ID#_____	Agency__	Comment Period	Recommendations/Requests_____ _____	Response_____ _____	VEC/VSEC	Status of Resolution	Baffinland Commitment
CIRNAC-01	CIRNAC	September 2019	A regional seismic assessment was performed for the South Railway embankment, the Mine site, Steensby Port and Milne Port expansion; however a seismic assessment was not carried out for the North Railway alignment. A seismic assessment of the North Railway alignment was needed to evaluate the potential risks to the Project and the potential environmental impacts.CIRNAC recommended Baffinland perform a seismic analysis taking into consideration the major geological structures along the North Railway alignment and incorporate findings into the detailed facility engineering design.Baffinland obtained additional seismic parameters along the railway from the National Building Code of Canada (2015). These seismic data were used for slope stability analyses of the North railway alignment, embankment cuts and fills. Stability analyses were completed using a pseudo-static seismic coefficient of 0.06, based on peak ground acceleration (PGA) of 0.090 g for 1:2500-year return period (2% probability of exceedance based on design life of 50 years).CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Baffinland understands that CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Terrestrial	Resolved	
CIRNAC-02	CIRNAC	September 2019	Geotechnical characteristics of the Project area were not fully described in the FEIS Addendum and could present risks that have not been identified. Geotechnical investigations are required to be cold regions/permafrost specific and should include thaw consolidation/thaw strain assessments.CIRNAC requested Baffinland provide, as per the EIS guidelines, a detailed description of the geology and geomorphology aspects in the Project area and consideration of their effects on the major Project components.In response, Baffinland provided Geotechnical recommendations for the Northern Railway, April 26, 2019. The report includes creep and thaw settlement estimates and thermal analysis. This is additional information to the previously submitted reports (Geotechnical Design Criteria, Hatch, March 2019 and Geotechnical investigations along the North railway alignment conducted from 2016 to 2018, Hatch October 5, 2018). This document includes: sampling and laboratory test results supporting the permafrost forecast, geochemical results and borehole data, acid base accounting results of potential quarry locations.CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Baffinland understands that CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Terrestrial	Resolved	
CIRNAC-03	CIRNAC	September 2019	The Railway Management Plan should describe how the mitigation measures will be carried out during construction of the rail embankment in the portions of the alignment where potential geotechnical issues have been identified. It was unclear from the review of the Railway Management Plan, how Baffinland intends to monitor any settlement issues that may be encountered. Geotechnical characteristics were not fully described which may present risks that have not been identified. CIRNAC requested Baffinland update the existing Railway Management Plan to include regular monitoring of potential settlement of the North Railway embankment.In response, Baffinland provided the draft document North Railway Operation and Maintenance Management Plan, May 13, 2019. The plan includes infrastructure inspection and maintenance strategy for the North Railway that considers the identified issues.CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Baffinland understands that CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Terrestrial	Resolved	

CIRNAC-04	CIRNAC	September 2019	As acknowledged by Baffinland, the potential for permafrost warming due to a warming climate increases the risk of permafrost degradation. Comprehensive geotechnical site investigations help identify areas where the risk associated with excessive settlement is the greatest. Geotechnical site investigations were completed along the North Railway alignment in 2010, 2016 and 2017 (AMEC, 2010a, Hatch, 2017a, Hatch, 2017b, and Hatch, 2018) and the North Railway embankment designs were established as part of a feasibility study completed for the Phase 2 Proposal (Hatch, 2017c). However, they did not include thaw settlement tests or thaw strain assessment. CIRNAC requested Baffinland to: 1) describe how they intend to deal with areas that are prone to excessive settlement that cannot be avoided and 2) commit to performing additional geotechnical assessments which will include thaw settlement tests or a thaw strain assessment.IQALUIT#1260889 - v7 11 In response, Baffinland provided report titled Geotechnical Recommendations for Northern Railway, Hatch, April 26, 2019. The Report provides creep and thaw settlement estimates and a thermal analysis. The impacted depth with the railway development is shallow and thermal modelling has been carried out including climate change scenarios. Geotechnical data basis, including ice content andground temperature measurements, have been updated. Ground temperatures below -8 ^{o}C and -10 ^{o}C at 10 m depth have been reported. Design measures and ongoing adaptive mitigation measures are identified to minimize any cumulative impacts of the Project on permafrost.CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Baffinland understands that CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Terrestrial	Resolved	
CIRNAC-05	CIRNAC	September 2019	CIRNAC recommends the following Terms and Conditions be included in the amended Project Certificate, should the Project be approved: Baffinland shall complete thermal modeling of the WRF and include the results in the Waste Rock Management Plan prior to the conclusion of Water Licence Amendment process, subject to NWB requirements. Baffinland shall develop a detailed site wide program to monitor the thaw consolidation and strain prediction under the structures/embankments constructed as part of the Project. The monitoring results shall be compared with the FEIS Addendum predictions and appropriate mitigation measures shall be identified and incorporated into the adaptive management approach.	Baffinland instituted a thermal monitoring program at the Waste Rock Facility (WRF) in December 2018, the preliminary results of which were presented in the March 2019 Interim Waste Rock Management Plan. Further analysis of the data, including evaluation of freeze/thaw cycles (spring and fall datasets) is required to adequately evaluate the thermal condition of the WRF and development of the thermal model for the WRF. Preliminary data downloaded from thermistor installations in the WRF in July and September 2019 demonstrate the active layer of the WRF is limited to approximately 1.5 metres below the top of pile. These results were presented to CIRNAC, ECCC, NrCan and the QIA on October 10, 2019. The presentations are included in this submission as Appendix E. As the update to the Phase 1 Waste Rock Management Plan was initiated under the current Type A Water Licence 2AM-MRY1325 Amendment No. 1, and the plan is regulated under the Type A Water Licence, a Project Certificate condition is not required to ensure regulator review and approval of the updated Phase 1 Waste Rock Management Plan is achieved. Furthermore, the update to the Phase 1 Waste Rock Management Plan will be completed in December 2019, prior to any Ministerial approval of an amended Project Certificate Term and Condition, thereby making any associated conditions redundant. With respect to thermal monitoring and modelling of structures associated with the Phase 2 Proposal (i.e. the rail embankment, material handling infrastructure at Milne Port), a program will be developed and implemented prior to the initiation of construction. Evaluation of this data will be incorporated into the geotechnical investigations and reported under the conditions of the existing Type A Water Licence 2AM-MRY1325 Amendment No. 1, Schedule B, Item 1(e). As a result, Baffinland maintains that a Term and Condition associated with thermal monitoring is not required.	Terrestrial	Resolved	Commitment: Baffinland shall complete thermal modeling of the Waste Rock Facility and include the results in the Waste Rock Management Plan prior to the conclusion of Water Licence Amendment process, subject to NWB requirements. Term and Condition: Baffinland shall develop a detailed site program to monitor the thaw consolidation and soil deformation under the structures/embankments constructed as part of the Phase 2 Project. The monitoring results shall be compared with the Final Environmental Impact Statement Addendum predictions and appropriate mitigation measures shall be identified and incorporated into the adaptive management approach.
CIRNAC-06	CIRNAC	September 2019	CIRNAC noted that the mine closure plan and waste rock management plan have not been updated to reflect the proposed production increase and update on ARD/ML issues. Generation of ARD/ML associated with the WRF may affect water quality and soils in the Project area and should be considered in the mine closure strategy.CIRNAC requested Baffinland provide an update of the closure plan presented in the TSD-28 Appendix C-ICRP, March 31, 2016 to include the Northern Railway and the Waste Rock Management Plan, as well as the environmental mitigation strategy.In response, Baffinland provided the updated Interim Closure and Reclamation Plan (ICRP) – Draft, dated May 1, 2019. The ICRP included all aspects of the North Railway and residual effects of the Project have been evaluated. In the ICRP, Baffinland states that a revised Waste Rock Management Plan to address WRF over the next five years, based on recent geochemistry results, is under preparation. The mine closure plan will be updated to take into consideration the revised Waste Rock Management Plan. Phase 2 Marginal Closure and Reclamation Financial Security Estimate were included in the updated ICRP Appendix I, May 1, 2019. In the Water Licence - Management Plans_Concordance_20190502 - Concordance Table, Baffinland states that they will submit a revised version of the ICRP within 60 days following approval of the requested water licence amendment, and in accordance with Part IQALUIT#1260889 - v7 15 C of the Licence for the Annual Security Review process.CIRNAC is satisfied with the provided response for the purposes of the EA process. Please refer to the CIRNAC proposed Term and Condition for Comment #8.	Baffinland understand that CIRNAC is satisfied with the response provided, however the proposed Term and Condition for Comment #8 is relevant to that comment (which deals specifically with PAG identification criteria), not Comment #6, which was a request for Baffinland to provide an update of the closure plan to include the North Railway and the Waste Rock Management Plan, as well as the environmental mitigation strategy.	Terrestrial	Resolved	See Term and Condition re. CIRNAC-08

CIRNAC-07	CIRNAC	September 2019	CIRNAC recommends the following Terms and Conditions be included in the amended Project Certificate, should the Project be approved: Baffinland shall undertake test work to confirm to the NWB the origin of elevated concentrations of aluminum, mercury and copper in SFE forrock materials sourced from quarry and borrow pits for road / railway construction, and develop and implement an appropriate water quality monitoring and management strategy for railway corridor rock quarries as part of water licensing.The monitoring results shall be compared with the FEIS Addendum predictions and appropriate mitigation measures shall be identified andimplemented.	Shake Flask Extraction is an aggressive test that provides conservative metal leaching results, and as such, they should not be treated as representative of field results in regard to the metals referenced as elevated in the SFE results: • Mercury - There was a single CCME exceedance of Hg for QMR2 in the data reported. Otherwise, 13 of the 15 samples had Hg concentrations at or below the minimum detection limit (MDL) of 0.00001 mg/L. • Copper - The results were compared to CCME freshwater aquatic life guidelines, and there were 4 copper exceedances: 0.00637, 0.00876, 0.00299, and 0.01076 mg/L. The discharge limit for copper in Table 10 of the water licence (Effluent Quality Discharge Limits for Open Pit, Stockpiles, and Sedimentation Ponds) is 0.5 mg/L for Cu. The results that exceeded the CCME guideline are one to two orders of magnitude less than the water licence discharge limit. • Aluminum: 14 of the 15 samples contained total aluminum concentrations ranging from 0.122 to 1.05 mg/L, above the CCME guideline value of 0.005 mg/L. if pH <6.5, or 0.1mg/L if pH ≥ 6.5. Previous sampling of the surface water in the Project area, has demonstrated that aluminum concentrations are naturally high. The average concentration of aluminum in Phillips Creek is 1.65 mg/L (see Attachment 1 of Baffinland's January 31, 2019 response to information request / advanced technical comment ECCC 12; Knight Piésold's December 12, 2018 Memo Ref. No. NB18-00854). Other than the single exceedance of Hg, the SFE data does not demonstrate concern regarding the metal leaching potential of the borrow material. Additional testing is not required to confirm the origin of the elevated concentrations. Baffinland already has requirements for weekly water quality monitoring at quarries in the Type A Water Licence, which is reflected in the existing Borrow Pit and Quarry Management Plan. This Plan also provides a comprehensive set of water management measures. Baffinland does not believe a Term and Condition is necessary to ensure the subject is addressed through the water licensing process.	Corporate	Resolved	Commitment: Baffinland shall confirm the origin of elevated concentrations of aluminum, mercury and copper in Shake Flask Extraction test results for rock materials sourced from quarry and borrow pits for road / railway construction, and develop and implement an appropriate water quality monitoring and management strategy for railway corridor rock quarries as part of water licensing. The monitoring results shall be compared with the FEIS Addendum predictions and appropriate mitigation measures shall be identified and implemented.
CIRNAC-08	CIRNAC	September 2019	To assess the potential significant adverse effects associated with ARD/ML, CIRNAC is requesting Baffinland provide the following information associated with the derivation of PAG identification criteria before the conclusion of the NIRB review process for the Project: Demonstration of how the absence of Ca/Mg carbonate mineral content has been considered in the PAG identification criteria. If the NPR is lessthan 2 criteria and associated 0.2 wt % total sulphur content is retained, there shall be clear demonstration of neutralization capacity to maintain non-acidic conditions.Demonstration of how the influence of soluble sulphate minerals has been incorporated into PAG identification criteria.Demonstration of the variation and uncertainty in ARD/ML behaviour of the different types of waste rock at Deposit 1 and how this has beenincorporated into PAG identification criteria. Should the Project be approved, CIRNAC suggests the following Term and Condition be included in the project certificate: Baffinland shall revise the PAG identification criteria and incorporate the new criteria in an updated Waste Rock Management Plan and Interim Closure and Reclamation Plan.	Baffinland remains committed to updating the Phase 1 Waste Rock Management Plan and evaluating the appropriateness of the 0.2% total sulphur cutoff for PAG classification, irrespective of the Phase 2 Proposal approvals process. Preliminary results from the geochemistry program completed in 2019 were communicated to CIRNAC, ECCC, NRCan and the QIA in a teleconference on October 10, 2019 (Appendix E). Preliminary results from the small data set indicate that use of the 0.2% cutoff would potentially mis-categorize 5% of samples (3 of 55 non-PAG based on 0.2% cutoff) as non-PAG, where shake flash extraction (SFE) results indicated a pH less than 6. If analysis of paste pH was considered in addition to the total sulphur results, the mis-categorization is reduced to 1.8% (1 of 55). If a 0.1% total sulphur cutoff was used, 1.8% of samples would be mis-categorized as non-PAG (1 of 55) with SFE result of pH less than 6. Baffinland is evaluating the addition of paste pH analysis for integration into the current analytical suite for waste rock determination. Based on evaluation of the preliminary results of the geochemistry program, the addition of this test would reduce the potential for misclassification of potentially acid generating rock, and in particular would address short term release of acid leachate from materials that would otherwise be considered non-acid generating. Based on the preliminary results, this secondary screening (in addition to the evaluation of waste placement strategies as a result of the thermal modelling) would achieve the goal of reducing or eliminating ARD at the waste rock facility. Further evaluation is required, and a fulsome update will be provided in the December 2019 update to the Phase 1 Waste Rock Management Plan. As the update to the management plan was initiated under the current Type A Water Licence 2AM-MRY1325 Amendment No. 1, and the plan is regulated under the Type A Water Licence, a Project Certificate condition is not required to ensure regulator review and approval of the updated Phase 1 Waste Rock Management Plan is achieved. Furthermore, the update to the Phase 1 Waste Rock Management Plan will be completed in December 2019, prior to any Ministerial approval of an amended Project Certificate Term and Condition, thereby making any associated conditions redundant.	Terrestrial	Resolved	Term and Condition: Baffinland shall develop effective criteria for identification of potentially acid generating rock following industry best practice. Baffinland shall incorporate these criteria in an updated Waste Rock Management Plan and Interim Closure and Reclamation Plan, to be submitted for review during the Water Licence Amendment process, subject to Nunavut Water Board requirements.

CIRNAC-09	CIRNAC	September 2019	Baffinland has gained site operations experience over the last number of years and this experience should be referenced. During the technical review of Baffinland's Phase 2 Application, CIRNAC requested that the following items be addressed in each plan:Explosives Management Plan: Update to reflect new quantities of explosives, as well as other required updates to the storage and handling method; and spill response.Waste Management Plan: Include an estimate of waste quantities that will be generated as a result of the Phase 2 proposal and how the waste reuse and recycling principles are implemented.Hazardous Materials and Hazardous Waste Management Plan: The inventory of the types and volumes of hazardous waste generated or produced by Project Activities.Spill Control Plan: Update required to reflect increased volumes of sewage generated during construction and operation of Phase 2, emergencyresponse equipment needed to respond to spills due to increases in fuels and other hazardous materials used/generated throughout the Project as a result of the Phase 2 proposal.Furthermore, CIRNAC requested that Baffinland should demonstrate how they apply the adaptive management principle to manage these materials. In response, Baffinland provided the document titled: DRAFT Hazardous Materials and Hazardous Waste Management Plan, May 1, 2019, and updated the Explosives Management Plan. The plan includes a table outlining the maximum cumulative quantities of explosives and ammonium nitrate as well as the storage location and storage container requirements. The existing management requirements for storage and handling appear adequate. The updated Draft Spill Contingency Plan presents a new Spill Scenario 5, including spills from locomotive during Railway Operation. A new table of explosives and ammonium nitrate was also added.CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Baffinland understands that CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Accidents/ Terrestrial	Resolved	
CIRNAC-10	CIRNAC	September 2019	A railway maintenance facility/yard at Milne Port Project is presented in the Project Description of the FEIS Addendum. Baffinland was requested to provide a description of forecasted changes in quantities, types of hazardous materials and waste that are expected to be generated under the Phase 2 Proposal. CIRNAC was referred to the Application to Amend Type A Water Licence, 2AM-MRY1325 for this information.A review of the licence application did not provide sufficient information to ascertain whether material and waste associated with this new facility has been considered in determining waste quantities related to Phase 2 and how this would be managed. CIRNAC requested Baffinland provide an inventory of waste types and quantities that would be generated by such a facility indicating additional material/wastes that would require management as a result of this new facility at Milne Port. In response, Baffinland provided the document titled: DRAFT Hazardous Materials and Hazardous Waste Management Plan, # BAF-PH1-830-P16-0011, Revision: Issued for review purposes only, Issue Date: May 1, 2019. The Plan includes information on hydrocarbon waste and hydrocarbon products such as engine oils and filters. Baffinland also provided estimated quantities of wastes and noted these were small in relation to all generated wastes. Table 4.2 of the Plan provides hazardous waste management methods that are appropriate for locomotive maintenance, including the proposed management options.CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Baffinland understands that CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Terrestrial	Resolved	
CIRNAC-11	CIRNAC	September 2019	The Application to Amend Type A Water Licence, 2AM-MRY1325, presents quantities of solid waste, sewage effluent and hazardous waste to be generated from the Phase 2 Proposal, as well as the description of waste management capacity to accommodate the increased volume of materials and waste. However no comparison was provided to current volumes of waste under the existing project.In response to the previously submitted on this issue Baffinland requested CIRNAC examine the Application to Amend the Type A Water Licence, specifically Section 4.7, Table 4.3, Attachments 11.2 and 11.4, as well as Figures B.1 and B.5. However, a review of these documents does not fully address the concern and a comparison of the original project and the Phase 2 with regards to these materials is not evident. Baffinland Response to CIRNAC Technical Comment # 12 provided a comparison of the current volumes of waste generated (2016, 2017 and 2018).CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Baffinland understands that CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Terrestrial	Resolved	

CIRNAC-12	CIRNAC	September 2019	The proposed Snow Management Plan did not provide for estimates of hydrocarbon contaminated snow and ice that will be generated by Phase 2 activities and details on how these will be managed. It was expected that Baffinland should have details of volumes of contaminated snow and ice from its current operational experience. This experience should inform the assessment of current capacities of the snow management areas and any modifications required to meet the management needs for the proposed Phase 2 activities.Baffinland has updated the Snow Management Plan to include the North Railway, construction and operation phases. The Snow Management Plan indicates the snow piles location at Milne port, mine site and along the Tote Road / North Railway. The plan also includes the position of culverts and guidelines for snow management along the North Railway. However, the plan does not include volumes of contaminated snow and ice estimates for the Phase 2 Project development.In their March 2019 Responses to CIRNAC Technical Comment # 13, Baffinland noted that the volume of contaminated snow and ice managed at the Milne Port snow dump is reported in the Qikiqtani Inuit Association / Nunavut Water Board Annual Report for Operations, expressed as the volume of water treated from the facility. In 2017, Baffinland discharged approximately 187 m^3 of treated water from the snow dump facility. Projected quantities of contaminated snow and ice for the phase 2 of the Project are not available, as the primary source of contamination are unplanned spills. Additional containment for contaminated soils, snow and ice will be addressed on an on-going basis as required by the operation. Baffinland has identified the construction of an additional landfarm facility at the Mine Site in the 2019 Work Plan, which mayinclude additional contaminated snow and ice storage.CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Baffinland understands that CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Accidents/ Terrestrial	Resolved	
CIRNAC-13	CIRNAC	September 2019	Section 8.2.7 of the FEIS Addendum describes the socio-economic baseline conditions for eight of the project's ten VSECs but does not mention theadequacy of baseline data. The presented VSECs are:1. Education and Training;2. Livelihood and Employment;3. Economic Development and Self-reliance;4. Benefits, Royalty, and Taxation;5. Community Infrastructure and Public Services;6. Contracting and Business Opportunities;7. Population Demographics; and8. Human Health and Well-being.The Technical Supporting Document on Socio-economic Assessment (TSD 25) briefly discusses baseline information in the assessment methodology subsections for all of the Project's VSECs. Most refer to Appendix C of TSD 25, Updated Socio-economic Baseline Information, which is primarily based on data from Statistics Canada, the Nunavut Bureau of Statistics, and the Nunavut Housing Corporation. However, no discussion is provided on the reliability of data sources or confidence in the updated baseline data.In response to technical comments, Baffinland explained the adequacy of baseline data presented in support of its phase 2 of the Project. A table was provided (Attachment 1: Table 1: Adequacy of Baseline Data Used for Each VSEC) that includes statements on the adequacy of baseline data used for each VSEC presented in TSD 25 and a rationale for their determination. The response provides reasonable descriptions of adequacy/overcoming limitations; identifies VSECs that have no baseline data (e.g., Royalties); and others that have no quantitative data (e.g., Governance).CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Baffinland understands that CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Human/ Socio-economic	Resolved	
CIRNAC-14	CIRNAC	September 2019	In response to technical comments, Baffinland adequately explained the incorporation of IQ in TSD 25 and previous assessments conducted for the Approved Project. The response was supplemented by a report on the use of IQ for the Phase 2 Proposal (Appendix 13). This report outlines Baffinland's approach to IQ, how IQ was incorporated into the Phase 2 Proposal, and future steps that will be followed (including additional IQ that will be collected, the use of IQ in monitoring programs, and adaptive management considerations).CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Baffinland understands that CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Human	Resolved	
CIRNAC-15	CIRNAC	September 2019	In response to technical comments, Baffinland provided summaries of interactions between the NIRB guidelines for the 'Culture, Resources, and Land Use,' 'Benefits, Royalty, and Taxation,' and 'Governance and Leadership' VSECs (Appendix 1) at the same level of thoroughness as the summaries of interactions provided for other VSECs in TSD 25.CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Baffinland understands that CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Human/ Socio-economic	Resolved	
CIRNAC-16	CIRNAC	September 2019	In response to technical comments and a commitment made at the April 2019 Technical Meeting, Baffinland provided a supplement to the Technical Supporting Document on Cumulative and Transboundary Effects (TSD 27). The supplement describes how the Project's main alternative development scenarios (I. A future without the Phase 2 Proposal; II. A future with the Phase 2 Proposal; and III. Potential future development at the Mary River Project) have been evaluated in accordance with Subsections 6.1 and 7.8 of the NIRB guidelines.Baffinland's view is that the intent of these guidelines is focused on alternative development scenarios, not individual project alternatives. Baffinland also believes that completing a Cumulative Effects Assessment of each Project alternative would result in several development scenarios that would not be practical or useful. CIRNAC agrees with the provided explanation.CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Baffinland understands that CIRNAC is satisfied with the provided response and does not have any additional comments at this stage.	Human / Corporate	Resolved	

CIRNAC 1 NEW	CIRNAC	February 2020	Internal heat generation: Provide a heat balance to clarify if the internal heat generation correlates with the heat generation associated with the exothermic reaction of PAG waste rock deposited. Such a heat balance needs to account for the expected effects of soluble sulphates. Oxygen consumption: Clarify if an oxygen balance has been performed and if the oxygen consumption correlates with the extent of oxidation process or oxidation volume taking place. Such an oxygen balance needs to account for the expected effects of soluble sulphates. Vibrating Wire Piezometers data: Assess if the water balance reflects that the dry piezometers are a result of infiltration rainfall that percolates through the waste rock or indicate poor functioning of the VWP instrumentation. Continued monitoring: Ensure installation of additional relevant instrumentation (e.g. further thermistors, moisture probes) and update the thermal modeling to account for three dimensional variations (where required, particularly if there needs to be an alteration to the design of the WRF).	Baffinland will provide all responses related to waste rock and/or ARD/ML to the Nunavut Water Board with copy to the Nunavut Impact Review Board on, or before, March 13, 2020.	Terrestrial	Outstanding - In progress	CIRNAC had telephone conference conversations with Baffinland on on March 11, 2020. From this meeting, and other supporting documents provided since that time, BIMC has not provide answers to thermal model internal heat generation and oxygen consumption with relation to the PAG waste rocks. However, BIMC has verbally addressed the concern related to piezometers and installation of relavant instrumentation during the conference call . Specifically, BIM confirmed that the piezometers that showed no water, were functioning correctly. BIM also indicated that more thermistors, piezometers, oxygen meters will be installed for continued monitoring.
CIRNAC 1a NEW	CIRNAC	February 2020	CIRNAC also recommends Baffinland to develop a detailed site wide program to monitor the thaw consolidation and soil deformation under the structures/embankments constructed as part of the Project. The monitoring results shall be compared with the FEIS Addendum predictions and appropriate mitigation measures shall be identified and incorporated into the adaptive management approach.	With respect to the recommendation related to a site wide monitoring program to monitor thaw consolidation and soil deformation, Baffinland reaffirms the following suggested term and condition, agreed to with CIRNAC on November 5, 2019, and provided to the NIRB in the Supplemental Submission for Phase 2, submitted on January 6th, 2020: Baffinland shall develop a detailed site program to monitor the thaw consolidation and soil deformation under the structures/embankments constructed as part of the Phase 2 Project. The monitoring results shall be compared with the Final Environmental Impact Statement Addendum predictions and appropriate mitigation measures shall be identified and incorporated into the adaptive management approach.	Physical/ Terrestrial	Partially Resolved	With respect to the recommendation related to a site wide monitoring program to monitor thaw consolidation and soil deformation, Baffinland reaffirms the following suggested term and condition, agreed to with CIRNAC on November 5, 2019, and provided to the NIRB in the Supplemental Submission for Phase 2, submitted on January 6th, 2020: Baffinland shall develop a detailed site program to monitor the thaw consolidation and soil deformation under the structures/embankments constructed as part of the Phase 2 Project. The monitoring results shall be compared with the Final Environmental Impact Statement Addendum predictions and appropriate mitigation measures shall be identified and incorporated into the adaptive management approach. This is a part of CIRNAC 1 NEW (CIRNAC Comment #1)
CIRNAC 2 NEW	CIRNAC	February 2020	CIRNAC recommends that Baffinland: •Confirm the origin of elevated concentrations of aluminum, mercury and copper in Shake Flask Extraction test results for rock materials sourced from quarry and borrow pits for road / railway construction, and develop and implement an appropriate water quality monitoring and management strategy for railway corridor rock quarries. •Compare the monitoring results with the FEIS Addendum predictions, identify and implement the appropriate mitigation measures.	Baffinland reaffirms the following commitment, agreed to with CIRNAC on November 5, 2019, and provided to the NIRB in the Supplemental Submission for Phase 2, submitted on January 6th, 2020: •Baffinland shall confirm the origin of elevated concentrations of aluminum, mercury and copper in Shake Flask Extraction test results for rock materials sourced from quarry and borrow pits for road / railway construction, and develop and implement an appropriate water quality monitoring and management strategy for railway corridor rock quarries as part of water licensing. •The monitoring results shall be compared with the FEIS Addendum predictions and appropriate mitigation measures shall be identified and implemented.	Corporate	Resolved	Baffinland reaffirms the following commitment, agreed to with CIRNAC on November 5, 2019, and provided to the NIRB in the Supplemental Submission for Phase 2, submitted on January 6th, 2020: •Baffinland shall confirm the origin of elevated concentrations of aluminum, mercury and copper in Shake Flask Extraction test results for rock materials sourced from quarry and borrow pits for road / railway construction, and develop and implement an appropriate water quality monitoring and management strategy for railway corridor rock quarries as part of water licensing. •The monitoring results shall be compared with the FEIS Addendum predictions and appropriate mitigation measures shall be identified and implemented.
CIRNAC 3 NEW	CIRNAC	February 2020	To assess the potential significant adverse effects associated with ARD/ML, CIRNAC recommends that Baffinland: •Demonstrate the origin of the soluble sulphates, estimate possible spatial extent and a tonnage estimate of waste rock containing significant soluble sulphates. •Demonstrate that waste rock associated with the greater life of mine deposit IQALUIT#1277133 17 does not have significant soluble sulphate content. •Provide further justification for the retention of 0.2% total sulphur cut-off threshold for identification of Non-PAG waste rock and using NPR of 2 as a cut-off for PAG identification considering the absence of Calcium / Magnesium carbonate mineral content. •Provide information on the variation and uncertainty in ARD/ML behavior of the different types of waste rock. •Develop effective criteria for identification of potentially acid generating rock following industry best practice and incorporate these criteria in an updated Waste Rock Management Plan and Interim Closure and Reclamation Plan. •Confirm adequate capacity of the WRF pond, including the sufficient contingency within the pond to prevent a potential of uncontrolled/untreated discharge to the environment.	Baffinland will provide all responses related to waste rock and/or ARD/ML to the Nunavut Water Board with copy to the Nunavut Impact Review Board on, or before, March 13, 2020.	Corporate	Outstanding - In progress	On March 11, 2020 CIRNAC had a teleconference call with BIMC; on this call and with the updates to the Waste Rock Management Plans, BIMC has has indicated that they have determined the composition of Deposit 1, including the spatial extent and tonnage of WR with soluble sulphates; BIMC has determined that the spatial extent and tonnage of WR with soluble sulphates is limited to the Deposit 1 area. BIMC has committed to continue assessing the 0.2% total suphur cut-off threshold as additional data is collected and, if deemed necessary, adjusted. BIMC has acknowledged that the previous ARD/ML behaviour investigations by AMEC in 2014 failed to consider soluble sulphate minerals. BIMC has indicated that additional monitoring is underway as part of a larger design and mitigation program. From the teleconference meetings with BIMC and updates to the Waste Rock Management Plans, BIMC has addressed CIRNAC's initial comments on the the adequacy of the WRF pond at this time.
DFO-3.1.1	DFO	September 2019	DFO recommends that Baffinland:In consultation with affected Inuit communities, conduct a thorough environmental assessment prior to use of any additional/alternative routes through the Northwest Passage, outside of the current approved shipping route, including Navy Board Inlet.The assessment should include: Clarification whether Baffinland intends to use the alternative routes including the Northwest Passage at any point as part of Phase 2, or whether the alternatives would be solely reserved for future development and will be assessed at such a time, that Baffinland would seek approval for said development.	Per our clarification letter provided to NIRB and MHTO on Sept. 20, 2019, Baffinland is not seeking approval from NIRB under the Phase 2 assessment to proceed with shipping via Navy Board Inlet or the NWP as part of the Phase 2 Project Proposal	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment	Resolved	

