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*Your file*      *Votre référence*  
08MN053

May 17, 2021

*Our file*      *Notre référence*  
07-HCAA-CA7-00050

Nunavut Impact Review Board (NIRB)  
PO Box 1360  
Cambridge Bay, NU  
X0B 0C0

Dear NIRB,

**Subject: Baffinland Iron Mines Corporation's Mary River Project – Technical Memorandum: Preliminary Summary of 2020 Narwhal Monitoring Programs**

As requested by the Nunavut Impact Review Board (NIRB) in their correspondence dated April 8, 2021, Fisheries and Oceans Canada (DFO) is providing the following comments in response to Golder's Technical Memorandum: Preliminary Summary of 2020 Narwhal Monitoring Programs submitted by Baffinland to the NIRB Registry.

DFO notes that on May 13, 2020, Baffinland Iron Mines Corporation (Baffinland) provided draft reports to the Marine Environmental Working Group (MEWG) for the 2020 Bruce Head Shore-based Monitoring Program, the 2019-2020 Shoulder Season Acoustic Monitoring Programs, and the 2020 Marine Mammal Aerial Survey Program. These draft reports contain more detailed information and data that DFO requires to undertake a more comprehensive review of Baffinland's analysis and conclusions presented in their Technical Memo. Baffinland has requested that Marine Environmental Working Group (MEWG) members provide comments on the draft reports by June 24, 2021. DFO intends to review and provide responses to Baffinland and the MEWG by this date, and to the NIRB for further consideration in the review of Baffinland's Phase 2 Development Proposal.

DFO's comments on the Technical Memorandum are provided below and are divided by topics. For each topic, DFO made one or multiple recommendations to help address our technical comments. For ease of reference, DFO provides a summary of these recommendations, separated by topic, in Appendix I.

## **2022 Satellite Tagging Program**

In the Introduction on page 2 of the Technical Memo, Golder recommends that Baffinland undertake “*instrumentation of narwhal with satellite tags during early season ice conditions to fill data gaps associated with narwhal interactions with icebreaking.*”

Narwhal tagging data during icebreaking activities could provide valuable data and information that could help to inform impacts to narwhal from project-related icebreaking activities, and could be beneficial to inform future mitigation and adaptive management measures. However, DFO notes that currently there are health and safety restrictions imposed by both the Government of Nunavut and by Baffinland due to the COVID-19 pandemic. Narwhal tagging at this time may be a significant challenge, therefore Baffinland should investigate alternative monitoring methods in order to obtain this type of information.

DFO recommends that Baffinland consider alternative monitoring methodologies to acquire this information in the event that COVID-19 restrictions remain in place throughout 2022. DFO further recommends that Baffinland engage with the Mittimatalik Hunters and Trappers Organization and the Nunavut Wildlife Management Board to determine the approach preferred by these organizations for the acquisition of this data.

## **Cumulative Effects**

In the Introduction on page 2 of the Technical Memo, three potential factors are identified that may have caused decreased abundance of narwhal within Eclipse Sound in 2020. These factors include: Baffinland’s icebreaking operations, increased killer whale presence within the Regional Study Area (RSA), and pile-driving activities at the Pond Inlet Harbour.

DFO acknowledges that Baffinland has committed to further investigate these contributing factors through desktop analyses and additional monitoring, but has not specifically indicated if they will be further investigating each of these potential causal factors individually, or if Baffinland will also be further investigating combined and cumulative impacts of these factors. DFO notes that Baffinland does have a responsibility to determine and monitor combined and cumulative impacts within the impacted Project Area.

DFO recommends that an analysis of combined and cumulative effects for these factors should be undertaken by Baffinland, including the potential accumulation of project-related impacts on narwhal since project-related shipping began in 2015.

## **Marine Mammal Aerial Survey Program: Leg 1**

Figure 13 on page 26 of the Technical Memo depicts the transects followed for Leg 1 of the Marine Mammal Aerial Survey Program, and includes a satellite image of ice conditions within Eclipse Sound. Within the area of the consolidated ice field, it appears that the survey plane largely followed ice leads west of Pond Inlet where narwhal congregated.

