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Technical Comments

Baffinland Iron Mines Corporation's request for further modifications of condition 179(a) and 179(b) of Mary River Project Certificate 005

Submitted to: **Nunavut Impact Review Board**

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Executive Summary

Mary River Mine (The Project) is an iron ore mine owned by Baffinland Iron Mine Corporation (Baffinland or the Proponent) within the Qikiqtani region in Nunavut. The Project is currently in operation and involved construction of the Milne Inlet Tote Road and the Milne Inlet Ore Dock to facilitate transportation of ore from the Mary River mine site. The Project is also undergoing a concurrent NIRB reconsideration process for their Phase 2 Development Proposal, which focuses on an increase in production to 12 Mpta (million Tonnes per annum), the transportation of ore to Milne Port via the construction of a new railway running largely parallel to the existing Tote Road, and the construction and operation of a second ore dock which will support increased shipping activities.

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO-FFHPP) is responsible on behalf of the department for regulatory review of proposed developments occurring in or near Canadian fisheries waters. The Program has reviewed Baffinland's additional information provided in their request to the NIRB for further modification of Conditions 179(a) and 179(b) of Mary River Project Certificate No. 005 to increase permitted trucking and shipping from 4.2 million tons per year to 6 million tonnes per year for the remainder of 2020. DFO-FFHPP is providing comments based on the department's mandate under the *Fisheries Act* to maintain the sustainability and ongoing productivity of fisheries, including marine mammals and their habitat. DFO-FFHPP's primary focus in reviewing developments in and around fisheries waters is to ensure that works, undertakings and activities are conducted in compliance with the applicable provisions of the *Fisheries Act*.

The fish and fish habitat protection and pollution prevention provisions of the *Fisheries Act* (2019), specifically subsections 34.4(1) and 35(1), state that "*No person shall carry on any work, undertaking or activity, other than fishing, that results in the death of fish*" and "*No person shall carry on any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat.*" However, under paragraphs 34.4(2)(b) and 35(2)(b) of the *Fisheries Act*, the Minister of Fisheries and Oceans may issue an authorization with terms and conditions in relation to a proposed work, undertaking or activity that may result in death of fish or the harmful alteration, disruption or destruction (HADD) of fish habitat.

DFO-FFHPP is providing the following submission in response to the Nunavut Impact Review Board's (NIRB) correspondence dated January 8, 2020 which invites parties to provide comments to the board by February 3, 2020. The technical comments in this submission are categorized under the general topic of the Marine Environment.

The proposed extension of increased shipping as part of '*Baffinland Iron Mines Corporation's request for further modifications of condition 179(a) and 179(b) of Mary River Project Certificate 005*' has the potential to cause additional negative impacts to the marine environment including behavioural changes resulting from increased frequency of noise, potential increased mortality to marine mammals and prolonged potential of propagation of aquatic invasive

species and non-indigenous species. DFO notes that monitoring programs may not be as robust as needed, and it is unclear how feedback and recommendations from the MEWG are being incorporated into Baffinland's monitoring plans and mitigation measures.

DFO finally notes that Baffinland intends to engage in ice breaking activities. The analysis of information to date suggests that ice-breaking may have serious implications for marine mammals including the potential for change in migratory patterns leading to a lack of immigration into the area. These effects have yet to be fully and effectively assessed. As such, icebreaking activities should not occur until a full review of impacts and potential mitigations can be completed, such as through the ongoing Phase 2 Development environmental assessment.

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1 Introduction

This technical review submission summarizes Fisheries and Oceans Canada (DFO) – Fish and Fish Habitat Protection Program’s (FFHPP) assessment and recommendations concerning the Baffinland Iron Mines Corporation’s request for further modifications of condition 179(a) and 179(b) of Mary River Project Certificate 005 (the Project). The purpose of these interventions is to provide expert advice to the Nunavut Impact Review Board (NIRB) regarding Baffinland’s proposed modifications and identify potential impacts to fish and fish habitat associated with the project changes.

This submission focuses on a technical assessment of the Project. The objective is to analyse the updated plans and/or revised information presented by Baffinland Iron Mine Corporation in support of the proposed modifications, and reflecting DFO-FFHPP’s mandate.