DFO-3.1.2	DFO	September 2019	The assessment should include: Consideration of a larger proportion of the potentially impacted populations for each species along the alternate route, to adequately reflects the increase of use.	See response to DFO 3.1.1.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment	Resolved	
DFO-3.1.3	DFO	September 2019	The assessment should include: An updated monitoring plan, which would include monitoring shipping through all alternative routes utilized for the Mary River Project, prior to usage of any additional routes outside the current approved shipping route.	See response to DFO 3.1.1.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment	Resolved	
DFO-3.2.1	DFO	September 2019	In order for DFO to adequately assess the project's marine vessel traffic, DFO requires that Baffinland clarifies: The number of escorted vessels that will be permitted at any one time into the RSA	Baffinland expects that a maximum of four ore carriers would be escorted by a single ice breaker during a single transit in the early shoulder season. Based on acoustic modelling conducted in support of the Phase 2 Proposal, the noise field from a 4th carrier would not appreciably increase the aggregate noise field generated by the ice breaker.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment	Resolved	
DFO-3.2.2	DFO	September 2019	In order for DFO to adequately assess the project's marine vessel traffic, DFO requires that Baffinland clarifies: The rationale for the maximum of 176 ore carrier transits	Rationale for the 176 ore carriers has been available to DFO since the time of the EIS submission, notably in Section 2.5.2.2 of TSD 24 (Marine Mammal Effects Assessment). Specifically, Baffinland noted that in order to account for the increased tonnage of ore being transported, an increase in vessel traffic serving Milne Port will be required. An estimated 176 ore carrier round trips was provided as an upper limit estimate in Table 2.4 of TSD 24 (provided below for reviewer reference). This table is based on a reasonable mix of vessel types calling on Milne Port between July and October to transport approximately 12 Mt. Baffinland further provided example shipping schedules in the Overview of Marine Operations submitted to the NIRB as Appendix 12 of the December 20,2019 response submission to information requests. These tables consistently demonstrate the need for 176 ore carriers to transport ore required as part of the Phase 2 proposal. In these shipping schedules Baffinland has given consideration to historical ice conditions, operating experience and the need to have both predictably (i.e. start and end shipping dates) and operational flexibility to allow for contingency due to things like weather, operational malfunctions etc. Baffinland acknowledges that there were inconsistencies in the original EIS submitted in October 2018, those were corrected by December and DFO has been in receipt of this information since that time. Table 2.4: Maximum Number of Ore Carrier Calls (Round-trips) at Milne Port during Phase 2 Operations Vessel TypeVessel Size JulyAugustSeptember OctoberTotal Supramax50,000 DWT10 5 5 1030 Panamax 65,000 DWT9 45 45 34133 Capesize 150,000 DWT0 6 5 213 Total 19 56 55 46176 DWT = Dead Weight Tonnage. Note – Above schedule assumes all shipping will occur between July and October, although the original proposal anticipated some shipping into November.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment	Resolved	
DFO-3.3	DFO	September 2019	DFO is concerned that the present level of assessment may not be adequate to fully assess the effects of the vessels strikes on whales and other marine mammals. In order for DFO to adequately assess the effects of vessel strikes on marine mammals, Baffinland, working cooperatively with DFO, shall re-assess the impact of vessel strikes on bowhead whales and re-evaluate the significance of ship strikes related to the project (including inside and outside the RSA) and should consider other marine mammals (e.g., Killer whale, Sperm whale, Fin whale) that would potentially be entering the RSA in summer during the open water shipping season and risk of vessel strikes. The assessment shall include the knowledge and observation of Inuit hunters and trappers.	The physiological attributes of toothed whales (narwhal, beluga, killer whale) make them relatively less vulnerable to ship strikes compared to baleen whales, as they use echolocation to perceive their environment and can maneuver out of the way of oncoming vessels. Similarly, seals are considered to be at relatively low risk of vessel strike owing to their fast swimming speed, maneuverability and agility. This is consistent with available literature and IQ, as there is no record of a ship strike on narwhal, beluga or seal since shipping operations began in 2015, nor evidence of a recreational vessel strike on any of these species in the RSA (including by hunting vessels which commonly travel at speeds above 13 knots). The critical ship speed threshold above which strikes on marine mammals have a higher potential to occur is 13 knots, and this is largely applicable to baleen whales (e.g. bowhead whales) as they spend a considerable more amount of time at the surface feeding, do not have echolocation ability to detect ships as well at a distance, and are generally less mobile/maneuverable. In order to effectively avoid ship strikes on all marine mammal species, Baffinland has implemented a 9 knot (16.7 km/h) speed restriction applicable to all Project vessels and throughout the entire shipping corridor in the Regional Study Area. This exceeds any existing mitigation in Canadian (and U.S.) waters for reducing the probability of deaths and injuries to whales due to collisions with ships, including the following government-initiated measures to protect the endangered North Atlantic right whale from ship strikes, the cetacean species most commonly prone to being struck by vessels (Vanderlaan and Taggart 2007): • Regulations introduced in 2017 by the Government of Canada (and renewed in 2018 and 2019) for protecting endangered right whales from ship strikes, which include seasonal speed restrictions for vessels ≥13 m to a maximum of 10 knots (18.52 km/hr) when travelling in the western Gulf of St. Lawrence. • Regulations introduced in 2008 by the U.S. Government requiring all vessels ≥65 feet to travel ≤ 10 knots (18.52 km/h) when travelling in defined seasonal management areas (SMAs) along the Eastern U.S. coast to reduce the probability of deaths and injuries to right whales due to collisions with ships.	Marine Wildlife and Icebreaking	Resolved	Baffinland will implement the following requirement for vessels serving the Mary River Project: Once advised of the presence and location of bowhead whales, Masters of project ships operating within the RSA will be instructed to exercise due caution in order to minimize the likelihood of interaction with the mammals. In such events, Masters will be authorized to adjust speed or alter course within safe and prudent navigational constraints to avoid to the extent possible interaction with bowhead whales. Note: Baffinland notes that the surveillance measures implemented in the Guld of St Lawrence, as refernced by DFO, are to spot right whales and implement the 10 knot speed restriction. This additional mitigation measure is not required in the RSA as a blanket 9 knot speed limit is in place for the entire season. The only mitigation measure more restrictive than the speed limit is a 15 day shut down for non-tended fixed gear fisheries. Again, this is not applicable to Mary River operations. Baffinland strongly urges DFO to consider the commitment provided above and work with Baffinland to implement it.

				Preliminary findings suggest that the 10-knot speed limit has been effective (when applied) as mitigation for ship strikes, with no documented fatalities of North Atlantic right whale in Canadian waters reported in 20181. Similar results were observed by Laist et al. (2014) in their study evaluating the effectiveness of the mandatory 10-knot speed limit in the U.S for protecting right whales from ship strikes. In the 5-year period following the enactment of the mandatory 10-knot speed limit, there were no right whale mortalities recorded in any of the identified SMAs or within 83 km of their boundaries, compared to the 18-year period preceding the 10-knot limit coming into force, in which 13 of 15 (87%) reported right whale deaths by ship strike occurred within the SMAs or within 83 km of their boundaries. Marine mammals occurring along the Northern Shipping Route during the shipping season consist primarily of narwhal and ringed seal, with occasional sightings of bowhead2, killer whale, beluga whale, sperm whale, harp seal, bearded seal and walrus, as documented in the Marine Mammal Baseline Report (Appendix A of TSD 24) and based on available Inuit Qaujimajatuqangit (IQ) including information shared through discussions and workshops held with the community of Pond Inlet and the Mittamatalik Hunters and Trappers Association (JPCS 2017). Ship strikes on bowhead whale, beluga, killer whale and walrus are not expected to occur as a result of the Phase 2 Proposal in light of proposed mitigation (e.g. 9 knots speed limit) and given the paucity of these species along the shipping corridor during the active shipping season. With the implementation of vessel speed restrictions (9 knots) along the Northern Shipping Route, in addition to the other noted mitigation measures, no ship strikes on marine mammals are anticipated to occur as a result of the Phase 2 Proposal. This is consistent with monitoring data available to date; there has been no evidence of ship strikes on the Project following four consecutive years of shipping and despite extensive marine mammal monitoring undertaken in the area (multiple programs). Ship speed restrictions as a mitigation are demonstrated to be effective. This above rationale is also consistent with IQ gathered during IQ studies (JPSC 2015-2016), community risk assessment workshops and monitoring program end of season interview • Inuit workshop participants and Inuit researchers on the Baffinland marine mammal monitoring programs noted that shipping impacts on seals is not an activity of concern for Inuit (Golder 2019) • Inuit workshop participants and Inuit researchers on the Baffinland marine mammal monitoring programs do not believe ship strikes will occur at current ship speeds for any marine mammal species (Golder 2019) • This is consistent with other IQ studies (Remnant and Thomas 1992; JPSC 2017; QIA 2019). • 1The Canadian Government removed the vessel speed restrictions in early 2019 to minimize impact on industry. However, the 10-knot speed limit was re-instated in the the Gulf of St. Lawrence in July of 2019 after eight North Atlantic right whales were found dead in Canadian waters throughout June 2019, some of which were attributed to vessel strikes. • 2Preliminary results from 2019 aerial surveys and Ship-based Observer Program indicate a higher number of bowhead whales were present in the RSA during the 2019 early shoulder season than observed in previous survey years (Golder 2019). References: Environmental Resources Management (ERM). 2019. Baffinlands Iron Mines Corporation – Mary River Phase 2 Proposal: Community Risk Assessment Workshops: Final Report. Project No. 0489284-0004, Version C.1. Technical report by ERM Consultants Canada Ltd. Golder Associates Ltd. (Golder). 2019 Marine Mammal Monitoring Programs – Preliminary Findings. Reference No. 1663724-161-TM-Rev0-3000. 11 October 2019. 45 p. Jason Prno Consulting Services Ltd (JPCS). 2017. Technical Supporting Document (TSD) No. 03: Results of Community Workshops Conducted for Baffinland Iron Mines Corporation's – Phase 2 Proposal. Report submitted to Baffinland Iron Mines Corporation. January 2017. Qikiqtani Inuit Association (QIA). 2019. Tusaqtavut Study Specific to Mary River Project Phase 2 Proposal. June 2019 • Remnant, R.A. and M.L. Thomas. 1992. Inuit Traditional Knowledge of the Distribution and Biology of High Arctic Narwhal and Beluga. Unpublished report by North/South Consultants Inc. Winnipeg, Manitoba. vii + 96 p.			

DFO-3.4	DFO	September 2019	In order for DFO to properly assess the impact of the shipping season on ice formation, DFO recommends that Baffinland provides environmental conditions and ecological factors criteria used to determine yearly opening and closing of the shipping season, along with the monitoring plan to determine if ice-breaking in the shoulder season will have an impact on ice formation and that Baffinland report annually on the determination of opening and closing the shipping season.	The environmental conditions present along the shipping route in terms of ice formation in the Fall are described in Section 4.3 of the Ice Study (TSD-16) for Phase 2. Mid-November is the average date that fastice has formed in Milne Inlet since 1997 and its presence would trigger the end of the shipping season from a technical (vessels receiving positive ice numerals) and environmental (commitment not to break landfast ice) perspective. Baffinland is committed to undertaking an end-of-season aerial survey of the LSA, following the end of shipping operations, to confirm no narwhal entrapment events have occurred. During this survey observations will be taken of the ship track and how it has influenced ice formation. Should local knowledge indicate that ice formation during the fall shoulder season has interrupted travel routes on the sea ice, Baffinland will work with the local community to develop an appropriate monitoring program and/or adaptive management response.	Marine Wildlife and Icebreaking/ Marine	Further discussed in DFO 3.2.1 NEW and 3.2.2 NEW, which are resolved.	Environmental and ecological criteria for the opening of the shipping season is described in the Shoulder Season Shipping Operational Guide. The following clarifications will be added to the Shoulder Season Shipping Operational Guide to reflect the environmental and ecological conditions for closing the shipping season. Environmental - The formation of fastice along the shipping route will trigger the end of the shipping season. Ecological - There are no ecological triggers to close the shipping season, however, monitoring and adaptive management will be applied to ensure no significant impacts occur. Note: Seals - During the Fall season Seals are just beginning to establish breathing holes in the ice as part of their development of an overwinter territory, but this is not considered a critical life cycle period. Seals may avoid establishing breathing holes along the shipping route during this peirod, but this would be limited to general area of the ship path, which is minimal in extent. Seals do not start denning until January when enough snow is available on the ice for them to build a den. Shipping would not overlap with the denning period. Narwhal- The fall shoulder season will overlap with the outmigration of narwhal throughout October and November. Aerial surveys are planned each year to confirm no entrapment events have occured, and to inform adaptive management, should it be required.
DFO-3.5	DFO	September 2019	DFO is concerned about the impacts to pinnipeds and disagrees with Baffinland's conclusions that effects will be non-significant. As such, DFO overall recommends Baffinland implement the most conservative mitigation measure and avoid shipping during the shoulder seasons and ice-breaking activities; only ship during the open water season.	DFO has not provided evidence to support a determination of significance for shipping impacts on pinnipeds. Baffinland considered a substantial body of information in its evaluation of significance of shipping impacts on pinnipeds along the Northern Shipping Route, including Inuit Quajimajatuqangit (IQ), available scientific literature, empirical data (site-specific, quantitative data collected over an extended time series from multiple monitoring programs including aerial surveys, acoustic monitoring, shore-based monitoring, ship-based monitoring), and extensive acoustic modelling. The expert opinion of multiple professionals was incorporated into both the marine mammal effects assessment (TSD 24) and the icebreaking operations effects assessment (Golder 2019). Further to this, Baffinland has developed a number of key mitigation measures to effectively eliminate and/or greatly minimize any adverse impacts on pinnipeds from shipping operations under the Phase 2 Proposal. This includes: • Avoidance of sensitive periods - Shipping and icebreaking will be conducted outside key sensitive periods for ringed seal, including pupping, nursing and mating periods – see Table 1. • Project vessels will not exceed 9 knots in the RSA, thus avoiding and/or reducing the risk of vessel strikes on seal and minimizing the extent of acoustic disturbance. • Marine Wildlife Observers (MWOs) will be stationed on all icebreaker transits in the RSA and are responsible for alerting vessel Master and crew to observed potential risk of ship strikes or other signs of disturbance to marine wildlife. • The number of daily icebreaker transits in the RSA will be reduced in heavy to moderate (4/10 to 10/10) ice conditions, thereby further reducing potential for vessel strikes and minimizing the daily noise exposure period for ringed seal. • Implementation of a 40-km buffer zone around the floe edge at the entrance of the RSA to reduce interactions between Project vessels and marine mammals (vessels entering the RSA during the spring shoulder season must wait 40 km to the east of the RSA until clearance from the Port Captain is obtained to enter the RSA).	Marine Wildlife and Icebreaking/ Marine	Further discussed in DFO 3.4.4 NEW, which is outstanding.	

				The following additional elements were key in supporting a determination of no significant impacts on pinnipeds from shipping: • IQ gathered during IQ studies, community risk assessment workshops, and monitoring program end of season interview focusing on the effects of project shipping and icebreaking on marine mammals (Golder 2019; ERM 2019). o Inuit workshop participants and Inuit researchers on the Baffinland marine mammal monitoring programs noted that shipping impacts on seals is not an activity of concern for Inuit. o Inuit workshop participants and Inuit researchers on the Baffinland marine mammal monitoring programs do not believe ship strikes will occur at current ship speeds for any marine mammal species. o This is consistent with other IQ studies (Remnant and Thomas 1992; JPCS 2017; QIA 2019). • No evidence of ship strikes to date on Project following four consecutive years of shipping and marine mammal monitoring (multiple programs). Ship speed restriction as mitigation demonstrated to be effective. • Ringed seal hotspots (Yurkowski et al. 2019) and pupping grounds are specific to the spring season (not summer) and will have dissolved by the time icebreaking commences in July. • Ringed seal molt period is largely completed by July. Literature demonstrates that basking behavior is greatly reduced in July, ringed seals have become solitary at this time and they are in the water for a greater proportion of the day, and they are highly mobile at this time (up to 35 km/day) (Heide Jorgensen et al. 1992; Kelly et al. 2010). • In thicker ice conditions, icebreaker will travel slower than 9 knots, thereby further reducing potential for ship strikes. • Minimal loss of sea ice habitat will occur based on narrow icebreaking path – sea ice has already fractured and become mobile at this time. • There are relatively few documented cases of vessel strikes in pinnipeds in the literature (seals and walrus) (Richardson et al. 1995; Van Waerebeek et al.2007) and none reported for ringed seal. Seals are considered to be at relatively low risk of vessel strike owing to their fast swimming speed, maneuverability and agility (Richardson et al. 1995; Laist et al. 2001; Jensen and Silber 2003). • Reports from the literature suggest that seals hauled out on ice are likely to detect icebreakers ahead of time and are likely to engage in active avoidance of the ship (i.e., fleeing behaviour) at approach distances <1km (Richardson et al. 1995). In summary, while Project shipping and icebreaking activities will likely result in some level of disturbance of pinnipeds, available evidence indicates that shipping is unlikely to result in permanent habitat displacement from the RSA nor a compromise in the integrity of the ringed seal population in the North Baffin region. Based on the effective application of the proposed mitigation, residual effects of Project shipping on pinnipeds is predicted to be limited to short-term localized disturbance from vessel noise exposure. Considering the commitments from Baffinland to effectively mitigate and monitor over the long-term, the residual effects of shipping on pinnipeds is characterized as not significant. While uncertainties exist, Baffinland is of the opinion that these can be addressed via follow-up monitoring and adaptive management. Table 1 – Key ringed seal life-history stages by month in relation to Project shipping schedule for Phase 2 Proposal References: Environmental Resources Management (ERM). 2019. Baffinlands Iron Mines Corporation – Mary River Phase 2 Proposal: Community Risk Assessment Workshops: Final Report. Project No. 0489284-0004, Version C.1. Technical report by ERM Consultants Canada Ltd. Golder Associates Ltd. (Golder). 2019 Marine Mammal Monitoring Programs – Preliminary Findings. Reference No. 1663724-161-TM-Rev0-3000. 11 October 2019. 45 p. Laist, D.W., A.R. Knowlton, J.G. Mead, A.S. Collet, and M. Podesta. 2001. Collisions Between Ships and Whales. 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Vessel collisions with small cetaceans worldwide and with large whales in the Southern Hemisphere, an initial assessment. Latin American Journal of Aquatic Mammals 6:43–69. Yurkowski, D.J., B.G. Young, J.B. Dunn and S.H. Ferguson. 2019. Spring distribution of ringed seals (Pusa hispida) in Eclipse Sound and Milne Inlet, Nunavut: implications for potential ice-breaking activities. Arctic Science. 5(1): 54–61.			
DFO-3.5.1	DFO	September 2019	Uses walrus haul out buffer zone guidelines set by the US Fish and Wildlife Service (USFWS) and the US Federal Aviation Administration (FAA).	During Phase 2 Operations, Baffinland commits to using the walrus haul out buffer zone guidelines set by the US Fish and Wildlife Service (USFWS) and the US Federal Aviation Administration (FAA).	Marine Wildlife and Icebreaking/ Marine	Resolved	During Phase 2 Operations, Baffinland commits to using the walrus haul out buffer zone guidelines set by the US Fish and Wildlife Service (USFWS) and the US Federal Aviation Administration (FAA).

DFO-3.5.2	DFO	September 2019	Avoid icebreaking where and when seal density is relatively high. These areas occur in closed embayments and inlets where landfast ice exists	Baffinland will not be icebreaking in closed embayments nor in inlets where landfast ice exists (per Baffinland's commitment to not break landfast ice). Furthermore, as stated previously, icebreaking will avoid sensitive ringed seal life cycle periods (e.g. pupping, nursing, mating) when seal density is relatively high.	Marine Wildlife and Icebreaking	Resolved	Baffinland will not break ice in closed embayments and inlets where landfast ice exists. Should other areas of high seal density be encountered along the shipping route during the shoulder season, the Ship Board Observer Program will record and report this for potential adaptive management actions. This may include notices to Masters of project ships operating within the RSA to exercise due caution in order to minimize the likelihood of interaction with the mammals. In such events, Masters will be authorized to adjust speed or alter course within safe and prudent navigational constraints to avoid to the extent possible interactions with high density seal areas. See other commitments related to the SBO Program in response to DFO 3.5.3 and 3.5.6
DFO-3.5.3	DFO	September 2019	Provide an estimate of how many ringed seals are in Eclipse Sound, and re-evaluate the percentage of affected seals using available region and water-body specific abundance estimates.	An estimated 15,947 ringed seals are predicted to occur in the combined areas of Eclipse Sound, Pond Inlet and Milne Inlet (5,755 individuals in Eclipse Sound East; 2,457 individuals in Eclipse Sound West; 4,212 individuals in Pond Inlet; 2,763 individuals in Milne Inlet North, and 759 individuals in Milne Inlet South). This is based on ringed seal density estimates from Yurkowski et al. (2019), 1.40 individuals/km2 for Milne Inlet and 0.98 individuals/km2 for Eclipse Sound, and includes a correction factor of 2.46 for availability bias (Born et al. 2002) and 1.22 for perception bias (Frost et al. 1988). These were the values used to determine the predicted number of ringed seals affected by icebreaker noise in the Icebreaking Operations Assessment submitted May 13, 2019 to the NIRB. Based on a maximum-case icebreaker transit scenario (2 icebreakers escorting 2 capesize carriers), using corrected ringed seal density estimates for June (Yurkowski et al. 2019), the estimated number of ringed seals predicted to demonstrate avoidance of an icebreaker transit is: • 199 individuals (1.2% of 15,947 animals) per transit during Heavy Ice Regime (early summer) • 128 individuals (0.8% of 15,947 animals) per transit during Moderate Ice Regime (early summer) • 84 individuals (0.5% of 15,947 animals) per transit during Light Ice Regime (early summer) • 238 individuals (1.5% of 15,947 animals) per transit during Heavy Ice Regime (fall) • 93 individuals (0.6% of 15,947 animals) per transit during Moderate Ice Regime (fall) Based on a maximum-case icebreaker transit scenario (2 icebreakers escorting 2 capesize carriers), using corrected ringed seal density estimates for June (Yurkowski et al. 2018), the estimated number of ringed seals predicted to occur in the acoustic disturbance zone of an icebreaker transit is: • 1,219 individuals (7.6% of 15,947 animals) per transit during Heavy Ice Regime (early summer) • 688 individuals (4.3% of 15,947 animals) per transit during Moderate Ice Regime (early summer) • 339 individuals (2.1% of 15,947 animals) per transit during Light Ice Regime (early summer) • 1,530 individuals (9.6% of 15,947 animals) per transit during Heavy Ice Regime (fall) • 414 individuals (2.6% of 15,947 animals) per transit during Moderate Ice Regime (fall) References: Born, E.W., J. Teilmann and F. Riget. 2002. Haul-out activity of ringed seals (Phoca hispida) determined from satellite telemetry. Marine Mammal Science 18(1):167-181.Frost, K.J., L.F. Frost, K., L.F. Lowry, J.R. Gilbert and J.J. Burns. 1988. Ringed seal monitoring: relationships of distribution and abundance to habitat attributes and industrial activities. U.S. Dep. Commer., National Oceanic & Atmospheric Administration, OCSEAP Final Rep. 61(1989):345-445. NTIS PB89-234645. Available from National Technical Information Service, Springfield, VA. Yurkowski, D.J., B.G. Young, J.B. Dunn and S.H. Ferguson. 2019. Spring distribution of ringed seals (Pusa hispida) in Eclipse Sound and Milne Inlet, Nunavut: implications for potential ice-breaking activities. Arctic Science. 5(1): 54–61.	Marine Wildlife and Icebreaking	Further discussed in DFO 3.4.1 NEW, which is outstanding.	Baffinlands Ship Board Observer Program will confirm the prediction that no seal strikes will occur as a result of project shipping. Should monitoring demonstrate that the predictions are incorrect, Baffinland will implement adaptive managament measures in consultation with the MHTO and MEWG. Note: Baffinland will not provide an updated estimate of ship strikes on seals based on a study that covers a period in time and location that are fundamentally different from what is proposed under Phase 2.

