

Attachment 2

Key issues raised in review of 2017 BIMC Annual Report to NIRB - aquatic environment

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1) Climate change and emissions monitoring:

Several Project Certificate Conditions refer to climate change and emissions monitoring, and these activities are not being undertaken and reported to the degree that the Project Certificate requires. For example, Condition No. 2 requires the Proponent to "provide the results of any new or revised assessments and studies done to validate and update climate change impact predictions for the Project." The Proponent considers this condition to be "Not Applicable", but this is not the case. The 2016 report stated that "Baffinland is developing a Climate Change Strategy, which the company aims to implement in 2017". The 2017 Annual Report (p. 33) states that "Baffinland is in the process of developing a Climate Change Strategy." Why was the strategy not implemented in 2017? Further, p. 36 indicates that "Baffinland will prepare a Climate Change Assessment as part of the Proponent's submission for the Phase 2 Expansion Project." These conditions relate to the existing Project and should not be deferred to future Project plans. The current monitoring (two meteorological stations) does not provide the full complement of information needed to monitor climate change, and furthermore, measuring impacts isn't enough, as mitigation is also required. The Project Certificate also requires monitoring and reporting of greenhouse gas (GHG), sulphur dioxide (SO₂), and NO₂ (nitrogen dioxide) emissions. Table 4.4 (Climate Impact Evaluation, p. 33) indicates that GHG, SO₂, and NO₂ emissions are within FEIS predictions, but no data are provided. Table 4.6 (Air Quality Impact Evaluation, p. 41) indicates that continuous NO₂ and SO₂ monitoring was conducted at Milne Port from March to December, and at the Mine Site in November and December. Why was this monitoring not conducted on a year-round basis? For Project Certificate Condition No. 6, are vessel emissions included? What is the breakdown of vessel-based emissions relative to other emissions? Project Certificate Condition No. 7 (p. 43) requires "continuous monitoring at land-based monitoring stations designed to capture operations-phase ship-generated SO₂ and NO₂ emissions" at the port site(s). What are the sources of emissions besides vessels, and how does the monitoring program separate ship-based emissions from other sources? For Project Certificate Condition No. 9, how are the Project's annual GHG emissions distributed among the various Project components? We note that QIA raised similar issues during the review of the 2016 Annual Report, and NIRB recommendations from the review of the 2016 Annual Report also identified deficiencies that were not adequately addressed in the 2017 Annual Report. QIA has made a number of recommendations to address these issues.

2) Aquatic impacts of dustfall:

In 2017, annual terrestrial dustfall exceeded FEIS threshold predictions at all but one of the monitoring sites at Milne Port and within 30 m and 1000 m on either side of the Tote Road (see Project Certificate Conditions 10 and 21; Table 4.6; pg. 41; see also **EDI 2018**, pgs. 13-30). These exceedances occurred despite dust suppression efforts, and suggest that modeling predictions have badly underestimated dustfall. The amount of dust entering aquatic

environments directly or in runoff from surrounding areas is unknown. The effects of increased dustfall and applications of calcium carbonate dust suppressant on aquatic sedimentation rates and aquatic biota along the Tote Road or in Phillips Creek are also unknown. Sampling suggests that the proportion of fines in sediment west of the Milne Ore Dock has increased. Alluvial transport of sediment from Phillips Creek may be contributing to this increase. Higher than predicted dustfall will likely continue and may increase. Dustfall modelling should be updated and monitoring conducted to assess the effects of dustfall on aquatic receiving environments and inform adaptive management.