2 Mandate, Relevant Legislation and Policy

The *Constitution Act* (1982) provides the Federal Government with exclusive authority for coastal and inland fisheries within Canada’s territorial boundaries. DFO exercises this power through the administration of the *Fisheries Act* and some aspects of the *Species at Risk Act*. Under the *Fisheries Act*, DFO is responsible for the management, protection and conservation of fish (which include marine mammals as defined by the *Fisheries Act*) and their habitats. The Minister of Fisheries, Oceans and the Canadian Coast Guard is one of the competent ministers under the *Species at Risk Act* (SARA).

In general, DFO-Fish and Fish Habitat Protection Program (DFO-FFHPP) undertakes the review of proposed projects in and around fisheries waters to ensure that works, activities and undertakings are conducted in such a way that proponents are in compliance with the applicable provisions of the *Fisheries Act*.

Bill C-68

On February 6, 2018, the Government of Canada introduced in Parliament Bill C-68, *An Act to Amend the Fisheries Act and other Acts in Consequence*. On **June 21, 2019** the new *Fisheries Act* received Royal Assent and became law.

The new *Fisheries Act* (2019): As of **August 28th, 2019**, new Fish and Fish Habitat Protection Provisions (FFHPP) of the *Fisheries Act* came into force. From the provisions, there are two key prohibitions:

- **Subsection 34.4(1)** of the *Fisheries Act* (2019) prohibits the carrying on of any work, undertaking or activity, other than fishing, that results in the death of fish, and
- **Subsection 35(1)** of the *Fisheries Act* (2019) prohibits the carrying on of any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat.

The new *Fisheries Act* (2019) includes the following definitions:

- *“fish” includes (a) parts of fish, (b) shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals, and (c) the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals.*
- *“fish habitat” means water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas.*
- *“Death of Fish” means any action that results in the end of life of fish. Furthermore, No person shall carry on any work, undertaking or activity, other than fishing, that results in the death of fish.*
 - *“Work” means a physical thing that has been created through labour or the exercise of creative process that has some degree of permanency or lasting quality;*
 - *“Undertaking” means to take upon oneself a task;*
 - *“Activity” means physical task incidental to a work or undertaking as well as physical tasks that may not qualify as works or undertakings.*
- *“Harmful Alteration, Disruption and Destruction of fish habitat” is defined as follows:*
 - *Harmful alteration of fish habitat is any permanent change to fish habitat that reduces its capacity to support one or more life processes of fish but does not permanently eliminate the fish habitat.*
 - *Disruption of fish habitat is any change to fish habitat occurring for a limited period that reduces its capacity to support one or more life processes of fish for a limited period.*
 - *Destruction of fish habitat is any permanent change to fish habitat that completely eliminates its capacity to support one or more life processes of fish.*

Under paragraphs 34.4(2)(b) and 35(2)(b) of the *Fisheries Act*, the Minister of Fisheries, Oceans and the Canadian Coast Guard (the Minister) may issue an authorization with terms and

conditions in relation to a proposed work, undertaking or activity that may result in death of fish or harmful alteration, disruption or destruction of fish habitat. Factors that the Minister must consider prior to recommending to the Governor-in-Council regulations or the Minister exercising powers related to authorizations, permits, orders or Ministerial regulations include:

- (a) the contribution to the productivity of relevant fisheries;
- (b) fisheries management objectives;
- (c) whether there are measures and standards;
- (d) the cumulative effects;
- (e) any fish habitat banks;
- (f) whether any measures and standards to offset the harmful alteration, disruption or destruction of fish habitat give priority to the restoration of degraded fish habitat;
- (g) Indigenous knowledge of the Indigenous peoples of Canada that has been provided to the Minister; and
- (h) any other factor that the Minister considers relevant.

DFO-FFHPP is guided by the new “Fish and Fish Habitat Protection Program Policy Statement (2019)”. This Policy provides guidance on undertaking effective measures to offset death of fish and the harmful alteration, disruption or destruction of fish habitat, consistent with the fish and fish habitat protection provisions of Canada’s *Fisheries Act*.