DFO-3.5.4	DFO	September 2019	Implement 300m proposed buffer zone for seals as there currently is for polar bears and walruses.	Baffinland has developed a number of key mitigation measures to effectively eliminate and/or greatly minimize any adverse impacts on pinnipeds from shipping operations under the Phase 2 Proposal. This includes: • Avoidance of sensitive periods - Shipping and icebreaking will be conducted outside key sensitive periods for ringed seal, including pupping, nursing and mating periods • Project vessels will not exceed 9 knots in the RSA, thus avoiding and/or reducing the risk of vessel strikes on seal and minimizing the extent of acoustic disturbance. • Marine Wildlife Observers (MWOs) will be stationed on all icebreaker transits in the RSA to inform vessel Master and crew of buffer zones (where applicable), to avoid potential ship strikes on marine mammals, and to record other signs of disturbance to marine wildlife. • The number of daily icebreaker transits in the RSA will be reduced in heavy to moderate (4/10 to 10/10) ice conditions, thereby further reducing potential for vessel strikes and minimizing the daily noise exposure period for ringed seal. • Implementation of a 40-km buffer zone around the floe edge at the entrance of the RSA to reduce interactions between Project vessels and marine mammals (vessels entering the RSA during the spring shoulder season must wait 40 km to the east of the RSA until clearance from the Port Captain is obtained to enter the RSA). It would not be logistically possible to implement a 300-m buffer zone for seals given their overall high densities in the RSA (see response to DFO-3.5.3), nor does Baffinland feel that is warranted given the extensive mitigation already proposed, which Baffinland feels confident will effectively eliminate and/or greatly minimize the potential for ship strikes on pinnipeds under the Phase 2 Proposal. This is consistent with Inuit knowledge regarding potential ship strikes on marine mammals from Project shipping, based on existing IQ studies (JPCS 2017; QIA 2019), community workshops focusing on the effects of shipping and icebreaking on marine mammals from shipping (ERM 2019) and from interviews with Inuit following their participation in monitoring programs (Golder 2019) • Workshop participants noted that shipping impacts on seals is not an activity of concern. • Ship strikes are not thought to occur at current ship speeds. References: Environmental Resources Management (ERM). 2019. Baffinlands Iron Mines Corporation – Mary River Phase 2 Proposal: Community Risk Assessment Workshops: Final Report. Project No. 0489284-0004, Version C.1. Technical report by ERM Consultants Canada Ltd. • Golder Associates Ltd. (Golder). 2019 Marine Mammal Monitoring Programs – Preliminary Findings. Reference No. 1663724-161-TM-Rev0-3000. 11 October 2019. 45 p.	Marine Wildlife and Icebreaking/ Marine	Resolved	
DFO-3.5.5	DFO	September 2019	Avoid shipping during the shoulder seasons and ice-breaking activities and only ship during the open water season.	As part of the August 23, 2019 submission to the NIRB in support of the Phase 2 Proposal, Baffinland submitted a Draft Early Shipping Season – Operational Guide that clearly outlines the conditions under which Baffinland would begin shipping in the shoulder season. This criterion is based on both ecological and community determinants, and includes the following requirements: • Before commencing shipping, Baffinland must receive written confirmation from the MHTO that the floe edge is no longer being used by community members. No transits to Milne Port will be permitted until confirmation is received. • Baffinland will not break ice during ringed seal denning, pupping, nursing or mating periods and will manage its vessel traffic during the Eclipse Sound narwhal summer stock spring migratory period. Furthermore, Baffinland has established several precedent-setting mitigations to minimize potential effects on ringed seal as a result of ice breaking activities, including: • Restricting the number of transits during the early shoulder season where ice concentrations above 3/10 cannot be avoided. • Implementation of speed restrictions (9 knots) that are more conservative than Government of Canada guidelines for speed reduction to 10 knots. • Local Inuit Marine Wildlife Observers (MWOs) will be stationed on all icebreaker transits in the RSA and are responsible for alerting vessel Master and crew to observed potential risk of ship strikes on pinnipeds and other marine mammals, or record other signs of disturbance to marine wildlife. Implementation of a 40-km buffer zone around the floe edge at the entrance of the RSA to reduce interactions between Project vessels and marine mammals (vessels entering the RSA during the spring shoulder season must wait 40 km to the east of the RSA until clearance from the Port Captain is obtained to enter the RSA). Follow-up monitoring commitments are appropriate and tailored to managing any uncertainties in the assessment. Furthermore, project economics require reasonably predictable access, based on historic ice conditions. Once shipping has begun, any interruptions, such as weather delays and maintenance, have cascading effects that diminish the viability of the project. As such, for each cumulative 24-hour loss, or delay, two potential ship loads are lost. Based on the above Baffinland disagrees with DFOs recommendation to avoid shipping during the shoulder seasons and to only ship during the open water season.	Marine Wildlife and Icebreaking/ Marine	Further discussed in DFO 3.4.4 NEW, which is outstanding.	

DFO-3.5.6	DFO	September 2019	Prepare a monitoring plan, with an appropriate survey methodology (e.g., Wilson et al. 2017), for the purpose of documenting and reporting any mortalities due to icebreaking and shoulder season shipping activities or otherwise.	Mitigation and monitoring measures recommended by Wilson et al. (2017) are specific to icebreaking of land-fast ice in the Caspian Sea during peak winter months which corresponds with key life cycle periods for the Caspian seal, including denning, pupping and nursing periods. This is not an appropriate comparison to the present Project (Phase 2 Proposal), as mitigation has already been proposed that includes avoiding breaking land-fast ice altogether, and avoiding icebreaking during the sensitive life cycle periods for ringed seal, including denning, pupping, nursing and mating periods. Reporting procedures for any marine mammal mortalities or injuries due to icebreaking or shipping are outlined in Section 3.7 of the Shipping and Marine Wildlife Management Plan (SMWMP), and are outlined below: In the event any accidental contact occurs between a Project vessel and a marine mammal or an aggregation of seabirds, with resulting death or serious injury, the regional office of Fisheries and Oceans Canada (marine mammals) or Environment Canada (seabirds) is to be notified and supplied with information documenting the incident (date/time/location, affected species and condition, circumstances of the incident, weather and sea conditions, location/travel direction of the affected animal(s)). The Ship's Master will inform Baffinland Site personnel, who will contact the appropriate government agency. Annually, Baffinland will summarize any such incidents in its report to NIRB. In the event a ship-based Marine Wildlife Observer is onboard, they will be required to report any significant observation (e.g. threatened collision) to the ship master. Other vessel traffic would also be advised of any such threat. References: Wilson, S.C., I. Trukhanova, L. Dmitrieva, E. Dolgova, I Crawford, M. Baimukanov, T. Baimukanov, B. Ismagambetov, M. Pazylbekov, M Jussi and S. M. Goodman. Assessment of impacts and potential mitigation for icebreaking vessels transiting pupping areas of an ice-breeding seal. Biological Conservation. Vol 214. October 2017. 213-222.	Marine Wildlife and Icebreaking/ Marine	Further discussed in DFO 3.4.1 NEW, which is outstanding.	Baffinland will updated the Marine Monitoring Program to make it clear what behavioural indicators are recorded during the Ship Board Observer Program. These indicators include breaching, flipper slapping, lobtailing, diving, fluking, blowing, resting, looking, feeding, hauled-out, milling, swimming, surfacing. Other recorded information includes initial distance from vessel, minimum distance from vessel (i.e. closest point of approach), and bearing from vessel and movement direction. These methods and indicators are currently described in annual Ship Board Observer Reports.
DFO-3.6	DFO	September 2019	DFO is concerned that the lack of defensible information makes the assessment of the effect of shipping on cetacean difficult and highly uncertain. As such DFO recommends that, for the time being, Baffinland maintain the current level of shipping and avoid shipping during the shoulder seasons and ice-breaking activities. Before any increase in shipping is considered, Baffinland should provide further information and provide further mitigation options in an updated shipping management plan (see DFO-3.6.1-DFO-3.6.6).	Baffinland contracted Hemmera to undertake a third-party peer review of the icebreaking operations effects assessment. Hemmera's review considered a substantial body of information and used a 'multiple lines of evidence' approach for evaluating the significance of shipping impacts on narwhal along the Northern Shipping Route, including the following: • Inuit Quajimajatuqangit (IQ) • literature evidence (journal articles and reports published) • empirical evidence (site-specific, quantitative data collected over an extended time series from multiple monitoring programs including aerial surveys, acoustic monitoring, shore-based monitoring, ship-based monitoring) • modelling evidence (acoustic modelling) • evidence from other past environmental assessments in Canada including the Canadian Arctic region • expert opinion including knowledge and experience that trained professionals have accumulated over time in a specific technical discipline. The expert opinion of multiple professionals was incorporated into effects assessment elements for the marine mammal assessment. This included a peer-review of the assessment chapters and associated monitoring reports. • follow-up monitoring programs to address uncertainty The outcomes of Hemmera' third party peer review substantiate Baffinland's original determinations of significance in the icebreaking operations effects assessment, including a non-significant effect on narwhal from icebreaking. Further to this, Baffinland has developed a number of key mitigation measures to effectively eliminate and/or greatly minimize any adverse impacts on narwhal from shipping operations under the Phase 2 Proposal. This includes: Furthermore, Baffinland has established several precedent-setting mitigations to minimize potential effects on cetaceans as a result of ice breaking activities, including: • Restricting the number of transits during the early shoulder season where ice concentrations above 3/10 cannot be avoided. • Implementation of speed restrictions (9 knots) that are more conservative than Government of Canada guidelines for speed reduction to 10 knots. • Local Inuit Marine Wildlife Observers (MWOs) will be stationed on all icebreaker transits in the RSA and are responsible for alerting vessel Master and crew to observed potential risk of ship strikes on cetaceans and other marine mammals, or record other signs of disturbance to marine wildlife. • Implementation of a 40-km buffer zone around the floe edge at the entrance of the RSA to reduce interactions between Project vessels and marine mammals (vessels entering the RSA during the spring shoulder season must wait 40 km to the east of the RSA until clearance from the Port Captain is obtained to enter the RSA). Baffinland will include the above mitigation options in an updated version of the Shipping and Marine Wildlife Management Plan (SMWMP) prior to initiation of Phase 2 shipping operations. References: Hemmera Envirochem Inc. (Hemmera). 2019. Review of the Mary River Phase 2 Assessment Conclusions on the Effects of Icebreaking to Narwhal. Project No. 103182-01. October 11, 2019.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Further discussed in DFO 3.4.4 NEW, which is outstanding.	

DFO-3.6.1	DFO	September 2019	An estimate of the percentage of narwhal that could exhibit disturbance and avoidance behavior regularly depending on the icebreaking scenarios.	The number of narwhal (and the relative proportion of the Eastern Baffin Bay population and Eclipse Sound stock) that could exhibit disturbance and avoidance from icebreaking operations is provided in the Icebreaking Operations Assessment (Golder 2019) and represents 'average' and 'maximum-case' scenarios - see page 62 and Table D-1 in Appendix A of Icebreaking Operations Assessment (Golder 2019). DFO has suggested that effects are more appropriately assessed at the level of the Eclipse Sound stock (~12,000 narwhal) rather than the larger Baffin Bay population (~140,000 narwhal), given that stock level abundance estimates exist. Values are presented for both below: • DISTURBANCE: It is predicted that 3,500 to 4,700 narwhal in the RSA may experience noise levels above the disturbance threshold (120 dB) per icebreaker transit; this represents between 2.5 and 3.3% of the Baffin Bay population (estimated at 141,909 individuals based on DFO 2015a), and between 29 and 39% of the Eclipse Sound narwhal summer herd stock (estimated at 12,039 individuals based on Marcoux et al. 2019). • AVOIDANCE: It is predicted that 1,000 and 2,900 narwhal in the RSA may experience noise levels above the avoidance threshold (135 dB) per icebreaker transit, this represents between 1 and 2% of the Baffin Bay population and between 8 and 24 % of the Eclipse Sound narwhal summer herd stock. The total daily cumulative exposure period for narwhal from icebreaking operations is presented in DFO-3.8.1. Multiple lines of evidence, including empirical data, indicate that icebreaking and shipping operations are likely to trigger low- and possibly moderate-severity behavioural responses (Southall et al. 2007; Finneran et al. 2017) that are predominantly localized and temporary in nature. There is currently no evidence to suggest that extended exposure to vessel traffic noise has the potential to produce high severity responses that would compromise the integrity of the Eclipse Sound stock nor permanently displace narwhal from the RSA. Further, considering the application of effective mitigation measures (e.g., limiting the number of transits in heavy ice conditions to create periods of quiescence, vessel speed restrictions, establishment of a floe-edge buffer zone and "no-go" zones in key calving areas) and commitment to monitor, and adaptively manage, effects over the long-term, icebreaking and shipping operations as proposed for the Phase 2 proposal are not likely to result in a significant environmental effect on narwhal. References: Golder Associates Ltd. (Golder). Assessment of Icebreaking Operations during Shipping Shoulder Seasons on Marine Biophysical Valued Ecosystem Components (VECs). Report No. 1663724-102-R-Rev1-30000. 17 May 2019. 343 p. Finneran, J., E. Henderson, D. Houser, K. Jenkins, S. Kotecki, and J. Mulsow. 2017. Criteria and Thresholds for US Navy Acoustic and Explosive Effects Analysis (Phase III). Technical report by Space and Naval Warfare Systems Center Pacific (SSC Pacific). 183 pp. Marcoux, M., Montsion, L.M., Dunn, J.B., Ferguson, S.H., and Matthews, C.J.D. 2019. Estimate of the abundance of the Eclipse Sound narwhal (Monodon Monoceros) summer stock from the 2016 photographic aerial survey. DFO Can. Sci. Advis. Sec. Res. Doc. 2019/028. iv + 16 p. Southall, B.L., A.E. Bowles, W.T. Ellison, J.J. Finneran, R.L. Gentry, C.R. Greene Jr., D. Kastak, D.R. Ketten, J.H. Miller, P.E. Nachtigall, W.J. Richardson, J.A. Thomas, and P.L. Tyack. 2007. Marine mammal noise exposure criteria: initial scientific recommendations. Aquat. Mamm. 33(4):411-522.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Resolved	
DFO-3.6.2	DFO	September 2019	Mitigation measures to address this concern that frequency of entrapments will increase over natural levels due to icebreaking in the fall shoulder season (e.g., no icebreaking while narwhal migrate into and out of Eclipse Sound).	'Natural' levels of narwhal entrapment are presently unknown. Regardless, Baffinland is committed to undertaking an end-of-season aerial survey of the LSA, following the end of shipping operations, to confirm no narwhal entrapment events have occurred. Baffinland will work directly with the Mittimatilik HTO in implementation of this survey. The need for the mitigation measure proposed by DFO to not break ice while narwhal migrate into and out of Eclipse Sound is not supported by evidence and an unreasonable application of the precautionary principle. Such a mitigation measure would unnecessarily limit Baffinlands shipping season and the ability to transport the proposed increase in production to market. This recommendation does not adequately consider the shoulder season mitigation measures proposed by Baffinland, including vessel traffic management and setbacks from staging areas. Related to this technical comment, Baffinland would also like to note the following: the background to this comment suggests a linkage exists between the 2015 entrapment event and Baffinland's shipping operations that year (which was limited to 13 ore carriers and 4 fuel/cargo ships). Baffinland would like to formally document that Baffinland's shipping operations in 2015 ended on 12 October 2015 – and at this time, open water conditions were still prevalent throughout the RSA. The entrapment event occurred in early November 2015. Given the lack of spatial and temporal overlap between shipping and the entrapment event that year, it should be clear that there is no connection between these activities. Baffinland requests that DFO formally acknowledge this misrepresentation.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Further discussed in DFO 3.4.3 NEW, which is outstanding.	Baffinland is committed to undertaking an end-of-season aerial survey of the LSA for each year shoulder season shipping occurs, to confirm no narwhal entrapment events have occurred. Baffinland will work directly with the Mittimatilik HTO in implementation of this survey. Note Mitigation measures are limited, Baffinland has proposed having an icebreaker re-enter the RSA to create an exit pathway, assuming it is safe to do so. it is uncertain if this is a desireable action from the communities perspective. There is also an issue of identifying a natural event from a project affected one. Baffinlands suggests the MEWG is an appropirate forum to investigate such an event occurs in the future, and development adaptive mitigation measures, should they be neccessery.
DFO-3.6.3	DFO	September 2019	Clarify what the 'Eclipse Sound complex' refers to and provide justification for not including the Pond Inlet area in this statement.	The use of the term 'Eclipse Sound Complex' refers collectively to the Eclipse Sound area, inclusive of Milne Inlet, Tremblay Sound, Navy Board Inlet, Eclipse Sound West, Eclipse Sound East and Pond Inlet. Pond Inlet is therefore already included in this statement.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment	Resolved	

DFO-3.6.4	DFO	September 2019	Re-evaluation of the potential effects using the most recent stock size estimate.	See response to DFO 3.6.1.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment	Resolved	
DFO-3.6.5	DFO	September 2019	Re-evaluation of the extent beyond the local study area (LSA) and within the RSA, the magnitude and the reversibility of the impacts of ice entrapment on narwhals.	The area outside the marine mammal LSA and inside the marine mammal RSA is restricted to the northern half of Navy Board Inlet and waters off the north coast of Bylot Island. There is no Project shipping undertaken in these areas and they are outside the acoustic zone of influence for Project shipping. Therefore, Baffinland does not feel that a re-evaluation of the effect of entrapment on narwhal is warranted in these areas.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment	Further discussed in DFO in DFO 3.4.2 NEW, which is outstanding.	
DFO-3.6.6	DFO	September 2019	Short and long term monitoring of potential effects of shipping on cetaceans, potentially including multi-year aerial surveys for determination of the residual environmental effect of ice entrapment.	As stated in Baffinland's response to DFO-3.6.2, Baffinland is committed to undertaking an end-of-season aerial survey of the LSA, following the end of shipping operations, to confirm no narwhal entrapment events have occurred. Baffinland will work directly with the Mittimatilik HTO in implementation of this survey. Short- and long-term monitoring of potential effects of shipping on narwhal (example types include narwhal tagging study, shore-based monitoring at Bruce Head, ship-based monitoring, aerial surveys, etc.) will be implemented in support of Phase 2 operations at a frequency that is mutually agreed upon by Baffinland and the MEWG.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment	Resolved	Baffinland is committed to undertaking an end-of-season aerial survey of the LSA for each year shoulder season shipping occurs, to confirm no narwhal entrapment events have occurred. Baffinland will work directly with the Mittimatilik HTO in implementation of this survey. Note Baffinlands commitment to annual aerial surveys is for the life of the project.
DFO-3.7.1	DFO	September 2019	DFO-FFHPP recommends that Baffinland clarify on how NL1 was calculated and on how LSR was calculated for ambient noise, providing rationale for the modifications to the equation from Pine et al. (2018), and providing an example of how LSR is calculated.	The computation that is presented in the May 2019 Technical Memorandum is consistent with what is described in Frouin et al. (2019). The modifications to the equation from Pine et al. were made to compute the more intuitive Listening Range Reduction (LRR). LRR was computed using the provided Equation 1. Note that Equation 1 contains a typo, as discussed during a teleconference with DFO on June 13, 2019; there is a minus sign missing in the exponent and the equation should read LRR = 100 * (1 - 10^(-(NL2-NL1)/N). The term N in the equation is the geometric spreading loss term. It will typically fall between 10 (cylindrical spreading) and 20 (spherical spreading). It is common practice to assume a value of 15 for a geometric spreading loss in the absence of empirical transmission loss data for a specific environment; this is commonly referred to as the "practical spreading loss model". As described in the Technical Memo, NL1 is the sound pressure level without the masking noise (in this case vessel noise) present. NL1 was determined using the maximum of the mid-frequency cetacean audiogram (Finneran 2015) or the median 1-minute sound pressure level recorded during times with no vessel detections. At 1kHz, the mid-frequency cetacean hearing threshold exceeds the ambient sound level and the LRR is computed relative to the hearing threshold in this case. References: Finneran, J.J. 2015. Noise-induced hearing loss in marine mammals: A review of temporary threshold shift studies from 1996 to 2015. The Journal of Acoustical Society of America. Vol. 138. 1702 (2015). 26 p. Frouin-Mouy, H., E.E. Maxner, M.E. Austin and S.B. Martin. 2019. Baffinland Iron Mines Corporation–Mary River Project: 2018 Passive Acoustic Monitoring Program. Document 01720, Version 4.0. Technical report by JASCO Applied Sciences for Golder Associates Ltd.	Marine Wildlife and Icebreaking	Resolved	
DFO-3.7.2	DFO	September 2019	DFO-FFHPP recommends that Baffinland conduct a modelling exercise to calculate the LSR associated with the proposed increased transits. Including modelling in other parts of the Regional Study Area including Milne Inlet and Eclipse Sound.	During the Technical Meeting in Iqaluit in April 2019, DFO requested that JASCO expand the analysis in "Frouin-Mouy, H. and E.E. Maxner. 2018. Baffinland Iron Mines Corporation–Mary River Project: 2018 Passive Acoustic Monitoring Program. Document 01720, Version 2.0. Technical report by JASCO Applied Sciences for Golder Associates Ltd." to also include an analysis at 1 kHz. To meet this request from DFO, JASCO performed the calculation for 1 kHz; preliminary results were provided and in a Technical Memo dated May 10, 2019 and final results were included in a revised monitoring report (Frouin-Mouy et al. 2019). Although this analysis is based on the volume of traffic during existing operations, it can be extrapolated to adequately assess the expected future impacts and modelling is therefore not required. The results from the existing conditions can be used to make an informed estimate of the anticipated Listening Space Reduction (LSR), now termed Listening Range Reduction LRR), during proposed Phase 2 activities based on the anticipated increase of vessel traffic. For example, analysis of the 2018 acoustic monitoring data indicated that for a narwhal directly in the shipping lane (AMAR-1 recorder), a 90% LRR1 would occur at 1 kHz for approximately 1% of the time when vessels were present. For a whale in Koluktoo Bay (AMAR-3 recorder), a 90% LRR threshold would never occur for calls emitted at 1 kHz. Under a Phase 2 scenario, one can assume that narwhal would be subject to a similar proportional loss of listening space during each vessel exposure, only the number of exposures in a given day would roughly double. . Taking also into account that capesize ore carriers are slightly louder than the ore carriers associated with the current operations, one could conservatively assume that a 90% LRR at 1 kHz could occur as much as 3% of the time a vessel was present. Acoustic measurements presented in JASCO's 2018 Passive Acoustic Monitoring Report (Frouin-Mouy et al. 2019) indicate that the acoustic modelling provides conservative estimates of sound exposure (as designed). As such, interpretation of the empirical results provides a more realistic assessment of the potential loss of communication space due to vessel noise associated with the Project.	Marine Wildlife and Icebreaking	Further discussed in DFO 3.3.1 NEW, which is resolved.	

				In 2019, Baffinland considered this request for additional acoustic data from other parts of the Regional Study Area (RSA) and acoustic recorders were also deployed in Eclipse Sound and Pond Inlet. Analysis of the acoustic data from those recorders has not yet been completed but an evaluation of LRR will be executed on those data as well, and for data from future monitoring programs into Phase 2, should it be approved. 1A '90% reduction' in listening range was arbitrarily selected as a threshold for where acoustic masking may become substantial for narwhal (noting that the level at which masking occurs is presently unknown and that no acoustic thresholds for masking presently exist). References: Finneran, J.J. 2015. Noise-induced hearing loss in marine mammals: A review of temporary threshold shift studies from 1996 to 2015. The Journal of Acoustical Society of America. Vol. 138. 1702 (2015). 26 p. Frouin-Mouy, H., E.E. Maxner, M.E. Austin and S.B. Martin. 2019. Baffinland Iron Mines Corporation–Mary River Project: 2018 Passive Acoustic Monitoring Program. Document 01720, Version 4.0. Technical report by JASCO Applied Sciences for Golder Associates Ltd.			
DFO-3.7.3	DFO	September 2019	DFO-FFHPP recommends that Baffinland provide new calculations based on the new guidelines (Southall et al. 2019) or provide comments on the difference in methods and results between the older and newer methods, as well as consider temporary threshold shift (TTS) and not just permanent threshold shift (PTS), where relevant.	The thresholds and auditory weighting functions in Southall et al. (2019) are consistent with those from NMFS (2018) that were used in the acoustic modelling assessments. The methods and results are unchanged. The noise from transiting vessels will not exceed the thresholds for Temporary Threshold Shift. This can be seen in Figures E-42 through E-53 in TSD 24 (Marine Mammals Effects Assessment) Appendix B and Figures D-39 through D-76 in Appendix B of the Icebreaking Operations Assessment submitted to the NIRB on May 13, 2019. References: National Marine Fisheries Service (NMFS). 2018. 2018 Revision to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0): Underwater Thresholds for Onset of Permanent and Temporary Threshold Shifts. US Department of Commerce, NOAA. NOAA Technical Memorandum NMFS-OPR-59. 167 pp. https://www.fisheries.noaa.gov/webdam/download/75962998 Southall B.L., J.J. Finneran, C. Reichmuth, P.E. Nachtigall, D.R. Ketten, A.E. Bowles , W.T. Ellison, D.P. Nowacek and P.L. Tyack. 2019. Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects. Aquatic Mammals 2019, 45(2), 125-232.	Marine Wildlife and Icebreaking	Resolved	
DFO-3.7.4	DFO	September 2019	DFO-FFHPP recommends that Baffinland provide long term monitoring plan to verify the prediction of the sound propagation modelling and its potential effects on the populations of marine mammals.	A comparison of model estimates and measured data is presented in Frouin-Mouy et al. (2019). Similar analyses will be conducted using data collected during the 2019 shipping season to characterize the degree of conservatism in the sound propagation modelling that has been conducted. Additional AMARs have been deployed and will collect data during the Fall 2019 and Spring 2020 seasons. We are confident that the model provides a conservative estimate of the sound field, allowing for a precautionary assessment of the potential acoustic impacts. Monitoring data to date indicate that the narwhal are not showing pronounced reactions to the current levels of vessel activities. References: Frouin-Mouy, H., E.E. Maxner, M.E. Austin and S.B. Martin. 2019. Baffinland Iron Mines Corporation–Mary River Project: 2018 Passive Acoustic Monitoring Program. Document 01720, Version 4.0. Technical report by JASCO Applied Sciences for Golder Associates Ltd.	Marine Wildlife and Icebreaking	Further discussed in DFO 3.3.1 NEW and 3.3.3 NEW, which are resolved.	An analyses will be conducted using data collected during the 2019 shipping season to characterize the degree of conservatism in the sound propagation modelling that has been conducted. Additional AMARs have been deployed and will collect data during the Fall 2019 and Spring 2020 seasons to further this analysis. See response to DFO 3.8.4 for commitment to long term acoustic monitoring.