It is unclear to DFO whether this survey methodology was intentional, and it is unclear if the satellite image presented is representative of ice conditions on the day that Leg 1 survey activities were undertaken.

DFO recommends that Baffinland clarify how survey transects were determined for Leg 1 of the Marine Mammal Aerial Survey, and that Baffinland confirm if the satellite image of ice conditions in figure 13 is from the same day that Leg 1 survey activities were undertaken.

### **Marine Mammal Aerial Survey Program: Leg 2**

On page 5 of the Technical Memo, Golder indicates that Leg 2 aerial surveys were undertaken from August 28-29, 2020. Previous marine mammal aerial surveys conducted by DFO have taken place prior to August 25<sup>th</sup> in order to ensure that narwhal have not yet left Eclipse Sound due to fall migration (Watt et al., 2015). The Leg 2 survey for the Eclipse Sound narwhal stock was completed on August 29, 2020, and DFO is concerned that this may have coincided with when narwhal were starting their fall migration out of Eclipse Sound. This may have impacted Golder's 2020 narwhal abundance estimate calculated for this stock.

DFO recommends that the narwhal abundance estimate calculated from the 2020 Leg 2 aerial survey be compared to the narwhal abundance estimate calculated from 2019 Leg 2 Survey 5, as this survey was completed from August 29-30, 2019 and may provide a suitable comparison for the 2020 Leg 2 aerial survey results. Alternatively, the 2020 Leg 2 aerial survey narwhal abundance estimate could also be compared to the average of the abundance estimates for Surveys 3, 4, and 5 from the 2019 Leg 2 aerial survey. These surveys were completed on August 21-22, 25-27, and 29-30 of 2019, and capture potential fluctuations in narwhal abundance as they begin to migrate out of Eclipse Sound.

### **Marine Mammal Aerial Survey Program: Leg 2, Coefficient of Variation**

Further, on page 5 of the Technical Memo, Golder indicates that the Coefficient of Variation (CV) calculated for the 2020 Leg 2 Eclipse Sound narwhal abundance estimate is 0.03, but no details are provided on how this analysis was performed. DFO is concerned there are no additional details on the survey methodology provided in the Technical Memo to justify and explain this low CV. These additional details would provide certainty that the low CV is accurate.

DFO recommends that Baffinland provide further details on whether the survey was completed with full photographic coverage or if a mix of photographic and visual methods were used in some strata, and if a CV was calculated for strata surveyed using multiple methods. Additionally, DFO recommends that Baffinland provide details on what values were used as a correction factor to account for availability bias, and if not, a justification of why a correction factor was not applied. DFO further recommends that a detailed analysis on the CV calculation be provided for further review.

DFO acknowledges that the requested details are potentially included in the Draft 2020 Marine Mammal Aerial Survey Program Report, but expects that these details are additionally provided in Baffinland's June 4<sup>th</sup> response to comments on the Technical Memo.

### **Bruce Head Shore-based Monitoring Program**

On page 7 of the Technical Memo, Golder states: *“Results from the 2020 behavioural and group composition study components are consistent with existing impact predictions in the FEIS in that ship noise effects on narwhal will be limited to temporary, localized avoidance behaviour.”*

It is unclear to DFO what is meant by ‘temporary, localized avoidance behaviour’, and if displacement of narwhal out of the RSA would still qualify as ‘temporary, localized avoidance behaviour’. Further, DFO would like to note that ‘temporary, localized avoidance behaviour’ may still qualify as a significant impact if the disturbance is recurrent.

Further on page 7, Golder additionally states: *“Similar to previous years, calves were observed during most sampling days and mean annual proportion of calves observed in 2020 (11.3%) was higher than three of the previous years [...]”*.

