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May 6, 2022

RE: Eclipse Sound narwhal abundance decline

Dear David Qamaniq,

Further to our last letter, dated April 29th, and the Baffinland Marine Environment Working Group conference call this week, Oceans North recommends significant mitigation measures be taken by Baffinland to reduce shipping intensity in an effort to protect summering narwhal populations and in the context of steep population decline in this region.

A growing body of evidence, from harvesters and biologists, suggests that the narwhal population in Eclipse Sound is less than a quarter of what it was before active Baffinland shipping began and further decline could lead to the abandonment of animals from your area. Underwater noise monitoring and numerous narwhal studies in the region suggests that there may be a correlation between narwhal decline and increased shipping. Therefore the precautionary principle should be applied. The principle stipulates that governments shall be obligated to restrict or ban activities that *may* cause serious and/or irreversible harm to human health and the environment, even without fully established scientific evidence of a causal relationship. NIRB has also required that adaptive management of this project be guided by the precautionary principle. Consequently, the most precautionary mitigation measures with biological relevance should be applied to shipping operations.

We suggest an urgent meeting be called to discuss adaptive management options for the upcoming shipping season. It is our opinion that ice breaking should not occur this year and further that a limit be placed on the number of vessels in Eclipse Sound and Milne Inlet. Term and Condition 110 and 111 for the existing project are clearly deficient and there is no indication in the 2022 monitoring plans that Baffinland is further developing Early Warning Indicators or shifting their monitoring programs to understand the significant reductions of narwhal in Milne Inlet and Eclipse Sound. Finally, any ultimate decision regarding Phase 2 must take into consideration the best and most recent evidence regarding narwhal health and numbers in this region.

Please note that despite our serious reservations regarding the management of this project, Oceans North remains hopeful that this project will result in significant development benefits for the people of this region and that the proponent will succeed in operating an environmentally responsible mine on Baffin Island. We believe that responsible shipping, the protection of marine life and Inuit harvesting can be achieved.

Please see the attached memo on our assessment of the decline in narwhal numbers.

Sincerely,

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cc: Members of the Marine Environment Working Group

Assessment of Eclipse Sound narwhal population decline

The narwhal population in Eclipse Sound continues to show a significant decline. The 2020 aerial survey (Golder for Baffinland, April 7 2021) suggested a 50% reduction compared to historical estimates. 2021 numbers show an additional decline in this population which is significant compared to the years prior, and is near 20% of its original size (Table 1).

Table 1. Stock Assessment Estimates for Eclipse Sound Narwhal (from Golder, 2021)

Year	Abundance	Data Source
2013	10,489	Doniol-Valcroze et al. 2015
2016	12,039	Marcoux et al. 2019
2019	9,931	Golder 2020
2020	5,018	Golder 2021
2021	**2, 595**	**Golder 2022**

Suggestions have been made that the decline could be due to a number of factors including killer whales, small craft harbour development, and natural phenomena. Evidence to support these hypotheses are not available. Killer whales have been in this region for a long time, with records reaching back to mid 1800's in the Pond Inlet area (Higdon et al., 2012; Reeves and Mitchell, 1988) and small craft harbour construction (impact pile driving specifically) occurred for a short period of time – 7 days total between June 24 and July 1 2020. Additionally Inuit have reported changes in narwhal abundance, distribution, and behavior in response to the increased presence of project-related ships (QIA Tusaqtavut Study; June 14, 2019) and discussion with local hunters suggest that narwhal numbers have never been this low and a natural shift to another location is unlikely.

Shipping is the single largest environmental change in the Eclipse Sound region and has steadily increased in the last six years (Figure 1). Although no single source can be proven without a doubt to affect narwhal numbers, Oceans North, DFO, the MHTO, and Baffinland have all provided data (changes in distribution, changes in abundance, changes in distribution, changes in proportions of calves, higher cortisol levels, and changes to the underwater habitat due to noise from ships) that indicates disturbance and suggests that there may be a correlation between increased shipping and the declining numbers of narwhals.