DFO-3.8.1	DFO	September 2019	Baffinland should provide an assessment of the percentage (%) of time that narwhals will be exposed to noise under the Phase 2 proposal shipping scenario.	Early Shoulder Season: The predicted 'per transit' and 'cumulative daily' noise exposure period that narwhal (and all marine mammal species) would be exposed to under Phase 2 shipping during the early shoulder season is presented below in Table 2 for disturbance (120 dB) and in Table 4 for avoidance (135 dB). During 'heavy' ice conditions (6/10 to 10/10 concentration), narwhal would be exposed to noise levels above the disturbance threshold for up to 9.5 hours per day (40% of the day, limited to a single transit event per 24-h period), effectively providing >14 h of quiet time for narwhal in a given day (60% of the day, Table 2). With respect to avoidance behaviour, narwhal would be exposed to noise levels above the avoidance threshold (135 dB) for up to 2 h per day (8% of the day) during 'heavy' ice conditions (Table 4). During 'moderate' ice conditions (4/10 to 5/10 concentration), the 'per transit' exposure period for disturbance is predicted to be 4.5 h (Table 2). With a maximum of two transits per day allowable in 'moderate' ice conditions, the resulting cumulative daily noise exposure period for disturbance is predicted to be 9 h (37% of the day) (Table 2), equivalent of 15 h of quiet time (63% of the day). With respect to avoidance behaviour, narwhal would be exposed to noise levels above the avoidance threshold (135 dB) for up to 1.6 h per day (7% of the day) during 'moderate' ice conditions (Table 4). During 'light' ice conditions (≤3/10), the 'per transit' exposure period for disturbance is predicted to be 3.1 h (Table 2). Although the number of daily transits in the RSA is not limited in ≤3/10 concentrations, no more than four transits per day was considered possible at this time of year because of the limited number of icebreakers (n=2) and the time required to complete an escort. The resulting cumulative daily noise exposure period for disturbance is predicted to be up to 12.4 h (52% of the day) (Table 2), equivalent of 11.6 h of quiet time (48% of the day) . With respect to avoidance behaviour, narwhal would be exposed to noise levels above the avoidance threshold (135 dB) for up to 1.2 h per day (5% of the day) during 'light' ice conditions (Table 4). It is important to note that these predictions are based on conservative modelling. Based on acoustic monitoring data collected in the field in 2019 (see below), Baffinland is confident that these cumulative daily noise exposure periods are, in reality, considerably shorter. For example, in 0/10 ice conditions, narwhal would in reality be exposed to noise levels above the disturbance threshold for a total daily period of up to 5.2 h (22% of the day), rather than 12.4 h per day (52% of the day) as predicted through modelling (Table 2). In 2019, the sound levels of five icebreaker transits were measured at the Bylot Island AMAR (recorder station) to determine the total amount of time per transit in which sound levels exceeded both the disturbance onset threshold (120 dB) and the avoidance threshold (135 dB) at Bylot Island, with results presented in Tables 1 and 3, respectively. Measured values were subsequently compared to predicted (i.e. modelled) values[1] for the same transiting scenario at Bylot Island (icebreaker escort + 2 ore carriers in 0/10 ice) to evaluate relative conservancy of the model. Results demonstrated that the measured noise fields associated with disturbance and avoidance were less than half those predicted by modeling (Tables 2 and 4), even when considering the loudest of the five icebreaker transits. For example, based on acoustic modelling, it was predicted that a narwhal exposed to an icebreaker accompanied by two ore carriers transiting in 0/10 ice would be subject to noise levels exceeding the disturbance threshold (≥120 dB) for a period lasting up to 3.1 h (per transit). Measured values at Bylot Island demonstrate that narwhal would be subject to noise levels ≥120 dB for a maximum period of 0.5 to 1.3 h per transit (>58% lower than predicted). Similarly, for the same icebreaker transit scenario, modelling results predicted that the exposure period for avoidance (≥135 dB) would last up to 20 min per transit. Measured values at Bylot Island indicated that the avoidance exposure period is actually in the range of 0 to 10 min per transit. These preliminary results support assumptions that acoustic modelling results are conservative and over-representative of measured effects. Open Water Season: For the open-water shipping season, Table 5 presents the predicted aggregate number of Project vessels in the RSA per month for Phase 2 operations. The predicted 'per transit' and 'cumulative daily' noise exposure period that narwhal (and all marine mammal species) would be exposed to is presented in Table 6 for the 'average' case (up to 5 vessel transits in the RSA per day), and in Table 7 for the 'maximum' case (up to 8 vessel transits in the RSA per day). The predicted 'cumulative daily' noise exposure period for disturbance is predicted to be, on average, up to 9.2 h (38% of the day), equivalent to > 14 h of quiet time (62% of the day), and under a 'worst case' scenario, up to 14 h (58% of the day), equivalent to 10 h of quiet time (42% of the day). Again, these estimates are based on acoustic modelling results, and are therefore considered to be conservative. Calculated as the total time period that a stationary narwhal would be exposed to a vessel's transiting noise field at sound levels ≥120 dB for disturbance, or at levels ≥135 dB for avoidance, based on modelling results and in consideration of ship speed, ice conditions, and escort configuration.	Marine Wildlife and Icebreaking	Resolved	

DFO-3.8.2	DFO	September 2019	Re-evaluate the impact of masking on narwhal noting the evidence that narwhals will get close enough to vessels to experience masking effects.	The conclusions made by Baffinland in the Phase 2 assessment that the effect of acoustic masking from shipping during both the shoulder and open water season is non-significant for narwhal was also independently supported by the results of the peer review of Baffinland's Mary River Phase 2 Assessment Conclusions conducted by Hemerra (Appendix N). In their review, Hemmera determined that acoustic masking from shipping and icebreaking operations are not anticipated to result in population or stock level effects on narwhal given: •many of the narwhal calls occur at predominantly higher frequencies than icebreaker noise and hence may not be masked •the majority of icebreaking will occur in the shoulder seasons when abundances of narwhal are generally lower •icebreaking will be intermittent in nature (as per mitigation measures) and the effects of masking will cease in the absence of icebreaking •literature indicates that in the presence of noise, narwhal initially exhibit a "freeze" response during which vocalizations cease; in the absence of communication clicks, acoustic masking is unlikely to occur. Following the initial "freeze" response narwhals have been documented to begin vocalizing again. This behaviour may suggest narwhal likely exhibit some level of habituation. This conclusion of non-significance is made with moderate confidence given the lack of scientific understanding in general on the effects of acoustic masking (and how this may affect energetics and habitat use over the long term), the fact that narwhal hearing is not well understood, and their ability to change calls to adapt is not understood. While uncertainties exist, Baffinland is of the opinion that this will be addressed by the proposed mitigation (e.g. end-of-season aerial surveys to confirm narwhal are clear of RSA) and via ongoing and follow-up monitoring programs looking specifically at masking effects, and via adaptive management measures integrated into the Project. Please also see responses to ON-01-03 and summary provided in Hemmera (2019). References: Hemmera Envirochem Inc. (Hemmera). 2019. Review of the Mary River Phase 2 Assessment Conclusions on the Effects of Icebreaking to Narwhal. Project No. 103182-01. October 11, 2019.	Marine Wildlife and Icebreaking	Further discussed in DFO 3.3.2 NEW, which is resolved.	
DFO-3.8.3	DFO	September 2019	Re-evaluate the level of the impact of masking from icebreaking on narwhal and provide supporting evidence, justification, and rationale for their conclusions.	Currently, there are no established regulatory thresholds that would aid in the determination of significance of acoustic masking effects on narwhal. Erbe et al. (2016) characterize acoustic masking as a complex phenomenon and masking levels can be variable and dependent on the physiological and anatomical characteristics and activity of the sender and receiver, the levels of ambient noise and the degree of habituation of the individuals, as well as any anti-masking strategies employed. There is no call masking model developed in the literature that is narwhal-specific and no research is available on the hearing ability (i.e., audiogram) of narwhal (Erbe et al. 2016). There is uncertainty about how repeated exposure to icebreakers and ore carriers will affect narwhal and how narwhal might use anti-masking strategies to overcome masking effects. More research is needed to understand the process and biological significance of masking, as well as the risk of masking by various anthropogenic activities, before masking can be incorporated into regulation strategies or quantitatively within an effects assessment (Erbe et al. 2016). Although there is acknowledged uncertainty on how narwhal will be affected by repeated exposure to icebreakers and ore carriers or how narwhal might use anti-masking strategies to overcome masking effects, based on acoustic monitoring results to date and in light of conservative mitigation measures proposed by Baffinland, the degree of acoustic masking resulting from Project shipping is not anticipated to result in large-scale displacement or abandonment of narwhal from their summering grounds in the RSA, and population-level effects are not anticipated. Based on acoustic monitoring results to date and in light of proposed mitigation (i.e., 9 knot speed limit, reduced transits during shoulder season, convoyed transits), the degree of acoustic masking resulting from Project shipping is not anticipated to result in large-scale displacement or abandonment of narwhal from their summering grounds in the RSA, and population-level effects are not anticipated. The determination of a non-significant effect on narwhal from acoustic masking relies on the assumption that narwhal may alter their vocal behaviour (e.g., call amplitude, call shape, call frequency) to overcome acoustic masking effects as documented for belugas (Au et al. 1985; Lesage et al. 1999; Sheifele et al. 2005). However, the use of anti-masking strategies to overcome masking effects has not been studied in narwhal. Although no significant residual effects for masking are predicted for narwhal, to address uncertainty, Baffinland will continue to conduct tailored studies to evaluate narwhal responses to ore carrier traffic along the shipping corridor during Phase 2 operations. This will include acoustic monitoring studies to assess for potential acoustic masking effects including loss of listening range for narwhal. Also see response to ON-01-03 and summary provided in Hemmera - Appendix N References: Au, W.J., L.D.A. Gardner, R.H. Penner and B.L. Scronce. 1985. Demonstration of adaptability in beluga whale echolocation signals. Journal of Acoustic Society of America 82:807-813. Erbe, C., M. Ainslie, C. deJong, R. Racca and M. Stocker. 2016. Summary report panel 1: The need for protocols and standards in research on underwater noise impacts on marine life. In The effects of noise on aquatic life. Edited by A. Popper and A. Hawkins. Springer, New York. pp. 1265–1271. Lesage, V., C. Barrette, M.C.S. Kingsley and B. Sjare. 1999. The effect of vessel noise on the vocal behaviour of belugas in the St. Lawrence River Estuary, Canada. Marine Mammal Science. Vol. 15(1):65–84. Hemmera Envirochem Inc. (Hemmera). 2019. Review of the Mary River Phase 2 Assessment Conclusions on the Effects of Icebreaking to Narwhal. Project No. 103182-01. October 11, 2019. Scheifele, P.M., S. Andrew, R.A. Cooper, M. Darre. 2005. Indication of a Lombard vocal response in the St. Lawrence River beluga. The Journal of Acoustical Society of America 117: 1486.	Marine Wildlife and Icebreaking	Further discussed in DFO 3.3.2 NEW, which is resolved.	

DFO-3.8.4	DFO	September 2019	Commits to additional acoustic monitoring related to icebreaking beyond 2019 regardless of if Phase 2 is approved or not, to verify predictions and better inform/refine ongoing monitoring, mitigation, and adaptive management	Baffinland will continue to undertake acoustic monitoring supportive of its operations in accordance with terms and conditions of the existing Project Certificate No. 005.	Marine Wildlife and Icebreaking	Resolved	
DFO-3.9.1	DFO	September 2019	All project related vessels (e.g., icebreakers, escort vessels, ore carriers) have MWOs present for the entire shipping season (e.g., port to port). If this not logistically possible, an alternative plan should be developed by Baffinland to monitor presence and behavior of marine mammals.	Placing marine wildlife observers on ore carriers as they enter the RSA is not an option due to safety and logistical limitations. It is also unfeasible to place MWOs on each vessel from their originating and terminating ports, which would be required as Milne Port is not equipped to process such arrivals to enter Canada from another country. Baffinland notes that monitoring for Project effects within the Regional Study Area (RSA) allows for effective and comprehensive monitoring of areas of Inuit traditional land use and harvesting and within the area where incremental effects have the greatest potential to interact with the effects of existing and reasonably foreseeable activities on marine mammals. The ship-based observer (SBO) program was re-instituted when a safe and logistically feasible opportunity presented itself. The Marine Wildlife Observers (MWOs) are based aboard the icebreaker which is only operating in the RSA during the shipping shoulder seasons. However, potential effects of shipping on marine mammals during the open water season are collected through other ongoing monitoring programs implemented by Baffinland including marine mammal aerial surveys, the Bruce Head Shore-based Monitoring Program, the Passive Acoustic Monitoring (PAM) program and the Narwhal Tagging Program. These programs collectively provide for data evaluation of potential interactions of vessels with marine mammals during the entire shipping period.	Marine Wildlife and Icebreaking	Further discussed in DFO 3.5 NEW, which is outstanding.	Baffinland will implement an incidental marine mammal monitoring program with vessel operators calling on Milne Port, which will request incidental observations of marine mammals to be recorded and relayed to Baffinland. In support of this program, Baffinland will develop educational materials for vessel crew to assist in marine mammal identification and data recording. Baffinland will provide a draft of the materials and program for review by the MEWG before they are finalized.
DFO-3.9.2	DFO	September 2019	Baffinland provide the “standard instructions to operate their vessel in a manner that avoids separating an individual member(s) of a group of marine mammals from other members of the group” for DFO to review.	The Standing Instructions to Masters are provided to Captains to operate their vessel within the RSA and outline, among other things, the manner in which to avoid separating an individual from a group of marine mammals are as follows: • Maintain constant speed and course when possible. • Follow waypoints provided in Standing Instructions to Masters • Reduce vessel speed to 9 knots. • Heed guidance of Shipboard Marine Wildlife Observers who are monitoring vessel interactions with marine mammals. • When marine mammals appear to be trapped or disturbed by Project vessel movements, the vessel will implement appropriate measures to mitigate disturbance, including stoppage of movement until wildlife move away from the immediate area (as safe navigation allows). • Do not approach within 300 m of a walrus or polar bear on observed sea ice.	Marine Wildlife and Icebreaking	Resolved	
DFO-3.10.1	DFO	September 2019	With current level of information provided, DFO is not able to adequately assess the risk of ballast water release on the spreading of unwanted species in the project area. In order to DFO properly assess the ballast release, DFO recommends that Baffinland, prior to issuance of the project certificate and issuance of authorizations, provide the following (DFO 3.10.1-DFO-3.10.6)The ballast water dispersion model and analyses be complete.	Comparison with 2018 seasonal data has been completed and provided in a Technical Report (Appendix N) with appendices. The above memo was sent to DFO, QIA, Parks Canada, Transport Canada, NPMO and NIRB on October 11, 2019. References: Golder Associates Ltd. 2019. Technical Report - Ballast Water Dispersion Modelling - Ballast Water Model Validation. Submitted to Baffinland Iron Mines Corporation. 1663724-154-R-Rev0. 09 October 2019.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment	Further discussed in DFO 3.6.1 NEW and 3.6.2 NEW, which are resolved.	
DFO-3.10.2	DFO	September 2019	All project vessels use ballast water treatment plus exchange strategy.	It is noted that all vessels calling to Milne Port are required to operate in accordance with Transport Canada’s Ballast Water Control and Management Regulations (Regulations; SOR/2011-237) pursuant to the Canada Shipping Act, 2001 (S.C. 2001, c. 26) and the International Maritime Organization’s International Convention for the Control and Management of Ship’s Ballast Water and Sediment (IMO 2017). Baffinland wishes to emphasize that current ballast water sampling by Baffinland remains a voluntary measure that exceeds federal and international guidelines for ballast water management. Baffinland has put into place additional measures that exceed regulatory and industry standards to include the requirement for all vessels calling on Milne Port that treat their ballast under the D2 Standard to also perform a ballast water exchange prior to treatment. This practice will continue until Baffinland provides updated ballast water dispersion modelling that more accurately reflects the spectrum of salinity and temperature that can be expected to be discharged at Milne Port. The Ballast Water Management Plan will be updated post-Phase 2 Proposal approval to reflect the commitments described above.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment	Further discussed in DFO 3.6.3 NEW and 3.6.4 NEW, which are resolved.	Baffinland will revise the Ballast Water Management Plan to include a requirement for all vessels to conduct ballast water exchanges (with or wthout D2 treatment systems) prior to calling on Milne Port, until such a time that ballast water treatment systems are compliant with the D2 standards set by the IMO. Should Baffinland wish to discontinue the practice of exchange plus treatment, Baffinland will provide updated ballast water modelling that reflects the range of salinity that may be presnet in the ballast water tanks where no exchange occurs.

DFO-3.10.3	DFO	September 2019	Monitoring of all ballast water discharges for compliance with Regulations D-1 and D-2, which includes a provision requiring the ballast water of each ship is tested to confirm that it meets Canadian requirements for salinity (at least 30 ppt) and number of viable organisms (Regulation D-2) prior to discharging.	Baffinland wishes to emphasize that current ballast water sampling by Baffinland remains a measure that exceeds federal and international guidelines for ballast water management, including those mandated by Transport Canada. Baffinland has committed to implementing a pilot ballast water biological monitoring program for ships currently only subject to the D1 standard (open water exchange). This program has been designed to reflect a more appropriately scoped form of a ballast water sampling protocol provided by DFO to Baffinland in 2017 and will include sampling from one ballast tank on a total of five vessels per shipping season. Baffinland remains committed to continue conducting temperature and salinity test sampling of one randomly selected ballast water tank for all vessels calling to Milne Port, and biological sampling in the marine receiving environment to monitor for non-native species in Milne Port and at Ragged Island. The Ballast Water Management Plan will be updated post-Phase 2 Proposal approval to reflect the commitments described above.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment	Further discussed in DFO 3.6.5 NEW, which is resolved.	Baffinland is continuing to discuss a resolution to TC-02 regarding the sampling of mulitple ballast water tanks in circumstances where ballast water is taken on at multiple locations. Baffinland will mirror any commitment to TC here for DFO. Baffinland will implement a pilot ballast water biological monitoring program for ships calling on Milne Port. This program will be designed to reflect a more appropriately scoped form of a ballast water sampling protocol provided by DFO to Baffinland in 2017. This program will include sampling from one ballast tank on a total of five vessels per shipping season. Baffinland remains committed to continue conducting temperature and salinity test sampling of one randomly selected ballast water tank for all vessels calling to Milne Port, and biological sampling in the marine receiving environment to monitor for non-native species in Milne Port and at Ragged Island.
DFO-3.10.4	DFO	September 2019	A monitoring plan which includes biological sampling of ballast water and hull fouling for all arriving ships (not just foreign flagged vessels) to evaluate the number and types of organisms being discharged, and more intensive seasonal sampling for marine fish and invertebrates.	See response to DFO-3.10.3	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment	Further discussed in DFO 3.6.6 NEW (outstanding) and DFO 3.6.7 NEW (resolved).	Ballast water - See commitment to implement a pilot ballast water biological monitoring program (3.10.3) Hull fouling - Baffinland cannot implement a biological sampling program. Biological growth is typically limited to the deepest sections of the hull, so the only way to collect samples in these areas is to use divers. This would require 'lock out' of the vessel, which is not possible on our ore carriers. We do collect biological AIS data for hull biofouling via high definition ROV video surveys of the hulls – this is undertaken on a subset of the vessels calling to port each summer (this occurred in 2018 and 2019, and will be the plan moving forward). Note – lock out means that we would physically put locks on all the controls in the mechanical room and on the bridge such to ensure that no intakes, engines, discharges of the ship are operational. This is an occupational requirement when diving in proximity to ships due to the danger present. This procedure requires significant time and insurance to permit, which Baffinland does not feel is warranted given the biological program already in place. Baffinland will continue to integrate feedback from MEWG Members in the design of the MEEMP program, such as more intensive seasonal sampling for marine fish and invertibrates.
DFO-3.10.5	DFO	September 2019	An assessment of potential biological and ecological effects of ballast discharge and identification of the high risk species or groupings of species of concern. These species may include, but not be limited to any NIS/AIS that have been detected in the course of past AIS/MEEMP monitoring, and should be updated in the event that new NIS/AIS are detected in future monitoring.	Identification of high-risk biological species or groupings of species of concern is the responsibility of DFO. Baffinland will continue to share all results of the Marine Environment Effects Monitoring Program and AIS Monitoring Program with DFO to assist in this regard.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment	Further discussed in DFO 3.6.8 NEW, which is resolved.	Baffinland will update the AIS monitoring program in the next iteration of the Marine Monitoring Program for Phase 2 to describe the process it follows for identifying high-risk biological species discovered through its sampling programs.
DFO-3.10.6	DFO	September 2019	An early response plan (similar to an oil spill response plan) be developed with applicable regulators and local communities so that, should an NIS/AIS be detected, significant environmental effects or major change to species composition could be avoided.	In Baffinland's March 2019 response to Technical Comment DFO 3.8.2, Baffinland has committed to the following: "Should it be confirmed that an AIS has become established in the Project area and that this introduction was a direct result of Baffinland shipping operations, Baffinland is committed to working with DFO to develop management actions for control of the AIS in accordance with DFO's Canadian Action Plan to Address the Threat of AIS. The level of intervention would correspond proportionally to the level of threat of the AIS." This commitment was reiterated to DFO following the June technical meetings with the following "Baffinland will work with DFO to develop a management and response approach in the event a non-indigenous species is identified during monitoring." It is also noted that Baffinland's management of AIS is focused on prevention through regular ship inspections and on-board ballast water testing (as outlined in Baffinland's BWMP) and through comprehensive AIS monitoring in the marine receiving environment as outlined in the Marine Environment Effects Monitoring Program and AIS Monitoring Program Annual Reports.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Accidents	Further discussed in DFO 3.6.9 NEW and 3.6.10 NEW, which are resolved.	Baffinland will work with DFO to develop a management and response approach in the event a non-indigenous species is identified during monitoring. This response approach will be added an an attachment to the AIS monitoring program.

DFO-3.11.1	DFO	September 2019	All iron ore carriers related to the Baffinland Project stop and reduce noise when cruise ships are in the area.	Project economics require reasonably predictable access, based on information on community land-use and historic ice conditions. Once shipping has begun, any interruptions have cascading effects that diminish the viability of the project. As such, for each cumulative 24-hour loss, or delay, two potential ship loads are lost. In 2019, numerous cruise and pleasure crafts were operating in the Pond Inlet, Eclipse Sound area, from July to September. Some of these vessels remained in the area for consecutive days at a time. Restricting movement of ore carriers during these periods when pleasure craft were in the vicinity would result in time that cannot be recouped. There is currently no traffic management scheme in the area except that which is administered for Baffinland Project shipping. The measures in place (speed limits, defined routes, no passing areas, no-go zones, etc) all contribute to diminishing risks and lowering impacts. Pleasure craft do not operate with the same level of risk mitigation. Given these comments, and the degree to which the project has already undertaken measures to address community concerns, it remains entirely unclear to Baffinland why DFO would request that Baffinland suspend regular shipping operations when cruise ships are present in the area given that Baffinland's mitigations for minimizing effects of shipping in the RSA are far more conservative than those adopted by cruise ships operating in the RSA. To further illustrate, Baffinland notes that it has committed to restricting vessel speeds to less than 9 knots, and has demonstrated compliance to that commitment in 2019, with 99% of ore carriers travelling less than 9 knots while transiting in the RSA, compared to only 32% of cruise ships who travelled at that speed. Furthermore, cruise ships are known to frequent areas within the RSA that have been identified as important marine mammal summering grounds both through IQ and scientific literature, namely Koluktoo Bay and Tremblay Sound, while Baffinland has in sharp contrast, identified these as restricted shipping areas for Project vessels. Baffinland has also established means for ongoing VHF radio communications with local hunters within the RSA via Shipping Monitors in Pond Inlet to minimize disturbances of shipping operations. Baffinland also notes that both the direct and indirect socio-economic benefits (i.e. employment and training opportunities and financial revenues) of the proposed Phase 2 Project to local communities and the Territory more generally, far exceed those of the cruise ship industry. Lastly, Baffinland notes that while it has a long-standing commitment to extensive ongoing monitoring of the marine environment and marine mammals within the RSA, the cruise ship industry does not provide even a relative proportion of the same contribution for understanding either individual (i.e. single cruise ship) or industry level effects of their activities in the area. In light of the above, DFOs recommended preference for cruise ships operations to take priority in the RSA over Baffinland's well managed vessel operations in the area appear contradictory to the objectives of other recommendations provided by DFO in the Agency's FWS.	Marine Wildlife and Icebreaking	Resolved	
DFO-3.11.2	DFO	September 2019	Baffinland conduct a thorough cumulative effects analysis and assessment examining all the combined impacts of all the Project activities inside and outside the study areas. This should include a final assessment on the expected available quiet time during the shipping season and whether the Phase 2 development will in fact result in continuous noise through the shipping route.	The Phase 2 development will not result in continuous noise along the shipping route. Table 1 presents the aggregate number of vessels in the RSA per month, based on both Project and estimated known non-project related vessel traffic. For the open-water shipping season, the predicted 'per transit' and 'cumulative daily' noise exposure period1 that narwhal (and all marine mammal species) would be exposed to is presented in Table 2 for the 'average' case (up to 6 vessel transits in the RSA per day including Project and non-Project vessels), and in Table 3 for the 'maximum' case (up to 9 vessel transits in the RSA per day including Project and non-Project vessels). The predicted 'cumulative daily' noise exposure period for disturbance is predicted to be, on average, up to 11.4 h (48% of the day), equivalent to > 12 h of quiet time (52% of the day), and under a 'worst case' scenario, up to 16.2 h (68% of the day), equivalent to ~8 h of quiet time (32% of the day). Again, these estimates are based on acoustic modelling results, and are therefore considered to be conservative. For the early shoulder season, it is assumed that only Project vessels would be active in the RSA. Therefore, daily noise exposure periods presented for the early shoulder season in Baffinland's response to DFO-3.8.1 would apply, as summarized below. • During 'heavy' ice conditions (6/10 to 10/10 concentration), narwhal would be exposed to noise levels above the disturbance threshold for up to 9.5 hours per day (40% of the day, limited to a single transit event per 24-h period), effectively providing >14 h of quiet time (60% of the day) for narwhal in a given day. With respect to avoidance behaviour, narwhal would be exposed to noise levels above the avoidance threshold (135 dB) for up to 2 h per day (8% of the day) during 'heavy' ice conditions. • During 'moderate' ice conditions (4/10 to 5/10 concentration), the 'per transit' exposure period for disturbance is predicted to be 4.5 h. With a maximum of two transits per day allowable in 'moderate' ice conditions, the resulting cumulative daily noise exposure period for disturbance is predicted to be 9 h (37% of the day), equivalent of 15 h of quiet time (63% of the day). With respect to avoidance behaviour, narwhal would be exposed to noise levels above the avoidance threshold (135 dB) for up to 1.6 h per day (7% of the day) during 'moderate' ice conditions.	Marine Wildlife and Icebreaking	Further discussed in DFO 3.7 NEW, which is outstanding.	