3) Sediment thresholds for char egg survival:

Better information is needed on the sensitivity of Arctic char eggs to the accumulation of sediment generated by Project activities (see Project Certificate Condition 21). Sedimentation rates at Sheardown Lake NW have been elevated relative to the mine baseline period since the winter of 2015 (Baffinland 2018c). In 2017 dustfall along the Tote Road and at Milne Port exceeded FEIS threshold predictions (Table 4.6; pg. 41), the effects on aquatic sedimentation are unknown. The current 1 mm sediment thickness threshold for Arctic charr egg survival is not based on studies of Arctic char or local sediment. Collection of seasonal sediment bulk density data from Sheardown Lake or another local system (e.g., along the Tote Road) is needed to enable accurate estimations of sediment accumulation thickness. The sensitivity of fish eggs to sediment varies among species. Some species spawn and hatch in the same spring; others, like char, have eggs that incubate over the winter. Fine sediment (silt) can cause egg mortality at thicknesses of < 1 mm, and at 1 mm can effectively smother salmonid eggs causing high mortality (Lapointe et al. 2004; Louhi et al. 2008). Based on larval catches and comparison with the Reference Lake, Minnow Environmental Inc. (Baffinland 2018c) has suggested current levels of sediment deposition in Sheardown Lake are not adversely affecting hatch success. Unfortunately, pre-development baseline data are not available to support or refute this suggestion. Higher than predicted dustfall will likely continue and may increase, so validation of a sediment impact threshold for Arctic char egg survival is needed.

4) Tote Road fish passage:

QIA recognizes that the Proponent is working to remove barriers to fish passage along the Tote Road but is concerned by the number of culverts each year that are perched, obstructed, or damaged. Culvert perching in 2017 exceeded FEIS impact predictions (Table 4.16; pg. 114) (see Project Certificate Conditions 45 and 47). During a survey in early July 2017, issues with fish passage and/or habitat were observed at 12 crossings. Ten of these crossings were actively worked on in 2017 and work is planned to continue in 2018 (pg. 113-114; see also Baffinland 2017). Shipping containers were removed from stream crossing BG-50 in November 2016 but the culvert was perched in 2017 and requires additional remediation and monitoring (Baffinland 2017). The proponent is encouraged to develop proactive approaches that prevent obstructions to fish passage and eliminate the need for follow-up remediation.

5) Prevention of non-native species introductions:

Measures to prevent introductions of non-native species via ship's ballast water and hull fouling

are reactive, rather than proactive. The only measure designed to actively prevent introductions is testing the salinity of 1 ballast water tank per incoming vessel (Project Certificate Conditions 89). Its goal is to verify that open-ocean exchange of ballast water has been conducted to reduce biota entrained at coastal ports. Each vessel can have up to 20 or more ballast water tanks; so much uncertainty remains regarding exchange compliance. There is also uncertainty regarding measures that have been, or will be, taken by the Proponent when vessels are found to be non-compliant. None of the tanks is tested for the presence or abundance of potentially invasive species, so uncertainty regarding the efficacy of exchange for eliminating non-native species is even greater. Lack of compliance testing and of data on the identity and abundance of species in the arriving ballast water mean that the risks associated with discharging ballast water, and associated species, into Milne Port cannot be adequately assessed to inform adaptive management. Treatment of ballast water may not solve these problems and none of the incoming ships has yet been tested for hull fouling species. With more vessels arriving from more ports, and the potential for future increases, a more proactive approach is required to prevent introductions of non-native species.

6) Detection of non-native species:

Monitoring for the presence of non-native species in Milne Inlet is useful for verifying that current efforts have failed to prevent their arrival (see Project Certificate Conditions 87, 88, 91). Evidence of failure should catalyze adaptive management responses designed to prevent further arrivals, including measures to properly assess risks and ensure ballast water exchange and treatment compliance and efficacy. This response relies on the monitoring program being able to capture non-native species, identify them, and assess the risk they may pose. In 2017 "[n]one of the macroflora, benthic epifauna, or fish taxa observed during the AIS surveys in 2017 were identified to be invasive" (2017 Baffinland Annual Report to NIRB; Table 4.22, pg. 194). In fact, provided they were correctly identified, four of the species captured may be non-native, one of them invasive. *Monocorophium insidiosum*, a tube-dwelling crustacean, is an invasive fouling species unlikely to be indigenous in Milne Inlet. *Polycarpa pomaria*, a tunicate, is native to the northeastern Atlantic Ocean. A fish (*Apodichthys* sp., F. Pholidae) and a bivalve (*Mya arenaria*) that were also reported well outside their known ranges were likely species indigenous to the area that had been misidentified (*i.e.*, *Pholis fasciata* and *Mya truncata*), otherwise they too are likely non-native. The presence of some, perhaps all of these taxa is evidence that efforts at preventing species introductions may not be effective and that adaptive management is required to prevent introductions in 2018. To its credit the monitoring program caught these species, but greater care must be taken to verify the identity of potentially non-native species and to assess the risks they pose.