DFO notes that it would be beneficial for Baffinland and Golder to establish an estimate of standard error for the annual proportion of calves to account for variability each year, and recommended that Baffinland and Golder create an estimate of variation during the May 13<sup>th</sup> MEWG meeting hosted by Baffinland for further discussion on the Technical Memo. Baffinland indicated that this could be further discussed during a MEWG meeting anticipated for June 2021. DFO looks forward to further discussing this recommendation during the next scheduled MEWG meeting, but requests that Baffinland provide further detail on how an estimate of variation could be established in their June 4<sup>th</sup> response to comments.

On page 7, it is indicated that two narwhal nursing events occurred within 4.25 km and 9.08 km of a vessel. DFO acknowledges these findings, and recommends that narwhal nursing events continue to be monitored in the future through the marine mammal monitoring programs, as these are important behaviours that could be impacted by project-related shipping activities.

DFO additionally recommends that Baffinland provide any additional info acquired on these narwhal nursing events identified in the 2020 monitoring, such as the duration of each event, and the number of different nursing sessions that took place during these events.

Finally, DFO recommends that Baffinland provide clarification on what is meant by ‘temporary, localized avoidance behaviour’, and if Baffinland considers displacement of narwhal outside of the RSA to be ‘temporary, localized avoidance behaviour’.

### **Underwater Acoustic Monitoring during Icebreaking Operations**

Figure 2 on page 9 of the Technical Memo demonstrates the two locations of JASCO’s acoustic recorder stations, however it is unclear how deep the acoustic recorders are located, as well as the water depth in these locations. Underwater depth of the acoustic recorder plays an important role in the sound levels measured by the recorder. Overall, more information is required to understand and interpret the results of the underwater acoustic modelling during icebreaking activities. In particular, information on ice condition, as well as icebreaking

activities, together with the maximum recorded noise is required. DFO notes that the recorders are at different locations than what was anticipated in the noise modelling.

DFO recommends that Baffinland provide further information the depth of the acoustic recorder, the total water depth at their location, ice condition, icebreaking activities and the maximum recorded noise for each recorder. Further, DFO recommends that the implications of the discrepancy between the modelled noise level and field location of acoustic recorders be analysed and discussed in the context of comparing measured versus modelled sound levels and associated impacts to narwhal.

DFO reiterates that the requested details are potentially included in the Draft 2019-2020 Shoulder Season Acoustic Monitoring Program Report, but expects that these details are additionally provided in Baffinland's June 4<sup>th</sup> response to comments on the Technical Memo.

### **Icebreaking Activities: Startle Response**

Throughout section 4.1 of the Technical Memo, Golder draws comparisons between 2018 and 2020 ice conditions. DFO acknowledges the similarities in ice conditions between these two years, but notes that the Bruce Head Shore-based Monitoring Program and the Marine Mammal Aerial Survey Program were not operated in 2018. Consequently, it is not possible to compare the narwhal densities during 2018 with the narwhal densities of the other survey years. This further highlights the need for consistent and long-term monitoring programs in order to effectively compare data between years and draw conclusions.

On page 14 of the Technical Memo, Golder argues that narwhals did not exhibit a startle response to icebreaking in 2019 based on the following statement: *"2019 narwhal abundance increased after icebreaking activities were underway with an initial abundance of 5,793 narwhal (CV=0.23) on 15-16 2019 July prior to Baffinland vessel in the RSA to 15,591 narwhal (CV=0.19) on 21-22 July 2019 after Baffinland vessels entered the RSA (Golder 2020)."*

DFO is of the opinion that Golder and Baffinland do not have sufficient data to support the above statement regarding startle response. The number of narwhal surveyed on July 21 and 22 may actually suggest that narwhals from other stocks might have passed through the area. In order to effectively determine if narwhal are experiencing a startle response from icebreaking activities, narwhal tagging data, acoustic monitoring data, focused behaviour observation and the vessel location information should be analysed together to draw conclusions.

DFO recommends that Baffinland undertake an integrated analysis of narwhal tagging data, acoustic monitoring data, and vessel location data to determine if narwhal experience startle responses, and other behavioural responses, during icebreaking activities.

