for 58(a), or caribou in area for 58(b). Measuring dust on vegetation was investigated in 2018 and will be incorporated into vegetation and soil base metals monitoring, which is planned to be reinstated for the 2019 season. See The 2018 Terrestrial Environment Annual Monitoring Report. Terrestrial Environment Mitigation and Monitoring Plan (2016)

59	Ensure that aircraft maintain, whenever possible altitudes outlined in the condition. Develop measures to ensure all employees and subcontractors providing aircraft services are respectful of wildlife and Inuit harvesting that may occur in the Project development area.	Partial Compliance	Helicopters have generally been compliant with the project certificate; however, this remains a contentious issue at the TEWG meetings. Baffinland has their pilots follow flight altitude policies and specified areas are built into the GPS; however, altitudes can be changed at pilots' discretion. See the 2018 Terrestrial Environment Annual Monitoring Report. Terrestrial Environment Mitigation and Monitoring Plan (2016)
60	Develop a blasting program to minimize the effects of blasting on terrestrial wildlife, prior to construction.	In Compliance	No known harm has occurred to wildlife by blasting during the construction. Borrow Pit and Quarry Management Plan (2014) Environmental Protection Plan (2016)
61	Implement a stop work policy when wildlife in the area may be endangered by Project work, whenever practical and not causing human safety concerns.	In Compliance	This policy is actively being applied at both the Mine Site and Milne Port. See the 2018 Terrestrial Environment Mitigation and Monitoring Plan (2016). Environmental Protection Plan (2016)
62	Prohibit Project employees from transporting firearms to site and from operating firearms in the Project area for the purpose of wildlife harvest.	In Compliance	Baffinland policy prohibits employees from carrying firearms on site. In 2018, no incidences of Project personnel hunting or fishing within Baffinland's land lease. Weapons on Site Policy (2013) Hunting and Harvesting Policy (2013)
63	Liaise with local Hunters and Trappers Organizations in advance of carrying out terrestrial wildlife surveys. Meet with the organizations annually to discuss wildlife monitoring.	In Compliance	Wildlife Monitoring and Mitigation programs are reviewed at the TEWG meetings which have local HTO members in the group. See 2018 Community Engagement Records listed in the 2018 Annual Report and the 2018 TEWG Meeting Records.
64	Ensure the environment protection plan incorporates waste management provisions to ensure carnivores are not attracted to Project site(s).	Non-Compliant	Metal skirting is placed around accommodations buildings and needs repair on some places according to comments received from XX; however, inadequate fencing at the landfill creates an attraction to wildlife. Generally, carnivore interactions have decreased but arctic fox siting at the landfill during the 2019 August site visit have increased as habituation has occurred. The NIRB reminds Baffinland that they are expected to include clearly and succinctly in the relevant section of the annual report a comparison of monitoring data that has been collected to date so readers can view the direct comparison to the FEIS and any subsequent amendment Environmental Protection Plan (2016) Waste Management Plan (2018)

Birds

65	Ensure all employees at site receive bird awareness training (avoidance of nests and large concentrations of foraging and moulting birds).	In Compliance	Baffinland Site Environment Department Employees have continued to receive annually bird survey training. Environmental Protection Plan (2016)
66	Avoid bird Species at Risk and their nests; establish avoidance zones as per TEMMP.	In Compliance	No species at risk nests or eggs have been encountered during project activities. Terrestrial Environment Mitigation and Monitoring Plan (2016)
67	Ensure mitigation and monitoring strategies for bird Species at Risk are updated for consistency with applicable status reports, recovery strategies, action plans and management plans.	In Compliance	Baffinland coordinates with Environment and Climate Change Canada to develop mitigation and monitoring strategies for species at risk using the TEWG meetings. See Terrestrial Environment Mitigation and Monitoring Plan (2016). Baffinland is currently working with ECCC on plans to deploy passive sound recording devices to detect red knot vocalizations in 2019/2020. Canadian Wildlife Service is recommending that the sound recorders be deployed for at least two breeding seasons, in suitable red knot habitats at different locations to achieve the best results. If red knot are detected, CWS may recommend future monitoring.
68	Install flashing red, red strobe or white strobe lights and guy-wire deterrents on communications towers. Consider reducing lighting when possible in areas where it may serve as an attractant to birds or other wildlife.	In Compliance	Reflectors have been installed on guy wires of current communications towers and will continue to be done in future construction activities. Strobe lights were found to not be relevant mitigation measures since bird are mostly present during the period of 24h sunlight. See 2018 Terrestrial Environment Annual Monitoring Report, Terrestrial Environment Mitigation and Monitoring Plan (2016).
69	Prior to bird migrations and nesting, identify and install nesting deterrents (e.g. flagging) to discourage birds from nesting that will be disturbed by construction/clearing activities.	In Compliance	No deterrents have been used. There were no apparent nesting attempts by birds in the cleared areas. See 2018 Terrestrial Environment Annual Monitoring Report, Terrestrial Environment Mitigation and Monitoring Plan (2016).
70	Protect any nests found (or indicated nests) with a buffer zone as per setback distances outlined in the TEMMP.	In compliance	Two song bird nests were located in 2018 bird surveys and a snow bunting nest was found near the MS-08 waste rock pond. An American Pipit nest was found on the crusher pond access road. All nests were buffered to 100m according to the recommendations outlined in the TEMMP. Site development was also delayed at both sites until it was confirmed that nesting was complete. See 2018 Terrestrial Environment Annual Monitoring Report (2016).

71	Subject to safety requirements, the Proponent shall require all project related aircraft to maintain a cruising altitude of at least:	Partial Compliance	See 2018 Terrestrial Environment Mitigation and Monitoring Plan (2016)
	a. 650 m during point to point travel when in areas likely to have migratory birds		Generally not compliant
	b. 1100 m vertical and 1500 m horizontal distance from observed concentrations of migratory birds		No concentrations observed
	c. 1100 m over the area identified as a key site for moulting snow geese during the moulting period (July-August), and if maintaining this altitude is not possible, maintain a lateral distance of at least at least 1500 m from the boundary of this site		Generally not compliant
72	Ensure that pilots are informed of minimum cruising altitude guidelines and that a daily log or record of flight paths is maintained and available for regulatory authorities.	Partial Compliance	Pilots informed and contracted to follow flight regulations set in place by Baffinland through the Project Certificate. However, pilots are not fully compliant, some non-compliances are due to flight requirements such as weather, movement of personnel and equipment, or pilot safety concerns. Random flight log audit are conducted to identify non-compliance issues. remains a contentious issue throughout the MEWG meetings and through review of meeting minutes and NIRB staff observation.
73	Develop detailed and robust mitigation and monitoring plans for migratory birds taking into consideration input from relevant organizations.	In Compliance	Existing monitoring programs are in place and were carried out during the 2018 field season. See 2018 Terrestrial Environment Annual Monitoring Report, Terrestrial Environment Mitigation and Monitoring Plan (2016). CWS and Baffinland are currently discussing the potential deployment of passive sound recording devices to detect red knot vocalizations in 2019
74	Develop and update relevant monitoring plans for migratory birds prior to construction including the key indicators included in the condition.	In Compliance	Existing monitoring programs are in place and were carried out during the 2018 field season. See 2018 Terrestrial Environment Annual Monitoring Report, Terrestrial Environment Mitigation and Monitoring Plan (2016). CWS and Baffinland are currently discussing the potential deployment of passive sound recording devices to detect red knot vocalizations in 2019