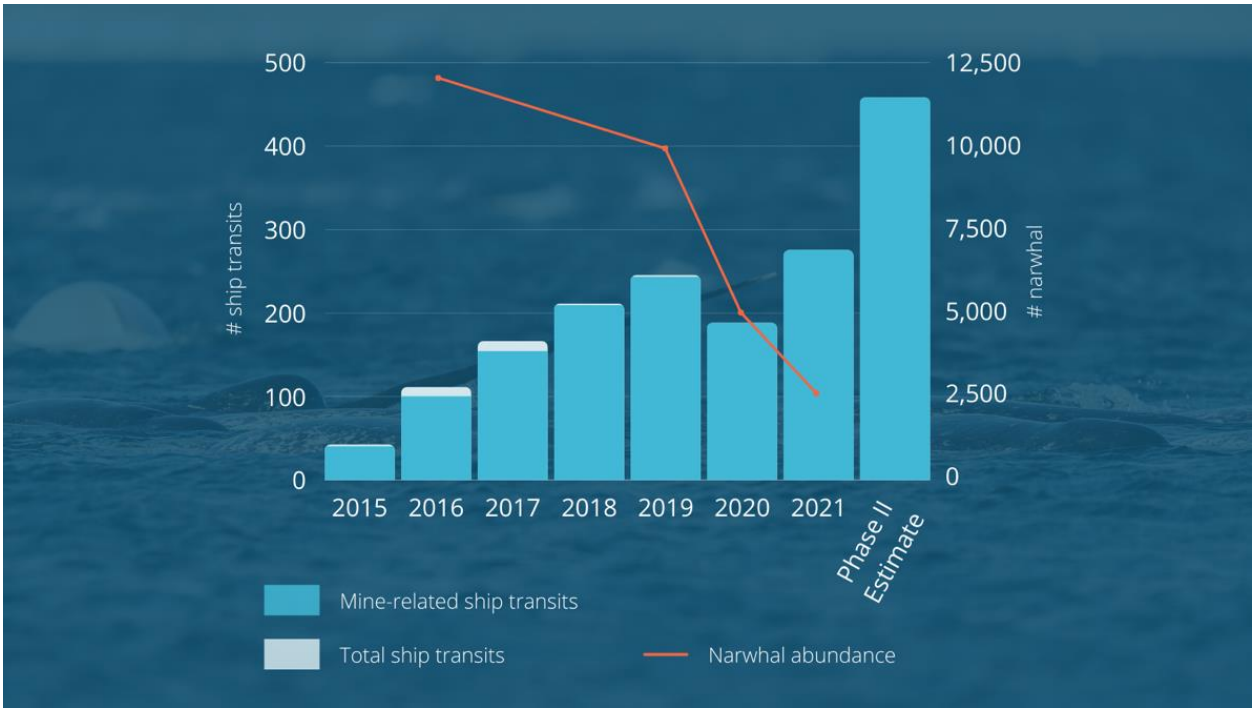

Figure 1. Narwhal population estimates (2016-2021) and ship transits in Milne Inlet, Nunavut

Through our long-term acoustic monitoring program in the region, carried out in collaboration with the Scripps Institution of Oceanography (SIO), we know that ships are much noisier than almost any other natural sounds underwater and that underwater noise from large ore carrier ships can be easily detected from more than 10 km away (Jones et al., 2021). Noise from some ships can be detected underwater by our hydrophones from more than 30 km away.

The information provided by Baffinland, Oceans North and others suggests that a precautionary approach to Baffinland shipping is required at this time until further information becomes available to disprove the role of shipping in disturbing narwhals. Options to reduce the current impact on narwhals, based on information currently available including Baffinland aerial survey and behavioral response data and independent acoustic research in partnership with Oceans North, include:

- Further reduction in speed, where this may reduce noise exposure
    - Reduced vessel speed is known to lower the levels of underwater noise from ships. While a general rule has been applied to reduce Baffinland ship speed to 9 knots, some vessels or vessel types may require further reductions in speed to achieve lower underwater noise levels.
- Reduction in the number of vessels in transit in Eclipse Sound and Milne Inlet at any one time
    - Analysis from Baffinland's 2015 aerial survey suggested that a decline in narwhal densities was related to the presence of three or more vessels in a given area.
- Reduction in the number of vessels at anchor in Eclipse Sound at any one time.
    - Vessels at anchor emit underwater noise continuously due to operation of onboard machinery. Each additional ship at anchor adds to the total underwater noise levels and may increase the footprint of animal disturbance surrounding the anchorage area.

- No ice breaking in the region at any time
    - The first large jump in narwhal decline was seen in 2020. That year narwhal were concentrated in a small number of leads prior to the first ice breaking transit (July 21, 2020). The first transit (one ice breaker, two ore carriers and two tugs) passed in close proximity to these leads, that was noted to contain mothers with calves (Golder for Baffinland, September 7 2021)

Suggestions for these mitigation options are based upon Baffinland aerial survey data and on the results of independent acoustic studies carried out in partnership with Oceans North. Scripps Institution of Oceanography analyses of acoustic data (Jones, 2021) combined with Baffinland studies of narwhal behavioral responses to ships indicate that narwhal are likely more sensitive to man-made underwater noise than other species of marine mammals and may require special considerations to prevent long-term negative effects of increased shipping.

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