DFO acknowledges that the additional information requested is potentially included in the Draft 2020 Marine Mammal Aerial Survey Program Report, but expects that these details are additionally provided in Baffinland's June 4<sup>th</sup> response to comments on the Technical Memo.

### **Icebreaking Activities: Congregation in Ice Leads**

Further on page 14, Golder states: “*Based on the AIS vessel tracking data, the icebreaker appeared to have transited in close proximity to one of the leads upon its initial entry through the ice field (Figure 8). The following day, narwhal relative abundance increased from 2.21 animals/km (from 21 July 2020) to 4.25 animals/km in leads in Eclipse Sound (on non-systematic transects) and decreased from 0.16 animals/km (on 21 July 2020) to 0.02 animals/km in Milne Inlet (systematic transects) after the icebreaker transited the RSA.*”

As limited information was included in the Technical Memo, it is unclear what methodology Golder used to estimate the number of narwhal congregating in the ice leads, and if Golder used photographic or visual survey methods to gather this information.

DFO recommends that Baffinland clarify the methodologies used to survey and estimate the number of narwhal in ice leads.

DFO acknowledges that the additional information requested is potentially included in the Draft 2020 Marine Mammal Aerial Survey Program Report, but expects that these details are additionally provided in Baffinland’s June 4<sup>th</sup> response to comments on the Technical Memo.

### **Increased Killer Whale Presence**

In section 4.3 on page 28, Golder references Lefort et al. (2020) and speculates that an increased presence of killer whales in the area may result in increased narwhals mortality, population decline, and range contraction. DFO notes that the Lefort et al. (2020) reference was an estimate of potential direct narwhal removal by killer whales in the Baffin region via predation based on bioenergetics modelling, and is not an appropriate reference for speculations on range contractions, as that would require long-term narwhal telemetry data. Therefore, DFO notes that the referenced paper does not use any telemetry data from narwhals and so any reference to this paper about narwhal range contractions are inappropriate.

Further, it is important to note that the provided estimates of killer whale abundance and the proportion of narwhals removed in the referenced paper are extrapolated to the entire Baffin Region, and are not representative of only Eclipse Sound where the killer whales were identified. DFO notes that the killer whale abundance estimate from the capture-mark-recapture analysis of photo-identified whales is appropriate and is our best current estimate of killer whale abundance for the Baffin Region, but further reiterates that it is based on photos from throughout Baffin Island and is not just an estimate for the Eclipse Sound Region. As indicated by Golder in the Technical Memo: “*A systematic comparison between narwhal and killer whale abundances across years is not possible because reliable abundance estimates for killer whale are not available*”. DFO further notes that it is also not possible to assess whether current rates of predation pressure on narwhals by killer whales represents an increase or no change relative to historic levels because historic levels are not available.

Further on page 28, Golder summarizes the findings of Laidre et al. (2006) and Breed et al. (2017) on the impact of the presence of killer whales on narwhals. DFO acknowledges that

the summaries presented by Golder are accurate overall, however it is important to note that while killer whale presence induced large changes in narwhal behaviour and distribution, the tagged narwhals in these studies did not *leave* Admiralty Inlet when killer whales were present. Therefore it cannot be drawn from these studies that the killer whales reduced numbers of narwhal in the area by displacing them. However, the impacts of killer whales on narwhal distribution (e.g., changes in spatial distribution patterns as well as potentially non-random movements between survey transects or strata) could impact aerial survey results.