75	Report annually on terrestrial habitat loss due to the Project to verify impact predictions and project footprint.	In Compliance	There was no Project construction carried out in 2018. The current footprint of the Project is smaller than the proposed PDA in the FEIS. See 2018 Terrestrial Environment Annual Monitoring Report, 2016 Terrestrial Environment Mitigation and Monitoring Plan (2016). Environmental Protection Plan (2016)
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Marine Environment

76	Develop a comprehensive environmental effect monitoring program to address concerns and identify potential impacts on the marine environment.	In Compliance	Marine Environmental Effects Monitoring Plan (MEEMP) in place since 2015 and the Aquatic Invasive Species Monitoring Program was developed as part of the MEEMP. To date no invasive species have been observed; however new species may have been identified through the program and Baffinland is awaiting confirmation from DFO. the MEEMP is reviewed annual with adjustments made and the plan updated as necessary.
77	Establish a Marine Environment Working Group.	In Compliance	The MEWG was established in 2013 and has met four times in 2018 to help guide the development of the MEEMP and other marine monitoring efforts. Baffinland, with support from the QIA and other members of the MEWG has put a strong emphasis on continuing existing programs and developing more diverse community-based monitoring programs.
78	Update baseline information for landfast ice using a long term data-set and with inter-annual variation.	In Compliance	Baseline information for landfast ice was updated in 2011 with a study done by ENFOTEC Technical Services Inc. as part of the original FEIS and has since been updated in 2015 as part of the ERP. The ice condition report for the Northern Shipping Route (Milne Port) will be updated periodically as new data becomes available. The ice condition study for the Southern Shipping Route (Steensby Inlet) will be updated prior to the construction and operation of the Steensby Port.
79	Provide the Canadian Hydrographic Services with bathymetric data and other information in support of Project shipping where possible.	In Compliance	Baffinland has entered into a collaborative agreement with Canadian Hydrographic Survey for their nautical charting program and also collected additional bathymetry data around the ore dock in 2016.

80	Prior to commercial shipping of iron ore, a detailed risk assessment is to be conducted for Project related shipping accidents.	In Compliance	Baffinland retains the services of a contractor in order to respond to potential spills along the shipping route within Milne Inlet and maintains equipment at the Milne Inlet facility. Oil Pollution Emergency Plan training was conducted with Baffinland staff in 2018 as well as a mock spill exercise was performed to ensure spill readiness. Baffinland is committed to conducting annual spill response exercises and training. Emergency Response Plan (2018) Oil Pollution Emergency Plan - Milne Inlet OPEP (2017) Shipping and Marine Wildlife Management Plan (2016) Spill at Sea Response Plan (2015) Spill Contingency Plan (2017)
81	Reassess the potential for ship wake impacts to cause coastal change following changes to the proposed shipping route.	Partial Compliance	There have been no changes to the current shipping route and through the FEIS and the ERP FEIS addendum, Baffinland has predicted that there would be no impacts from ship wakes.
82	Encouraged to have ore carriers to subjected to sea trials to measure wake characteristics at various speeds.	Not Applicable	Baffinland believes that they have assessed this through the FEIS and FEIS addendum for the ERP. They also state that shoreline erosion is mainly a concern for the southern shipping route which is not currently in use.
83	Install tidal gauges at Steensby and Milne Ports to monitor sea levels and storm surges.	Partial Compliance	There is currently installed and functioning tidal gauges installed at Milne Port; however, there is no gauges at Steensby. Baffinland believes this is not necessary as this portion of the Project is inactive. A Tide Gauge Monitoring Plan has been developed (2018) which provides guidelines for annual management and maintenance of the tide gauge station such that a long-term record of water levels at Milne Port during the open-water season can be developed and can be applied to Steensby Port when it becomes active.
83 (a)	Identify potential for and conduct monitoring to identify effects of sediment redistribution associated with construction and operation at Milne Port	Partial Compliance	Monitoring conducted and data collected; however, there was not enough data to confidently predict any associated trends. See Marine Environmental Effects Monitoring Plan (2018). The NIRB reminds Baffinland that it expects more information available in the Annual Report than a table summarizing the spills related to any of the plans and would expect a year over year comparison to ensure that any trends can be identified and addressed promptly.

84	Update sediment redistribution modelling once ship design has been completed and sampling should be undertaken to validate the model and inform sampling sites and the monitoring plan.	Not in compliance	According to Baffinland ship wake modelling performed in 2018 for the Phase 2 by Golder suggest that wakes are expected to be minimal along the Northern Shipping Route. Baffinland understands this Condition to be regarding the southern shipping route which is currently inactive. As a result, they have no ship wake modelling performed for the southern route. No sediment dispersion modelling was completed for Milne Port shipping either. Baffinland will review the requirement for updating ship wake modelling along the Southern Shipping Route when activities are renewed at Steensby Port.
85	Develop a monitoring plan to verify Project impact predictions associated with sediment redistribution resulting from propeller wash in shallow water locations along the shipping route. Additional mitigation measures are required if monitoring detects negative impacts.	Not Applicable	Baffinland believes this concerns the southern shipping route, which is not being used, and ore carriers which have not yet been commissioned. Baffinland will develop a monitoring plan to verify predictions of sediment redistribution resulting from propeller wash in shallow locations along the shipping route if and/or when ore carriers are commissioned for the Southern Shipping Route
86	Prior to commercial shipping of iron ore, use more detailed bathymetry collected from Steensby and Milne Inlets to model anticipated ballast water discharges from ore carriers. This information should be used to update ballast water discharge impact predictions and sampling should be conducted to validate the model.	Partial compliance	Canadian Hydrographic Service collected bathymetry around the ore dock in 2016. This data will be used to validate the improved ballast water dispersion model reflective of current Project operations as requested by the NIRB in its 2017 Board Recommendations. NIRB requested for Baffinland to utilize oceanographic and bathymetric data collected between 2014 and 2017 to develop an updated ballast water dispersion model for the current Project operations, independent of the assessment of the Phase 2 proposal.
87	Develop a detailed monitoring program at a number of sites over the long term to evaluate changes to marine habitat and organisms and to monitor for non-native introductions resulting from Project-related shipping. Initiate program several years prior to any ballast water discharge at Steensby or Milne Inlets.	In Compliance	Marine Environmental Effects Monitoring Plan (MEEMP) in place and carried out in 2018. To date, no confirmed Aquatic Invasive species have been found.