7) Shipboard observers:

Project Certificate Conditions No. 106-108 and 123 all speak to the shipboard observer (SBO) program. Many of these conditions spoke to the role of SBO on the purpose-built ore carriers that were proposed for the original Project but have since been deferred. It was not possible to place SBO on chartered ore carriers due to a lack of berth space, but observers were placed on fuel tankers from 2013 to 2015, with the program evolving over time (*e.g.*, picking up observers

off Pond Inlet in 2014 and 2015 via shore-to-ship transfer in a small vessel, rather than have them embark from Quebec City as was done in 2013). Observer coverage was also very limited (2-3 transits per shipping season). The Proponent cancelled the original program due to concerns about personal safety risk and a lack of data being collected, with the intent (see condition 106) "to seek alternative means of community-based monitoring [CBM] for interactions of vessels with marine mammals." Alternative program options (increasing shore-based monitoring, CBM) have been recommended by QIA for consideration, but progress on the establishment of alternatives has been inadequate. Meetings on this subject have been scheduled but then cancelled for various reasons (e.g., weather-related travel issues), and as it has been two years with no observers, moving this forward is a priority. In their review of the 2016 Annual Report, NIRB identified concerns related to non-compliance with these conditions. QIA shares these concerns. The Board requested that the Proponent develop an alternative strategy for monitoring vessel interactions with marine mammals and seabirds, also has not been completed. In autumn 2017, the Proponent engaged the Canadian Coast Guard for ice management services, although this is not discussed in the Annual Report. An ice management company will be engaged for the 2018 shoulder seasons, although details are currently lacking. The Proponent has indicated that SBO will be placed on the ice management vessels (IMVs), but QIA notes that this limited use of SBOs will not be enough to meet the intent of these Project Conditions, and consideration of alternatives is still required.

8) Vessel deviations and communication of shipping schedules:

Project Certificate Condition Nos. 105 and 120 require that Project vessels follow speed limits and minimize deviations from the nominal shipping route. Ore carriers effectively followed these requirements in 2017, but re-supply vessels did not. The Proponent has acknowledged this and is making changes to ensure that all Project vessels are aware of these requirements. The most recent update, provided in 23 April 2018 files submitted to MEWG members, confirms that adaptive management measures will be implemented with respect to maximum vessel speed (maximum 9 knots), course maintenance, and specific shipping and berthing/anchoring directives. QIA is pleased to see these adaptive management measures being implemented in the 2018 shipping season. QIA recommends that the Proponent carefully monitor vessel movements throughout summer 2018 and have near real-time capability for adaptive management, should vessels not maintain straight course and constant speed, use excessive speeds, or deviate from the nominal route.

Vessel movements also need to be communicated to local harvesters, and Project Certificate Condition Nos. 102, 164 and 166 all concern the tracking and communicating of shipping information to community members. Residents of north Baffin communities, particularly Pond Inlet, have raised numerous concerns about the suitability of the Proponent's vessel tracking and reporting system. QIA has sent several letters to BIMC discussing these issues (May 20, 2016; July 25, 2017), which remain outstanding. In 2017 the system for shipping notifications and communication of ship traffic information to communities was still inadequate relative to the requirements of NIRB Project Certificate and those in the Inuit Impact and Benefits Agreement (IIBA). Baffinland developed the AIS Vessel Tracking application for reporting real-time ship positions on the company website, and has put substantial effort and resources into developing

