Stephanie Autut
Executive Director
Nunavut Water Board

November 2, 2021

Re: Application for Amendment to Water Licence No. 2AM-MRY1325 associated with the "Phase 2 Development" Project Proposal submitted by Baffinland Iron Mines Corporation

Dear Stephanie,

Please find enclosed a copy of Baffinland Iron Mines Corporation's ('Baffinland') responses to technical comments received on in relation to the Application to Amend Type A Water License 2AM-MRY1325, August 2018, updated September 2021 (the 'Application') for Phase 2 of the Mary River Project.

Comments were received from Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), Environment and Climate Change Canada (ECCC), and the Qikiqtani Inuit Association (QIA). Fisheries and Oceans Canada (DFO) has indicated they will provide updated comments in advance of the technical meeting to be held on November 12, 2021.

This submission provides responses to a majority of the technical comments provided by the Parties listed above. Due to the limited time available for Baffinland to provide responses as a result of the extension granted to Intervenors, Baffinland will provide its written response to the balance of remaining comments by end of day on November 4. Baffinland will also work directly with Parties to advance issue resolution prior to the technical meeting.

For any questions or clarifications please do not hesitate to contact the undersigned for further information.

Best Regards,

Lou Kamermans
Senior Director – Sustainable Development
Baffinland Iron Mines

cc: Karen Costello, Cory Barker, Tara Arko (NIRB)
Karén Kharatyan, Assol Kubeisinova (NWB)
Jared Ottenhof, Chris Spencer (Qikiqtani Inuit Association)
Bridget Campbell (CIRNAC)
Alasdair Beattie, Alexandra Sorckoff, Gabriel Bernard-Lacaille (DFO)
Margaret Fairbairn, Melissa Pinto (ECCC)
Megan Lord-Hoyle, Steve Borcsok (BIM)

Partial Responses to October 2021 Technical Comments
Application to Amend Type A Water Licence 2AM-MRY1325

November 2,2021

Baffinland Iron Mines Corporation
Mary River Project – Phase 2 Proposal
Type A Water Licence No. 2AM-MRY1325

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CROWN-INDIGENOUS RELATIONS AND NORTHERN AFFAIRS CANADA

ID#	Document Reference	July 2019 Recommendations/Requests	Baffinland's August 2019 Response	Intervenor's October 2021 Status Update	Intervenor's October 2021 Recommendations/Requests	Baffinland's November 2021 Response	Attachment
CIRNAC-TR#1	Mary River Phase 2 Proposal Update (Knight Piésold, May 2, 2019); Section 4.3 and Attachment 29 Interim Waste Rock Management Plan (Golder 2019); Section 2	1) CIRNAC maintains our request that the updated Phase 1 Waste Rock Management Plan that BIMC committed to developing by the end of December 2019 be provided to CIRNAC for review. 2) CIRNAC recommends that the Phase 1 Waste Rock Management Plan be finalized and approved prior to initiating the increased ore production rate associated with Phase 2. 3) In addition, CIRNAC requests that BIMC continue to provide CIRNAC frequent updates on other research plans and activities that directly or indirectly relate to predictions of waste rock geochemistry, seepage and water quality as they become available.	Baffinland will submit the updated Phase 1 Waste Rock Management Plan in December 2019. Baffinland maintains that this is an operational document, and that approval of this plan is independent of the Phase 2 process and will be required regardless of the permitting timeline for Phase 2. Updates on the investigation and strategy to address the Waste Rock Facility have been regularly provided to all stakeholders, and Baffinland will continue to engage all interested parties to provide updates.	R-01 Resolved			
				R-02 Ongoing		While Baffinland maintains that the Ph1 WRMP is independent of the Phase 2 Proposal, we agree to have this plan reviewed and approved before initiating the increased ore production rate associated with Phase 2. Note the Rev B version of this plan included with the Updated Water Licence Application is consistent in content with the Rev 3 but with additional adaptive management including a trigger action response plan.	
				R-03 Ongoing		Yes, Baffinland has been and will continue to provide updates to CIRNAC on research plans and activities that directly or indirectly relate to predictions of waste rock geochemistry, seepage and water quality.	
CIRNAC-TR#2	Mary River Phase 2 Proposal Update (Knight Piésold, May 2, 2019); Section 4.3 and Attachment 29 Attachment 29 - Interim Closure and Reclamation Plan (BIMC 2018e); Sections 5.2.1.1 to 5.2.1.9 and Appendix D1 and D2 Research Plans CIRNAC IR #3; CIRNAC, November 23, 2018	4) CIRNAC recommends that prior to commencing work on the advancement of the open pit, BIMC demonstrate a thorough understanding of the future pit conditions including methods and timelines for pit flooding, geochemistry and ARD/ML potential of waste rock and pit walls based on information/data obtained through the numerous research commitments stated in the ICRP. Periodic updates to the ICRP will need to be completed to include the results of research programs and their implications with respect to pit development and closure planning.	Deposit 1 remains a hilltop outcrop, and development of the pit was projected to occur after 10 years of full-scale production for the Approved Project. Baffinland has committed to reclamation research through the most recent revision of the ICRP so that prior models on pit flooding, geochemistry and ARD/ML potential presented in the FEIS can be validated with observations from active mining of the deposit and further assessment of local hydrology. Results of the reclamation research programs will be incorporated into future versions of the ICRP, as intended.	Commitment		Baffinland will continue operational monitoring and advance studies to refine closure predictions related to future pit conditions. The requirement to further refine modelling for pit flooding and water chemistry is built into the ICRP, which states in Section 5.2.1.4 that "The mining plan and the ongoing waste rock characterization plan will inform the prediction modeling of the mine pit water quality at the end of mine life." A specific condition is not required in the Water Licence for this work, given the ICRP forms part of the Licence.	