88	Prior to commercial shipping of iron ore, provide update risk analysis regarding ballast water discharge to assess the adequacy of treatment and implications on the receiving environment.	In Compliance	Risk assessment complete 2013 determined that shipping operations of the ERP are unlikely to increase the risk of Aquatic Invasive species. To date no confirmed aquatic invasive species have been found.
89	Develop and implement a ballast water management program that may include the treatment and monitoring of ballast water discharges in a manner consistent with or exceeds applicable regulations. The management program should reflect all inclusions outlined in the condition.	In Compliance	Baffinland has developed a Ballast Water Management Plan (2019) that is functional of both current and future shipping operations. Canada's ratification of the International Convention for the Control and Management of Ships' Ballast Water and Sediments (IMO 2017) that entered into force on September 8, 2017 (IMO 2017), ships are now required to incorporate an on-board ballast water treatment system to meet D-2 performance standards and further reduce the potential for invasive species introductions. Newly built ships must now meet the D-2 standard, while the requirements for existing ships will be implemented over a phased period up to 2024 in coordination with the renewal of each ship's International Oil Pollution Prevention Certificate (IOPPC). Until then, all ships will continue ballast water exchange outside the Canadian Exclusive Economic Zone (EEZ). Baffinland has updated its BWMP to reflect this new legislation.
90	Incorporate into the Project Shipping and Marine Wildlife Management Plan provisions to achieve compliance with the requirements under the International Convention for the Control and Management of Ships Ballast Water and Sediment (2004) or its replacement regulation as amended.	In Compliance	Ballast Water Management Plan (2019)
91	Develop a detailed monitoring plan for Steensby and Milne Inlets for fouling that complies with all applicable regulatory requirements and guidelines issued by Transport Canada.	In progress	Baffinland indicates that ship hull biofouling monitoring was included in the Marine Environmental Effects Monitoring Plan (2018) and associated AIS Monitoring Program. This work was only conducted at Milne Port as Steensby is still inoperable. No non-native or invasive species were found during the 2018 studies. To improve the studies, High Definition cameras are planned for future use.
92	Ensure that the Proponent maintains the necessary equipment and trained personnel to respond to all sizes of potential spills in a self sufficient manner.	In Compliance	Baffinland current has spill response plans in place and spill response exercises are carried out annually. See 2018 Emergency Response Plan, 2017 Spill Contingency Plan, 2017 Oil Pollution Emergency Plan-Milne Inlet, 2015 Spill at Sea Response Plan.

93	Prior to construction, based on vessel selection, reassess the risk analysis of using vessel -based fuel storage with the inclusions outlined in the condition.	Not Applicable	Not applicable as the use of vessel-based fuel storage is not currently proposed
94	Consult directly with affected communities regarding its plans for over-wintering of fuel in Steensby Inlet.	Deferred	Baffinland indicated that it would re-visit this condition if overwintering of fuel at Steensby Inlet is proposed.
95	Meet or exceed all regulatory regulations and requirements to the practice of overwintering of a fuel vessel at Steensby Inlet with reporting to NIRB and Transport Canada.	Deferred	Baffinland indicated that it would re-visit this condition if overwintering of fuel at Steensby Inlet is proposed.
96	Update the NIRB on the results of all compliance monitoring and site inspections undertaken by government agencies for the overwintering of a fuel vessel at Steensby Inlet.	Deferred	Overwintering of fuel in Steensby Inlet is not currently proposed.
97	Prior to commercial shipping of iron ore, conduct fuel spill dispersion modelling that minimally includes those items outlined in the condition.	In Compliance	Baffinland indicated that there have been no changes to the shipping practices since the revised oil spill modelling was conducted in 2015, therefore no updates are required. See 2018 Emergency Response Plan, 2017 Spill Contingency Plan, 2017 Oil Pollution Emergency Plan-Milne Inlet, 2015 Spill at Sea Response Plan.
98	Incorporate the results of revised fuel dispersion modelling into its impact predictions for the marine environment and the spill response and emergency preparedness plans.	Complete	The revised fuel spill modelling completed in 2015 was used to revise Baffinland's spill response and emergency preparedness plans, including the development of a Spill at Sea Response Plan. See 2018 Emergency Response Plan, 2017 Spill Contingency Plan, 2017 Oil Pollution Emergency Plan-Milne Inlet, 2015 Spill at Sea Response Plan.
Marine Wildlife			
99	With the Marine Environment Working Group, consider and identify priorities for conducting supplemental baseline assessments for the items outlined in the condition.	In Compliance	In compliance through the ERP phase of the project and its associated Environmental Effects Monitoring plans. Monitoring activities in Steensby Inlet are inactive. See 2016 Marine Environmental Effects Monitoring Plan.

100	Update the Project Shipping and Marine Wildlife Management plan to include avoidance of polynyas and mitigation measures designed for potential fuel spills along the shipping lane during the winter months.	Not Applicable	Baffinland indicated that there is currently no winter shipping or ice breaking occurring as part of the Mary River Project so there is no need to address fuel spills during winter months in the SMWMP.
101	Incorporate all items outlined in the condition into the appropriate monitoring plans.	Applicable items are complete for 2016. Some items are Not applicable in 2016.	Baffinland has been compliant with these terms and conditions. Several items were not applicable as the Steensby Inlet portion of the Project is currently inactive. See 2016 Marine Environmental Effects Monitoring Plan.
102	Ensure that routing of project vessels is tracked and recorded for both the southern and northern shipping routes, with data made real-time available to communities in Nunavut and Nunavik.	In Compliance	Baffinland has made vessel routing accessible to the public via the Baffinland corporate website (put in website) and they have also installed an Automated Information System at the MHTO office for continuous monitoring of vessel traffic along the Northern Shipping route. Baffinland has found the use of exactEarth® to be beneficial in providing information related to ship routing to the public. Baffinland will continue to use this service.
103	Report annually to the NIRB regarding project related ship track and sea-ice information including all items outlined in the condition.	In Compliance	Baffinland has reported no significant deviations from the nominal shipping route in 2018 by Project Ore carriers. Draft 2018 Ship-Based Observer Program (2018)
104	Plan shipping routes to Steensby Port in accordance with the items outlined in the condition. Summarize all incidences of significant deviations from the nominal shipping route presented in the FEIS to/from Milne and Steensby Ports.	In compliance	Steensby Port is current inactive. There were no significant deviations from nominal shipping routes to/from Milne Port in 2018. Baffinland will continue to monitor ship tracks using the shore-based AIS station at Bruce Head and satellite-based ship tracking using the exactEarth® service.