The “Policy for Applying Measures and Standards to Offset Impacts to Fish and Fish Habitat Under the Fisheries Act (2019)” was prepared by DFO to provide an overview of how to apply measures and standards to offset for impacts to fish and fish habitat. Furthermore this policy is intended to support the conservation and protection of fish and fish habitat, including objectives, guiding principles and types of measures; and describes step-by-step procedures for developing an offsetting plan.

The *Species at Risk Act* (SARA) is intended to prevent Canadian indigenous species, subspecies and distinct populations of wildlife from being extirpated or becoming extinct. SARA facilitates the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity and manage species of special concern (to prevent them from becoming endangered or threatened). The Minister is the competent minister for listed aquatic species that are fish as defined in the *Fisheries Act* Section (2) and for marine plants as defined in the *Fisheries Act*, Section 47.

Environmental and Climate Change Canada (ECCC) is responsible for the administration and enforcement of the pollution prevention provisions of the *Fisheries Act*, Sections 34 and 36-42 on behalf of DFO.

For more information, see: <http://www.dfo-mpo.gc.ca/pnw-ppe/pol/index-eng.html>

3 Technical Review Comments

3.1 Shipping - Voyages

Review Comment Number	3.1 Voyages
Subject/Topic	Increased number of voyages
References	<ul style="list-style-type: none"> • Mary River Project – Production Increase Proposal Extension Request, Baffinland, January 6, 2020 • Final Submission – Baffinland Iron Mines Corporation’s Production Increase, Fuel Storage and Milne Port Accommodations Modification Proposal, DFO, July 26, 2018 • Mary River Modification Application – Production Increase, Fuel Storage, and Milne Port Accommodations (Revised), Stantec, June 19, 2018 • DFO. 2014. Science review of the final environmental impact statement addendum for the early revenue phase of Baffinland’s Mary River Project. DFO Can. Sci. Advis. Sec. Sci. Resp. 2013/024, Table 1.
Summary	Section 2.5, on page 5 of Baffinland’s Mary River Project Production Increase Proposal (PIP) Extension Request, indicates the proponent’s anticipated shipping increases: <i>“The additional 1.8 Mtpa increase in the amount of ore shipped (i.e., an increase from 4.2 Mtpa to 6 Mtpa) will require up to 28 voyages or round trips (56 one way transits) above what was assessed during the ERP. The 2019 operating experience required an additional 24 voyages (48 one way transits) to ship approximately 5.9 Mt.”</i>
Importance of issue to the impact assessment process	It is important to quantify impacts associated with the increase in voyages required for the proposed extension.
Detailed Review Comment <ol style="list-style-type: none"> 1. Gap/Issue 2. Disagreement with conclusion 3. Reasons for disagreement with conclusion 	In DFO’s Final Submission for the initial Production Increase Proposal, DFO noted that the proposed 83 voyages would mean 166 passages for a period of about 75 days (2 months and 2 weeks) and an average of 2.2 carrier passages per day. According to Baffinland sound propagation models, the sound pressure level of noise 71.2 km away from a Post-Panamax-size ore carrier could be 120 dB re 1 µPa (Addendum to Final Environmental Impact Statement, Appendix 8C-2 Table 29). Assuming that carriers move at 13 km/hour (7 knots), a whale would experience the sound of 120 dB re 1 µPa from a single carrier passage for over 11 hours (142.4 km divided by 13 km/hour). Since there will be average of 2.2 passages per day, whales will experience the noise from two ships at the same time. Additionally, unpredictable Arctic sea conditions and logistical challenges may lead to more than two carrier passages on a given day. This scenario would need to be modelled in order to assess Baffinland’s current conclusions.

	DFO notes that in Baffinland’s initial Production Increase Proposal, they only requested an additional 25 voyages, for a total of 83 voyages. Baffinland has not provided an updated assessment of acoustic disturbance related to the additional 3 voyages that are proposed in their PIP Extension Request. Noting that only 24 additional voyages were required to ship 5.9 mtpa, DFO believes that the total number of voyages at 83 voyages should be maintained, to ensure consistency between amendments and for data collection purposes. Prior to increasing the number of voyages, an updated assessment of acoustic disturbance on marine mammals should be provided.
Recommendation/ Request	Recommendation 3.1: DFO recommends that the total number of voyages remain what was originally approved for the initial PIP request.