				• During 'light' ice conditions (≤3/10), the 'per transit' exposure period for disturbance is predicted to be 3.1 h. Although the number of daily transits in the RSA is not limited in ≤3/10 concentrations, no more than four transits per day was considered possible at this time of year because of the limited number of icebreakers (n=2) and the time required to complete an escort. The resulting cumulative daily noise exposure period for disturbance is predicted to be up to 12.4 h (52% of the day), equivalent of 11.6 h of quiet time (48% of the day). With respect to avoidance behaviour, narwhal would be exposed to noise levels above the avoidance threshold (135 dB) for up to 1.2 h per day (5% of the day) during 'light' ice conditions. • It is important to note that these predictions are based on conservative modelling. Based on acoustic monitoring data collected in the field in 2019 (see response to DFO-3.8.1), Baffinland is confident that these cumulative daily noise exposure periods are, in reality, considerably shorter. For example, in 0/10 ice conditions, narwhal would in reality be exposed to noise levels above the disturbance threshold for a total daily period of up to 5.2 h (22% of the day), rather than 12.4 h per day (52% of the day) as predicted through modelling (See Table 2 in response to DFO-3.8.1). Table 1: Number of Project and Non-Project vessel one way transits in the RSA presented by month – Phase 2 Proposal Table 2: Estimated cumulative daily noise exposure period for marine mammals during open water shipping - Average Case Table 3: Estimated cumulative daily noise exposure period for marine mammals during open water shipping - Maximum Case*			
DFO-3.12	DFO	September 2019	If the Project is approved, DFO-FFHPP recommends Baffinland, during DFO's regulatory phase, provide rationale for the selection of crossing infrastructure for fish bearing watercourses.	This will be provided as part of the application for an authorization under the Fisheries Act for the North Railway.	Freshwater	Resolved	Baffinland will include the requested information in the apllication for the Fisheries Act Authorization
DFO-3.13.1	DFO	September 2019	If the Project is approved, DFO-FFHPP recommends that, during the Regulatory phase, Baffinland: Analyze monitoring reports related to the Tote Road existing watercourses crossings and provide comprehensive "lessons learned" report (for the Tote Road crossings) that would include strategic analysis of what will be done differently to ensure the fish-passage issue will be mitigated, avoided and addressed	A discussion on lessons learned from the Tote Road crossings will be provided with the crossing selection rationale as part of the application for an authorization under the Fisheries Act.	Freshwater	Resolved	Baffinland will include the requested information in the apllication for the Fisheries Act Authorization
DFO-3.13.2	DFO	September 2019	If the Project is approved, DFO-FFHPP recommends that, during the Regulatory phase, Baffinland: Provide updated hydrological assessment of proposed watercourses crossings that includes, but is not limited to, crossing selection and design criteria, flow rates, velocities and discharge.	This information will be provided to the DFO-FFHPP during the permitting phase, as part of Baffinland's application for an authorization under the Fisheries Act.	Freshwater	Resolved	Baffinland will include the requested information in the apllication for the Fisheries Act Authorization
DFO-3.14.1	DFO	September 2019	Provide detailed water withdrawal plan that includes an in-depth risk analysis informed by site specific fish and fish habitat features for the waterbodies chosen for water withdrawal as part of any 'DFO Request for Review' submission.	This information will be provided to the DFO-FFHPP during the permitting phase, as part of Baffinland's application for an authorization under the Fisheries Act.	Freshwater	Resolved	Baffinland will include the requested information in the apllication for the Fisheries Act Authorization
DFO-3.14.2	DFO	September 2019	Conduct a thorough localized assessments on the waterbodies selected for water withdrawal in order to adequately assess the potential impacts on the fish habitat resulting from 20% of the 10-year dry unit runoff water withdrawal on fish-bearing watercourses and connecting waterbodies. This assessment should include, but not be limited to, an assessment of the effects to littoral/shore/riparian areas from the proposed water withdrawal, the specific withdrawal locations proposed for each waterbody including fish habitat in the area and updated rationale on how this level of withdrawal will be environmentally protective threshold.	Fish habitat surveys were completed at water withdrawal sites in late August 2019. Localized assessments of water withdrawals will be undertaken and presented in a Detailed Water Withdrawal Plan that will be provided to the DFO-FFHPP during the permitting phase, as part of Baffinland's application for an authorization under the Fisheries Act.	Freshwater	Resolved	Baffinland will include the requested information in the apllication for the Fisheries Act Authorization
DFO-3.14.3	DFO	September 2019	Provide additional rational/ assessment to support the assertion that 40% of the 10-year dry unit runoff water withdrawal from non-fish-bearing streams will not negatively affect downstream fish-bearing waterbodies.	The limits for water withdrawal were established as a screening tool to identify suitable waterbodies on the Northern Transportation Corridor. The limits are conservative but require additional site-specific assessments to confirm the avoidance of impacts on fish and fish habitat. These site-specific assessments will be provided as part of the Request for Review Application to DFO as part of project permitting.	Freshwater	Resolved	Baffinland will include the requested information in the apllication for the Fisheries Act Authorization
DFO 3.1.1 NEW	DFO	February 2020	DFO recommends Baffinland provide a brief review and assessment of how changing the limitation from the amount of ore to number of voyages will alter any of the provided assessments and models provided to this point in the assessment process.	Baffinland has considered all Project vessels (ore carriers, freight vessels, and fuel vessels) in its assessment. For example, see the estimates of daily exposure duration and daily quiet time for Phase 2 Shipping based on modelled and measured sound levels (specifically Tables 11 and 12) in section 4.1.3.2 of the Marine Mammal Monitoring Technical Memo (Appendix B).	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Resolved	

DFO 3.1.2 NEW	DFO	February 2020	DFO recommends Baffinland provide consideration for vessels, in addition to ore carriers, in determining the potential for impacts due to increased production.	On January 23, 2020, Baffinland met with DFO representatives to discuss outstanding issues related to the marine environment. Baffinland provided the following commitment relevant to the given recommendation, which it is formally providing here for to the Board: Baffinland can confirm that it will not surpass the number of vessels described and assessed in the Phase 2 FEIS Addendum to ship an additional 20% of ore over 12 Mtpa in the maximum operational flexibility scenario. For clarity, this is a limit of 176 ore carriers, 12 freight vessels and 12 fuel vessels. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Resolved	Baffinland can confirm that it will not surpass the number of vessels described and assessed in the Phase 2 FEIS Addendum to ship an additional 20% of ore over 12 Mtpa in the maximum operational flexibility scenario. For clarity, this is a limit of 176 ore carriers, 12 freight vessels and 12 fuel vessels.
DFO 3.2 NEW	DFO	February 2020	DFO is concerned with Baffinland's determination of the start and end of the shipping season, as the operational season can vary year-to-year. In relation to the opening and closing of the shipping season, DFO recommends Baffinland provide the following:	Please refer to responses below.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	DFO 3.2.1 NEW, 3.2.2 NEW, and 3.2.3 NEW are resolved.	
DFO 3.2.1 NEW	DFO	February 2020	A summary of monitoring conducted during the opening and closing of the shipping season	On January 23, 2020, Baffinland met with DFO representatives to discuss outstanding issues related to the marine environment. Baffinland provided the following commitment relevant to the given recommendation, which it is formally providing here for to the Board: Baffinland commits to provide a summary of monitoring conducted during the opening and closing of the shipping season, as well as a summary of the determinants for opening and closing the shipping season as part of its annual reporting. The requirement for, and format of, this report will be included in the final Marine Monitoring Plan, should Phase 2 be approved. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved. Background Shipping during the shoulder seasons to date has been monitored through several of Baffinland's marine monitoring programs (which are subject to ongoing annual reporting requirements) and include: Opening of the Shipping Season •Aerial Surveys (Distribution and Abundance) - A marine mammal aerial survey was conducted immediately prior to the start of, and in the early shoulder season to examine changes in distribution and abundance of marine mammals in relation to early season shipping activities. This was then followed by a second leg of marine mammal aerial-based abundance survey to estimate the abundance of the Eclipse Sound narwhal summer stock and compare this to previous abundance estimates when the icebreaker was not in operation. •Shipboard Observers - A ship-based observer program onboard the icebreaker was implemented during both the shoulder seasons to examine changes in the relative abundance, distribution and behaviour of marine mammals in relation to the icebreaker and shipping activities. •Passive Acoustic Monitoring - A passive acoustic monitoring program was also executed in 2019 to measure icebreaker noise levels in Pond Inlet and Eclipse Sound and compare measured levels vs. those predicted by the acoustic model. Closing of the Shipping Season • Aerial Surveys (Clearance) - Baffinland has committed to undertaking an annual end of season aerial clearance survey, which will assist in confirming that ice entrapment events are not occurring as a result of Project activities. • Shipboard Observers - Program continues through to closing of the shipping season. • Tagging - Baffinland is also examining effects of shipping via narwhal tagging data collected from the 2018 shipping season which includes extended periods when tagged narwhal occurred within close range of the icebreaker during the fall shoulder season. Changes in surface and dive behaviour in relation to icebreaker movements (via AIS ship positional data) will be assessed as part of this work (to the extent possible). • Passive Acoustic Monitoring - A passive acoustic monitoring program was also executed in 2019 to measure icebreaker noise levels in Pond Inlet and Eclipse Sound and compare measured levels vs. those predicted by the acoustic model. The most current results of the 2019 monitoring programs during the opening and closing season described above are summarized in Appendix B, which continue to confirm the predictions contained in Baffinland's FEIS Addendums for Early Revenue Phase and Phase 2. The details of the Marine Monitoring Plan will be finalized following the approval of Phase 2. The frequency of monitoring programs and study designs will be determined in consultation with Inuit and the MEWG. The overarching objective of the Plan will be to confirm that effects remain within FEIS Addendum predictions, and should unanticipated effects occur, the Plan will inform adaptive management response strategies. The Plan will be updated throughout the life of the Project as necessary to ensure the overarching objectives continue to be met. See also response to DFO 3.4.1.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Resolved	Baffinland commits to provide a summary of the following information as part of its annual reporting requirements and in preliminary field reports within 35 days of Spring shoulder season shipping activities commencing and 15 days of Fall shoulder season activities ending: i. marine monitoring programs ii. determinants for opening and closing the shipping season, iii. ecological and cultural (or "Inuit use") factors that influence shipping activities. iv. other information as requested by DFO and other regulators and key stakeholders, relevant to the marine environment The requirement for, and format of, these reports will be included in the final Marine Monitoring Plan, should Phase 2 be approved. Additional information requested after submission of the preliminary field report is to be provided by Baffinland as a memo within 35 days and will be included in Annual Reporting.

DFO 3.2.2 NEW	DFO	February 2020	Consideration for marine mammal behaviours or additional ecological factors in their determination of shipping season opening and closing, such as the mentioned outmigration of narwhal, and a commitment to reporting annually on the determination of the opening and closing of the shipping season.	On January 23, 2020, Baffinland met with DFO representatives to discuss outstanding issues related to the marine environment. Baffinland provided the following commitment relevant to the given recommendation, which it is formally providing here for to the Board: Baffinland commits to updating the Draft Early Shipping Season-Operational Guide, to better characterize considerations used in determining the nominal shipping season. See response to DFO 3.2.2 for the commitment to report on determinants of opening and closing the shipping season. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved. Background As part of the August 23, 2019 submission to the NIRB in support of the Phase 2 Proposal, Baffinland submitted a Draft Early Shipping Season – Operational Guide that clearly outlines the conditions under which Baffinland would begin shipping in the shoulder season. This criterion is based on both ecological and community determinants, and includes the following requirements: •Before commencing shipping, Baffinland must receive written confirmation from the MHTO that the floe edge is no longer being used by community members. No transits to Milne Port will be permitted until confirmation is received. •Baffinland will not break ice during ringed seal denning, pupping, nursing or mating periods and will manage its vessel traffic during the Eclipse Sound narwhal summer stock spring migratory period. Furthermore, Baffinland has established several precedent-setting mitigations to minimize potential effects on ringed seal as a result of ice breaking activities, including: • Restricting the number of transits during the early shoulder season where ice concentrations above 3/10 cannot be avoided. • Implementation of speed restrictions (9 knots) that are more conservative than Government of Canada guidelines for speed reduction to 10 knots. • Local Inuit Marine Wildlife Observers (MWOs) will be stationed on all icebreaker transits in the RSA and are responsible for alerting vessel Master and crew to observed potential risk of ship strikes on pinnipeds and other marine mammals, or record other signs of disturbance to marine wildlife. • Implementation of a 40-km buffer zone around the floe edge at the entrance of the RSA to reduce interactions between Project vessels and marine mammals (vessels entering the RSA during the spring shoulder season must wait 40 km to the east of the RSA until clearance from the Port Captain is obtained to enter the RSA). Baffinland has also already committed to undertaking an end-of-season aerial survey of the LSA, following the end of shipping operations, to confirm no narwhal entrapment events have occurred. During these survey observations will be taken of the ship track and how it has influenced ice formation.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Resolved	Baffinland commits to updating the Draft Early Shipping Season-Operational Guide, to better characterize considerations used in determining the nominal shipping season. See response to DFO 3.2.1 for the commitment to report on determinants of opening and closing the shipping season.
DFO 3.3 NEW	DFO	February 2020	DFO is concerned that the Baffinland provided acoustic modelling does not fully allow DFO to assess cumulative sound level and the assessment of the effect of the sound on marine mammals. DFO recommends that Baffinland	The cumulative effects of Project and non-Project vessel noise on marine mammals in the RSA is described in Section 4.1.3.2 of the Marine Mammal Monitoring Technical Memo (Appendix B). This describes the cumulative daily noise exposure on marine mammals in the RSA based for both average and maximum daily vessel transit scenarios accounting for both Project and non-Project vessels.	Marine Wildlife and Icebreaking/ Marine	Resolved	
DFO 3.3.1 NEW	DFO	February 2020	Provide the committed to technical memorandum which include calculations for the LSR associated with the proposed increased transits and modelling in other parts of the RSA including Milne Inlet, Eclipse Sound and Koluktoo Bay, for DFO's review.	The requested LSR calculations are provided in Section 4.1.4 of the Marine Mammal Monitoring Technical Memo (Appendix B). This describes the cumulative daily noise exposure on marine mammals in the RSA based for both average and maximum daily vessel transit scenarios accounting for both Project and non-Project vessels. The initial commitment was for JASCO to prepare a stand-alone technical memorandum which included a summary of noise measurements of shipping Operations in 2019 as well as modelling of Listening Range Reduction under a Phase 2 scenario. The memo prepared by JASCO was integrated into the above-mentioned technical memorandum in an effort to provide DFO and other regulators with an integrated summary of monitoring and modelling results as previously requested by these parties.	Marine Wildlife and Icebreaking/ Marine	Resolved	
DFO 3.3.2 NEW	DFO	February 2020	DFO recommends that, before the Project is approved, Baffinland reevaluate the impact of masking on narwhal to a magnitude of 2.	re-evaluation of masking effects on marine mammals in the RSA has been completed and is presented in Section 4.1.4 and Section 6.0 of the Marine Mammal Monitoring Technical Memo (Appendix B). This describes the cumulative daily noise exposure on marine mammals in the RSA based for both average and maximum daily vessel transit scenarios accounting for both Project and non-Project vessels. Masking effects on narwhal have been re-assessed to a Magnitude 2 rating.	Marine Wildlife and Icebreaking/ Marine	Resolved	

DFO 3.3.3 NEW	DFO	February 2020	Commit to collect data with AMARs at an appropriate frequency (eg. yearly) and develop a long-term monitoring plan, which is provided to MEWG members and approved by DFO, prior to the start of the Phase 2 increased shipping season.	On January 23, 2020, Baffinland met with DFO representatives to discuss outstanding issues related to the marine environment. Baffinland provided the following commitment relevant to the given recommendation, which it is formally providing here for to the Board: Baffinland commits to collecting acoustic data in the RSA using AMARs to characterize the degree of conservatism in the sound propagation modelling, at an appropriate frequency for the duration of the Phase 2 construction and operation periods, to be determined in consultation with Inuit and MEWG members, of which DFO is a member. Recommendations from MEWG members will be treated consistent with the consensus-based decision requirements of the final updated MEWG Terms of Reference. Baffinland commits to updating the marine monitoring plan (MMP) with this long-term monitoring plan, should Phase 2 be approved. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved.	Marine Wildlife and Icebreaking/ Marine	Resolved	Baffinland commits to collecting acoustic data in the RSA using AMARs to characterize the degree of conservatism in the sound propagation modelling, at an appropriate frequency for the duration of the Phase 2 construction and operation periods. Baffinland will collaborate with Inuit and DFO on the development of the draft program prior to submission to the MEWG for additional advice and recommendations. Recommendations from MEWG members will be treated consistent with the consensus-based decision requirements of the final updated MEWG Terms of Reference. Baffinland commits to updating the marine monitoring plan (MMP) with this long-term monitoring plan, should Phase 2 be approved.
DFO 3.4 NEW	DFO	February 2020	DFO is concerned about the impacts to marine mammals from shoulder season shipping and ice-breaking and disagrees with Baffinland's conclusions that effects will be non-significant.	Please refer to responses below.	Marine Wildlife and Icebreaking/ Marine	DFO 3.4.1 NEW, 3.4.2 NEW, 3.4.3 NEW, and 3.4.4 NEW are outstanding.	
DFO 3.4.1 NEW	DFO	February 2020	DFO recommends that Baffinland prepare a monitoring plan, with an appropriate survey methodology, for the purpose of documenting and reporting any impacts due to icebreaking and shoulder season shipping activities, which includes the indicators Baffinland intends to use and rationale for the selection of said indicators. Baffinland should provide this plan or an adequate outline of the proposed plan to DFO for review and approval prior to any addition of ice breaking activities.	On January 23, 2020, Baffinland met with DFO representatives to discuss outstanding issues related to the marine environment. Baffinland provided the following three commitments relevant to the given recommendation, which it is formally providing here for to the Board: Baffinland has provided a draft Marine Monitoring Plan (MMP) as part of the Phase 2 review process. Should Phase 2 be approved, Baffinland will update this Plan to reflect all relevant commitments and terms and conditions. Rather than develop a separate, stand-alone monitoring plan specific to icebreaking as suggested by DFO, Baffinland will include a specific section relevant to icebreaking and shoulder season shipping activities in the MMP. Survey methodology and indicators (including rationale) will be determined in consultation with the MEWG, of which DFO is a member. Recommendations from MEWG members will be treated consistent with the consensus-based decision requirements of the final updated MEWG Terms of Reference. An updated draft MMP will be provided to the MEWG for comment and the NIRB within 180 days of issuance of an amended Project Certificate, should Phase 2 be approved. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved. Background Baffinland notes that under the current permitting and construction schedule, Phase 2 shipping levels would not commence before 2024, providing at least 4 years to continue monitoring for potential impacts due to shipping activities.	Marine Wildlife and Icebreaking/ Marine	Outstanding - Further Discussions Required	Baffinland's current proposed commitment is: Baffinland has provided a draft Marine Monitoring Plan (MMP) as part of the Phase 2 review process. Should Phase 2 be approved, Baffinland will update this Plan to reflect all relevant commitments and terms and conditions. Rather than develop a separate, stand-alone monitoring plan specific to icebreaking as suggested by DFO, Baffinland will include a specific section relevant to icebreaking and shoulder season shipping activities in the MMP. Survey methodology and indicators (including rationale) will be determined in consultation with the MEWG, of which DFO is a member. Recommendations from MEWG members will be treated consistent with the consensus-based decision requirements of the final updated MEWG Terms of Reference. An updated draft MMP will be provided to the MEWG for comment and the NIRB within 180 days of issuance of an amended Project Certificate, should Phase 2 be approved.
DFO 3.4.2 NEW	DFO	February 2020	DFO recommends Baffinland provide consideration for the reevaluation of the magnitude and the reversibility of the impacts of ice entrapment on narwhals.	Baffinland's assessment of magnitude and reversibility were based on the following points: •There is no evidence in the literature connecting shipping and entrapment events. •Existing IQ, literature, and empirical data (e.g., narwhal tagging data, Ship-based Observer data, fall aerial surveys) indicate that most narwhal have left or are leaving the RSA before freeze-up. •Ice conditions at the time of outmigration are similar to ice conditions the animals occupy overwinter in Baffin Bay pack ice. •In early shoulder season of 2019, aerial surveys documented narwhal in 10/10 ice concentrations when other open water areas were available, confirming the animal's strong connection to heavy ice. Narwhal tagging data also confirms that narwhal naturally occupy areas of 10/10 ice including when no shipping is taking place. •No narwhal entrapment events occurred as a result of icebreaking operations during previous Nanisivik Mine operations which included icebreaking earlier in the season (May) and ending in November. •No entrapment events occurred during Baffinland icebreaking operations in 2018 and 2019. Based on the above rationale, Baffinland does not anticipated that shipping operations will result in entrapment of narwhal in the RSA. Regardless, Baffinland has still committed to undertaking an aerial-based clearance survey after cessation of fall shipping activities to visually confirm that no entrapments have occurred in the RSA. Furthermore, Baffinland is committed to implementing a response plan (see Section 3.4.3) in the unlikely event that a narwhal entrapment event does occur. In light of this information, Baffinland is confident that the current magnitude and reversibility ratings assigned for entrapment of narwhal are valid.	Marine Wildlife and Icebreaking/ Marine	Outstanding - Further Discussions Required	
DFO 3.4.3 NEW	DFO	February 2020	DFO recommends Baffinland commit to producing a response plan in the event of ice entrapments, as determined by the committed to multi-year aerial surveys. This plan should include action level triggers and associated outlined response actions, in the event of an ice entrapment and subsequently an increase in frequency of ice entrapments. This plan should be developed in discussion with DFO and other parties and provided to DFO for review and approval.	On January 23, 2020, Baffinland met with DFO representatives to discuss outstanding issues related to the marine environment. Baffinland provided the following commitment relevant to the given recommendation, which it is formally providing here for to the Board: Baffinland commits to produce a response plan for the potential event of an ice entrapment, should this be observed during the annual end of season clearance surveys. This plan will include action level triggers and associated response actions. This plan will be developed in consultation with the MHTO and DFO, understanding that these two groups are ultimately responsible for determining the appropriate course of action should an entrapment event occur. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved.	Marine Wildlife and Icebreaking/ Marine	Outstanding - Further Discussions Required	Baffinland's current proposed commitment is: Baffinland commits to produce a response plan for the potential event of an ice entrapment, should this be observed during the annual end of season clearance surveys. This plan will include action level triggers and associated response actions. This plan will be developed in consultation with the MHTO and DFO, understanding that these two groups are ultimately responsible for determining the appropriate course of action should an entrapment event occur.

DFO 3.4.4 NEW	DFO	February 2020	Overall, DFO reiterates the recommendation that Baffinland implement the most conservative mitigation measure and avoid shipping during the shoulder seasons and ice-breaking activities; only ship during the open water season.	Baffinland is confident in the conclusion drawn in the assessment of icebreaking activities (Golder, 2019) that, with mitigation, Phase 2 operations will not result in significant residual effects to marine mammals. Confidence is based on conservative assumptions and modelling scenarios applied in the assessment, the extensive set of shipping-related mitigation measures proposed and outlined in the draft Shipping and Marine Wildlife Management Plan (SMWMP) for Phase 2, and commitments for follow-up monitoring to manage uncertainty. To further address interveners outstanding uncertainties in the assessment, Baffinland contracted Hemmera to undertake a third-party peer review of the icebreaking operations effects assessment. Hemmera's review considered a substantial body of information and used a 'multiple lines of evidence' approach for evaluating the significance of shipping impacts on narwhal along the Northern Shipping Route, including the following: •Inuit Quajimajatuqangit (IQ) •literature evidence (journal articles and reports published) •Empirical evidence (site-specific, quantitative data collected over an extended time series from multiple monitoring programs including aerial surveys, acoustic monitoring, shore-based monitoring, ship-based monitoring) •Modelling evidence (acoustic modelling) •Evidence from other past environmental assessments in Canada including the Canadian Arctic region •Expert opinion including knowledge and experience that trained professionals have accumulated over time in a specific technical discipline. The expert opinion of multiple professionals was incorporated into effects assessment elements for the marine mammal assessment. This included a peer-review of the assessment chapters and associated monitoring reports. •Follow-up monitoring programs to address uncertainty The outcomes of Hemmera' third party peer review substantiate Baffinland's original determinations of significance in the icebreaking operations effects assessment, including a non-significant effect on narwhal from icebreaking (Appendix N). Furthermore, Baffinland has established several precedent-setting mitigations that will effectively eliminate and/or greatly minimize any adverse impacts on cetaceans as a result of icebreaking activities, including: • Project vessels do not enter the RSA until landfast ice has broken up along the entire shipping corridor. • Restricting the number of transits during the early shoulder season where ice concentrations above 3/10 cannot be avoided. • Implementation of speed restrictions (9 knots) that are more conservative than Government of Canada guidelines for speed reduction to 10 knots. • Local Inuit Marine Wildlife Observers (MWOs) will be stationed on all icebreaker transits in the RSA and are responsible for alerting vessel Master and crew to observed potential risk of ship strikes on cetaceans and other marine mammals, or record other signs of disturbance to marine wildlife. • Implementation of a 40-km buffer zone around the floe edge at the entrance of the RSA to reduce interactions between Project vessels and marine mammals (vessels entering the RSA during the spring shoulder season must wait 40 km to the east of the RSA until clearance from the Port Captain is obtained to enter the RSA). Each of these mitigation measures has been tailored to address the effect pathways of icebreaking operations that were identified in the effects assessment, as shown in the Mitigation and Monitoring Overview Table (Appendix B).	Marine Wildlife and Icebreaking/ Marine	Outstanding - Further Discussions Required	