CIRNAC-TR#3	Mary River Phase 2 Proposal Update (Knight Piésold, May 2, 2019); Attachment 29 - Interim Closure and Reclamation Plan (BIMC 2018e)	5) CIRNAC requests that BIMC update the ICRP to appropriately address the issue of information gaps by including missing information, or updating contradictory or outdated information, in the sections identified in TR#3.	Baffinland appreciates the review and feedback provided by CIRNAC on the ICRP, and will incorporate these comments into the updated draft of the ICRP to be provided in advance of the Technical Meeting.	Ongoing		Baffinland commits to incorporating CIRNAC's comments in the updated ICRP and reclamation security estimate, aiming for prior to the NWB public hearing. The timing is contingent on advancing work on the ICRP with the Qikiqtani Inuit Association.	
CIRNAC-TR#4	Mary River Phase 2 Proposal Update (Knight Piésold 2019, May 2, 2019)	6) CIRNAC requests that the Blasting Management Plan and the Quarry Management Plan QMR2 are submitted for review in advance of the Technical Review meeting.	The QMR2 Quarry Management Plan will be updated if the quarry limits require expansion. Updates to Quarry Management Plans for quarries on Inuit-Owned Land are managed under Baffinland's Commercial Lease. The Blasting Management Plan will be reviewed to determine its adequacy for rail construction, and if updated, will be provided for review in advance of the technical meeting.	Resolved			
CIRNAC-TR#5	Mary River Phase 2 Proposal Update (Knight Piésold 2019, May 2, 2019) Railway Emergency Response Plan (Baffinland, May 13, 2019) Railway Operation and Maintenance Management Plan (Baffinland, May 13, 2019); Section 9.2 Attachment 28 - Environmental Protection Plan (Baffinland, May 1, 2019); Section 2.26	7) CIRNAC recommends that the Railway Emergency Response Plan be further updated to include the following information: a. Procedures identifying the medical services that should be contacted in the event of injuries, the first aid responses that should be executed at the site of the accident, and the modes of transportation that should be used for injured persons depending upon the location of the accident and ambient conditions; b. Company personnel and government departments that require advisories of an accident/incident; c. Type and location of emergency equipment and the procedures to be followed in the event of a derailment, including check lists and accident reports; and d. Information on health and safety emergencies.	A revised version of the Railway Emergency Response Plan is provided in Attachment 01. This draft Plan will be updated further prior to the commencement of railway operations.	Resolved			