3.2 Shipping - Ice Breaking

Review Comment Number	3.2 Ice Breaking
Subject/Topic	Impacts of ice breaking activities on Marine Mammals
References	<ul style="list-style-type: none"> • Mary River Project – Production Increase Proposal Extension Request, Baffinland, January 6, 2020 • Nunavut Impact Review Board Mary River Project Certificate 005 – Amended October 31, 2018
Summary	<p>In section 5.3.1 on page 19 of the PIP Extension Request, which references assessments, such as the Ice Breaking Assessment, completed in support of Phase 2 shipping activities, Baffinland concludes: <i>“Each assessments conclusion was that no significant adverse residual effects were anticipated, consistent with the findings of related VEC/VSEC assessments from the original PIP application. Baffinland maintains that the conclusions of the Phase 2 Addendum are accurate and well-supported. Understanding that the activities proposed under the PIP Extension Request are significantly smaller in scope than the Phase 2 Proposal, it is Baffinland’s position that the Phase 2 FEIS Addendum conclusions are overly conservative and provide a reasonable level of certainty that no significant adverse effects should be anticipated in the case of the PIP Extension Request.”</i></p> <p>In section 5.3.4 on page 22 of the PIP Extension Application, Baffinland lists a high-level summary of mitigations to minimize impacts on marine mammals, the following of which are related to ice breaking activities:</p> <p>“</p> <ul style="list-style-type: none"> • <i>No breaking of landfast ice.</i> • <i>Between the period of 01 July and 30 July, a maximum of one icebreaker transit (with escorted vessels) will occur per 24-hour period where ice concentrations of 6/10 or greater cannot be avoided along the shipping route.</i> <p>”</p>

	<ul style="list-style-type: none"> • <i>Between the period of 01 July and 30 July, a maximum of two icebreaker transits (with escorted vessels) will occur per 24-hour period where ice concentrations of 3/10 of greater cannot be avoided along the shipping route.</i> • <i>All icebreaking activities will be conducted outside of the period of ringed seal parturition, nursing and breeding periods.</i> • <i>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).</i> • <i>Baffinland will place Marine Wildlife Observers (via the SBO program) on ice breaking vessels during the shoulder season that will be responsible for recording relative abundance, group composition and behaviour of marine mammals, and if any relevant any incidences of marine mammal strike of near misses with Project vessels.</i> • <i>Posting of ice analyst of board ice breaking vessels. “</i> <p><i>Baffinland further notes that “several of these mitigation measures have been implemented on a voluntary basis by Baffinland, exceed regulatory requirements, and are representative of a more conservative vessel traffic management approach than is executed by all other operators in the RSA.”</i></p> <p><i>In DFO’s Final Submission to the NIRB for the proposed Phase 2 Development, DFO recommended 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.”</i></p>
<p>Importance of issue to the impact assessment process</p>	<p>Ice breaking activities may cause harmful alterations, disruption, and destruction of habitat and death of marine mammals during critical life stages.</p>
<p>Detailed Review Comment</p> <ol style="list-style-type: none"> 1. Gap/Issue 2. Disagreement with conclusion 3. Reasons for disagreement with conclusion 	<p>DFO notes the issues surrounding the Phase 2 assessment are largely outstanding and unresolved and further that the conclusions drawn in support of Phase 2 in relation to Baffinland’s assessment of ice breaking activities are currently unsupported. Therefore, DFO believes that it is inappropriate to use assessments conducted to evaluate the shipment of 12 Mtpa of iron ore for the current assessment of shipment of 6 Mtpa.</p> <p>Furthermore, Baffinland has not provided an updated assessment of ice breaking activities in the PIP Extension Request, but does intend to engage in these activities in 2020. DFO notes that ice breaking has the potential to significantly deter animals from entering Eclipse Sound, or leaving the area due to noise disturbance, and has the potential to prevent animal movement into and out of preferred marine habitat through displacement and entrapment in sea ice. Ice breaking may also result in habitat</p>