this program. This helps fulfill some Project requirements (e.g., the real-time data reporting requirement of Condition 164) but does not completely satisfy the conditions with respect to shipping schedules. The system gives no indication of future activity/vessel status information, for example, and this information would help harvesters plan their activities. In previous letters to BIMC, QIA identified the use of community radio and VHF radio announcements in combination as the best option for local communication. The use of both FM and VHF radio reaches the greatest number of people, both within the community and those already engaged in traditional activities outside the community. Having ships' masters make position reports on the VHF radio channel(s) utilized by harvesters would avoid a costly overhaul to the AIS system or extensive community FM radio announcements, and take advantage of the multiple VHF repeater stations established in Eclipse Sound. Baffinland, QIA and the community have been actively discussing improvement to communications procedures, and QIA and community groups remain committed to assisting the company in developing effective communication procedures. QIA strongly recommends working with the community of Pond Inlet to develop and test communication protocols. A Pond Inlet Mary River Community Group already exists for these purposes. QIA notes that discussions between QIA, the Proponent, and the Pond Inlet community are being scheduled, and discussion is on-going.

9) Marine mammal monitoring, thresholds and indicators:

The Proponent has conducted extensive marine mammal monitoring along the northern shipping route, as mandated by a number of Project Conditions (e.g., 99, 101, 104-112), but there are deficiencies within the program. Project Certificate Condition No. 109, for example, requires monitoring in Milne Inlet, Eclipse Sound and Pond Inlet. The Bruce Head shore-based program is effective at monitoring some Project interactions, but "does not provide information on larger-scale movements of whales", as noted by the Proponent. Previous studies (e.g., the 2016 aerial surveys analyzed by Golder) and Inuit knowledge both show that narwhal range widely in the region, and areas like Eclipse Sound are heavily used on occasion. This highlights the need for monitoring activities at the other locations/spatial scales. The tagging study will address some of these issues but is not yet available, so QIA is unable to determine the degree to which the Proponent is in compliance with this condition.

Project Certificate Condition No. 110 established the need for "a monitoring protocol that includes, but is not limited to, acoustical monitoring, to facilitate assessment of the potential short term, long term, and cumulative effects of vessel noise on marine mammals and marine mammal populations." Passive acoustic monitoring (PAM) was conducted in 2014 and 2015, but the available reports did not analyze the dataset to the extent possible. As noted above, the narwhal-based acoustic monitoring conducted in 2017 also has not yet been reported. QIA acknowledges that there is a large volume of data generated by the narwhal-tagging studies, and that data processing and analysis needs are intensive. However, the value of tagging is reduced if results are not available in time to inform the next shipping season, including the 2018 season.

As noted by the Proponent, there has been little to no progress towards developing early warning indicators of negative impacts of vessel noise. The Annual Report notes that the

Proponent and their consultants "are holding discussions with the MEWG to determine the best approach to meet this condition", but there has been no substantive discussion to date. The Proponent plans to consult with the MEWG in 2018 to "consider what elements could be incorporated into the monitoring programs to provide an early warning indicator for rapid detection of adverse impacts on marine mammal such as reduced population growth." QIA notes that the company has had many years to initiate these discussions, with no progress. As NIRB stated in its 2016 review, condition 110 requires the Proponent to develop a monitoring protocol and determine appropriate early warning indicators. The Board requested that the Proponent provide information on how it intends to work with the MEWG to develop its early warning indicators of negative impacts of vessel noise on marine mammals, and that the Proponent "report on the specific indicators being developed noting how the Marine Environmental Working Group has been involved in identifying such indicators for use, including a description of how the indicators are to be used to inform marine mammal-vessel interactions." This information was to be included within the 2017 Annual Report. The Proponent has also acknowledged that it is non-compliant with Project Certificate Condition No. 111. QIA is concerned by the lack of progress on development of clear thresholds for determining whether negative impacts are occurring, and recommends that these discussions be given priority to ensure they proceed in a timely fashion.