CIRNAC-TR#6	Modification Request No. 12 – Milne Port Stockpile #1 and Water Management Expansion (Baffinland, May 3, 2019); Attachments 3, 4 and 5 Modification No.12 Attachment 5 – Civil Design Philosophy (Hatch 2018); Section 6.6	8) CIRNAC recommends that BIMC revise its design storm criteria from the 1:10yr 24 hour to a minimum of 1:25 year storm for the design of the new sedimentation ponds at the Milne Port associated with the expansion of the stockpile facilities. 9) CIRNAC recommends that BIMC revise its Civil Design Philosophy design storm criteria from the 1:10yr 24 hour to a minimum of 1:25 year storm for the design of any future permanent Life of Mine sedimentation ponds.	Sedimentation ponds designed for the Approved Project have utilized the 1:10 24 hr storm presented in the Civil Design Philosophy. Application of this design criteria for new infrastructure is consistent with its previous application.	R-08 Ongoing R-09 Ongoing	Appropriate planning, design, and construction of facilities is needed for the effective management of site water erosion and sedimentation to ensure potential impacts are minimized during all times of the year over the life of the project. CIRNAC reiterates recommendation numbers R-08 and R-09 that BIMC revise its storm design criteria for sedimentation ponds, and suggests that BIMC also assess the feasibility of expanding existing sedimentation ponds to meet the MSWMP design criteria. CIRNAC supports the initiative to address the past and ongoing erosion issues at the Mine Site and would appreciate additional schedule details on implementation of the plan.	With respect to CIRNAC's request to expand the exsiting sedimentation ponds to the design criteria adopted in Modification Request No. 13, the existing crusher pad pond will be replaced by a future SDLT-1 pond designed to the Modification Request No. 13 criteria. The design criteria for the WRF pond will remain unchanged for now, as the current design criteria (1 in 10-year, 15-day storm; 310 mm) reflect both the expected lifespan of that facility as well as the holding time required for water treatment. As part of ongoing water management planning at Milne Port, Baffinland is currently evaluating the appropriate design criteria considering site-specific conditions including the lifespan of the faciliites, our experience with settling times before discharge, and site-specific climatic conditions at Milne Port, which notably drier compared to the mine. The schedule for implementation is presented in Modification Request No. 13.	
CIRNAC-TR#7	Mary River Phase 2 Proposal Update (Knight Piésold 2019, May 2, 2019) Railway Operation and Maintenance Management Plan (Baffinland, May 13, 2019); Section 3.3	10) CIRNAC requests that dust monitoring data and any other relevant information, if available, are provided to assess potential environmental impacts to surface water/snow from dust generation along the northern transportation corridor from the railway and truck traffic.	Information on the low potential for ore dusting from rail cars is provided in an email to the GN following a Terrestrial Environment Working Group meeting on Phase 2 management plans, dated Feb 14, 2019, and provided as Attachment 02. Baffinlands ore dusting exposure assessment (TSD 11) reviewed the chemistry of dustfall from stations along the Tote Road and at the Mine and Port, and this demonstrated that while the ore dust at the Project sites have the chemistry resembling the ore, the dust generated by the Tote Road does not have chemistry resembling the ore. Dust monitoring data is reported annually to the NIRB through the Terrestrial Environment Annual Monitoring Report, which can be found in the NIRB public registry or on Baffinlands document portal (http://www.baffinland.com/document-portal-new/?cat=5&archive=1)	Ongoing	To confirm predictions, CIRNAC maintains recommendation R-10 that BIMC continue to monitor dust deposition impacts from ore blow-off on the freshwater receiving environment throughout the lifetime of the project, to provide updates as they become available, and implement approved mitigations if significant effects are observed. CIRNAC would consider this comment resolved with a commitment from BIMC.	The lakes and streams within the Mine Site receive comparatively high levels of deposited ore dust, compared to the transportation corridor, as acknowledged by CIRNAC. For this reason, the Aquatic Effects Monitoring Program at the mine includes a lake sedimentation monitoring program in Sheardown Lake NW. If ore dust generated by the Project had the potential to adversely affect fish populations, it would be detected first by this monitoring program. In response to the QIA's Final Written Submission QIA-41 in the NIRB review, Baffinland committed to lower the lake sedimentation threshold in this monitoring program (Commitments 148 and 200). The latest draft SWAEMP (Attachment 22 of the Updated Application) adopts the lower sedimentation threshold.	

CIRNAC-TR#8	Mary River Phase 2 Proposal Update (Knight Piésold, May 2, 2019); Attachment 29 - Interim Closure and Reclamation Plan (BIMC 2018e)	11) CIRNAC requests that BIMC update the ICRP to appropriately address the concerns raised in TR#8 surrounding insufficient financial security by updating the ICRP to increase Interim Care and Maintenance and Post Closure Monitoring time as suggested by CIRNAC.	Baffinland appreciates the review and feedback provided by CIRNAC on the ICRP, and will incorporate these comments into the updated draft of the ICRP to be provided in advance of the Technical Meeting. Baffinland does not believe an adjustment to security is required for the open pit, as the deposit remains a hilltop outcrop and not an open pit. As security for the project is currently revised on an annual basis, there is no need to assess and hold security for a scenario that has not yet occurred and will not in the coming year.	R-11 Ongoing		Future iterations of the ICRP will evaluate the need for increased Closure and Post Closure Monitoring. Baffinland maintains that the duration of closure activities (3 years) is adequate given the total person-hours required to execute the closure and assumed crew sizes, and that the post closure monitoring phase is sufficient given that there are no significant adverse residual effects identified in the FEIS for VECs or VSECs associated with the Project.	
		12) Given current measured acidity in waste rock seepage, CIRNAC recommends that a cost for open pit water treatment be included in the security until such time that treatment is shown to not be needed.		R-12 Ongoing		Baffinland maintains that no adjustment to security is required for the open pit, as the deposit remains a hilltop outcrop and not an open pit. There is no need to assess and hold security for a scenario that has not yet occurred and will not for a number of years.	
CIRNAC-TR#9	Nunavut Water Board Water Licence No. 2AM-MRY1335 – Amendment No. 1, Baffinland Iron Mines Corporation, Mary River Iron Mine, Signed by Thomas Kabloona on July 21, 2015.	13) CIRNAC proposes that all parties use the opportunity for any future amendments to Water Licence 2AM-MRY1325 – Amendment No. 1 to change the procedure for the Annual Security Review to one of the following options: a. A phased approach with security applied in tranches, as is used on other mining projects; b. Decreasing the frequency of the security review to occur every 5 years rather than every year; or c. Other suggestions made by interested parties.	Baffinland agrees with CIRNAC that the current amendment to the Type A Water Licence provides an opportunity to review current practice for setting and updating security for the project and is open to considering changes, subject to further review and discussion with all parties. Baffinland recognizes that QIA as the landowner will ultimately need to approve any changes to the security review process. Baffinland will engage QIA on this matter and any agreed upon path forward will be presented to the Board.	Ongoing		Baffinland continues to agree with CIRNAC that the current amendment to the Type A Water Licence provides an opportunity to review current practice for setting and updating security for the project and is open to considering changes, subject to further review and discussion with all parties. Baffinland is open to discussing options during the technical meeting but recognizes that QIA as the landowner will ultimately need to approve any changes to the security review process.	