105	Ensure that measures to reduce the potential for interaction with marine mammals particularly in Hudson Strait and Milne Inlet area identified and implemented prior to commencement of shipping operations.	Partial Compliance	<p>No activity took place at Steensby port in 2018 as it is currently inactive. Interactions between marine mammals and ships are monitored using Bruce Head as part of the Narwhal monitoring program, the ship based observer program and various other marine monitoring programs. Ore carriers rarely exceeded 10 knots along the northern shipping route and follow up was completed if excessive speeds were noted.</p> <p>After a trial aimed at running the Shore-based Monitoring Program from a vessel platform in 2018, Baffinland is considering what modifications could be made to the Bruce Head Shore-based Monitoring Program to reinitiate it in 2019. See update to Condition No. 101. In 2019, cargo and fuel vessels will continue to be provided with standing instructions to travel along the Northern Shipping Route at speeds not exceeding 9 knots, similar to the requirements for ore vessels</p>
106	Ensure that shipboard observers are employed during seasons where shipping occurs and provided with the means to effectively carry out the duties. The role of shipboard observers should be taken into consideration in the design of any Project purpose built ships.	Partial ompliance	<p>Baffinland resumed it's ship based observer program in 2018 by placing observers on board the MSV Botnika. Marine mammal surveys were conducted using conventional sampling methods with observers sampling on both sides of the ship. Since the purpose built ships have yet to be commissioned by Baffinland, the MSV Botnika acts as a stand in. The MSV Botnika was only present at the beginning and end of the shipping season.</p> <p>Safety concerns that were raised regarding the initial SBO program (that led to the postponement of the program in 2016) were mitigated through the use of the MSV Botnika as the survey platform in 2018. This included on-board accommodation for Inuit observers to allow for regular wildlife surveys over consecutive days. In doing so, the need to conduct at-sea boarding of observers on different survey vessels was no longer necessary. A similar program as completed in 2018 is under consideration for 2019.</p>
107	Revise the proposed 'surveillance monitoring' to improve the likelihood of detecting strong marine mammal, seabird or seaduck responses occurring too far ahead of the ship to be detectable by observers aboard the ore carriers.	In Progress	<p>In 2018, a total of 551 sightings occurred totaling 2766 individual marine mammals (narwhal, ringed seal, harp seal, bearded seal and polar bear). Sea birds were also spotted during these surveys. No ship strikes were noted in 2018. The SBO Program resumed in 2018 using an MSV Botnika survey platform at the beginning and end of the shipping season. This proved successful at increasing monitoring effort and detection of marine mammals and seabirds, while reducing risks associated with safe onboarding of the observers. A similar program as completed in 2018 is under consideration for 2019.</p> <p>Draft 2018 Ship-based Observer Program (2019)</p>

108	Ensure that data produced by the surveillance monitoring program is analyzed by experienced analysts (in addition to being discussed as proposed in the FEIS) to maximize effectiveness in providing baseline information and/or detecting potential effects. Data from the long term monitoring should be treated with the same rigor.	Partial Compliance	See T&C 107. This work is performed using the ship based observer program. The MSV Botnika was only present at the beginning and end of the shipping season, limiting the amount of data collected. Draft 2018 Ship-based Observer Program (2019)
109	Conduct a monitoring program to confirm the predictions in the FEIS with respect to disturbance effects from ships noise on the distribution and occurrence of marine mammals.	Partial Compliance	Baffinland uses the Ship based observer program and the Bruce head shore-based monitoring program (not in 2018 due to winter damage to camp) in order to confirm FEIS predictions. The MSV Botnika was only present at the beginning and end of the shipping season, limiting the amount of data collected.
110	Immediately develop a monitoring protocol that includes acoustical monitoring to assess short, long term and cumulative effects of vessel noise on marine mammals. Work with the MEWG to identify appropriate early warning indicators that will ensure rapid identification of negative impacts along southern and northern shipping routes.	Partial Compliance	In 2018, underwater passive acoustic monitoring stations were deployed over a 2 month period. The MEWG is currently helping to organize and design these programs and early warning indicators of negative impacts of vessel noise. Definitive Early Warning Indicators have not been established. See Marine Environment Working Group Meeting Notes. A passive acoustic monitoring study is proposed in 2019 that would be undertaken in concert with the 2019 Bruce Head Shore-based Monitoring Program (visual-based behavioral study) to evaluate whether the frequency, intensity, and duration of different narwhal call types is modified in the presence of large vessel traffic (in relation to visually recorded behavioral changes). A collaborative study between Golder, JASCO, the University of New Brunswick and Baffinland is proposed in 2019. In 2019, Baffinland will, in consultation with the MEWG, finalize the identification of appropriate thresholds for the selected EWIs and link the thresholds to monitoring programs to ensue that EWIs provide rapid detection of adverse impacts on marine mammals. Draft 2018 Passive Acoustic Monitoring Program (2019)
111	Develop clear thresholds for determining if negative impacts as a result of vessel noise is occurring.	Partial Compliance	Acoustic data has been collected, is being analyzed, and is expected to be completed with thresholds determined in Q4 of 2019. Thresholds have not been established. See Marine Environment Working Group Meeting Notes. 2018 Passive Acoustic Monitoring Program (2019)

112	Prior to commercial shipping of iron ore, in conjunction with the MEWG, develop a monitoring protocol that includes acoustical monitoring that provides an assessment of the negative effects of vessel noise on marine mammals. Consideration of early warning indicators and thresholds of impacts should be included.	Partial Compliance	Baffinland and the MEWG has designed and used the Passive Acoustic Monitoring Program in order to examine ambient noise in the Project area. The program was actively used in 2018; however no early warning indicators have been established. See Marine Environment Working Group Meeting Notes. Draft 2018 Passive Acoustic Monitoring Program (2019)
113	Conduct monitoring of marine fish and fish habitat including monitoring for Arctic Char stock size and health condition in Steensby and Milne Inlets, as recommended by the MEWG.	In Compliance	Arctic char monitoring has been ongoing each year of the Project using a variety of fishing methods over 1700 hours of effort. Once fish are caught, measurements are taken in order to calculate relative abundance and distribution, catch per unit effort and age distribution. Total fish catch in 2018 was significantly higher than previous years. See MEWG meetings notes for further discussing topics.
114	In the event of the development of a commercial fishery in Steensby Inlet or Milne Inlet areas, in conjunction with the MEWG, shall update the monitoring program for fish and fish habitat to ensure that the ability to identify Arctic Char stock(s) and any changes in stock size and structure of affected stocks and fish health is maintained to address any monitoring issues relating to the commercial stock fishery.	In Compliance	There is no commercial fisheries located in Steensby or Milne inlet. Baffinland will adapt its monitoring programs accordingly in the event a commercial fishery is developed in the Steensby Inlet area or Milne Inlet-Eclipse Sound areas.
115	Continue to explore off-setting options in both the freshwater and marine environment to offset serious hard to fish which will result from the construction and infrastructure associated with the project.	In Compliance	In 2014 DFO issues a Fisheries authorization from DFO to construct a dock that was completed that same year. In 2018 Baffinland submitted the Milne Ore Dock Fish Offset Monitoring Report was submitted to the DFO and has implemented the plan.

116	Prior to construction, develop mitigation measures to minimize the effects of blasting on marine fish and fish habitat, marine water quality and wildlife that includes compliance with the Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters.	Not Applicable	Blasting in the marine environment has not occurred during the life of the project. If required, Baffinland will develop plans with the MEWG and DFO.
117	Ensure that blasting in, and near, marine water shall only occur during periods of open water. Blasting in, and near, fish-bearing freshwater should occur to the greatest degree possible in open water. Blasting during ice-covered periods must meet requirements established by Fisheries and Oceans Canada.	Not Applicable	Blasting in the marine environment has not occurred during the life of the project. If required, Baffinland will develop plans with the MEWG and DFO using existing plans such as the ones listed below. Surface Water and Aquatic Ecosystem Management Plan (2019) Quarry Blasting Operations Management Plan (2013)
118	Prior to construction, incorporate into the appropriate mitigation plan, thresholds for the use of specific mitigation measures meant to prevent or limit marine wildlife disturbance.	In Compliance	Ore docks were constructed at Milne Port in 2014 and were fully compliant with marine environment monitoring thresholds as per the 2014 Aquatic Effects Management Plan.
119	In conjunction with the MEWG, monitor ringed seal birth lair abundance and distribution for at least two years prior to the start of ice-breaking to develop a baseline, with continue monitoring over the life-time of the project.	Deferred	No winter shipping has occurred during the current phase of the Project.