				Understanding some of the mitigation measures identified above were implemented for the first time in 2019, and the monitoring results provided in the Marine Mammal Monitoring Memo (Appendix B) generally confirm FEIS and FEIS Addendum predictions (i.e., relating to changes in abundance at the population/stock level either through mortality or via seasonal displacement or abandonment of marine mammals in the RSA, no changes in relative abundance and group composition, disturbance effects are shown to be localized and temporary), this should provide adequate confidence for reviewers for proposed Phase 2 activities. In the event that effects of the Project exceed predictions, Baffinland has committed to the implementation of adaptive management strategies to eliminate or manage unanticipated effects. It is also noted that icebreaker activities proposed for Phase 2 are limited in scope. Icebreakers are contracted to provide escort for safe navigation of Project vessels travelling through Eclipse Sounds and Milne Inlet at the beginning and end of the shipping season. While this does mean that ice breaking may occur at intermittent points during a given transit in the shoulder seasons, it is not continuous along the entire route. Rather, ice concentrations are variable and the icebreakers interactions with ice are similarly variable. It is also noted that this is a time-limited activity that is only required at the beginning and end of the shipping season. With the application of transit restrictions in the Spring shoulder season, there is effectively no difference in icebreaking activity expected between current operations and Phase 2. Icebreaking activity occurs regularly in the Arctic. To the best of our knowledge, DFO has not mandated any specific mitigations in relation to those shipping activities (i.e. for example vessel management practices, such as speed limits, that could be imposed on GoC icebreaking vessels which are annually active in Eclipse Sound). This approach suggests that overall, DFO does not view icebreaking as an inherently significant activity of concern requiring additional regulatory oversight. Shipping during the shoulder seasons and ice-breaking activities are essential components of the Phase 2 proposal. DFO's recommendation to 'implement the most conservative mitigation measure and avoid shipping during the shoulder seasons and ice-breaking activities' would be an unreasonable application of the precautionary principle, which states that "where there are threats of serious or irreversible damage; lack of full scientific certainty must not be used as a reason for postponing cost-effective measures to prevent environmental degradation". Baffinland has taken a conservative approach and respects the concerns that have been raised about the threat of damage. Baffinland has not used lack of full scientific certainty as a reason for postponing any cost-effective mitigations, indeed Baffinland has implemented many novel and precedent setting measures developed in consultation and collaboration with Inuit, QIA and the DFO in order to ensure the project proceeds in a precautionary manner. In the event that the comprehensive monitoring program identifies adverse effects in future years, additional mitigations could be developed including modification of shipping activity if required. However Baffinland has provided evidence from the 2019 monitoring programs that support our view that the measures that are in place and also proposed for implementation during Phase 2 are effective and protective of marine mammals. In this submission Baffinland has made relevant additional commitments to DFO, specifically in response to DFO 3.2.1, DFO 3.2.2, DFO 3.3.3, DFO 3.4.1, DFO 3.4.3 and DFO 3.5. It is Baffinland's hope that with these additional commitments as well as the evidence filed on this topic to date, which taken together are comparable with or exceed those made by any other industrial proponents that we are aware of that ship in Canada, DFO can support Phase 2 shipping during shoulder seasons (including ice-breaking			
DFO 3.5 NEW	DFO	February 2020	DFO reiterates if having MWOs present for the entire shipping season on all project related vessels (e.g., icebreakers, escort vessels, ore carriers) is not logistically possible, an alternative plan should be developed by Baffinland to monitor presence, behavior and potential ship strikes of marine mammals.	On January 23, 2020, Baffinland met with DFO representatives to discuss outstanding issues related to the marine environment. Baffinland provided the following two commitments relevant to the given recommendation, which it is formally providing here for to the Board: Baffinland will prepare and submit to DFO a literature review of ship-based marine mammal remote monitoring systems. This literature review will include a summary of commercially available remote wildlife monitoring systems that could be installed on vessels to supplement existing marine mammal monitoring programs and enhance detection of ship strikes on marine mammals. The remote monitoring systems identified in this literature review will inform adaptive management, should the need be triggered. For clarity, in the event of a ship strike on a marine mammal, a single event, although unlikely based on present mitigations (i.e. speed restrictions), would trigger an adaptive management response. Baffinland will implement an incidental marine mammal monitoring program with vessel operators calling on Milne Port, which will request incidental observations of marine mammals to be recorded and relayed to Baffinland. In support of this program, Baffinland will develop educational materials for vessel crew to assist in marine mammal identification and data recording. Baffinland will provide a draft of the materials and program for review by the MEWG before they are finalized. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved. Background During the shoulder season, Baffinland has committed to having MWOs present on the icebreaker in addition to the ship crew who will monitor presence, behavior and potential ship strikes. As identified by DFO, placing marine wildlife observers (MWOs) the entire shipping season on all project vessels (e.g. icebreakers, escort vessels, ore carriers) is not possible due to safety concerns and logistical limitations. From a safety perspective, ship to ship transfers of MWO's in open waters within the RSA presents an unacceptable level of risk for Baffinland staff.	Marine Wildlife and Icebreaking/ Marine	Outstanding - Further Discussions Required	Baffinland's current proposed commitments are: Baffinland will prepare and submit to DFO a literature review of ship-based marine mammal remote monitoring systems. This literature review will include a summary of commercially available remote wildlife monitoring systems that could be installed on vessels to supplement existing marine mammal monitoring programs and enhance detection of ship strikes on marine mammals. The remote monitoring systems identified in this literature review will inform adaptive management, should the need be triggered. For clarity, in the event of a ship strike on a marine mammal, a single event, although unlikely based on present mitigations (i.e. speed restrictions), would trigger an adaptive management response. Baffinland will implement an incidental marine mammal monitoring program with vessel operators calling on Milne Port, which will request incidental observations of marine mammals to be recorded and relayed to Baffinland. In support of this program, Baffinland will develop educational materials for vessel crew to assist in marine mammal identification and data recording. Baffinland will provide a draft of the materials and program for review by the MEWG before they are finalized.

				Logistically, it is unfeasible to place MWOs on each vessel from their originating and terminating ports, which would be required as Milne Port is not equipped to process arrival of foreign workers to enter Canada from another country. The Ship-Based Observer (SBO) program is an alternative to the MWO program as it was originally envisioned and was implemented when a safe and logistically feasible opportunity presented itself. The wildlife observers are based aboard the icebreaker which is only operating in the RSA during the shipping shoulder seasons. During the remainder of the shipping season, Baffinland has other monitoring programs in place that monitor presence, behavior and potential ship strikes, including: marine mammal aerial surveys (presence); the Bruce Head Shore-based Monitoring Program (presence, behavior, ship strikes); the Passive Acoustic Monitoring program (presence and behavior); and the Narwhal Tagging Program (behavior). These programs collectively provide for a comprehensive data evaluation of the effects of vessel interactions with marine mammals during the entire shipping period. For Phase 2, Baffinland has also proposed the implementation of an incidental marine mammal monitoring program with Project vessels, which will require incidental observations be recorded and reported to Baffinland. In addition to the incidental marine mammal monitoring program, Baffinland as part of Phase 2 Baffinland is also proposing a Culture, Resource and Land Use Monitoring Program and Community Based Monitoring Program, both of which may contribute additional observations and perspectives on marine mammal presence, behavior and potential ship strikes.			
DFO 3.6.1 NEW	DFO	February 2020	Clarification on where vessels have been discharging ballast to date and how Baffinland validates/tracks this information.	On January 23, 2020, Baffinland met with DFO representatives to discuss outstanding issues related to the marine environment. Baffinland provided the following commitment relevant to the given recommendation, which it is formally providing here for to the Board: Project vessels are limited to releasing ballast water at one of the three anchorage locations at Milne Port, or while berthed at the ore dock. Further, prior to any ballast water discharge D-1 compliance testing must be completed. Instructions to not release ballast water prior to arrival at Milne Port and completion of ballast water testing is provided to all ship operators in Baffinland's Standing Instruction to Masters (SITM). This requirement will remain under Phase 2. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Resolved	Project vessels are limited to releasing ballast water at one of the three anchorage locations at Milne Port, or while berthed at the ore dock. Further, prior to any ballast water discharge D-1 compliance testing must be completed. Instructions to not release ballast water prior to arrival at Milne Port and completion of ballast water testing is provided to all ship operators in Baffinland's Standing Instruction to Masters (SITM). This requirement will remain under Phase 2.
DFO 3.6.2 NEW	DFO	February 2020	A commitment to including discharge coordinates in ballast reporting.	On January 23, 2020, Baffinland met with DFO representatives to discuss outstanding issues related to the marine environment. Baffinland provided the following commitment relevant to the given recommendation, which it is formally providing here for to the Board: Baffinland commits to record the Milne Port anchorage and associated coordinates where compliance testing and discharge occurs in the ballast water testing forms, completed by Baffinland's environmental monitors. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Resolved	Baffinland commits to record the Milne Port anchorage and associated coordinates where compliance testing and discharge occurs in the ballast water testing forms, completed by Baffinland's environmental monitors. As dataset with discharge coordinates will be provided to MEWG members as part of annual reporting.
DFO 3.6.3 NEW	DFO	February 2020	A commitment that exchange will be carried out prior to treatment for all vessels conducting exchange plus treatment procedures.	On January 23, 2020, Baffinland met with DFO representatives to discuss outstanding issues related to the marine environment. Baffinland provided the following commitment relevant to the given recommendation, which it is formally providing here for to the Board: Baffinland will require all vessels calling on Milne Port that treat their ballast under the D2 Standard to also perform a ballast water exchange prior to treatment. This updated commitment will be reflected in the 2020 Standing Instructions to Masters. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Resolved	Baffinland will require all vessels calling on Milne Port that treat their ballast under the D2 Standard to also perform a ballast water exchange prior to treatment. For ships unable to conduct exchange as specified in Canadian Ballast Water Regulations (e.g. ships on Canadian domestic trips), exchange is to be conducted as specified in revised ABWEZs for the Eastern Arctic as per DFO CSAS advice (See DFO 2015, Stewart et al, 2015 and Goldsmit et al, 2019). This updated commitment will be reflected in the 2020 Standing Instructions to Masters.

DFO 3.6.4 NEW	DFO	February 2020	Clarify what would trigger Baffinland to discontinue exchange plus treatment practices.	On January 23, 2020, Baffinland met with DFO representatives to discuss outstanding issues related to the marine environment. Baffinland provided the following commitment relevant to the given recommendation, which it is formally providing here for to the Board: Baffinland will consider discontinuing exchange plus treatment requirements should treatment systems efficacy reach a point that makes the benefits of an exchange plus treatment system negligible. In this event Baffinland will update ballast water dispersion modelling to more accurately reflects the spectrum of salinity and temperature that can be expected to be discharged at Milne Port under Phase 2 operations if prior exchange were to be discontinued. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Resolved	Baffinland will consider discontinuing exchange plus treatment requirements should treatment systems efficacy reach a point that makes the benefits of an exchange plus treatment system negligible. This decision will be made in consultation with TC and DFO and will be based on a consideration of factors outlined in DFO 2019 (i.e. if ballast water organism concentration or composition, environmental conditions, shipping patterns, proportion of voyages meeting the D-2 standard, or available data describing these conditions changes in the future, and updates to global research on ballast systems). In this event Baffinland will update ballast water dispersion modelling to more accurately reflect the spectrum of salinity, temperature, and discharge volumes that can be expected to be discharged at Milne Port under Phase 2 operations if prior exchange were to be discontinued.
DFO 3.6.5 NEW	DFO	February 2020	Clarification on how Baffinland intends to monitor ballast water discharges for compliance with D2 regulations.	The D-2 regulations are currently not scheduled to be fully phased in until 2024. If Phase 2 is approved, it is anticipated that shipping at Phase 2 levels would not occur until 2024. It is anticipated that in order to ensure industry compliance with the D-2 regulations, prior to 2024 Transport Canada will issue refined guidance on the need for pre-discharge compliance testing requirements for all vessels entering Canadian waters. Baffinland will monitor ballast water discharges for compliance with D-2 regulations in accordance with the Transport Canada guidance, once issued. While the D-2 regulations are not currently phased in, Baffinland is generally familiar with this type of monitoring and anticipates that Transport Canada guidance will follow similar protocols. Baffinland understands that vessels subject to D-2 must be outfitted with IMO Type-Approved treatment systems. Following installation of the IMO Type-Approved treatment systems, some flag states may follow additional guidance from IMO, which require vessels to undergo compliance testing during commissioning in accordance with the IMP BWM.2/Circ.70. The purpose of such testing is to demonstrate that the principle treatment methods of the system are capable of functioning as installed. Through this process, compliance testing is conducted as follows: 1.a sample should be collected during a ballast water uptake to characterize the ambient water, by any means practical (e.g. in-line sample port or direct harbour sample). The ambient water should be accepted for testing regardless of the level of challenge it poses to the ballast water management system (BWMS); 2.a sample should be collected during the corresponding ballast water discharge after the full treatment has been applied. Samples should be taken in accordance with the Guidelines on ballast water sampling (G2); 3.the representative samples should be analyzed for all size classes included in the D-2 standard using indicative analysis methods listed in table 3 of BWM.2/Circ.42/Rev.1; 4. the applicable self-monitoring parameters (e.g. flow rate, pressure, TRO, UV intensity, etc.) of the BWMS should also be assessed, taking into account the System Design Limitations of the BWMS, and the correct operation of all sensors and related equipment should be confirmed. The validation is considered successful if the analysis indicates that the discharge sample does not exceed the D-2 standard and the self-monitoring equipment indicates correct operation. In the case that the ambient water is not appropriate for the operational testing during the commissioning of the BWMS (e.g. salinity of ambient water is outside the SDL of the BWMS), testing should be evaluated to the satisfaction of the Administration. Completion of successful testing will result in the issuance of an International Ballast Water Management Certificate to the vessels.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Resolved, as per BIM's commitment to TC-02	Transport Canada appreciates the efforts by BIM to ensure current regulations are followed with respect to their plans for ballast water management. Given the learning curve associated with use of ballast water treatment systems, for Phase 2, Transport Canada (TC) in consultation with Fisheries and Oceans Canada (DFO), recommends, in conjunction with present sampling and testing protocols being proposed/adopted [NTD - will be summarized in complete package] by BIM, that BIM implement a ballast water compliance sampling plan based on a risk-based targeting methodology to be developed in consultation with DFO and TC. Such a risk-based methodology should be applied to evaluate the risk of all vessel ballast water management (D1, D2) with subsequent salinity and D-2 biological compliance sampling conducted on vessels identified as high or very high risk. The respective risk-based methodology and associated ballast water compliance sampling plan will be developed in consultation with DFO and TC following completion of DFO's Project-specific sampling conducted on a subset of vessels calling to Milne Port. The risk-based methodology and associated ballast water compliance sampling plan should include a consideration of other compliance initiatives or research being undertaken elsewhere by TC relative to implementation of the D-2 standard. Sampling conducted that supports building a body of knowledge for D-2 treatment systems, beyond biological compliance sampling conducted on high risk and very high risk tanks, should not compromise Baffinland's ability to transport annual ore quantities as approved under a modified Project Certificate No 005. Understanding that the rationale for this program is tied to a learning curve associated with the use of ballast water treatment systems, the compliance sampling program and risk based methodology will be adapted as deemed necessary based on the results of the program

DFO 3.6.6 NEW	DFO	February 2020	A commitment to develop of a biofouling sampling program, approved by DFO and completed prior to increase shipping activities for Phase 2, which specifically includes physical collection of organisms in a representative, standardized and comprehensive manner (sampling of hull and niche areas) that will allow for identification of non-native species that may be transported through project shipping.	On January 23, 2020, Baffinland met with DFO representatives to discuss outstanding issues related to the marine environment. Baffinland provided the following commitment relevant to the given recommendation, which it is formally providing here for to the Board: Baffinland remains committed to conducting ship hull biofouling monitoring surveys using an ROV on ore carriers, with focused efforts on areas of the hull and niche areas where biofouling has the greatest potential to occur (e.g. chain lockers, stern tube, rope guard, bottom, rubber side, etc.). The projected number of ore carriers that will be sampled annually will be determined in consultation with the MEWG, of which DFO is a member. Recommendations from MEWG members will be treated consistent with the consensus-based decision requirements of the final updated MEWG Terms of Reference. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved. Background Baffinland has considered the use of divers (physical collection) for biofouling monitoring but this option has not been selected, due to the unnecessary safety risks to personnel. Sampling by a remotely operated vehicle (ROV), however, remains a viable alternative that can continue to be implemented at Milne Port. Baffinland notes ship hull monitoring is already successfully completed in compliance with PC Condition No. 91. To Baffinland's knowledge, Milne Port is the only marine port in Canadian Waters that currently undertakes annual ship hull biofouling monitoring as part of its operations. This level of monitoring presently exceeds all regulatory requirements of Transport Canada related to hull biofouling.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Outstanding - Further Discussions Required	Baffinland's current proposed commitment is: Baffinland remains committed to conducting ship hull biofouling monitoring surveys using an ROV on ore carriers, with focused efforts on areas of the hull and niche areas where biofouling has the greatest potential to occur (e.g. chain lockers, stern tube, rope guard, bottom, rubber side, etc.). The projected number of ore carriers that will be sampled annually will be determined in consultation with the MEWG, of which DFO is a member. Recommendations from MEWG members will be treated consistent with the consensus-based decision requirements of the final updated MEWG Terms of Reference.
DFO 3.6.7 NEW	DFO	February 2020	A commitment to update the monitoring plan, to include more intensive sampling, which includes greater seasonal and spatial coverage, increased sample sizes to address concern related to statistical power for detection, clear protocols for determining identity and status of species (native, non-indigenous or cryptogenic).	On January 23, 2020, Baffinland met with DFO representatives to discuss outstanding issues related to the marine environment. Baffinland provided the following commitment relevant to the given recommendation, which it is formally providing here for to the Board: Baffinland commits to updating the marine monitoring plan (MMP) in consultation with MEWG members and this will be undertaken prior to the start of the Phase 2 increased shipping season. The updated MMP will detail the revised MEEMP sampling design which includes greater seasonal and spatial coverage and increased sampling effort and sample sizes to address DFO concerns related to statistical power for detection. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved. Background The Aquatic Invasive Species (AIS) Monitoring Program is a biological screening program (species ID, presence /absence data); as such, it does not involve any statistical analysis. The updated MMP will include clear protocols for determining identify and status of species collected as part of this program. The sampling effort for the AIS Monitoring Program is currently very rigorous. For example, in 2018 an estimated total of 745,124 zooplankton organisms (representing 44 taxa), 62,803 benthic infaunal organisms (representing 349 taxa), 25 distinct benthic epifaunal organisms, 1,733 encrusting epifaunal organisms (representing 9 taxa) and 6 distinct macrofloral organisms taxa were identified in samples collected at Milne Port and Ragged Island. All were taxonomically processed and subsequently screened against existing baseline inventories for Milne Inlet and against the national and global invasive species databases. None of these organisms were confirmed as being newly identified Non-Indigenous Species (NIS) in the Project area since Baffinland shipping operations began. Baffinland will continue to undertake AIS sampling in future years at the same scale of effort.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Resolved	Baffinland commits to updating the marine monitoring plan (MMP) in consultation with MEWG members and this will be completed prior to the start of the Phase 2 increased shipping season. The updated MMP will detail the revised MEEMP sampling design which includes greater seasonal and spatial coverage and increased sampling effort and sample sizes to address DFO concerns related to achieving sufficient statistical power for detection of project effects ((≥0.8) (as per recommendations in DFO 2020, pages 4-7). **Background** The Aquatic Invasive Species (AIS) Monitoring Program is a biological screening program (species ID, presence/absence data); as such, it does not involve any statistical analysis. The updated MMP will include clear protocols for determining identity and status of species collected as part of this program (as per recommendations in DFO 2019 and DFO 2020 and comments on disposition table provided in June (DFO 3.8.1) and November (DFO 3.10.4). The sampling effort for the AIS Monitoring Program is currently very rigorous.
DFO 3.6.8 NEW	DFO	February 2020	An assessment of potential biological and ecological effects of ballast discharge and identification of the high risk species or groupings of species of concern. These species may include, but not be limited to any NIS/AIS that have been detected in the course of past AIS/MEEMP monitoring, and should be updated in the event that new NIS/AIS are detected in future monitoring.	On January 23, 2020, Baffinland met with DFO representatives to discuss outstanding issues related to the marine environment. Baffinland provided the following commitment relevant to the given recommendation, which it is formally providing here for to the Board: Baffinland continues to maintain that the identification of high-risk biological species or groupings of species of concern is the primary responsibility of DFO. Despite this, Baffinland is committed to supporting the development of a trigger list of species through the process outlined in response to DFO 3.6.9 and to refining that list with DFO following Phase 2 approval. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved. Background In addition to NIS monitoring already being conducted in accordance with PC Conditions No. 76, 87, and 91, Baffinland has also committed to conducting a ballast water biological monitoring pilot program in 2020 to assist DFO in determining which species could be deemed high risk. This ballast water biological monitoring program will also be implemented for Phase 2.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Resolved	Baffinland continues to maintain that the identification of high-risk biological species or groupings of species of concern is the primary responsibility of DFO. Despite this, Baffinland is committed to supporting the development of a trigger list of species and associated response plans through the process outlined in response to DFO 3.6.9 and DFO 3.6.10 and to refining that list with DFO following Phase 2 approval.

DFO 3.6.9 NEW	DFO	February 2020	A commitment to develop an appropriate early response plan with a clear sequence of events to be followed in the event that a nonindigenous species is introduced and/or becomes established.	On January 23, 2020, Baffinland met with DFO representatives to discuss outstanding issues related to the marine environment. Baffinland provided the following commitment relevant to the given recommendation, which it is formally providing here for to the Board: Baffinland commits to develop an appropriate early response plan with a clear sequence of events to be followed in the event that a nonindigenous species is introduced and/or becomes established Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved. Background On January 23, 2020 Baffinland shared a draft Rapid Response Plan (RRP) framework (Appendix B) with DFO on for review and input.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Resolved	Baffinland commits to follow the most updated version of DFO's AIS Rapid Response Framework in the event that a noningenous species is introduced and/ or becomes established.
DFO 3.6.10 NEW	DFO	February 2020	A commitment to develop taxa-specific response plans for high risk species or groups of species identified through species level risk assessments. These could be informed by known vessel origins prior to arrival at the project.	On January 23, 2020, Baffinland met with DFO representatives to discuss outstanding issues related to the marine environment. Baffinland provided the following commitment relevant to the given recommendation, which it is formally providing here for to the Board: Baffinland commits to work with the MEWG and DFO to establish species-specific Rapid Response Plans. Rapid Response Plans will be developed for species identified as high risk through ongoing NIS monitoring in the receiving environment, the ROV biofouling monitoring program, results yielded from the 2020 biological ballast water sampling pilot program, and through a review of the Canadian Marine Invasive Screening Tool. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Resolved	Baffinland commits to work with the MEWG and DFO to establish species-specific Rapid Response Plans. Rapid Response Plans will be developed for species identified as high risk through ongoing NIS monitoring in the receiving environment, the ROV (or any other future) biofouling monitoring program, results yielded from the 2021 biological ballast water sampling pilot program (and any ongoing ballast monitoring), examination of existing invasive species databases and lists in key ecoregions where vessels calling originate from (as per Goldsmit et al., 2020 Global Change Biology), and based on ranking of potential risk using the Canadian Marine Invasive Screening Tool.
DFO 3.7 NEW	DFO	February 2020	DFO recommends that Baffinland conduct a thorough analysis and assessment examining all the combined impacts of all the Project activities inside and outside the study areas.	Baffinland has undertaken a detailed environmental assessment of potential impacts on Marine Environment and Marine Mammal VECs in the Regional Study Area. A combined effects assessment is included in Section 6 of the Marine Mammal Monitoring Tech Memo (Appendix B). Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved.	Marine Wildlife and Icebreaking/ Marine	Outstanding - Further Discussions Required	
DFO 3.8 NEW	DFO	February 2020	If the Project is approved, DFO recommends Baffinland provide decision criteria and decision matrix for the selection of water crossing methods for fish bearing watercourses in support of any regulatory applications made to DFO.	Baffinland provides the following commitment in relation to the recommendation: Baffinland will provide decision criteria and decision matrix for the selection of water crossing methods for fish bearing watercourses in support of any regulatory permit applications made to DFO. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved.	Freshwater	Resolved	Baffinland will provide decision criteria and decision matrix for the selection of water crossing methods for fish bearing watercourses in support of any regulatory permit applications made to DFO.
DFO 3.9.1 NEW	DFO	February 2020	If the Project is approved, DFO recommends that, during the Regulatory phase, Baffinland: Analyze monitoring reports related to the Tote Road existing watercourses crossings and provide comprehensive "lessons learned" report (for the Tote Road crossings) that would include strategic analysis of what will be done differently to ensure the fish-passage issue will be mitigated, avoided and addressed	Baffinland provides the following commitment in relation to the recommendation: Baffinland will analyze monitoring reports related to the Tote Road existing watercourses crossings and provide comprehensive lessons learned report (for the Tote Road crossings) that would include strategic analysis of what will be done differently to ensure the fish-passage issue will be mitigated, avoided and addressed. This report will be included as part of any regulatory applications made to DFO. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved.	Freshwater	Resolved	Baffinland will analyze monitoring reports related to the Tote Road existing watercourses crossings and provide comprehensive lessons learned report (for the Tote Road crossings) that would include strategic analysis of what will be done differently to ensure the fish-passage issue will be mitigated, avoided and addressed. This report will be included as part of any regulatory applications made to DFO.
DFO 3.9.2 NEW	DFO	February 2020	Provide updated hydrological assessment of proposed watercourses crossings that includes, but is not limited to, crossing selection and design criteria, flow rates, velocities and discharge, and fish passage.	Baffinland provides the following commitment in relation to the recommendation: Baffinland will provide an updated hydrological assessment of proposed watercourses crossings that includes, but is not limited to, crossing selection and design criteria, flow rates, velocities and discharge, and fish passage. This content will be included as part of any regulatory permit applications made to DFO. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved.	Freshwater	Resolved	Baffinland will provide an updated hydrological assessment of proposed watercourses crossings that includes, but is not limited to, crossing selection and design criteria, flow rates, velocities and discharge, and fish passage. This content will be included as part of any regulatory permit applications made to DFO.
DFO 3.10.1 NEW	DFO	February 2020	DFO recommends that Baffinland: Provide detailed water withdrawal plan that includes an in-depth risk analysis informed by site specific fish and fish habitat features for the waterbodies chosen for water withdrawal as part of any 'DFO Request for Review' submission.	Baffinland provides the following commitment in relation to the recommendation: Baffinland will provide a detailed water withdrawal plan that includes an in-depth risk analysis informed by site specific fish and fish habitat features for the waterbodies chosen for water withdrawal as supplemental information to water licensing and any DFO Request for Review submission. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved.	Freshwater	Resolved	Baffinland will provide a detailed water withdrawal plan that includes an in-depth risk analysis informed by site specific fish and fish habitat features for the waterbodies chosen for water withdrawal as supplemental information to water licensing and any DFO Request for Review submission.