CIRNAC-TR#10	Borrow Pit and Quarry Management Plan, Section 3.0, Implementation, Section 5.0, Monitoring; WL 2AM-MRY1325 - Amendment No. 1, Part D Item 9			New	14) CIRNAC recommends that BIMC provide additional text in the plan to discuss the development of the borrow sources and their impact on the permafrost regime on a borrow-by-borrow source/quarry-by-quarry evaluation. Furthermore, CIRNAC recommends details also be provided on how borrow area developemnt will be done on a case-by-case basis to minimize the potential long-term damage to the permafrost regime.	Most of the material for rail construction will be from rock quarries and not borrow pits. Nonetheless, overburden (some of which may be ice-rich) will be encountered during quarry development. Geotechnical investigations to date provide some delineation of ice-rich and ice-poor areas as a starting point for understanding which quarries pose a potential concern from a permafrost perspective. Baffinland plans to complete exploratory drilling to verify material characteristics and overburden thicknesses that require stripping, and to identify the presence of ice or thaw-sensitive soils that can either be avoided or planned for in quarry design. Identified permafrost issues will be managed by applying measures identified in each quarry-specific management plan. Generic measures for dealing with permafrost during borrow pit development are described in Appendix D of the Borrow Pit and Quarry Management Plan. Designs established for excavations and cuts in ice-rich and ice-poor soils along the railway will be applied to excavations in overburden encountered in the rock quarries. Slopes will be monitored against any destabilizing of the cut surfaces. If necessary, cover materials will be placed or cut slopes altered to reduce potential thawing. **Commitment**: The above additional text will be added to the Borrow Pit and Quarry Management Plan.	
IRNAC-TR#11	Geotechnical Studies - Geotechnical Recommendations for North Railway, Hatch, Rev. 0, Apr. 26, 2019			New	15) CIRNAC recommends that BIMC undertake supplementary investigation work within the Route 3 realignment to complete the geotechincal assessment of the Northern Railway, and integrate the findings into a management strategy to minimze the impact of construction on permafrost.	A geotechnical field program was recently completed in summer 2021. Laboratory testing work is currently underway and the results and an updated report will be made available when the work is completed. Baffinland expects this work will be complete by February/March 2022. This work will inform design but will	

						not further influence the overall alignment in a major way.	
CIRNAC-TR#12	AEMP; BMP; FWSSWMP			New	16) CIRNAC recommends that the following updates, which have not been addressed in other TRCs, be made to the Management Plans listed. a) Aquatic Effects Monitoring Plan: provide for review prior to the Techincal Meeting. b) Blasting Management Plan: Update to include procedures and blasting of frozen ground and for spoils management. c) Fresh Water Supply, Sewage, and Wastewater Management Plan: Update to include the new Mine Site stations added to the SNP based on Modication No. 13, and the water withdrawal volunes to indicate the proposed volumes under the Updated Amendement Application. Note - recommendations R-16d and R-16e are minor suggestions for editorial purposes and would not impede approval of the amendement: d) Draft Emergency Reponse Plan and Draft Spill Contingency Plan: For consistency with other plans that have been updated, BIMC might consider reorganizing in the next update to ocnform with ISO 14001:2015, and to include sections on IQ consideration and adaptive management. e) Waste Management Plan: for clarity, BIMC might consider updating to remove references to the Roads Management Plan.	AEMP - The AEMP is currently available on the public registry. Blasting Management Plan - Procedures for blasting of frozen ground will be added to the next update. Baffinland suggests that the management of spoils is best handled in the Borrow Pit and Quarry Management Plan. Fresh Water Supply, Sewage and Wastewater Management Plan - this plan will be updated incorporating changes to the SNP program and proposed water withdrawal volumes. Draft Emergency Response Plan and Draft Spill Contingency Plan - Baffinland suggests that as response plans, they do not lend themselves to adopting CIRNAC's recommended changes. Waste Management Plan - the editorial issues are noted and will be addressed in the next revision. Plan updates will be filed with sufficient review time ahead of the NWB public hearing.	