120	Ensure, subject to vessel and human safety, that all Project shipping adhere to mitigation measures outlined in the condition for the protection of marine wildlife.	In Compliance	The 2018 ship tracked are plotted in the Baffinland 2018 annual report and there were no significant deviations from the route. Vessel speeds exceeded 10 knots in 2 situations; however, the vast majority of vessels were travelling below 10 knots. To ensure adherence to the SMWMP, Baffinland will continue to monitor ship tracks and ship speeds using shore-based AIS stations at Pond Inlet and Bruce Head, and satellite-based ship tracking using the exactEarth® archive. In 2019, all Project vessels (ore carriers, fuel tankers, cargo ships, tugs, icebreaker) will be provided with standing instruction to travel through Eclipse Sound and Milne Inlet at speeds of no greater than 9 knots. Shipping and Marine Wildlife Management Plan – Rev 06 – March 2016
121	Immediately report any accidental contact by Project vessels with marine mammals or seabird colonies to Fisheries and Oceans Canada and Environment Canada, respectively.	In Compliance	There were no observations of accidental contact between project vessels and marine mammals or sea bird colonies during 2018. See 2018 Annual Report.
122	Summarize and report annually to the NIRB regarding accidental contact by Project vessels with marine mammals or seabird colonies through the applicable monitoring report.	In Compliance	This is mandated through Baffinland's Shipping and Marine Wildlife Management Plan (2016). There were no contacts reported during the 2018 shipping season.
123	Provide sufficient marine mammal observer coverage on Project vessels to ensure that collisions with marine mammals and seabird colonies are observed and reported throughout the lifecycle of the Project. The marine wildlife observer protocol should include those items outlined in the condition.	In Compliance	Baffinland collected marine mammal data through the Ship-based Observer Program and will continue in 2019 through this program as well as the Bruce head program. Draft 2018 Ship-based Observer Program (2019)
124	Prohibit all Project employees from recreational boating, fishing and harvesting of marine wildlife in Project areas, including Steensby and Milne Inlets.	In Compliance	No incidences of Project personnel hunting or fishing within the Baffinland lands lease in 2018. See Baffinland Hunting and Harvesting Policy, 2016. Environmental Protection Plan (2016)

125	Prior to the use of acoustic deterrent devices, carry out consultations with communities along the shipping routes and nearest to Steensby and Milne Inlet Ports to assess acceptability of the devices. Feedback from consultation should be incorporated into the mitigation plan.	Not applicable	No acoustic deterrents have been considered or used in the project to date.
125(a)	Consult with potentially affected communities and groups, particularly the Hunters and Trappers Organizations regarding the identification of Project vessel anchor sites and potential areas of temporary refuge for Project vessels along the shipping routes within the Nunavut Settlement Area. Feedback from the consultation should be incorporated.	Partial Compliance	Baffinland consulted with the MHTO regarding vessel traffic on July 7,8 12, August 30, 31 and November 28 and 29, 2018. Through attendance at the MEWG meetings and the Marine Workshop in Pond Inlet (May 2019), NIRB staff noted that MHTO is still unhappy with the current anchoring locations and vessel traffic.
126	Design monitoring programs to ensure that local users of the marine area in communities along the shipping route have opportunity to be engaged throughout the life of the Project in assisting with monitoring and evaluating potential Project-induced impacts and changes in marine mammal distributions.	In Compliance	Baffinland indicates that a total of 11 Inuit were actively involved in the planning and execution of the 2018 monitoring programs. This involved the 2018 MEEMP, AIS monitoring, 2018 Habitat Offset Monitoring, The Bruce Head Observation and the Ship based observer program.
127	Ensure that communities and groups in Nunavik are kept informed of Project shipping activities and are provided with opportunity to participate in the continued development and refinement of shipping related monitoring and mitigation plans.	In Compliance	Baffinland has enlisted ExactEarth, which is a global vessel monitoring and tracking service based on AIS to track and report vessel movements. These data are provided and advertised on the Baffinland website www.baffinland.com .

128	Consult with local communities as fish habitat off-setting options are being considered and demonstrate incorporation of this input in the design of the Fish Habitat Off-Setting Plan.	Partial Compliance	Through various consultations with communities throughout the ERP phase, Baffinland is confident that their fish habitat offsetting plan incorporates community feedback. Through community consultations, NIRB continuously receives comments from community members regarding the health of the fish habitat near the Project. Baffinland approach community consultation as an ongoing and iterative process. We have established a program for continuous engagement opportunities on an annual basis with community members. Subsequently, Baffinland is committed to discussing concerns related to construction and monitoring of offset for the freight dock should they arise during future consultation opportunities.
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Population Demographics

129	Encouraged to engage in the work of the Qikiqtaaluk Socio-Economic Monitoring Committee along with other agencies and affected communities, endeavoring to identify areas of mutual interest into a collaborative monitoring framework that includes socio-economic priorities related to the Project, communities and the North Baffin region as a whole.	In Compliance	Baffinland's socio-economic monitoring report assesses the socio-economic performance of the Project annually. Report has revealed positive, negative and inconsistent results when compared to the initial predictions of the FEIS. Baffinland suggests that longer term monitoring will be necessary to draw firm conclusions. Socio-Economic Monitoring Plan (2018) The NIRB reminds Baffinland that they are expected to include clearly and succinctly in the relevant section of the annual report a comparison of monitoring data that has been collected to date so readers can view the direct comparison to the FEIS and any subsequent amendment.
130	Consider establishing and coordinating with smaller socio-economic working groups to meet Project specific monitoring requirements throughout the life of the Project.	In Compliance	Baffinland has continued to engage with QSEMC and SEMWG, The GN, the GoC, and the QIA to help meet specific monitoring requirements. The 2018 meetings were as follows: February 14, 2018 (SEMWG), June 19, 2018 (SEMWG), June 20, 2019 (QSEMC). Meeting dates and details are outlined in their 2018 Annual Report. Socio-Economic Monitoring Plan (2018)
131	The Qikiqtaaluk Socio-Economic Monitoring committee is encouraged to engage in monitoring of demographic changes including the movement of people into and out of the North Baffin communities and the territory as a whole.	In Compliance	Demographic trend changes have been indicated and detailed in Baffinland's Socio-economic Monitoring Report (2018).