On pages 28 and 29 of the Technical Memo is it stated: *“It is unclear to what extent killer whale presence may have contributed to lower narwhal numbers observed in Eclipse Sound in 2020, either by direct removal (i.e., hunting and feeding) and/or via seasonal displacement, but an increase in killer whale numbers in the RSA was apparent in 2020 and available IQ indicates that killer whales are likely to influence narwhal distribution and abundance in the RSA.”*

DFO attempts to collect sightings reports of killer whales in communities throughout the eastern Canadian Arctic. That being said, there are higher numbers of sightings reports of killer whales from the Eclipse Sound region over the past decade, which could reflect a number of (or combination of) factors, including: increased numbers of killer whales; shift in the extent of killer whale range; longer occupancy of the area by killer whales; increased effort (i.e., DFO itself began a killer whale research program in the area in 2013 and most of the sightings are directly from that program and the monitoring program at Bruce Head began within the same time period); and increased awareness and participation to DFO’s program.

DFO acknowledges that there are difficulties in drawing conclusions about trends in killer whales numbers from this data. That being said, the range of dates killer whale observations were reported in the Eclipse Sound Milne Inlet in 2020 (18 Aug to 4 Sept) was *less than or similar to (but not longer than)* those reported in 2017 (31 July to 11 Sept), 2018 (12 Aug to 8 Sept), and 2019 (26 Jul to 5 Sept) in DFO’s sightings database. DFO also notes that killer whales have been more regularly observed in neighboring Admiralty Inlet throughout the month of August for at least the past decade, according to the DFO sightings database, where high numbers of narwhals also occur without any significant trends in narwhal abundance.

On page 29 of the Technical Memo, Golder cites Inuit observations that killer whale number are increasing from three different IQ interview reports. DFO acknowledges these statements, and further notes that Higdon et al. (2013) summarized Inuit knowledge on killer whales through semi-directed interviews in 11 Nunavut communities from 2007 to 2010, and found most of them said there were either increasing numbers of killer whales, or increasing sightings. However, 2 of 6 people interviewed in Pond Inlet said killer whale numbers were decreasing, but it is important to note that this information dates before 2010.

Overall, DFO is of the opinion that there is currently insufficient information to infer trends in the killer whale population in the Baffin area, and any subsequent impacts on narwhal that reside in this area. DFO recommends that Baffinland work with DFO as we may be able to provide Baffinland with additional information on killer whales in Eclipse Sound and Admiralty Inlet.

### **Pile-driving at the Pond Inlet Harbour**

DFO acknowledges Golder's analysis of impact pile-driving activities undertaken at the Pond Inlet Harbour in 2020. At present, DFO is unable to provide further comments on this potential factor, as the Department is further reviewing and investigating these activities. DFO will continue to work with the Government of Nunavut, and Baffinland, as necessary, to acquire the data and information required for the Department to complete this investigation, and to ensure that the potential impacts to marine mammals from pile-driving are fully mitigated.

### **Marine Monitoring Plan**

On page 30 of the Technical Memo, Golder cites the document 'draft Marine Monitoring Plan (Baffinland 2021)', and further references this document as 'Baffinland Iron Mines Corporation (Baffinland). Marine Monitoring Plan (MMP) (DRAFT)' in the reference section on page 41.

DFO acknowledges that updates to the Marine Monitoring Plan, and other monitoring and management plans, occur periodically and are provided for review. However, DFO has not yet seen an updated draft of the Marine Monitoring Plan for 2021.

DFO recommends that Baffinland clarify if a draft Marine Monitoring Plan has been provided for review from parties, and if not, when parties can anticipate receiving this updated draft plan for review.

### **Enhanced Mitigation Measures**

In section 5.4 from pages 33 to 36 of the Technical Memo, Golder identifies five 'enhanced mitigation' options to manage icebreaking activities for the upcoming 2021 shipping season. To justify each option, Golder attempts to provide 'biological rationale'. However, the justifications that Golder provides for each option are focused on ice conditions and whether or not narwhal are present in ice leads, rather than identifying the biological considerations that impact whether or not narwhal are present in ice leads. Further, DFO is concerned that there is insufficient biological data to comprehensively inform and review each option.