CIRNAC WRMP R-01					CIRNAC recommends that BIMC revise Section 9.2 to reflect the actual site water management issues with regard to the WRF [Waste Rock Facility] and how BIMC now plans to address and manage them, as outlined below: I. clearly state that water treatment as needed will be through the use of the HDS [High Density Sludge] plant; II. provide information on the design, operation, control and monitoring of the pumping systems to the water treatment plant; III. provide a detailed discussion with specific, relevant information with respect water treatment plant design, operations and monitoring, as appropriate; IV. expand the discussion of sludge management to provide more specific information on practices to be followed; and V. add the commitment that in the event of in-pond water treatment, BIMC will complete the evaluation and record keeping required to ensure there is no long-term impact on pond capacity, as outlined in CIRNAC comment 1 i. an estimate of volume of sediment to be produced; ii. an assessment of the need for standby pond capacity; iii. details regarding the procedures for sediment handling, transport, and disposal; and iv. monitoring and sediment disposal record keeping practices.	Baffinland provided a response to this technical comment on July 30, 2020. Baffinland will continue to work with CIRNAC to address this ongoing concern through the collection of additional data.	
CIRNAC WRMP R-02					CIRNAC recommends that BIMC update and calibrate the water balance model for the Waste Rock Facility, as per the recommendations provided by Golder (2019), with reliable measurements of pond water elevation, surface water flows, and site climate data. Predictions of pond water quality should also be updated using the improved surface water flows.	Baffinland provided a response to this technical comment on July 30, 2020. Baffinland will continue to work with CIRNAC to address this ongoing concern through the collection of additional data.	

CIRNAC WRMP R-03					CIRNAC recommends that BIMC provide CIRNAC with an update of progress made to date and a specific timeline for when the earliest update to the water balance model could be expected.	Baffinland provided a response to this technical comment on July 30, 2020. Baffinland will continue to work with CIRNAC to address this ongoing concern through the collection of additional data.	
CIRNAC ICRP R-01				Commitment	Waste Rock Pile and Open Pit closure costs be calculated directly by BIMC and be included in the next updated ICRP.	As provided in Baffinland's Jan 10, 2021 response to CIRNAC's recommendations /requests as part of the 2021 ASR process: Baffinland agrees that opportunities for reduction in contingency may be possible in future iterations of the reclamation estimate. Due to the outcome of the 2019 Work Plan arbitration, Baffinland has carried 20% contingency in order to align with the final award. Baffinland notes that the estimate currently accounts for the uncertainty at the waste rock facility through the addition of water treatment in closure. Additionally, while uncertainty may exist regarding predictions associated with the open pit, and open pit does not exist at the Mary River Project as mining at Deposit 1 remains a hilltop outcrop.	
CIRNAC ICRP R-02				Commitment	Update the ICRP according to the updated Waste Rock Management Plan approved by the NWB.	As provided in Baffinland's Jan 10, 2021 response to CIRNAC's recommendations /requests as part of the 2021 ASR process: Baffinland agrees that future updates to the ICRP should respect any updates to the Waste Rock Management Plan. The current waste rock management plan maintains a final closure strategy of freezing waste rock in permafrost to mitigate the generation of ARD, and has revised the waste placement strategy accordingly with the objective of freezing material in place to mitigate ARD. Baffinland has integrated adaptive management into the Waste Rock Management Plan to further demonstrate a commitment to ensuring the final closure objectives are met.	

CIRNAC ICRP R-03				Ongoing	Increase interim care and maintenance to 5 years, and post-closure cost to 25 years.	As provided in Baffinland's Jan 10, 2021 response to CIRNAC's recommendations /requests as part of the 2021 ASR process: Future iterations of the ICRP will evaluate the need for increased Closure and Post Closure Monitoring. Baffinland maintains that the duration of closure activities (3 years) is adequate given the total person-hours required to execute the closure and assumed crew sizes, and that the post closure monitoring phase is sufficient given that there are no significant adverse residual effects identified in the FEIS for VECs or VSECs associated with the Project.	
CIRNAC ICRP R-04				Commitment	Update a WRF cover layer in the ICRP and include Prevention of Fugitive dust in the cost estimate.	As provided in Baffinland's Jan 10, 2021 response to CIRNAC's recommendations /requests as part of the 2021 ASR process: Dust impacts were considered in the FEIS for the life of mine, including closure, and no significant adverse residual effects were identified for dust. It is noted that the primary sources of dust (ore crushing, ore stockpiling, and ore transport) will no longer be in operation at closure, and therefore negligible contribution to air quality. Air quality monitoring is included as a Post Closure Monitoring activity in the ICRP and is included in the reclamation security estimate. Baffinland will gain better understanding of revegetation success relative to cover material through future reclamation research studies.	
CIRNAC ICRP R-05				Commitment	Update Long term criteria for permafrost conditions in the ICRP and include in the cost estimate.	As provided in Baffinland's Jan 10, 2021 response to CIRNAC's recommendations /requests as part of the 2021 ASR process: The ICRP is an iterative document that will evolve throughout the life of mine, based on reclamation research studies, results of on-going monitoring, development of new/novel mitigation measures and feedback from Inuit and intervenors. No additional adjustments to reclamation security are required at this time based on the currently understanding of the project effects and desired reclamation objectives.	