132	Encouraged to partner with other agencies in the North Baffin region, the Municipal Training Organization and the Government of Nunavut in developing/implementing programs which encourage Inuit to remain living in their home communities while seeking ongoing and progressive training and development.	In Compliance	Baffinland has indicated that they offered numerous on-site training opportunities for Inuit employees who are working on-site. In 2018, Baffinland has also developed the Q-step partnership to achieve 54 Heavy Equipment trainees, 8 apprenticeships and 72 work ready graduates. These along with other efforts are detailed in their 2018 Socio-economic Monitoring Report. Socio-Economic Monitoring Plan (2018)
133	Encouraged to work with the Qikiqtaaluk Socio-Economic Monitoring committee and with the Government of Nunavut and other relevant stakeholders to design and implement a voluntary survey to be completed by its employees on an annual basis in order to track housing status and migration intentions. Non-confidential findings are to be reported to the Government of Nunavut and the NIRB.	In Compliance	In 2018, a total of 71 surveys were completed by Inuit employees and contractors pertaining to residence change in and out of the LSA within the last 12 months. See Baffinland's 2018 Socio-economic Monitoring Report. Socio-Economic Monitoring Plan (2018)
134	Provide in the annual report to the NIRB a summary of employee origin information including information outlined in the condition.	In Compliance	Baffinland has collected data on the origin, number and ethnicity of employees and contractors who work on the Project in 2018 and it is presented in the Socio-Economic Monitoring Report. The information was obtained from Baffinland's internal records. Socio-Economic Monitoring Plan (2018)

Training and Education

135	Encouraged to consider offering additional options for work/study programs available to Project employees.	In Compliance	Baffinland has worked in conjunction with the IIBA joint management committee to discuss training opportunity and will continue to do so in 2019. Baffinland has also designed work ready programs outlined in the re-negotiated IIBA agreement (2018) as well as their 2018 Annual Report.
136	Encouraged to work with training organizations and/or government departments offering mine-related or other training in order to provide additional training opportunities for employees which are transferable and meaningful.	In Compliance	Baffinland works in partnership with the QIA on the Q-step program to help train heavy equipment operators and apprentices. See 2018 Annual Report.

137	Prior to construction, develop an easy referenced listing of formal certificates and licenses that may be acquired via on-site training or training during employment at Mary River. Listing to be updated on an annual basis, provided to the NIRB upon completion and whenever it is revised.	In Compliance	Baffinland delivered a total of 32, 629.2 hours of training in 2018 to Inuit employees which represents 45% of the total training hours provided by Baffinland. See 2018 Socio-economic Monitoring Report.
138	Encouraged to work with the Qikiqtani Inuit Association to ensure timely development of effective Inuit training and work-ready programs.	In Compliance	The Q-step program has been developed and applied in 2018 to promote meaningful Inuit employment and training opportunities. See 2018 Socio-economic Monitoring program.
139	Prior to construction, undertake and provide results of a detailed labor market analysis which provides quantitative predictions on the number of employees to be sourced from southern Canada and foreign markets. Within 90 days of receipt of the Project Certificate, submission of an updated labor market analysis must be submitted.	In Compliance	Baffinland provided a revised labor market analysis in the 2014 annual report to the NIRB. In 2018 Baffinland engaged Mining Industry Human Resources Council to conduct a Labour Market Analysis with a larger scope in 2019
140	Encouraged to survey Nunavummiut employees as they are hired and specifically note the level of education obtained and whether the incoming employee resigned or left an educational institute to take up employment with the Project.	In Compliance	Baffinland conducted 71 surveys in 2018 through both employees and contractors. These results are summarized in table 4.33 of Baffinland's 2018 Annual Report. Socio-Economic Monitoring Plan (2018)

141	Prior to construction, encouraged to work with the Qikiqtani Inuit Association in order to prioritize the provision of training of Inuit to serve as employees in monitoring or other such capacities.	In compliance	Baffinland has indicated that it continues to work with the QIA to promote Inuit training, education and employment initiatives which are consistent with the provisions outlines in the IIBA. See 2018 Annual Report for description of Meetings with the QIA as well as the 2018 Socio-economic Monitoring Report Baffinland recognizes the need to institute training programs at early stages to ensure potential Inuit employees are equipped with the necessary skills to take advantage of employment opportunities at the Mary River Project. Baffinland's IIBA with the QIA and its Inuit Human Resources Strategy outline several initiatives Baffinland is undertaking to advance Inuit training and employment. The success of Inuit training and employment initiatives will continue to be tracked through Baffinland's Socio-Economic Monitoring Reports and IIBA Implementation Reports provided to QIA.
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Livelihood and Employment

142	Encouraged to address the potential direct and indirect effects that may result from Project employees on-site use of various Inuktitut dialects as well as other spoken languages.	In Compliance	Baffinland has company policies in place to outline the Company's position in support of the use of Inuktitut at all Project sites in Nunavut and ensures that a lack of English does not pose a barrier to Inuit employment by translating signage on-site. Inuktitut in the Workplace Policy
143	Encouraged to consider the use of both existing and innovative technologies as a way to ensure Project employees are able to contact their family and friends.	In Compliance	Internet and telephone access is available free of charge to all employees in the accommodations complexes.
144	Encouraged to make requirements for employment clear in its work-readiness and other programs and documentation.	In Compliance	The Baffinland Community Liaison Officers in each community are responsible for communicating the employment requirements for individuals who apply for jobs at Baffinland. See 2018 Annual Report and the Socio-economic Monitoring Report.
145	Encouraged to work with the Government of Nunavut and the Qikiqtaaluk Socio-Economic Monitoring committee to monitor the barriers to employment for women.	In Compliance	This is an ongoing effort. Baffinland has provided examples of the potential barriers to employment for women in the Socio-Economic Monitoring Report. This includes data on the number of women employed along with the number of hours worked and childcare availability and costs. Socio-Economic Monitoring Plan (2018)

146	The Government of Nunavut and the Qikiqtani Inuit Association are encouraged to investigate the possibility for Project revenue streams to support initiatives or programs which offset or subsidize child care for Project employees.	Not Applicable	Not directly applicable to Baffinland. The GN and QIA are responsible for fulfillment of this condition.
147	Encouraged to work with the Government of Nunavut and the Nunavut Housing Corporation to investigate options and incentives which might enable and provide incentive for employees living in social housing to maintain employment as well as to negotiate for an obtain manageable rental rates.	In Compliance	Baffinland indicated that it discusses housing related issues with the Mary River Socio-Economic Monitoring Working Group, of which the Government of Nunavut (including Nunavut Housing Corporation) are active participants. See the Socio-Economic Monitoring report and 2018 Annual report for meeting notes.

Benefits, Royalties and Taxation

148	Encouraged to undertake collaborative monitoring in conjunction with the Qikiqtaaluk Socio-economic Monitoring committee's monitoring program which addresses Project harvesting interactions and food security and broad indicators of dietary habits.	In Compliance	Baffinland has provided information on Project and harvesting interactions and food security in the 2018 Socio-Economic Monitoring Report. However, appropriate community-level indicator data are currently unavailable for this topic. As such, this topic continues to be tracked through the QSEMC process, community engagement conducted for the Project, and related information. Baffinland is open to discussing with the SEMWG and QSEMC how improved monitoring data may be obtained Socio-Economic Monitoring Plan (2018)
149	Prior to operations, required to undertake an analysis of the risk of temporary mine closure giving consideration to the affects of such to the North Baffin region.	In Compliance	In 2014, Baffinland submitted a report titled " Potential Effects of a Mine Closure" to the NIRB. Baffinland is working with the QIA to develop a Mine Closure Working Group that will include members from local communities and will address biophysical and socio-economic issues related to temporary and permanent site closure.
150	Ensure that specific conditions are met in regard to Sirmilik National Park, as outlined in the condition.	In Compliance	Baffinland includes the minimum flying altitudes in the aviation contracts; however, no flights over Sirmilik Park occurred in 2018 Environmental Protection Plan (2016)

151	Encouraged to investigate measures and programs designed to assist Project employees with home ownership or access to affordable housing options.	In Compliance	Baffinland indicated that currently, there is not a clear and direct relationship between Project employment and any measures or programs undertaken by Baffinland or others, and home ownership. They believe that project income to residents will increase the purchasing power of those individuals in their home communities. In 2018, Baffinland provided financial literacy training to its employees, which included discussion around home ownership. In 2019, Baffinland plans to include questions regarding financial literacy training and home ownership in their employee surveys.
152	The Qikiqtani Inuit Association is encouraged to provide the Board and the Qikiqtaaluk Socio-Economic Monitoring committee which information regarding the effectiveness of any provisions within the Inuit Impact Benefit Agreement which may require that larger contracts are broken into smaller contracts.	Not Applicable	The condition is primarily directed to the QIA. However, Baffinland believes that the value of Project-related procurement with Inuit-owned business and joint ventures acts as a useful indicator of the business opportunities created by the Project.