DFO 3.10.2 NEW	DFO	February 2020	Conduct a thorough localized assessments on the waterbodies selected for water withdrawal in order to adequately assess the potential impacts on the fish habitat resulting from 20% of the 10-year dry unit runoff water withdrawal on fish-bearing watercourses and connecting waterbodies. This assessment should include, but not be limited to, an assessment of the effects to littoral/shore/riparian areas from the proposed water withdrawal, the specific withdrawal locations proposed for each waterbody including fish habitat in the area and updated rationale on how this level of withdrawal will be environmentally protective threshold.	Baffinland provides the following commitment in relation to the recommendation: Baffinland will conduct a thorough localized assessment on the waterbodies selected for water withdrawal in order to adequately assess the potential impacts on the fish habitat resulting from 20% of the 10-year dry unit runoff water withdrawal on fish-bearing watercourses and connecting waterbodies. This assessment will include an assessment of the effects to littoral/shore/riparian areas from the proposed water withdrawal, the specific withdrawal locations proposed for each waterbody including fish habitat in the area and updated rationale on how this level of withdrawal will be an environmentally protective threshold. This content will be included as supplemental information to water licensing and regulatory permit applications made to DFO. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved.	Freshwater	Resolved	Baffinland will conduct a thorough localized assessment on the waterbodies selected for water withdrawal in order to adequately assess the potential impacts on the fish habitat resulting from 20% of the 10-year dry unit runoff water withdrawal on fish-bearing watercourses and connecting waterbodies. This assessment will include an assessment of the effects to littoral/shore/riparian areas from the proposed water withdrawal, the specific withdrawal locations proposed for each waterbody including fish habitat in the area and updated rationale on how this level of withdrawal will be an environmentally protective threshold. This content will be included as supplemental information to water licensing and regulatory permit applications made to DFO.
DFO 3.10.3 NEW	DFO	February 2020	Provide additional rationale/ assessment to support the assertion that 40% of the 10-year dry unit runoff water withdrawal from non-fish-bearing streams will not negatively affect downstream fish-bearing waterbodies.	Baffinland provides the following commitment in relation to the recommendation: Baffinland will provide additional rationale/ assessment to support the assertion that 40% of the 10-year dry unit runoff water withdrawal from non-fish-bearing streams will not negatively affect downstream fish-bearing waterbodies. This content will be included as supplemental information to water licensing and regulatory permit applications made to DFO. Baffinland expects that this commitment will satisfy DFO's concern and the comment will now be considered resolved.	Freshwater	Resolved	Baffinland will provide additional rationale/ assessment to support the assertion that 40% of the 10-year dry unit runoff water withdrawal from non-fish-bearing streams will not negatively affect downstream fish-bearing waterbodies. This content will be included as supplemental information to water licensing and regulatory permit applications made to DFO.
ECCC-FC1	ECCC	September 2019	**ECCC recommends that the NIRB include or amend the Terms and Conditions of Project Certificate No. 005 to require the Proponent to:** Submit all air quality and meteorological monitoring data as part of the annual reports and compare the monitoring data to the CAAQS, where applicable. The air quality and meteorological monitoring data should be presented to include at least, but not limited to:• Time series of data.• Hourly, daily, and annual averages in graphical and/or tabulated form (if applicable to the air quality or meteorological parameter).• Comparison to the CAAQS (and relevant statistical forms, if three years is not available, CAAQS can be calculated using one year).• Wind roses.• Graph and tables indicating seasonal variability.• Comparisons to other years of data.• Include any photos taken of dust on snow in the annual reports.• Present the predicted concentrations in the annual reports as a range of absolute concentrations.	Baffinland will provide all quality assured measured air quality and meteorological data in an annual report and compare to applicable criteria as outlined in the revised Air Quality and Noise Abatement Plan (AQNAMP) for the project. The annual report will include all raw data, averages in graphical and tabular form as most relevant to the data set, comparison to relevant criteria and visual presentation including wind roses and comparisons to previous year's data. In relation to photography, if major dusting events are observed, they will be photographed and included in the annual report. Also, the available satellite imagery will be reviewed and included if considered relevant. The use of satellite imagery will be evaluated on an ongoing basis to confirm whether it adds value or provides any relevant context to the dust fall evaluations. As the revised AQNAMP will be updated to detail these reporting requirements specifically, additional requirements in the Terms and Conditions of the Project are not deemed necessary. As per recent discussions, the 2020 CAAQS would be used for comparison purposes only with the objective to "keep clean areas clean" with respect to ambient air quality while the Project Standards are based on Nunavut Standards where available, or otherwise the most stringent available from a Provincial or other Territorial Government. Appendix G includes memos describing dustfall management action triggers for the protection of human health and vegetation. Baffinland will reflect the commitment to annual reporting in the final AQNAMP for the Phase 2 Proposal and subsequently does not believe a new Term and Condition is required.	Atmospheric	Resolved	Baffinland will reflect the commitments provided in its response in the Air Quality and Noise Abatement Management Plan following the issuance of an amended Project Certifcate. In the interim these commitments will be captured in a commitment register, to be provided to the Board during the Public Hearings. Baffinland does not object to having relevant terms and conditions modified to reflect this commitment.
ECCC-FC2	ECCC	September 2019	ECCC recommends that the Proponent: Investigate NO2 reduction measures that could be applied to power generation that would offset the use of a portion of the emissions from the generators. This information should be provided in a management plan along with a quantitative analysis of the potential emissions offset.Commit that all mobile equipment (new and existing) be Tier 4 or better.	Baffinland will review options to reduce NO^x emissions and document this review in the first annual air quality report. The report will also quantify potential reductions achievable, where feasible. New equipment procurement will meet Tier 4 standard or better, however, Baffinland cannot commit to replacement of existing equipment that does not meet the Tier 4 standard.	Atmospheric	Resolved	Baffinland commits to investigate and implement NOX reductions measures, where feasible, and report on this in the 2020 annual air quality report (to be submitted by March 31, 2021)

ECCC-FC3	ECCC	September 2019	**ECCC recommends that the NIRB amend the Terms and Condition #7 of Project Certificate No. 005 to require the Proponent to**:• Complete the AQNAMP in consultation with ECCC and other interested interveners.• Monitor PM2.5 and TSP using continuous monitors at:• The sites that already monitor NO2 and SO2 at both Milne Port and the Mine Site.• New locations on or close to the Project Boundary at both the Milne Port and Mine Site that include sites that are close to locations of passive dustfall monitoring and in locations that have predicted and passively measured high dustfall; and site placement also consider prevailing wind direction.ECCC recommends that the Proponent update the AQNAMP with the following:• Present the predicted concentrations in the AQNAMP as a range of absolute concentrations.• Investigate ways to mitigate the emissions from the stockpiles and present these in the AQNAMP for review.• Include management actions for the stockpiles in Section 4 of the AQNAMP as well as Table 5-2, and Table 5-3.• Define the management action trigger levels for both the 24-hour and annual averaging periods for all species (Table 5-1, Table 5-2, and Table 5-3).• Define the frequency at which air quality and meteorological data is reviewed that allows for timely response for implementation of corrective actions in response to exceedances of triggers.• Include details on how the air quality data and meteorological data will be analyzed together during the investigation of exceedance of trigger levels and necessary management actions.• Confirm the trigger levels for dustfall and include corrective actions associated with collected dustfall data.• Include 24-hour and annual Total Suspended Particulate data in the dustfall management action trigger levels and describe how it will be used as a tool for determining potential causes of elevated dustfall.• Include the wind roses from onsite meteorological stations, maps showing where these potential monitoring stations are located, discussion on the rational for the site locations, and discussion on how emissions from the stockpiles would be captured by these monitoring stations.	Baffinland is committed to updating the AQNAMP in consultation with ECCC and other interested interveners and has undertaken a number of discussions in relation to this commitment. The revised AQNAMP will include the following (which is consistent with ECCC's recommendations): • Monitor PM2.5 and TSP using continuous monitors at: o The sites that already monitor NO^2 and SO^2 at both Milne Port and the Mine Site. o Seasonally at at least one new location on or close to the Project Boundary at both the Milne Port and Mine Site considering prevailing wind direction during the peak dust season and locations of sensitive receptors (camp locations). These will be seasonal as permanent power is not available near the boundaries thus the systems will run on solar power as feasible during the summer. The revised AQNAMP will also include the following recommended items: • Presentation of the predicted concentrations in the AQNAMP as a range of absolute concentrations. • Investigation of ways to mitigate the emissions from the stockpiles as warranted. • Include management actions for the stockpiles in Section 4 of the AQNAMP as well as Table 5-2, and Table 5-3. • Define the management action trigger levels for both the 24-hour and annual averaging periods for all species (Table 5-1, Table 5-2, and Table 5-3). • Define the frequency at which air quality and meteorological data is reviewed that allows for timely response for implementation of corrective actions in response to exceedances of triggers. • Include details on how the air quality data and meteorological data will be analyzed together during the investigation of exceedance of trigger levels and necessary management actions. • Confirm the trigger levels for dustfall and include corrective actions associated with collected dustfall data. • Include 24-hour and annual Total Suspended Particulate data in the dustfall management action trigger levels and describe how it will be used as a tool for determining potential causes of elevated dustfall. • Include the wind roses from onsite meteorological stations, maps showing where these potential monitoring stations are located, discussion on the rational for the site locations, and discussion on how emissions from the stockpiles would be captured by these monitoring stations. The recommendations outlined above will be captured in a management plan update register, which Baffinland will use to track changes and additions to management plans committed to during the final review of the Phase 2 Proposal. Baffinland suggests that this register, submitted to the Board on the record before the close of the Public Hearing, is a more appropriate means of ensuring the requested updates to the AQNAMP are made, that an amendment to an existing Term and Condition.	Atmospheric	Resolved	Baffinland will reflect the commitments provided in its response in the Air Quality and Noise Abatement Management Plan following the issuance of an amended Project Certifiicate. In the interim these commitments will be captured in a commitment register, to be provided to the Board during the Public Hearings. Baffinland does not object to having relevant terms and conditions modified to reflect this commitment.
ECCC-FC4	ECCC	September 2019	Given the sensitive nature of the Arctic, ECCC recommends the Proponent investigate additional mitigation measures to mitigate the black carbon associated with Project-related shipping.	The science surrounding the various sources of the black carbon emissions, especially shipping, is continually evolving. Baffinland will keep abreast of the technology changes that could reduce black carbon emissions and implement changes if and when the technology has been deemed feasible and economically achievable by the shipping contractors. The shipping contractors will follow the latest emissions limits that are published by ECCC. Notwithstanding the above, in order to manage shipping logistics, Fednav Limited (Fednav) has been partnering with Baffinland to act as their Shipping Agent. Fednav, a 75-year old company, is Canada's largest ocean-going, dry-bulk ship owning and chartering group. It is known for its "best in class" service, excelling in the safe navigation of the Canadian Arctic. Fednav has participated in every major shipping project in the Canadian Arctic since the late 1950s, and thus has demonstrated proven excellence in the delivery of innovative and effective solutions in challenging arctic regions. Fednav's mission and core values aligns with those of Baffinland, particularly with regards to their approach in achieving the highest levels of corporate social responsibility, with the aim of protecting people and the communities in which it serves. Fednav is a founding member and collaborator of Green Marine, a voluntary North American program aimed at strengthening the marine industry's environmental performance through various means, by "promoting a process of continuous improvement, building stronger relations with stakeholders, and raising awareness of the industry's activities". Their involvement with Green Marine demonstrates their leadership within the maritime shipping industry in addition to being a member of the Trident Alliance, a coalition of shipping owners and operators who share a common interest in robust enforcement of maritime Sulphur regulations. They are thus at the forefront of newly emerging regulations and of implementing best practices in advance of mainstream adoption.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Atmospheric	Resolved, contingent on ECCC receiving a preliminary feasibility study.	Baffinland commits to investigate and implement black carbon reduction measures, where feasible, and report on this in the 2020 annual air quality report (to be submitted by March 31, 2021). The investigation will consider the use of distillate fuels as a reduction measure for local black carbon emissions.

				Consistent with their commitment for reducing the environmental footprint of shipping and improving best practices, Fednav partnered with the World Wildlife Fund (WWF) on a report entitled "Benchmarking of Best Practices for Arctic Shipping" (WWF 2012). In this report, best practices for safe and sustainable arctic shipping were identified, and as part of this benchmarking, provided a number of recommendations covering a wide range of topics including, for example, vessels sailing at reduced speeds to reduce emissions. Baffinland has already committed to enforcing lower speeds (maximum of 9 knots) for its vessels sailing in the Regional Study Area, which goes beyond existing regulations. Baffinland strives to work with shipowners possessing a high quality fleet (e.g., young, modern vessel fleet), capable of safely navigating arctic waters. Transporting ore with high quality fleets plays a significant role in reducing pollutants. As part of the 2019 ore carrier vessel fleet, most ice A-class ore carrier vessels were contracted through numerous leading international dry bulk shipping companies, namely Golden Ocean Group (Golden Ocean), Nordic Bulk Carriers, and Sovcomflot, among others. Golden Ocean is a member of the Clean Shipping Alliance 2020. The CSA 2020 is composed of industry leaders committed to complying with International Marine Organization 2020 fuel requirements. Similarly, Sovcomflot has endeavored to develop a Ship Energy Efficiency Management Plan for each ship. Baffinland will continue with reputable operators and continue to comply with emissions regulations as they evolve and apply to Canadian waters.			
ECCC-FC5	ECCC	September 2019	**ECCC recommends that• The NIRB include a new Term and Condition as part of Project Certificate No. 005 that** requires the Proponent to Submit the Phase 1 WRMP for review by interested parties.• The Proponent consider the results of the Phase 1 WRMP in re-evaluating the 0.2 % Sulphur cut-off for quarries and rock cuts.	Baffinland remains committed to updating the Phase 1 Waste Rock Management Plan and evaluating the appropriateness of the 0.2% cutoff for PAG classification, irrespective of the Phase 2 approvals process. As the update to the management plan was initiated under the current Type A Water Licence 2AM-MRY1325 Amendment No. 1, and the plan is regulated under the Type A Water Licence, a Project Certificate condition is not required to ensure regulator review and approval of the updated Phase 1 Waste Rock Management Plan is achieved. Furthermore, the update to the Phase 1 Waste Rock Management Plan will be completed in December 2019, prior to any Ministerial approval of an amended Project Certificate, thereby making any associated conditions redundant.	Terrestrial	Resolved	Baffinland remains committed to updating the Phase 1 Waste Rock Management Plan and evaluating the appropriateness of the 0.2% cutoff for PAG classification, irrespective of the Phase 2 approvals process.
ECCC-FC6	ECCC	September 2019	ECCC continues to recommend that the Proponent conduct Arctic diesel fuel spill modelling for all scenarios in order to account for the differences in the fate and behaviour with IFO and adequately determine the best response strategy for Arctic Diesel.	Baffinland commits to conduct additional Arctic diesel fuel spill modelling to account for shoulder season shipping and update the SSRP as necessary (Appendix G). This will occur prior to the 2020 shipping season.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Accidents	Resolved	Baffinland commits to conduct additional Arctic diesel fuel spill modelling to account for shoulder season shipping and update the SSRP as necessary (Appendix G). This will occur prior to the 2020 shipping season.
ECCC-FC7	ECCC	September 2019	ECCC recommends that the Proponent:• Identify whether they intend to use the alternative shipping through Navy Board Inlet and/or the Northwest Passage and if so, under which circumstances.• Conduct an environmental assessment prior to using alternative shipping, including an evaluation of potential effects of shipping on migratory birds, the aquatic environment and the atmospheric environment.	Per our clarification letter provided to NIRB and MHTO on Sept. 20, 2019, Baffinland is not seeking approval from NIRB under the Phase 2 assessment to proceed with shipping via Navy Board Inlet or the NWP as part of the Phase 2 Project Proposal (Appendix N)	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Resolved	N/A
ECCC-1 NEW	ECCC	February 2020	As per Table 2 data above, and according to the proponent's estimates, at peak production (12 Mtpa from this Phase 2 Project, plus the 18 Mtpa from the previously Approved Project) the Project will contribute a high proportion of the total black carbon emissions in the Canadian Arctic. ECCC recommends that the proponent provide further description and analysis on how they came to the conclusion that the emissions of black carbon from Project-related marine vessels is not a significant impact. Given the sensitive nature of the Arctic, ECCC also recommends that the proponent consider using black carbon mitigation measures as suggested by Canada to the IMO (Lack, 2017). For example, the proponent could consider low aromatic distillate fuels, or other alternative low aromatic fuels.	Baffinland confirms the statement included on Page 17 of the Atmospheric Environment presentation was an error. Baffinland did not conduct a significance evaluation on black carbon and should not have used that terminology to reflect the conclusions from the Technical Memo – Black Carbon Emissions for the Phase 2 Project (August 22, 2019). While the project will increase black carbon emissions in the Arctic, quantitative cause-and-effect analysis of this impact would be unfeasible to carry out, and the lack of national standards or regulations specific to black carbon emissions presents a challenge for setting a quantitative significance threshold. Emissions of black carbon can travel long distances through the atmosphere, and black carbon in the Arctic is influenced by sources outside of the Arctic, and is subject to seasonal variability. Because of this, it is not possible to determine cause and effect relationships between a single project or source and potential observed changes to snow or ice. As such, while changes to snow and ice may occur as a result of black carbon, it is not possible to attribute those changes to a specific project or source. Baffinland notes that the Government of Canada has announced its support for a ban on heavy fuel oil (HFO) in Arctic waters. The Mining Association of Canada, of which Baffinland is a member, has been working with decision maker s and other stakeholders at the national and international level in relation to the HFO ban. As previously confirmed, Baffinland will comply with regulatory restrictions and limits and will continue to do so throughout the life of the Project. This is an emergent issue that is receiving the due attention of government and industry groups. As relates to the mitigation recommendations submitted to the IMO (Lack 2017), the following measures have been implemented by Baffinland and/or the vessels calling on Milne Port that reduce black carbon emissions: •Reduced speed (9 knots) requirements for project vessels in the RSA (slow steaming) •Use of shipping route evaluation criteria to design the shortest, most efficient route feasible while also considering safety and other environmental impacts (e.g. avoidance of whales/sensitive marine life). •Reduce power demand while idling by turning off equipment	Atmospheric	Deferred to NWB/ Resolved	Baffinland to provide the preliminary feasibility assessment 30 days prior to a Public Hearing, and a follow up report in the 2020 Annual Report (which wouldn't be until 2021)

				• Reduce power demand while stationary by anchoring over drifting, if it is safe to do so. • Equipment is maintained in good working order. Crews monitor and maintain equipment as part of their existing daily tasks. • Shipping contractors have the necessary training programs for their employees on optimal equipment use methods, such as proper driving/piloting techniques to reduce fuel consumption and required maintenance activities. • Compliance with the International Marine Organization's 2011 Guidelines for the Control and Management of Ships' Biofouling, reducing potential drag on a vessel while in transit Lastly, Baffinland reaffirms its commitment to ECCC on the subject of black carbon, however, suggests a modification to the timeframe on implementation and reporting due to the delay in the Phase 2 review process: Baffinland commits to investigate and implement black carbon reduction measures, where feasible, and report on this in the 2021 annual air quality report (to be submitted by March 31, 2022). The investigation will consider the use of distillate fuels as a reduction measure for local black carbon emissions.			
ECCC-2 NEW	ECCC	February 2020	ECCC recommends that the proponent revise the definition of PAG rock.	Baffinland will provide all responses related to waste rock and/or ARD/ML to the Nunavut Water Board with copy to the Nunavut Impact Review Board on, or before, March 13, 2020.	Freshwater	Outstanding	N/A
ECCC-3 NEW	ECCC	February 2020	ECCC recommends that: •the proponent assess all samples with Acid Base Accounting (ABA) and Shake Flask Extraction (SFE); •the proponent assess a wide range of samples without relying on the 0.2 wt. % S cut off, in order to ensure that no PAG rock is misclassified as non-AG rock and •the Proponent adopt Golder's recommendation that all samples be submitted for ABA and SFE testing on an ongoing basis.	Baffinland will provide all responses related to waste rock and/or ARD/ML to the Nunavut Water Board with copy to the Nunavut Impact Review Board on, or before, March 13, 2020.	Freshwater	Outstanding	N/A
ECCC-4 NEW	ECCC	February 2020	ECCC recommends that the proponent: •not use sulphide content only to classify Potentially Acid Generation and non-Acid Generating rock; •verify whether there are layers of the lifts that are not frozen within the Waste Rock Facility.	Baffinland will provide all responses related to waste rock and/or ARD/ML to the Nunavut Water Board with copy to the Nunavut Impact Review Board on, or before, March 13, 2020.	Freshwater	Outstanding	N/A
ECCC-5 NEW	ECCC	February 2020	ECCC recommends that the proponent provide clarification on the thickness of the cover proposed in the waste rock facility closure.	Baffinland will provide all responses related to waste rock and/or ARD/ML to the Nunavut Water Board with copy to the Nunavut Impact Review Board on, or before, March 13, 2020.	Freshwater	Outstanding	N/A
ECCC-6 NEW	ECCC	February 2020	ECCC recommends that the proponent provide clarification on potential treatment or mitigation measures for high sulphate, given the high levels of sulphate measured in the Waste Rock Facility in 2019 and given the use of ferric sulphate in the currently used treatment process.	Baffinland will provide all responses related to waste rock and/or ARD/ML to the Nunavut Water Board with copy to the Nunavut Impact Review Board on, or before, March 13, 2020.	Freshwater	Outstanding	N/A
HC-FC-01	HC	September 2019	HC recommends the NIRB consider the following terms and conditions:1) That the Proponent investigate further measures to reduce and mitigate NO2, PM2.5, and other common air pollutants to protect human health. Measures may include:a. implementation of Tier 4 engines for all mine site vehicles;b. investigate additional measures to reduce emissions from highest emitters of NO2;c. additional measures to mitigate the air pollutant emissions associated with project-related shipping	These items are addressed by Baffinland in the Air Quality and Noise Abatement Management Plan (AQNAMP) and through the climate change strategy. The climate change strategy has identified several fuel consumption reduction measures which would also lead to reductions in air pollutants. The various mitigation measures and commitments to reduce air emissions are discussed in Section 4 of the revised AQNAMP. Mitigation measures are discussed for the various components of operations such as Mine Site air quality, Northern Transportation Corridor, Milne Port, aircraft operation and ship operation.	Atmospheric	Resolved	See commitment to ECCC-FC2
HC-FC-02	HC	September 2019	HC recommends the NIRB consider the following modification to existing monitoring and reporting requirements and terms and conditions:1) The Proponent continue to undertake continuous monitoring of NO2 and other air quality contaminants identified in the air quality and noise abatement management plan (August 23 2019), and implement additional monitors at sites relevant to human health.2) The Proponent incorporate all air quality monitoring data into the annual monitoring reports, to allow for comparison to the CAAQS and the Nunavut ambient air guideline.3) If the monitored levels of any non-threshold pullutant exceed model predictions at sites relevant to human health, then a revised risk assessment should be presented. If warranted, appropriate adaptive management plans, targeted mitigation measures, and implementation strategies should be developed.	The responses to these queries are provided in the response to ECCC-FC1 and ECCC-FC3. These concerns will be addressed in the revised AQNAMP.	Atmospheric	Resolved	Baffinland will update the Air Quality and Noise Abatement Management Plan with the following text: "Use the existing continuous air quality monitors on site to validate the predictions of NO2 and other air quality contaminants in the EIS moving forward. Share results through reporting mechanisms, such as the annual report. Should exceedances occur beyond the EIS predictions, include an updated human health risk assessment in the annual report."

HC-FC-03	HC	September 2019	HC recommeneds the NIRB consider the following terms and conditions:The Proponent continue monitoring COPCs reported in the risk assessment, and that monitoring is done in all environmental media, for each project phase. If concentrations of any COPS increase in any environmental media during project activities, HC recommends that the Proponent update the human health risk assessment model with new environmental monitoring data, and extend the monitoring program to include relevant country foods as indicated by the risk assessment.	Baffinland will continue with monitoring of COPCs reported in the country foods risk assessment. If increases in a specific COPC are confirmed to be occurring outside of the Potential Development Area (PDA) and if country foods could be influenced by those changes, Baffinland will update the human health risk assessment model with the new data. Decisions related to extending the monitoring program to any relevant country foods would be made based on consideration of risk assessment outcomes. Updated modelling would be triggered by changes from monitoring stations that are outside the PDA where harvesting could occur. Changes to COPCs at stations inside the PDA would not trigger a need for re-modelling because changes in COPCs are expected within the active footprint of industrial activities. As part of existing terrestrial monitoring for metals in soil and vegetation, sampling is conducted within a distance gradient approach from the edge of PDA: Near (0–100 m); Far (101 –1,000 m); and Control (>1,000 m). The study was designed to detect changes in environmental media (soil and vegetation) at Near sites relative to baseline conditions and in comparison to sites further from the PDA. That objective requires collections being made within 0–100 m of the PDA. Any remodelling effort should also consider changes (or lack thereof) in more ecologically relevant distant stations (i.e., those stations located between 100 m and 1,000 m from the PDA boundary). Consideration of change at near sites (0 – 100m) and far sites (100 – 1,000 m), relative to baseline data, and environmental quality guidelines, in conjunction with statistical analyses, would be used to identify the need for supplementary risk assessment modelling. Baffinland will add this text to the Air Quality and Noise Abatement Management Plan. Specific wording can be agreed upon with Health Canada.	Atmospheric	Resolved	Baffinland will continue with monitoring of COPCs reported in the country foods risk assessment during all phases (including closure). If increases in a specific COPC are confirmed to be occurring outside or inside (in the closure phase) of the Potential Development Area (PDA) and if country foods could be influenced by those changes, Baffinland will update the human health risk assessment model with the new data. Decisions related to extending the monitoring program to any relevant country foods would be made based on consideration of risk assessment outcomes. Updated modelling would be triggered by changes from any of the monitoring stations where harvesting could occur. Any remodelling effort should also consider changes (or lack thereof) using a distance gradient approach from the edge of PDA: Near (0–100 m); Far (101 –1,000 m); and Control (>1,000 m) and more ecologically relevant distant stations (i.e., those stations located between 100 m and 1,000 m from the PDA boundary). Consideration of change at PDA (closure phase), near sites (0 – 100m) and far sites (100 – 1,000 m), relative to baseline data, and environmental quality guidelines, in conjunction with statistical analyses, would be used to identify the need for supplementary risk assessment modelling.
NRCan-01	NRCan	September 2019	NRCan recommends that the Proponent follow through on the plans outlined in their response to NRCan to support detailed design and environmental monitoring and management programs. Specifically NRCan recommends the Proponent:Conduct the summer 2019 mapping program in areas where the railway corridor deviates from the road.Conduct the winter 2019/20 drilling program, described in their response, to obtain additional subsurface data to support design.Conduct the pre-drilling program, described in their response, to improve delineation of ice-rich areas to support implementation of appropriate measures to deal with permafrost conditions prior to cuts or embankment construction.Install thermistors during the 2019/20 and pre-drilling programs to establish baseline conditions along the corridor prior to construction.	Baffinland has committed to carrying out the plans as outlined in NRCAN's final written submission comment	Physical/ Terrestrial	Resolved	Baffinland commits to: • Conducting the summer 2019 mapping program in areas where the railway corridor deviates from the Tote Road, including along the Route 1 deviation alignment. This summer mapping program was completed in summer 2019. • Conducting the winter 2019/2020 drilling program along the deviation route, following the proposed Route 3 deviation alignment, and near the port terminus to obtain additional information on subsurface conditions to inform the final design. • Conducting a pre-drilling program, to be completed by the railway contractor and supervised by BIM's Engineer during the construction period. Boreholes will be advanced into permafrost along the rail alignment prior to the railway earthworks. Boreholes will be used to delineate zones of ice-rich and ice-pore permafrost and to determine the required permafrost treatment prior to making cuts and placing fill for the embankments. • Installing thermistors and other monitoring instruments along the rail alignment including along the Route 3 deviation during the pre-drilling programs to establish baseline conditions prior and during rail construction.
NRCan-02	NRCan	September 2019	NRCan recommends that the Proponent implement the recommendations provide by Hatch in the design memo and the plans for further analysis and instrumentation as outlined in their response to NRCan to support detailed design and environmental monitoring and management programs. Specifically NRCan recommends the Proponent:Implement the recommendations made by Hatch to accommodate the 30 year design life including those related to pile length embedment and number of piles required for foundations.Continue to refine the thermal, stability and creep analysis incorporating new data collected during geotechnical investigations and from instrumentation along the railway corridor to support final design of embankments and bridges.Consider local factors (such as snow accumulation and presence of water bodies) in the 2D thermal modelling to support final design of embankments, cuts and bridges.Establish instrumentation as outlined in their response, prior to and during construction to improve characterization of baseline ground conditions, support final design, evaluate impacts due to construction and railway performance, and to inform the implementation ofmitigation/maintenance measures when triggers are reached.	Baffinland has committed to implementing recommendations outlined by Hatch in their design memo and plans for further analysis and instrumentation. Pile designs have been revised per recommendations to accommodate the 30-year design life.	Terrestrial	Resolved	Baffinland commits to: • Implementing the recommendations to accommodate the 30 year design life provided in the project memorandum 'Analysis of Proposed Rail Line Cut Sections and Port Area Structures Considering a Mine Life of 30 Years' (Hatch, 2019) including those related to pile length embedment and number of piles required for foundations. • Continue to refine the thermal, stability and creep analysis incorporating new data collected during geotechnical investigations and from instrumentation along the railway corridor, along the Route 3 deviation alignment as well the rail alignments outside the rail deviation, to support final design of embankments and bridges. • Consider local factors (such as snow accumulation and presence of water bodies) in the 2D thermal modelling to support final design of embankments, cuts and bridges. • Establish instrumentation along the rail alignment, including along the Route 3 deviation alignment, prior to and during construction to improve characterization of baseline ground conditions, support final design, evaluate impacts due to construction and railway performance, and to inform the implementation of mitigation /maintenance measures when triggers are reached.