	<p>degradation and fragmentation through the destruction and alteration of sea ice habitat, which is required across the life histories of marine mammals within the project area, and this may additionally result in the separation of seal mothers and their pups. Finally, ice breaking may result in increased mortality of marine mammals via ship strikes, crushing by moving sea ice, or entrapment within the broken sea ice.</p> <p>DFO acknowledges that Baffinland has voluntarily applied additional mitigations to reduce potential adverse effects of ice breaking activities on marine mammals. However, ice breaking activities were not addressed in Baffinland’s initial Production Increase Proposal, and therefore interveners were not granted the opportunity to assess any impacts that may arise from these activities.</p> <p>In DFO’s opinion, Baffinland has provided insufficient evidence to demonstrate that the proposed mitigations would indeed reduce potential adverse impacts on marine mammals resulting from ice breaking activities. Additionally, DFO notes that discussions during the Phase 2 proposal surrounding ice-breaking activities are still ongoing and outstanding. As noted above, to date DFO has recommended that ice-breaking activities not occur, even for Phase 2. Therefore, to ensure that impacts resulting from ice breaking activities are fully assessed, reviewed by interveners and properly mitigated, DFO suggests that the most conservative mitigation is that Baffinland avoid ice breaking activities as part of the 6mtpa production increase.</p>
Recommendation/ Request	<p>Recommendation 3.2: DFO recommends that the Project Certificate 005 amendment include the following Term and Condition: <i>“Baffinland shall not conduct icebreaking activities at any point along the Northern Shipping Route until a full assessment of the additional impacts to marine mammals is provided, and the additional activities and associated mitigations are approved and supported by DFO”.</i></p>

3.3 Ballast Water and Non-Indigenous Species

Review Comment Number	3.3 Ballast water and non-indigenous species
Subject/Topic	Impacts of increased shipping on the introduction of aquatic invasive species (AIS) and non-indigenous species (NIS)
References	<ul style="list-style-type: none"> • Mary River Project – Production Increase Proposal Extension Request, Baffinland, January 6, 2020 • Mary River Modification Application – Production Increase, Fuel Storage, and Milne Port Accommodations (Revised), Stantec, June 19, 2018
Summary	In Table 8 on page 23 of the initial Modification Application, Baffinland states: <i>“No species considered invasive to the Arctic have been observed.”</i>

	<p>In section 3.1 on page 6 of the PIP Extension Request, Baffinland states: <i>“that the potential interactions outlined in Table 8 of the Modification Application remain unchanged for the Extension Request with the exception that interactions will be limited to the time period it takes to complete the Phase 2 reconsideration process.”</i></p> <p>DFO provided a number of recommendations in the Final Submission for Baffinland Iron Mines Corporation Mary River “Phase 2 Development” Project Proposal (September 23, 2019), which include:</p> <p><i>“ 3.10.1 The ballast water dispersion model and analyses be complete.</i></p> <p><i>3.10.2 All project vessels use ballast water treatment plus exchange strategy.</i></p> <p><i>3.10.3 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.</i></p> <p><i>3.10.4 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.</i></p> <p><i>3.10.5 An assessment of potential biological and ecological effects of ballast discharge and identification of 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 AID/MEEMP monitoring, and should be updated in the event that new NIS/AIS are detected in future monitoring.</i></p> <p><i>3.10.6 An early response plan (similar to an oil response plan) be developed with applicable regulators and local communities so that, should NIS/AIS be detected, significant environmental effects or major change to species composition could be avoided.”</i></p>
<p>Importance of issue to the impact assessment process</p>	<p>Increased shipping activities and associated ballast water exchange can result in the transmission of aquatic invasive species and non-indigenous species.</p>
<p>Detailed Review Comment</p> <ol style="list-style-type: none"> 1. Gap/Issue 2. Disagreement with conclusion 	<p>DFO notes that Baffinland did not provide an updated assessment in the PIP Extension Request on impacts related to the propagation of aquatic invasive species and non-indigenous species in the Arctic through increased shipping activities.</p>

3. Reasons for disagreement with conclusion	DFO does not have sufficient evidence to effectively assess potential impacts associated with continued increased shipping of 6mtpa. DFO notes that in the absence of additional information provided for the PIP extension, that the recommendations provided by DFO for Phase 2 Development be incorporated into Baffinland’s plans and provided prior to the commencement of 2020 shipping activities. DFO notes this should include ballast water and AIS/NIS commitments Baffinland has agreed to.
Recommendation/Request	Recommendation 3.3: DFO recommends that Baffinland commit to incorporating DFO’s recommendations for aquatic invasive species/non-indigenous species and ballast water exchange made through the Phase 2 process, as well as any commitments Baffinland has already agreed to implementing for Phase 2.