Human Health and Wellbeing

153	Encouraged to employ a mental health professional to provide counselling to Inuit and non-Inuit employees in order to positively contribute toward employee health and well-being.	In Compliance	Baffinland's benefit plan includes an Employee and Family Assistance Program (EFAP) which offers all permanent employees and their dependents professional. Short-term counselling. Inuit cultural advisors are also available for the Projects Inuit employees. In 2018, 41 EFAP cases were files amid 36.6% of those were from families residing in Nunavut. The NIRB reminds Baffinland that they are expected to include clearly and succinctly in the relevant section of the annual report a comparison of all monitoring data that has been collected to date so readers can view the direct comparison to the FEIS and any subsequent amendment.
154	Work with the Government of Nunavut and the Qikiqtaaluk Socio-Economic committee to monitor potential indirect effects of the projects.	In Compliance	Baffinland has provided information on the potential indirect effects of the Project in the 2018 Socio-Economic Monitoring Report.
155	Encouraged to provide the NIRB with an updated report on its development of mitigation measures and plans to deal with potential cultural conflicts which may occur at site.	In Compliance	Through various on site programs and training such as cultural sensitivity for new employees, cultural awareness, promotion of Inuktitut in the workplace and Inuit Cultural Advisors on site, Baffinland is committed to promoting employee cohesion.

156	Encouraged to assist with the provision and/or support of recreation programs and opportunities within the potentially affected communities in order to mitigate potential impacts of employees' absence from home and community life.	In Compliance	In 2018, Baffinland partnered with Recreation and Parks Association of Nunavut (RPAN) to support summer camp programming in Pond Inlet. Through the IIBA, Baffinland is also committed to contributing to the Ilagiiktunut Pivalliajutsait Kiinaujat Fund to support various community opportunities.
157	Consider providing counselling and access to treatment programs for addictions, domestic parenting, and marital issues that affect employees and/or their families.	In Compliance	Baffinland's employee benefit plan includes an Employee and Family Assistance Program (EFAP), which offers all permanent employees and their dependents access to professional short-term counselling on an as-needed basis.

Community Infrastructure

158	Encouraged to work with the Government of Nunavut and other relevant parties to develop a Human Health Working Group.	In Compliance	Baffinland is currently involved with the QSEMC and SEMWG working groups which help to inform its socio-economic monitoring. The Government of Nunavut is an active participant in both of these groups. These meetings and discussions are listed in the 2018 Annual Monitoring Report. Socio-Economic Monitoring Plan (2018)
159	Encouraged to work with the Government of Nunavut to develop an effects monitoring program that captures increases to community based and airport infrastructure in the local study area and Iqaluit.	In Compliance	Baffinland continues to work with the QSEMC and the Mary River SEMWG on socio-economic monitoring initiatives; the GN actively participates in both these groups. Socio-Economic Monitoring Plan (2018)
160	The Government of Nunavut and the Qikiqtani Inuit Association are encouraged to cooperate to ensure that benefits are in a broad sense distributed across impacted communities and demographic groups that best offsets Project related impacts to infrastructure or services.	Not Applicable	Baffinland produces an annual Socio-economic Monitoring Report and regularly engages the Qikiqtaaluk Socio-Economic Monitoring Committee (QSEMC) and Mary River Socio Economic Monitoring Working Group (SEMWG) to discuss socioeconomic impacts and benefits of the Project. GN and QIA representatives are active members of both the QSEMC and Mary River SEMWG. This condition is directed towards the GN and the QIA.
161	The Government of Nunavut should be prepared for the potential need for increased policing to handle on-going Project related demographic changes in subsequent crime prevention.	Not Applicable	While Baffinland cannot influence how the Government of Nunavut (GN) and Royal Canadian Mounted Police (RCMP) interact with one another, the Company regularly cooperates with the GN with regards to Project-related socio-economic monitoring. Not directed at Baffinland.

Community Infrastructure

162	Make all reasonable efforts to engage Elders and community members of the North Baffin communities for input into monitoring programs and mitigative measures to ensure that they are informed by traditional activities, cultural resources and land-use.	In Compliance	Community members and other Project stakeholders continue to provide input that helps guide the development of monitoring programs. A list of community engagement dates, locations and topics are covered in table 4.47 and 4.48 in Baffinland's 2018 Annual Report. The NIRB reminds the Proponent to clearly demonstrate where this feedback from community members was used to influence changes in plans or practices for the company.
163	Continue to engage and consult with the communities of the North Baffin region to ensure that Nunavummiut are kept informed about Project activities.	In Compliance	Community members and other Project stakeholders continue to provide input that helps guide the development of monitoring programs. A list of community engagement dates, locations and topics are covered in table 4.47 and 4.48 in Baffinland's 2018 Annual Report. The NIRB reminds the Proponent to clearly demonstrate where this feedback from community members was used to influence changes in plans or practices for the company.
164	Provide notification to communities regarding scheduled ship transits throughout the Regional Study Area including Eclipse Sound and Milne Inlet. Real-time data should be made available. Changes to proposed shipping routes should be provided to the MEWG, the community of Pond Inlet and communities in the region.	In Compliance	Baffinland has held pre-shipping meetings in Pond Inlet, June 7 and 8, 2018. July 12, 2018, there was a meeting held in Pond regarding the production increase proposal. On August 30 and 31, 2018, the MHTO visited the Mary River Project site and on November 28 and 29, 2018, There was an end of shipping season meeting held in Pond Inlet. Baffinland has also contracted ExactEarth to actively track vessels real time and made that information publicly available on their website www.baffinland.com ; all information regarding meetings can be found in the 2018 Annual Report.
165	Encouraged to provide buildings along the rail line and Tote Road for emergency shelter purposes to be made available for employees and land users of the area.	In Compliance	Baffinland has emergency shelter stations at KM 33, 40, 60 and 69 along the Tote Road. The rail line is not yet constructed Emergency Response Plan (2018) Roads Management Plan (2016)

166	Ensure through consultation efforts and public awareness campaigns that the public has access to shipping operations personnel for transits into and out of Steensby and Milne ports via telephone or internet contact to ensure information regarding ice conditions and ship movements can be shared.	In Compliance	<p>Ship movement information is available on Baffinland's website (www.baffinland.com). Baffinland shipping personnel are accessible via telephone if issues need to be reported.</p> <p>Baffinland also implemented a new communications protocol with the community of Pond Inlet. Information regarding the communications protocol was shared during meetings with the MHTO on June 7 and 8, and community information sessions on July 12, 2018. Baffinland also made available a Shipping and Marine Monitoring Program Fact Sheet, which contained relevant Baffinland staff contact information should community members have any concerns throughout the season.</p> <p>Hunter and Visitor Site Access Procedure - Attachment F of the Roads Management Plan (2016)</p>
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Benefits, Royalties and Taxation