DFO has reviewed the five enhanced mitigation options proposed by Golder, and notes the following:

- Option 1 restricts icebreaking activities at ice concentrations greater than 6/10 and appears to be more conservative compared to Baffinland's transit restrictions mitigations utilized in previous years. However, there is insufficient biological data to determine if ice concentrations below 6/10 are biologically relevant to narwhal, and to determine if this option would be effective in reducing potential icebreaking impacts on narwhal.
- Option 2 appears to be following current transit restrictions, with the additional mitigation of ensuring that ice concentrations 9/10 and greater are avoided along the



shipping route. There is insufficient biological information to determine if this option would be effective in reducing potential icebreaking impacts on narwhal.

- Option 3 requires use of a density threshold to determine ‘sufficient narwhal absence’, however DFO is uncertain of the feasibility of this option as it would likely require rapid analysis of the survey data to generate narwhal density.
- Option 4 requires determination of ‘sufficient narwhal presence’ in Milne Inlet and DFO comments on Option 3 apply here as well. Further, this option seems quite similar to option 3, and ‘sufficient narwhal presence’ in Milne Inlet at the beginning of the season does not necessarily indicate that these animals could not still be later displaced by icebreaking activities.
- Option 5 restricts icebreaking activities until two weeks after land-fast ice has initially fractured, at which point it is assumed that ice concentrations will be below 6/10. This option appears to be similar in nature to option 1 and more conservative compared to Baffinland’s transit restriction mitigations utilized in previous years. However, there is insufficient biological data to determine if ice concentrations below 6/10 are biologically relevant to narwhal, and to determine if this option would be effective in reducing potential icebreaking impacts on narwhal, and ice concentrations greater than 6/10 may still persist after two weeks following initial fracturing of landfast ice.

DFO recommends that Baffinland clarify if biological considerations were considered for each option, and if there is any biological significance for narwhal at ice concentrations ranging between 3/10 and 9/10.

DFO recommends that Baffinland continue to engage with the MEWG and with Inuit to review the five options proposed by Golder, as well as to determine if any other enhanced mitigation options exist that may provide greater protection to narwhal during icebreaking activities, have more biological relevance to narwhal, or have sufficient data to demonstrate potential effectiveness.

If you have any questions with the content of this letter, please contact Alexandra Sorckoff at our at 867-445-1630, or by email at [Alexandra.Sorckoff@dfo-mpo.gc.ca](mailto:Alexandra.Sorckoff@dfo-mpo.gc.ca). Please refer to the file number referenced above when corresponding with the Program.

Sincerely,



Thomas Hoggarth  
A/Regional Director General  
Ontario & Prairie Region  
Fisheries and Oceans Canada

cc: Alexandra Sorckoff – DFO-FFHPP  
Gabriel Bernard-Lacaille – DFO-FFHPP  
Alasdair Beattie – DFO-FFHPP

## Appendix I: Summary of DFO recommendations by topic

| Topic  | Recommendation(s)   |
|--|---|
| 2022 Satellite Tagging Program                                       | <ol style="list-style-type: none"> <li>1. DFO recommends that Baffinland consider alternative monitoring methodologies to acquire this information in the event that COVID-19 restrictions remain in place throughout 2022.</li> <li>2. DFO further recommends that Baffinland engage with the Mittimatalik Hunters and Trappers Organization and the Nunavut Wildlife Management Board to determine the approach preferred by these organizations for the acquisition of this data</li> </ol>  |
| Cumulative Effects   | <ol style="list-style-type: none"> <li>1. DFO recommends that an analysis of combined and cumulative effects of each of these factors should be undertaken by Baffinland, including the potential accumulation of project-related impacts on narwhal since project-related shipping began in 2015.</li> </ol>   |
| Marine Mammal Aerial Survey Program: Leg 1                           | <ol style="list-style-type: none"> <li>1. DFO recommends that Baffinland clarify how survey transects were determined for Leg 1 of the Marine Mammal Aerial Survey, and that Baffinland confirm if the satellite image of ice conditions in figure 13 is from the same day that Leg 1 survey activities were undertaken.</li> </ol>   |
| Marine Mammal Aerial Survey Program: Leg 2                           | <ol style="list-style-type: none"> <li>1. DFO recommends that the narwhal abundance estimate calculated from the 2020 Leg 2 aerial survey be compared to the narwhal abundance estimate calculated from 2019 Leg 2 Survey 5, as this survey was completed from August 29-30, 2019 and may provide a suitable comparison for the 2020 Leg 2 aerial survey results. Alternatively, the 2020 Leg 2 aerial survey narwhal abundance estimate could also be compared to the average of the abundance estimates for Surveys 3, 4, and 5 from the 2019 Leg 2 aerial survey.</li> </ol> |
| Marine Mammal Aerial Survey Program: Leg 2, Coefficient of Variation | <ol style="list-style-type: none"> <li>1. DFO recommends that Baffinland provide further details on whether the survey was completed with full photographic coverage or if a mix of photographic and visual methods were used in some strata, and if a CV was calculated for strata surveyed using multiple methods.</li> <li>2. DFO recommends that Baffinland provide details on what values were used as a correction factor to account for availability bias, and if not, a justification of why a</li> </ol>   |