3.4 Mitigations and Monitoring

Review Comment Number	3.4 Mitigations and Monitoring
Subject/Topic	Mitigation and monitoring of project impacts
References	<ul style="list-style-type: none"> • Mary River Project – Production Increase Proposal Extension Request, Baffinland, January 6, 2020 • Final Submission – Baffinland Iron Mines Corporation’s Production Increase, Fuel Storage and Milne Port Accommodations Modification Proposal, DFO, July 26, 2018 • DFO. 2014. Science review of the final environmental impact statement addendum for the early revenue phase of Baffinland’s Mary River Project. DFO Can. Sci. Advis. Sec. Sci. Resp. 2013/024, Table 1. • Nunavut Impact Review Board Mary River Project Certificate 005 – Amended October 31, 2018 • Mary River Modification Application – Production Increase, Fuel Storage, and Milne Port Accommodations (Revised), Stantec, June 19, 2018
Summary	<p>In the initial Production Increase Proposal, Baffinland identified potential negative impacts to marine mammals due to additional shipping in Table 8 in the Mary River Modification Application – Production Increase, Fuel Storage, and Milne Port Accommodations (Revised), as follows:</p> <p><i>“Additional ship traffic has the potential to interact with marine mammal populations through acoustic disturbances, and vessel strikes. Past marine mammal research suggests that temporary and localized behavioural changes are to be expected in response to ship encounters among the species present in the region.”</i></p> <p>Baffinland later concludes: <i>“Given the relatively low likelihood and short duration of encounters between marine mammals and vessel traffic,</i></p>

acoustic disturbances are not expected to affect marine mammals at the population level”.

In section 3.1 on page 6 of Baffinland’s Mary River Project PIP Extension Request, Baffinland further references Table 8 on page 23 from the initial Mary River Modification Application – Production Increase, Fuel Storage, and Milne Port Accommodations (Revised) under Description of Change for VEC Category Marine Environment: “Additional ship traffic has the potential to interact with marine mammal populations through acoustic disturbances, and vessel strikes. Past marine mammal research suggests that temporary and localized behavioural changes are to be expected in response to ship encounters among the species present in the region. Given the relatively low likelihood and short duration of encounters between marine mammals and vessel traffic, acoustic disturbances are not expected to affect marine mammals at the population level. With respect to vessel strikes, due to existing mitigation and the low likelihood of encounters, increased vessel traffic may result in consequential increase in vessel strike potential. This conclusion is supported by the existing marine mammal monitoring under current operations. Specifically, narwhal abundance and distribution near Milne Port has not significantly changed and no known vessel strikes have been reported [...]with the application of existing mitigation, the environmental effects are anticipated to remain not significant.”

In section 5.3.1 of the PIP Extension Request, Baffinland provides a brief assessment of Phase 2 shipping activities, stating “Each assessments conclusion was that no significant adverse residual effects were anticipated, consistent with the findings of related VEC/VSEC assessments from the original PIP application. Baffinland maintains that the conclusions of the Phase 2 Addendum are accurate and well-supported. Understanding that the activities proposed under the PIP Extension Request are significantly smaller in scope than the Phase 2 Proposal, it is Baffinland’s position that the Phase 2 FEIS Addendum conclusions are overly conservative and provide a reasonable level of certainty that no significant adverse effects should be anticipated in the case of the PIP Extension Request.”

In section 5.3.3 of the PIP Extension Request, Baffinland provides an overview of all years of monitoring results associated with shipping activities, concluding that: “the Project will have temporary and localized disturbances on narwhal, but that long-term displacement and abandonment of the area will not occur as a result of Project operations.”