167	Encouraged to enter into negotiations for a Development Partnership Agreement with the Government of Nunavut.	Partial Compliance	In 2013, Baffinland reached out to the GN to develop a DPA; however, that is yet to be formalized. The DPA program for new mines is on hold while the GN's department of Economic Development and Transportation and Department of Finance work to develop a replacement program. Baffinland has indicated that they will re-engage with the GN once a new policy is formalized.
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Governance and Leadership

168	Include the aspects outlined in the condition into the monitoring program adopted by the Qikiqtani Socio-Economic Monitoring committee.	In Compliance	Data collection and analysis methods are presented in the 2018 Socio-Economic Monitoring Report. Socio-Economic Monitoring Plan (2018)
169	Provide an annual monitoring summary to the NIRB on the monitoring data collected related to the regional and cumulative economic effects associated with the Project and any proposed mitigation measures.	In Compliance	Baffinland has provided a summary of monitoring data related to regional and cumulative economic effects (positive and negative) associated with the Project in its annual Socio-Economic Monitoring Report.

Incidents and Malfunctions

170	Include an updated Terrestrial Wildlife Management and Monitoring Plan plans for increased caribou monitoring efforts including weekly winter track surveys and bi-monthly surveys in the summer and fall.	Deferred	Baffinland feels that this condition refers to interactions between the railway and caribou. The condition does not explicitly state railway interaction, however, the objective does. Deferred until construction of the railway.
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171	Include within the updated Terrestrial Wildlife Management and Monitoring Plan, a commitment to establish deterrents along the railway and Tote road embankments at any areas where the movement of caribou presents a likelihood of mortality to occur.	Partial Compliance	Baffinland identified that although caribou have been seen and harvested in the region, no caribou have been spotted near the Project sites. The Terrestrial Environment Annual Monitoring Report is updated annually with caribou information but no mention of deterrents was made in the 2018 Annual Report.
172	Encouraged to provide the Government of Nunavut with evidence that the vessel intended for use for the overwintering of fuel has been designed and certified for use under the operational conditions. Proof of vessel owners insurance policies are required.	Not applicable	Baffinland did not require overwintering of fuel in 2018.
173	Employ best practices and meet all regulatory requirements during ship to shore and other marine based fuel transfer events.	In Compliance	Baffinland maintains an approved Oil Pollution and Emergency Plan for shore to ship fuel transfers at Milne Port. Training for this occurred in 2018 and mock spill exercises are performed annually. Oil Pollution Emergency Plan – Milne Inlet (2017) Shipping and Marine Wildlife Management Plan (2016) Spill at Sea Response Plan (2015)
174	Provide, as well as the Canadian Coast Guard, spill response equipment and annual training to Nunavut communities along the shipping route.	In Compliance	Oil Pollution and Emergency plan training took place for Baffinland employees. In a letter to the NIRB in 2015, the Canadian Coast Guard acknowledges that it was the responsibility of the coast guard to provide emergency spill training to the communities along the shipping route. Oil Pollution Emergency Plan – Milne Inlet (2017) Shipping and Marine Wildlife Management Plan (2016) Spill at Sea Response Plan (2015)
175	In coordination with the Qikiqtani Inuit Association and the Hunters and Trappers Organizations of the North Baffin communities and Coral Harbour, provide updates to the Shipping and Marine Wildlife Management Plan to include adaptive management measures to take should the placement of route markers along the ships track during ice breaking not prove to be feasible for marking the route.	Deferred	There is no winter shipping under the current phase of the project. Baffinland will defer this condition until winter shipping is occurring.

176	Required to revise its spill planning to include additional trajectory modelling for Hudson Strait, where walrus concentrate, as well as Milne Inlet, Eclipse Sound and Pond Inlet during winter conditions.	Partial Compliance	Baffinland conducted spill modelling in 2015 which helped developed Baffinland's current spill response plan highlighting the importance of spill prevention. Oil Pollution Emergency Plan - Milne Inlet (2017) Shipping and Marine Wildlife Management Plan (2016) Spill at Sea Response Plan (2015) Spill Contingency Plan (2017) Exploration Spill Contingency Plan (2014)
177	Enroll any foreign flagged vessels commissioned for Project-related shipping within Canadian waters into the relevant foreign program, equivalent to Transport Canada's Marine Safety Delegated Statutory Inspection Program.	In Compliance	It is the responsibility of ship owners to enroll in such programs; however, Baffinland has included this requirement in their shipping contracts.
Alternative Analysis			
178	Subject to safety requirements, require all Project vessels to maintain a route to the south of Mill Island to prevent disturbances to walrus and walrus habitat.	Deferred	Shipping through Steensby Inlet is not occurring during the current phase.
Operational Variability			
179	Not to exceed 20 ore carrier transits to Steensby Port per month during the open water season (242 transits per year).	Deferred	Shipping through Steensby Inlet is not occurring during the current phase.
179a	The total volume of ore shipped via Milne Inlet shall not exceed 4.2 million tonnes.	Deferred	Under the Production Increase Proposal, until December 31, 2019, Baffinland is allowed to surpass 4.2MT but will not exceed 6.0MT. In 2018, Baffinland shipped a total of 5,094,477 tonnes of iron ore. This is deferred until 2020, where the ERP limits come back into force.
179b	The total volume of ore transported by truck on the Tote road shall not exceed 4.2 million tonnes per year.	In Compliance	Under the Production Increase Proposal, until December 31, 2019, Baffinland is allowed to surpass 4.2MT but will not exceeds 6.0MT. In 2018, Baffinland trucked 5,442,500 tonnes of iron ore along the Tote road. This is deferred until 2020, where the ERP limits come back into force.
179c	Third Party performance audit	Non-Compliant	Baffinland has stated that they have completed a third party performance audit and should expect in late summer 2019. The Audit was received on October 2, 2019; however, since this audit was received outside of the NIRB's 2018-2019 monitoring period, this will remain non-compliant for the current report.

Transboundary Effects

180	The Marine Environment Working Group shall invite a representative from Makivik Corporation to be a member of the group.	In Compliance	Makivik has been a member of the MEWG since 2013 and receives MEWG related correspondences. If a member is unable to attend in person, they receive finalized minutes and technical information. Members of the Makivik corporation rarely show up to the MEWG meetings or provide input. See 2018 Annual Report for MEWG meeting discussions.
181	Regardless of whether Makivik Corporation participates as a member of the Marine Environment Working Group, the group will provide Makivik with regular updates throughout the life cycle of the project.	In Compliance	In their 2018 Annual Report, Baffinland noted that they provided Makivik with transcripts and technical documents and information from the MEWG meetings.
182	Make available any ship route deviation routes provided to the NIRB to Makivik Corporation.	In Compliance	Vessel traffic information is currently publicly available through Baffinland's website. www.baffinland.com and it is reported in their 2018 Annual Report.