PCA-01	PCA	September 2019	Parks Canada recommends that:The Proponent identify whether they intend to ship through Navy Board Inlet and/or the Northwest Passage and if so, under what circumstances.Should the intention of the Proponent be to use this route, the project assessment should be informed by a review of potential impacts including: - Consultation with affected communities, - description of circumstances under which the route will be used, - identification of potential effects, mitigations, and significance of residual impacts, - gathering and incorporation of Inuit Qaujimanituqangit relevant to use of the route, and - identification of cumulative effects.	Per our clarification letter provided to NIRB and MHTO on Sept. 20, 2019, Baffinland is not seeking approval from NIRB under the Phase 2 assessment to proceed with shipping via Navy Board Inlet or the NWP as part of the Phase 2 Project Proposal (Appendix N)	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Resolved	
PCA-02	PCA	September 2019	Parks Canada recommends that:DFO Science review and provide expert advice regarding marine (and freshwater) monitoring plans from the Proponent, independent of the MEWG (as per DFO Science Review of Additional Documents submitted May 13–June 17, 2019 for the Second Technical Review of the Final Environmental Impact Statement Addendum for the Baffinland Mary River Project Phase 2", p. 51) in preparation for the submission of these plans to the MEWG, and the updated Terms of Reference for the MEWG be finalized and approved by all members, including the NIRB.	Baffinland notes that in recent in person Terrestrial and Marine Working Group meetings (June 20 and 21, 2019, Iqaluit) the functionality of the Working Groups and updates to the Terms of References were discussed. It was noted by some members during these meetings that they had observed improved changes to the functioning of the Working Groups. Notwithstanding, proposed changes to the ToR's have been ongoing throughout the summer 2019, with drafts available to the NIRB for review. In response to recommendations made by several Working Group members to date, Baffinland has submitted proposed revisions to the ToRs in Appendix O of this submission that reflect a more consensus-based approach to decision making that more clearly identifies how recommendations are identified, supported, communicated, and tracked. Baffinland believes the updated draft Terms of Reference provide the mechanism and accountability for the implementation of recommendations made by both the MEWG and DFO. Provision of draft monitoring programs to DFO Science before other MEWG members, aside from being impractical from a planning cycle perspective, is not consistent with the spirit of the working groups, which is to solicit advice from a range of scientific experts and knowledge holders in a collaborative environment. The prioritization of DFO Science participation in monitoring planning would also contradict Baffinlands commitment to weigh science and Inuit Qaujimanituqangit equally, and that of DFO as outlined in the PC-04a recommendation. Baffinland notes that this recommendation, although proposed in a DFO Science Review Report, was not carried forward by DFO in their final written submission.	Marine Wildlife and Icebreaking/ Marine	Outstanding - In progress	In progress: TOR still being revised; final version must be agreed upon by all MEWG members
PCA-03	PCA	September 2019	Parks Canada recommends that:Recommendations presented by DFO in the "Science Review of Additional Documents submitted May 13–June 17, 2019 for the Second Technical Review of the Final Environmental Impact Statement Addendum for the Baffinland Mary River Project Phase 2" regarding AIS (pp 31-48) be implemented, for example:• All project vessels use a treatment plus exchange strategy, and the Proponent be required to develop a coordinated early detection and rapid response plan for invasive species in Milne Inlet/Eclipse Sound with applicable regulators, communities, and other potential partners.• The ballast water dispersion model and analyses be completed prior to issuance of the project certificate and issuance of authorizations.	Please refer to responses to DFO 3.10.1-3.10.6.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Outstanding - In progress	In progress pending resolution of DFO 3.6.6 NEW (outstanding-in progress) and TC-02 (resolved)
PCA-04a	PCA	September 2019	Parks Canada believes there are significant gaps in information and as a result, uncertainty in conclusions, related to the impacts of shipping on the marine environment. The Government of Canada supports the establishment of Tallurutiup Imanga NMCA and as a result, Parks Canada recommends that the precautionary principle, as described by section 9(3) of the CNMCAA and the Tallurutiup Imanga IIBA, be followed when considering any decisions and recommendations regarding shipping.Parks Canada recommends that:If the project were to proceed, the Proponent work with DFO and incorporate Inuit Qaujimanituqangit, to address uncertainties and gaps in the Proponent's information andconclusions as described by the existing and pending DFO Science Canadian Science Advisory Secretariat Science Responses and that this occur prior to any increase in levels of shipping (for the total number of proposed project vessels: ore carriers, resupply vessels, tugs, and icebreakers).	Baffinland notes that Parks Canada has not provided any independent analysis to support their recommendations other than that sourced from the 'Review of Additional Documents submitted May 13–June 17, 2019 for the Second Technical Review of the Final Environmental Impact Statement Addendum for the Baffinland Mary River Project Phase 2'. This Review Report was conducted at the request of DFO's Fish and Fish Habitat Protection Program and is adequately reflected in DFO's final written submissions. Respectfully, while Parks Canada does have a mandate to protect areas in the RSA, they rely on the expertise of the other federal Intervenors for much of their submission, and do not maintain their own technical expertise to support their recommendations on these matters. Baffinland believes it is reasonable to request that the Board view the Parks Canada's submission as a reiteration of the DFO submission, and not a separate and distinct set of recommendations. Baffinland has also identified that neither the references or detailed review sections of Parks Canada's comment include any documentation submitted past June 17, 2019, consistent with what was considered in DFO's 'Review of Additional Documents submitted May 13–June 17, 2019 for the Second Technical Review of the Final Environmental Impact Statement Addendum for the Baffinland Mary River Project Phase 2'. This has made it challenging for Baffinland to identify and respond to potential outstanding issues, as it appears that the great majority of issues raised were answered by Baffinland's filings with NIRB post June 17, 2019. Baffinland also notes that given that the available information provided by Baffinland appears to have not yet been considered, the mitigation measures currently recommended by DFO and Parks Canada are premature – this approach would not be consistent with the precautionary principle, which requires the consideration of available relevant information in making recommendations. Between June 17 and August 23rd Baffinland provided the following documents related to the marine environment to NIRB, which Baffinland strongly encourages DFO (and Parks Canada) to take into full consideration prior to preparing their presentations for the NIRB public hearings (noting these materials should have been considered prior to the preparation of DFO and Parks Canada's final written submissions):	Marine Wildlife and Icebreaking/ Marine	Outstanding - In progress	In progress pending resolution of DFO issues 3.4 series (NEW) - under review, 3.5 (NEW) - under review, 3.7 (NEW) - under review and ECCC FC-1 (resolved)/1NEW (deferred to NWB/resolved)

				• Responses to Request for North Water Polynya Mapping – Additional Assessment Information (June 28, 2018) • Impact of icebreaking activities within the approaches to the Milne Inlet Port Site (Northern Shipping Route to Milne Port) – Additional Assessment Information (June 28, 2018) • Transport Canada Comments/Requests to Proponent – June 2019 – Additional Assessment Information (June 28, 2018) • Responses to WWF Questions Regarding Shipbuilding – Additional Assessment Information (June 28, 2018) • Responses to WWF Questions Regarding Black Carbon Emissions for the Phase 2 Project – Additional Assessment Information (June 28, 2018) • Draft Shipping and Marine Wildlife Management Plan – Additional Assessment Information (June 28, 2018) • Response to the questions submitted via email by WWF on the topic of the Ice Breaking (Email dated June 12 from Andrew Dumbrille to Lou Kamermans) – Additional Assessment Information (June 28, 2018) • Responses to WWF Questions Regarding Fuel Spill – Additional Assessment Information (June 28, 2018) • Revised Memo -Follow-up Information to ECCC Comment 3.08, 3.09 – Shipping CACs Errata, Follow-up Information to ECCC Comment 3.08, 3.09 - Black Carbon Emitted from Ore Carriers, Sealift Vessels and Tankers, CACs from Shipping – Additional Assessment Information (June 28, 2018) • RSA Sea-ice for Polar Bears – Additional Assessment Information (July 12, 2019) • TM2- DFO: Rationale for identifying "Icebreaking effect on sea ice habitat for arctic cod species" as a level 1 interaction in the icebreaker effects assessment – Additional Assessment Information (July 12, 2019) • Spill at Sea Response Plan (SSRP) – Additional Assessment Information (July 12, 2019) • Environmental Review of Shipping through the Northwest Passage – Additional Assessment Information (July 12, 2019) • Clarification – Open Water Period as Related to Polar Bear – Additional Assessment Information (July 12, 2019) • Daily Ship Exposure Periods for Narwhal During Shoulder and Open Water Season Relevant to the 135, 120 and 110 Decibel Noise Fields – Additional Assessment Information (July 15, 2019) • Draft Communication Protocol for Shipping Activities – Additional Assessment Information (August 23, 2019) • Draft Baffinland Early Shipping Season – Additional Assessment Information (August 23, 2019) • Operational Guide – Additional Assessment Information (August 23, 2019) • Draft Spill at Sea Response Plan – Additional Assessment Information (August 23, 2019) • Black Carbon Emissions for the Phase 2 Project – Additional Assessment Information (August 23, 2019) Baffinland disagrees with DFO's assessment that there remain significant gaps in information and uncertainty in the conclusions of the Phase 2 impact assessment. This is further supported by the results of the peer review of Baffinland's Mary River Phase 2 Assessment Conclusions conducted by Hemerra, which states the following: Using a multiple lines of evidence approach, information was extracted from six categories of evidence: (1) Inuit Quajimajatuqangit (2) empirical evidence (site-specific, quantitative data collected during aerial surveys, etc.), (3) model evidence (acoustic modelling), (4) literature (i.e., peer reviewed journal articles as well as grey literature published by government or industry), (5) evidence from other environmental assessments (such as for past developments in Canada), and (6) expert opinion (knowledge and experience that trained professionals have accumulated over time in a specific technical discipline). Expert opinion was also used to synthesize information and evaluate the merit of each line of evidence as they pertain to conclusions of the Review regarding potential effects on narwhal. Results of this Review indicate that: • A substantial body of information was collected and used by Baffinland to base its assessment (e.g., Baffinland has periodically been conducting narwhal studies since 2007; since 2016, Golder has undertaken six marine mammal study/monitoring programs with multiple surveys conducted per program); • Data are generally of high technical quality and appropriate within the context of impact assessment as a planning tool (e.g., studies conducted across multiple seasons and years, using a variety of survey methods, with good spatial coverage across the RSA); • Assessment information comes from multiple sources (including IQ, literature, modelling, field work/empirical studies); • Standard assessment methodology was applied and the assessment appropriately focused on the key Project issue to narwhals (i.e., impacts of Project-related underwater noise); • Progressive and known effective mitigation measures during icebreaking have been applied (e.g., Baffinland's commitment to a 9 knot speed restriction in the RSA is notable in that such voluntary speed restrictions in Canada are uncommon) • Mitigation proposed for narwhal will also be beneficial and effective for other marine mammal species, which are less likely to interact with the Project. Follow-up monitoring commitments are appropriate and tailored to managing the uncertainties Should Phase 2 be approved Baffinland will continue to engage DFO through the MEWG for the purposes of ensuring our proposed mitigation and monitoring programs are robust, effective, and responsive.		

				Inuit Qaujimanituqangit For a better understanding of how Baffinland views and plans to integrate IQ and Inuit perspectives into its environmental management and decision making processes for Phase 2, please refer to the IQ Management Framework, submitted to the NIRB on September 19, 2019. This document outlines our commitments to an Inuit Advisory Panel and a Culture, Resource, and Land Use Monitoring Program. Both of these elements has strong ties to Baffinlands adaptive management process, which is further outlined the draft Adaptive Management Plan, submitted August 23, 2019.			
PCA-04b	PCA	September 2019	Parks Canada recommends that:Shipping only occur during a clearly defined open water season. As described byTransport Canada, the Proponent could consider the definition of 'open water' asfound in the Polar Code: "Open water means a large area of freely navigable waterin which sea ice is present in concentrations less than 1/10. No ice of land originis present."	Baffinland would like to be clear that Transport Canada has NOT recommended that shipping only occur during a clearly defined open water season, as could be insinuated from this recommendation. Transport Canada (TC-04) did recommend that Baffinland provide a consistent definition of open water (which Baffinland has agreed), but it was in the context of understanding Baffinlands intentions to transfer fuel during the shoulder season. Baffinland also notes that this recommendation did not consider Baffinlands Draft Early Shipping Season – Operational Guide, submitted August 23, 2019, which outlines the conditions under which Baffinland would commence and manage shoulder season shipping. This is an important mitigation and could have been reviewed in light of the recommendation that has been made. Key details of the draft Early Shipping Season – Operational Guide are described here in for the benefit of Parks Canada. The criteria for initiating shoulder season shipping include environmental, ecological and community determinants as follows: • Before commencing shipping operations, Baffinland must receive written confirmation from the MHTO that the floe edge is no longer being used by community members. No transits to Milne Port will be permitted until confirmation is received. • Baffinland will not break landfast ice. • Baffinland will not break ice during ringed seal parturition, pupping and nursing periods and will manage its vessel traffic during the Eclipse Sound narwhal summer stock spring migratory period. Once the shipping season commences, Baffinland has established several precedent-setting mitigations to minimize potential effects identified by Baffinland, DFO and the MHTO as a result of ice breaking activities during the shoulder season, including: • Restricting the number of transits where ice concentrations above 3/10 cannot be avoided. • Implementation of speed restrictions (9 knots) that are more conservative than Government of Canada guidelines for speed reduction to 10 knots. • Avoidance of walrus or polar bear observed on sea ice by 300m. • Placing local Inuit Marine Wildlife Observers on ice breakers. For the purposes of shoulder season vessel traffic management, Baffinland considers uninterrupted transits through ice concentrations of 3/10 or less as the open water shipping season. This is appropriate given that in ice concentrations of 3/10 or less, noise generated from ice breaking activities would appreciably reduce and the level of decay in the ice would inevitably mean that marine mammals would no longer be able to use sea ice as habitat and hunters would no longer be using the ice for travelling or hunting purposes. Based on the above, Baffinland disagrees with Parks Canada's recommendation to avoid shipping during the shoulder seasons and to only ship during an open water season defined by ice concentration of 1/10 or less. The conclusions in Baffinlands Phase 2 assessment that shipping activities proposed in both the shoulder and open water season are non-significant were also independently supported by the results of a peer review of Baffinland's Mary River Phase 2 Assessment Conclusions conducted by Hemerra, which are described in response to PC-04a.	Marine Wildlife and Icebreaking/ Marine	Outstanding - In progress	In progress pending resolution of DFO issue: 3.4 series (NEW) - under review, 3.5 (NEW) - under review, 3.7 series (NEW) - under review
PCA-04c	PCA	September 2019	Parks Canada recommends that:If shipping, and associated icebreaking activities/ice management activities (asdefined by the Proponent in Appendix 12, Information Responses, March 2018),were to occur outside of a clearly defined open water season (not includingwinter), work with DFO and incorporate Inuit Qaujimanituqangit, to identifyconditions under which these activities could occur.	Baffinland submitted a draft Early Shipping Season – Operational Guide for review on August 23rd, 2019 with the intent to solicit input from Interveners. For a more detailed description of this Guide, please see Baffinlands response to PC-04b. Baffinland remains open to comments on the Guide and will commit to modifications through a post-EA process. For more details regarding Baffinlands intentions to work with DFO and Inuit in relation to the implementation of proposals and commitments, and the effectiveness of proposed mitigation measures, please see Baffinlands response to PC-04a. Should Phase 2 be approved, Baffinland will continue to engage DFO and Parks Canada through the MEWG for the purposes of ensuring our proposed mitigation and monitoring programs are robust, effective, and responsive.	Marine Wildlife and Icebreaking/ Marine	Outstanding - In progress	In progress pending resolution of DFO issues: 3.4 series (NEW) - under review, 3.5 (NEW) - under review, 3.7 series (NEW) - under review

PCA-04d	PCA	September 2019	Parks Canada recommends that: The Proponent consider additional options regarding the feasibility of shippingthrough Steensby Port.	Baffinland intends to use necessary capital generated by the Phase 2 expansion to support the eventual construction and operation of the southern portion of the Project. The Phase 2 proposal is a desirable and economically feasible option to capital generation for Steensby because it allows for the utilization of several existing infrastructures, notably a fully constructed Port at Milne Inlet and an established transportation corridor to support construction and maintenance of a railway. Baffinland has not assessed for winter shipping as part of the Phase 2 Proposal, as this was previously identified as unfavorable to the community of Pond Inlet. If Baffinland were to consider any future expansions of the Project through the Northern route, required regulatory processes would be followed. It is also noted that this is not being contemplated by Baffinland at this time.	Marine Wildlife and Icebreaking/ Marine	Resolved	
TC-01	TC	September 2019	TC recommends, should the project be approved to proceed, that the Proponent contact TC's NPP Office prior to the submittal of any information to confirm regulatory requirements under the CNWA.	Noted. Baffinland will contact Transport Canada's NPP Office prior to the submittal of any information to confirm regulatory requirements under the CNWA, should the project be approved to proceed.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Resolved	Baffinland will contact Transport Canada's NPP Office prior to the submittal of any information to confirm regulatory requirements under the CNWA, should the project be approved to proceed.
TC-02	TC	September 2019	Transport Canada is of the opinion that one random sample of the tanks is sufficient to verify compliance in only one circumstance; if the vessel takes on ballast water in one location and also carries out the exchange in similar waters on the open ocean. This usually means that one tank is exchanged after another until all exchanges are completed in the shortest possible distance from each other. However, if a vessel takes on ballast water from more than one location, and either treats it using a system or carries out exchange using a long exchange zone, Transport Canada recommends at least four tanks be sampled. Additionally, if ballast water is taken up in two different locations, Transport Canada again recommends that four tanks be sampled at each location, for a total of eight samples.	Baffinland wishes to once again emphasize that current ballast water sampling by Baffinland remains a voluntary measure that exceeds federal and international guidelines for ballast water management, including those mandated by Transport Canada. Baffinland has developed a comprehensive, stand-alone Ballast Water Management Plan for the Project. The BWMP includes a Standard Operating Procedure that 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. Salinity and temperature testing is conducted on all vessels prior to being authorized by the port captain to discharge in Milne Port. It is also noted that all vessels calling to Milne Port are required to operate in accordance with Transport Canada's Ballast Water Control and Management Regulations (Regulations; SOR/2011-237) pursuant to the Canada Shipping Act, 2001 (S.C. 2001, c. 26) and the International Maritime Organization's International Convention for the Control and Management of Ship's Ballast Water and Sediment (IMO 2017). Additional measures that Baffinland has put into place that exceed regulatory and industry standards include • The requirement for all vessels calling on Milne Port that treat their ballast under the D-2 Standard to also perform a ballast water exchange prior to treatment. This practice will continue until Baffinland provides updated ballast water dispersion modelling that more accurately reflects the spectrum of salinity and temperature that can be expected to be discharged at Milne Port. • Implementing • a pilot ballast water biological monitoring program for ships currently only subject to the D1 standard (open water exchange). This program has been designed to reflect a more appropriately scoped form of a ballast water sampling protocol provided by DFO to Baffinland in 2017 and will include sampling from one ballast tank on a total of five vessels per shipping season. • Continuation of conducting temperature and salinity test sampling of one randomly selected ballast water tank for all vessels calling to Milne Port, and biological sampling in the marine receiving environment to monitor for non-native species in Milne Port and at Ragged Island. The Ballast Water Management Plan will be updated to reflect the commitments described post EA.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Resolved	Transport Canada appreciates the efforts by BIM to ensure current regulations are followed with respect to their plans for ballast water management. Given the learning curve associated with use of ballast water treatment systems, for Phase 2, Transport Canada (TC) in consultation with Fisheries and Oceans Canada (DFO), recommends, in conjunction with present sampling and testing protocols being proposed/adopted [NTD - will be summarized in complete package] by BIM, that BIM implement a ballast water compliance sampling plan based on a risk-based targeting methodology to be developed in consultation with DFO and TC. Such a risk-based methodology should be applied to evaluate the risk of all vessel ballast water management (D1, D2) with subsequent salinity and D-2 biological compliance sampling conducted on vessels identified as high or very high risk. The respective risk-based methodology and associated ballast water compliance sampling plan will be developed in consultation with DFO and TC following completion of DFO's Project-specific sampling conducted on a subset of vessels calling to Milne Port. The risk-based methodology and associated ballast water compliance sampling plan should include a consideration of other compliance initiatives or research being undertaken elsewhere by TC relative to implementation of the D-2 standard. Sampling conducted that supports building a body of knowledge for D-2 treatment systems, beyond biological compliance sampling conducted on high risk and very high risk tanks, should not compromise Baffinland's ability to transport annual ore quantities as approved under a modified Project Certificate No 005. Understanding that the rationale for this program is tied to a learning curve associated with the use of ballast water treatment systems, the compliance sampling program and risk based methodology will be adapted as deemed necessary based on the results of the program
TC-03	TC	September 2019	Considering the deep drafts of a vessel, prevailing ice conditions, and limited hydrography and surveying of the NWP, combined with the availability of ice breakers, search and rescue and environmental response challenges, TC recommends a more detailed effects assessment be undertaken, including an assessment of the likelihood of a spill to occur and the ability to respond to a spill should an accident occur.	Per our clarification letter provided Sept. 20, 2019, Baffinland is not seeking approval from NIRB under the Phase 2 assessment to proceed with shipping via Navy Board Inlet or the NWP as part of the Phase 2 Project Proposal (Appendix N)	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Accidents	Resolved	n/a
TC-04	TC	September 2019	TC recommends that the Proponent provide a consistent definition of "open water season" throughout all of its documentation and that the Proponent clarify whether the supply and transfer of fuel is also being considered for the amended shipping season of July 1st to November 15th or whether it will remain limited to mid-July to mid-October.	For the purposes of shoulder season vessel traffic management, Baffinland considers uninterrupted transits through ice concentrations of 3/10 or less as the open water shipping season. This will be considered in any relevant management plans or operating procedures. The supply and transfer of fuel is being considered for the amended shipping season, July 1 to November 15.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Resolved	For the purposes of shoulder season vessel traffic management, Baffinland considers uninterrupted transits through ice concentrations of 3/10 or less as the open water shipping season. This will be considered in any relevant management plans or operating procedures.

TC-05	TC	September 2019	TC recommends that the SSRP, Page 30 and 31, Alert Procedures/Notification Table and Page 71 of Appendix 1 - Contacts Directory be updated to include the following and remove any reference to particular TC contact information:• The master of a vessel in waters under Canadian jurisdiction must report any discharge or anticipated discharge from the vessel to a marine safety inspector or a marine communications and traffic services officer (NORDREG in case of the Arctic). Reporting procedures should adhere to part 3 of Vessel Pollution and Dangerous Chemicals Regulations https://laws-lois.justice.gc.ca/PDF/SOR-2012-69.pdf.	Baffinland will make the recommended change to the SSRP.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Marine	Resolved	Baffinland will make the recommended change from TC-05 to the SSRP.
TC-06	TC	September 2019	TC recommends that the Proponent demonstrate its ability to maintain its preparedness and have the capacity to respond to a spill during fuel transfer at the oil handling facility in the event that there is also a spill from a transiting vessel along the shipping route at the same time.	Baffinland will update the SSRP to designate additional Tier 2 response equipment at Milne Port to enable a dual response as proposed by Transport Canada.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Accidents	Resolved	Baffinland will update the SSRP to designate additional Tier 2 response equipment at Milne Port to enable a dual response as proposed by Transport Canada.
TC-07	TC	September 2019	TC recommends that the use of lifeboats should be avoided and not included as part of the spill response equipment.	Baffinland agrees that the use of lifeboats should be avoided and will be removed as part of the spill response equipment on pages 88 and 103 of the SSRP.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Accidents	Resolved	Baffinland agrees that the use of lifeboats should be avoided and will be removed as part of the spill response equipment on pages 88 and 103 of the SSRP.
TC-08	TC	September 2019	TC recommends that the SSRP be updated to remove reference to the use of oil-water separation.	Baffinland will update the SSRP to make it clear no oil discharge is permitted in Arctic waters per the ASSPPR.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Accidents	Resolved	Baffinland will update the SSRP to make it clear no oil discharge is permitted in Arctic waters per the ASSPPR.
TC-09	TC	September 2019	TC recommends that the SSRP fully account for all potential locations of spills in its response planning, including the alternative route that has been proposed by the Proponent via Navy Board Inlet and the North West Passage.	Per our clarification letter provided Sept. 20, 2019, Baffinland is not seeking approval from NIRB under the Phase 2 assessment to proceed with shipping via Navy Board Inlet or the NWP as part of the Phase 2 Project Proposal	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Accidents	Resolved	n/a
TC-10	TC	September 2019	TC recommends that the potential conflicts between trains and caribou be considered in the execution of safe railway operations. Similarly, the NIRB might want to consider the effect of train whistling, and the location and design of wildlife crossings as part of the review process, and when formulating terms and conditions to mitigate these effects, as established between the Proponent and any affected groups.	Potential conflicts between trains and caribou have already been considered in the execution of safe railway operations. A response regarding train whistling has already been provided in the January 2019 Advance Technical Comment Responses to Transport Canada's technical comment #10, as follows: "Unnecessary use of the whistle is prohibited as per Rule 14 of Canadian Rail Operating Rules (CROR) which reduces the potential impact of train whistling on wildlife. Train whistles are expected to be infrequent and short in duration and are not expected to contribute substantially to noise related effects." (Baffinland Iron Mines Corporation 2019a) A complete list of caribou protection measures related to the railway are provided in Section 3.3.2 of the revised TEMMP (Baffinland Iron Mines Corporation 2019b). References Baffinland Iron Mines Corporation. 2019a. Advance Technical Comment Responses Phase 2 Proposal - Mary River Project. Baffinland Iron Mines Corporation. 2019b. Terrestrial environment mitigation and monitoring plan BAF-PH1-830-P16-0027, rev 4.1. 154 pp.	Marine Shipping, Ballast Water and Fuel Spill Modelling, Marine Environment/ Terrestrial	Resolved	n/a

Legend

Resolved

Consolidated with NEW

Unresolved Concern

*** References throughout the submission to Tables and Annexes maybe found in Baffinland's earlier submissions on the NIRB registry**