CIRNAC ICRP R-06				Commitment	Include cost for studies and instrumentation at the end of mine operations. The currently approved ICRP is dated 2018, and should be updated with additional equipment needed for geotechnical / thermal engineering monitoring.	As provided in Baffinland's Jan 10, 2021 response to CIRNAC's recommendations /requests as part of the 2021 ASR process: Costs for monitoring, including any required instrumentation, are included in the Closure & Post Closure Monitoring costs. Details of the monitoring programs included in this allocation are outlined in Section 9 of the ICRP (Rev. 5, Oct 2018). Geotechnical engineering monitoring is outlined in Section 9.4 of the ICRP, which includes stability, erosion and permafrost analyses and monitoring.	

FISHERIES AND OCEANS CANADA

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DFO-3.1.1	Various	DFO-FFHPP recommends Baffinland provide rationale for the selection of crossing infrastructure for fish bearing watercourses. DFO-FFHPP notes this can be provided to DFO as part of the Proponent's 'DFO Request for Review' submission and/or Application for Fisheries Act authorization, during DFO's regulatory phase.	As follow-up to the June 2019 NIRB technical meetings, Baffinland issued a July 2, 2019 memo by Knight Piésold (*Additional Information on Fish Habitat Interactions*), provided as Attachment 03 to this response. This memo is not listed in the referenced DFO documents. The document provides supplemental fisheries information, including a discussion regarding the basis of selecting crossing types in Section 5.	Unknown		**Update**: A final deliverable documenting the crossing design selection process will be included in the Application for Fisheries Act Authorization	
DFO-3.1.2	Various	DFO-FFHPP reiterates the recommendation that Baffinland provide the full scope and visual of catchment areas associated with fish-bearing water crossings.	Catchments of fish-bearing crossings along the Tote Road and proposed North Railway are shown on Figures 1 and 2 of Attachment 03 (*Additional Information on Fish Habitat Interactions*).	Unknown		**Update**: Fish-bearing status is shown on the detailed railway figures (Attachment 10 of the Updated Application). These figures have been updated to reflect to change to Route 3.	
DFO 3.1.3	Various	DFO-FFHPP recommends the Proponent provides maps for the entirety of the road and label all crossings, which includes the locations of proposed changes to existing Tote Road crossings (as currently provided) and the locations for crossings that are expected to remain as they are.	An updated version of the detailed railway figures that appeared as Attachment 10 of the May 2019 water licence amendment application appear as Figures 4 to 36 of the July 2, 2019 memo provided as Attachment 03 to this response (*Additional Information on Fish Habitat Interactions*). This updated version shows the entirety of the Tote Road including water crossing labels and proposed changes.	Unknown		**Update**: Relevant updates have been made to the detailed railway figures (Attachment 10 of the Updated Application), including Route 3.	
DFO 3.2.1	Various	DFO-FFHPP recommends that Baffinland clarify when they will provide updated hydrological modelling.	Updated hydrological modelling is presented in a June 18, 2019 memo by Knight Piésold provided as Attachment 04 (*Fish Passage Risk Assessment of Water Crossings and Stream Diversions)*. Baffinland is undertaking an engineering review of crossings assessed by KP to be high risk of being a barrier to fish passage, and the outline of a fish passage monitoring program is provided as Attachment 05 (*Proposed North Railway Aquatic Monitoring Programs*).	Unknown		**Update**: A final fish passage risk assessment will be provided with the future FAA Application	
DFO 3.2.2	Various	DFO-FFHPP recommends that Baffinland provide the flow volumes referenced as section 7.1.5.3 on page 23, in section 7.2.1.5 of attachment 7.2 of the updated application: North Railway Design Criteria, or provide the appropriate reference.	Section 7.1.2.5 of the Rail Design Criteria document (Attachment 7.2 of the Updated Water Licence Amendment Application) includes an incorrect reference: "The flow volumes calculated in 7.1.5.3 will be used to determine the ultimate sizing of the culvert structure in terms of number and size of	Unknown		**Update**: A final fish passage risk assessment will be provided with the future FAA Application	