In the Nunavut Impact Review Board Mary River Project Certificate 005 Amendment, Term and Condition No. 183 reads: “The proponent shall collaborate with the Marine Environmental Working Group to develop impact avoidance or mitigation strategies for the protection of the marine environment. The proponent shall implement any direction from the Department of Fisheries and Oceans for any avoidance or mitigation

	<p><i>measures, including cessation of any activity, for the protection of the marine environment.”</i></p> <p>In section 2 on page 5 of Baffinland’s PIP Extension Request, Baffinland’s provides a summary of the Marine Environment Working Group and its intent to address concerns regarding potential impacts on marine mammals, stating: <i>”Several opportunities have been made available to the MEWG since October 2018 to discuss the status of Baffinland’s compliance with Terms and Conditions in project Certificate No. 005 related to marine environmental protection. MEWG feedback on the status of compliance is sought through the operation of several MEWG meetings throughout the year, the opportunity to provide comments on all draft marine monitoring reports, and the opportunity to provide comments on the NIRB Annual report. In addition, as the marine monitoring programs for the Project are designed to meet the terms and condition of Project Certificate No. 005, the MEWG’s involvement in the design and assessment of these programs inherently supports compliance and the identification of additional mitigation and adaptive management strategies, as required.”</i></p>
<p>Importance of issue to the impact assessment process</p>	<p>It is important to update monitoring plans and reporting commitments to ensure that all related project impacts are being effectively captured and addressed through mitigations.</p>
<p>Detailed Review Comment</p> <ol style="list-style-type: none"> 1. Gap/Issue 2. Disagreement with conclusion 3. Reasons for disagreement with conclusion 	<p>In section 5.3.1 on page 19 of the PIP Extension Request references assessments completed in support of Phase 2 shipping activities, as quoted in the Summary section above. In DFO’s ongoing review of the Phase 2 Development, DFO notes that issues are still largely outstanding and unresolved and DFO is of the opinion that Baffinland’s conclusions regarding the impacts to marine mammals are currently unsupported. As such, DFO believes it’s inappropriate to use assessments for Phase 2, an increase to 12mtpa, for conclusions made on the PIP Extension, an increase to 6mtpa, and further notes that the impacts may differ greatly.</p> <p>An assessment of acoustic disturbances on marine mammals from increased shipping activities has not been provided from Baffinland in their PIP Extension Request. DFO notes that an updated assessment informed by monitoring data acquired since the last production increase to 6mtpa specifically should be completed.</p> <p>In Table 5.4 in section 5.3.3.1 of the PIP Extension Request, Baffinland provides results from the Relative Abundance and Disturbance (RAD) Surveys completed at Bruce Head from 2014 to 2019 for narwhal. However, DFO notes that this table excludes the 2018 monitoring results. DFO is of the opinion that Baffinland has provided insufficient evidence to support their conclusion that impacts to narwhal will be only temporary and localised. DFO additionally notes that Baffinland only discusses impacts to narwhal in the PIP Extension Request, and hasn’t addressed</p>

impacts on all marine mammals found within the project area, including seals, beluga and bowhead.

DFO notes that Baffinland routinely reports the results of its marine monitoring programs in the NIRB Annual Reports, but fails to provide data as well as the statistical analyses to demonstrate the validity of the monitoring results. Further, in DFO's review of Baffinland's Phase 2 Development proposal, DFO noted that Baffinland's monitoring programs lack the statistical power required to ensure that any statistically significant changes in the environment are detected and that some monitoring programs have not been completed every year, such as the aerial surveys, the narwhal tagging program, and the ship-based observer program. Inconsistencies in which monitoring programs are implemented each year are demonstrated in Table 5.3 of Baffinland's PIP Extension Request, which indicates which marine monitoring programs have been completed from 2006 to 2008 and 2013 to 2019. DFO is concerned that a lack of robust monitoring and variable monitoring programs from year to year will reduce Baffinland's ability to detect project impacts from increased shipping activities, as well as detect cumulative impacts over time from a variety of ongoing project activities.

DFO is of the opinion that, since Baffinland has engaged in marine monitoring since the last production increase, this data should be used to inform reviewers on impacts that may arise from an additional year of increased shipping activities. It is unclear to DFO how and if this data has been used to inform assessments of impacts from increased shipping, as well as what thresholds were used and how they were developed to determine significance to inform these updated impact assessments. In the absence of sufficient updated assessments, the marine monitoring programs should be appropriately updated to ensure that impacts to marine mammals resulting from a prolonged increase in shipping activities are effectively monitored and, if necessary, mitigated.