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|  | <p>correction factor was not applied</p> <p>3. DFO further recommends that a detailed analysis on the CV calculation be provided for further review</p>  |
| Bruce Head Shore-based Monitoring Program                    | <p>1. DFO recommends that narwhal nursing events continue to be monitored in the future through the marine mammal monitoring programs, as these are important behaviors that could be impacted by project-related shipping activities.</p> <p>2. DFO additionally recommends that Baffinland provide any additional info acquired on these narwhal nursing events identified in the 2020 monitoring, such as the duration of each event, and the number of different nursing sessions that took place during these event</p> <p>3. DFO recommends that Baffinland provide clarification on what is meant by ‘temporary, localized avoidance behaviour’, and if Baffinland considers displacement of narwhal outside of the RSA to be ‘temporary, localized avoidance behaviour’.</p> |
| Underwater Acoustic Monitoring during Icebreaking Operations | <p>1. DFO recommends that Baffinland provide further information the depth of the acoustic recorder, the total water depth at their location, ice condition, icebreaking activities and the maximum recorded noise for each recorder</p> <p>2. DFO recommends that the implications of the discrepancy between the modelled noise level and field location of acoustic recorders be analyzed and discussed in the context of comparing measured versus modelled sound levels and associated impacts to narwhal.</p>  |
| Icebreaking Activities: Startle Response                     | <p>1. DFO recommends that Baffinland undertake an integrated analysis of narwhal tagging data, acoustic monitoring data, and vessel location data to determine if narwhal experience startle responses, and other behavioural responses, during icebreaking activities.</p>  |
| Icebreaking Activities: Congregation in Ice Leads            | <p>1. DFO recommends that Baffinland clarify the methodologies used to survey and estimate the number of narwhal in ice leads.</p>   |
| Increased Killer Whale Presence                              | <p>1. DFO recommends that Baffinland contact DFO as we may be able to provide Baffinland with additional information on killer whales in Eclipse Sound and Admiralty Inlet.</p>  |
| Pile-driving at the Pond Inlet Harbour                       | No recommendation  |
| Marine Monitoring Plan                                       | <p>1. DFO recommends that Baffinland clarify if a draft Marine Monitoring Plan has been provided for review from</p>   |

|                              |  |
|------------------------------|--|
|                              | parties, and if not, when parties can anticipate receiving this updated draft plan for review.   |
| Enhanced Mitigation Measures | <ol style="list-style-type: none"> <li>1. DFO recommends that Baffinland clarify if biological considerations were considered for each option, and if there is any biological significance for narwhal at ice concentrations ranging between 3/10 and 9/10.</li> <li>2. DFO recommends that Baffinland continue to engage with the MEWG and with Inuit to review the five options proposed by Golder, as well as to determine if any other enhanced mitigation options exist that may provide greater protection to narwhal during icebreaking activities, have more biological relevance to narwhal, or have sufficient data to demonstrate potential effectiveness.</li> </ol> |