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			barrels." DFO is correct that there is no Section 7.1.5.3, and flows are not presented elsewhere in the same document. Catchment areas and mean monthly flows for July and August are presented for fish-bearing crossings in the updated fish passage assessment presented as Attachment 04 (*Fish Passage Risk Assessment of Water Crossings and Stream Diversions).*				
DFO 3.2.3	Various	DFO-FFHPP recommends Baffinland clarify which flood return period is intended for use for the hydrologic analysis.	The design return period is the 1:200-year flood, and the reference to the 1:100-year flood in Section 7.2.3 is incorrect.	Unknown		No update required.	
DFO 3.2.4	Various	DFO-FFHPP recommends Baffinland provide further information in regard to the potential cumulative impacts of all crossings on flow and fish passage (short-term and permanent; Tote Road, North Rail and Temporary Access Roads), including clear identification of crossings that occur on the same waterbody.	North/South Consultants Inc. conservatively assumed in Attachment 13.1 of the Application that rail crossings that are located <20 m from an existing Tote Road culvert are locations where two culverts in proximity could be a potential barrier to fish passage. Within Attachment 04 of this response (*Additional Information on Fish Habitat Interactions*), these locations are identified in Table 1 and are shown on the detailed railway figures (Figures 4 to 36).	Unknown		**Update**: A final fish passage risk assessment will be provided with the FAA Application.	
DFO 3.2.5	Various	DFO-FFHPP recommends the Proponent clarify the intent of the statement: *"mitigation measures, specific to bridges along the rail corridor, will be applied if flow velocities are found to restrict fish passage"*, and respond with clarification why the proposed bridges will not incorporate appropriate fish passages in the initial design	The aquatic considerations cited in Section 8.6 of Attachment 13.7 of the Application are adopted from a generic list of mitigation measures for water crossings. Preliminary bridge drawings are presented in Attachment 13.8. of the Application. The final bridge designs included with the application for a *Fisheries Act* authorization will maintain fish passage.	Unknown		**Update**: The Bridge Hydraulics Report (Attachment 13.7 of the Updated Application) and Rail Bridge Drawings (Attachment 13.8 of the Updated Application) have been updated to reflect the change in the location of Bridge #3 on the Ravn River associated with Route 3.	
DFO 3.3.1	FEIS addendum, Surface Water Assessment (TSD 13); Sections 2.1.1, 2.4, 2.5 & 4.0 of Appendix C FEIS addendum, Surface Water Assessment (TSD 13); Appendix D, Figure 1, p. D-7 And other documents	DFO-FFHPP recommends Baffinland provide a detailed water withdrawal plan, which can be provided to DFO as part of the Proponent's 'DFO Request for Review' submission and/or Application for Fisheries Act authorization, during DFO's regulatory phase.	At the second NIRB technical meeting in June 2019, Baffinland committed to providing more details on fish habitat features and potential effects to litoral areas at proposed water withdrawal locations (DFO technical review comment 3.12.2 in NIRB review process). A detailed water withdrawal plan will be provided that includes fish habitat information and that considers the DFO's 2013 Environmental Flow Requirements guideline as part of Baffinland's Request for Review and/or Application for a *Fisheries Act* authorization. .	Unknown		**Update**: The Detailed Water Withdrawal Plan has been provided as Attachment 16 of the updated Application.	

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DFO 3.3.2	FEIS addendum, Surface Water Assessment (TSD 13); Sections 2.1.1, 2.4, 2.5 & 4.0 of Appendix C FEIS addendum, Surface Water Assessment (TSD 13); Appendix D, Figure 1, p. D-7 DFO Technical Review Comments to the Nunavut Impact Review Board (NIRB), March 7, 2019. Technical comment 3.12.2 Baffinland Iron Mines Technical Comment Responses, March 25, 2019. DFO 3.12.2, page 43 Fresh Water Supply, Sewage, and Wastewater Management Plan, attachment 23 of the Updated Application for Amendment No. 2 of Type A Water Licence, Document #: BAF-PH1-830-P16-0010. Section 4.2, pg. 18.	Recommendation 3.3.2: DFO-FFHPP recommends Baffinland clarify what site specific conditions would indicate, that a greater water withdrawal than 10% in proposed withdrawal lake sites, would not be significant in the context of fish bearing habitat.	The referenced text from page 18 of the FWSSWMP stated as follows, "*Monthly cumulative withdrawals from lakes represent less than 10% of the monthly outflow, unless site-specific conditions indicate that a greater water withdrawal will not be significant in the context of fish bearing habitat (i.e. Camp Lake)*." This is in reference to circumstances such as described in the 2014 water take assessment, (July 16, 2014 letter report by Knight Piésold, *Hydrology Assessment of Water Sources for Dust Suppression along the Tote Road - Mary River Project - Early Revenue Phase;* Ref. No. NB19-00376): *"Each of the identified lakes will meet the threshold of 10% reduction of outflow under all flow conditions including 10-year return period low flow conditions that can be experienced during the month of September. The only exception to this is Camp Lake, which meets the 10% reduction of outflow threshold under mean flow conditions but not under low flow conditions. Under the 10-year low flow condition, however, a reduction of up to 27% of lake outflows could occur (Table 4), warranting further evaluation and consideration of potential effects to fish and fish habitat.* *While the proposed water withdrawal in Camp Lake will exceed the 10% lake outflow reduction threshold under the 10-year low flow condition, there are site-specific conditions to be considered. The outflow stream of Camp Lake reports to Mary Lake. The stream is broad and shallow and has been observed on multiple occasions (and various flow conditions) to lack connectivity. The proposed water withdrawal can be expected to increase the frequency at which natural lack of connectivity occurs between the two lakes. Limited movement of adult Arctic Char occurs through this stream, and consequently, this stream was not identified as critical fish habitat (North/South Consultants Inc., 2012). As such, a reduction in flow of 27% of the 10-year low flow is not expected to cause fish stranding or meaningful effects to fish or fish habitat (North/South, 2014)."*	Unknown		**Update**: The Detailed Water Withdrawal Plan (Attachment 16 of the Updated Application) applied a withdrawal threshold of 10% of the monthly flow. The previous estimate that withdrawals from Camp Lake would represent 27% of the 10-year low flow. This previous estimate was based on the 10-year low flow of the lowest flow month (September), which is unnecessarily constraining. In the Detailed Water Withdrawal Plan, the 10-year annual low flow threshold was applied as a more appropriate threshold that is sufficiently conservative. The proposed water withdrawal volumes will be less than the revised threshold of 10% of the 10-year annual low flow volume in Camp Lake.	