In section 5.3.2.1 on page 20 of the PIP Extension Request, Baffinland lists a variety of marine mammal indicators which are intended to inform early-warning indicator thresholds developed through the MEWG. The indicators chosen by Baffinland include: relative abundance and distribution, group composition, change in behaviour, mortality, underwater noise levels, narwhal vocal behaviour, narwhal abundance, distribution and density in the RSA, dive behaviour, and surface movement. DFO notes that none of the listed indicators currently have thresholds in place. DFO additionally is not confident that Baffinland's current monitoring programs would be able to detect changes caused by the project.

DFO has actively participated in the MEWG since its inception, and acknowledges that the MEWG has provided opportunities to provide feedback on Baffinland's monitoring programs and their results. However,

	<p>it is unclear how and if recommendations made through the MEWG are being implemented into Baffinland's monitoring programs.</p> <p>Additionally, in the current wording for Term and Condition No. 183 in the amended Project Certificate, DFO may provide direction to Baffinland for any avoidance and mitigation measures related to the marine environment. However, MEWG membership also includes indigenous communities impacted by the project, and other Government of Canada departments who also have mandates related to the marine environment that DFO does not have the authority to provide direction on. As such, the Term and Condition should be appropriately updated to ensure that it is inclusive of its members and allows for all mandates related to the marine environment to be adequately reflected.</p>
<p>Recommendation/ Request</p>	<p>Recommendation 3.4.1: DFO recommends Baffinland provide rationale on the effectiveness of proposed mitigations for the continued increased shipping and further report annually on the implementation and effectiveness of all mitigation measures related to shipping activities. This information could be included as an appendix to the NIRB Annual Report, and should be presented at the MEWG.</p> <p>Recommendation 3.4.2: DFO recommends that the marine monitoring programs be appropriately modified to demonstrate and ensure consistency and higher statistical power.</p> <p>Recommendation 3.4.3: DFO recommends that Baffinland conduct a review of all data acquired to date during the marine mammal monitoring programs, complete with statistical analyses and figures, and provide this overview report for review by the MEWG.</p> <p>Recommendation 3.4.4: DFO recommends that Baffinland update the Terms of Reference for the MEWG to the satisfaction of its members, and update its marine monitoring programs, incorporating comments and concerns made through the MEWG.</p>

Summary of Recommendations

1. Shipping		
1	Ref. 3.1	DFO recommends that the total number of voyages remain what was originally approved for the initial PIP request.
2. Ice Breaking		
2	Ref. 3.2	DFO recommends that the Project Certificate 005 amendment include the following Term and Condition: <i>"Baffinland shall not conduct icebreaking activities at any point along the Northern Shipping Route until a full assessment of the additional impacts to marine mammals is provided, and the additional activities and associated mitigations are approved and supported by DFO"</i> .
3. Ballast Water and Non-Indigenous Species		

3	Ref. 3.3	DFO recommends that Baffinland commit to incorporating DFO's recommendations for aquatic invasive species/non-indigenous species and ballast water exchange made through the Phase 2 process, as well as any commitments Baffinland has already agreed to implementing for Phase 2.
4. Monitoring and Reporting		
4	Ref. 3.4.1	DFO recommends Baffinland provide rationale on the effectiveness of proposed mitigations for the continued increased shipping and further report annually on the implementation and effectiveness of all mitigation measures related to shipping activities. This information could be included as an appendix to the NIRB Annual Report, and should be presented at the MEWG.
5	Ref. 3.4.2	DFO recommends that the marine monitoring programs be appropriately modified to demonstrate and ensure consistency and higher statistical power.
6	Ref. 3.4.3	DFO recommends that Baffinland conduct a review of all data acquired to date during the marine mammal monitoring programs, complete with statistical analyses and figures, and provide this overview report for review by the MEWG.
7	Ref. 3.4.4	DFO recommends that Baffinland update the Terms of Reference for the MEWG to the satisfaction of its members, and update its marine monitoring programs, incorporating comments and concerns made through the MEWG.