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DFO 3.3.3	FEIS addendum, Surface Water Assessment (TSD 13); Sections 2.1.1, 2.4, 2.5 & 4.0 of Appendix C FEIS addendum, Surface Water Assessment (TSD 13); Appendix D, Figure 1, p. D-7 DFO Technical Review Comments to the Nunavut Impact Review Board (NIRB), March 7, 2019. Technical comment 3.12.2 Baffinland Iron Mines Technical Comment Responses, March 25, 2019. DFO 3.12.2, page 43 Fresh Water Supply, Sewage, and Wastewater Management Plan, attachment 23	Recommendation 3.3.3: DFO-FFHPP recommends Baffinland conduct a thorough localized assessments on the waterbodies selected for water withdrawal in order to adequately assess the potential impacts on the fish habitat resulting from 20% of the 10-year dry unit runoff water withdrawal on fish-bearing watercourses and connecting waterbodies. This assessment should include, but not be limited to, an assessment of the effects to littoral/shore/riparian areas from the proposed water withdrawal, the specific withdrawal locations proposed for each waterbody including fish habitat in the area and updated rationale on how this level of withdrawal will be environmentally protective threshold. DFO-FFHPP notes this information can be provided as part of the Proponent's 'DFO Request for Review' submission and/or Application for Fisheries Act authorization, during DFO's regulatory phase.	As per Baffinland's response to DFO 3.3.1, a detailed water withdrawal plan will be provided in advance of the NWB technical meeting.	Unknown		**Update**: As per Baffinland's August 2019 commitment, a Detailed Water Withdrawal Plan was included in the updated Water Licence Amendment Application (Attachment 16).	
DFO 3.3.4	FEIS addendum, Surface Water Assessment (TSD 13); Sections 2.1.1, 2.4, 2.5 & 4.0 of Appendix C FEIS addendum, Surface Water Assessment (TSD 13); Appendix D, Figure 1, p. D-7 DFO Technical Review Comments to the Nunavut Impact Review Board (NIRB), March 7, 2019. Technical comment 3.12.2 Baffinland Iron Mines Technical Comment Responses, March 25, 2019. DFO 3.12.2, page 43 Fresh Water Supply, Sewage, and Wastewater Management Plan	DFO-FFHPP further recommends Baffinland provide additional rational/ assessment to support the assertion that 40% of the 10-year dry unit runoff water withdrawal from non-fish-bearing streams will not negatively affect downstream fish-bearing waterbodies. DFO-FFHPP notes this information can be provided as part of the Proponent's 'DFO Request for Review' submission and/or Application for Fisheries Act authorization, during DFO's regulatory phase.	As per Baffinland's response to DFO 3.3.1, a detailed water withdrawal plan will be provided in advance of the NWB technical meeting.	Unknown		**Update**: Revised thresholds have been applied in the Detailed Water Withdrawal Plan (Attachment 16 of the Updated Application). The revised thresholds are based on DFO's published guidance.	

DFO 3.4.1	Updated Application for Amendment No. 2 of Type A Water Licence, attachment 27: Aquatic Effects Monitoring Plan, Document #: BAF-PH1-830-P16-0039. Section 2.4.4, pg. 37.	DFO-FFHPP recommends that Baffinland revise their instantaneous pressure threshold limit of 100 kPa to 50 kPa when calculating setback distances and update their conclusions as necessary.	Baffinland will adopt the lower threshold of 50 kPa as a precautionary measure. Applicable draft management plans for Phase 2 will be revised accordingly when next updated in advance of the NWB technical meeting.	Unknown		**Update**: the 50 kPa threshold has been reflected in the applicable management plans, including the Surface Water and Aquatic Ecosystem Management Plan (Attachment 22 of the Updated Application), Blasting Management Plan (Attachment 27) and the Environmental Protection Plan (Attachment 29).	

ENVIRONMENT AND CLIMATE CHANGE CANADA

ID#	Document Reference	July 2019 Recommendations/Requests	Baffinland's August 2019 Response	Intervenor's October 2021 Status Update	Intervenor's October 2021 Recommendations/Requests	Baffinland's November 2021 Response	Attachment
ECCC 3.1	Baffinland Iron Mines Corporation. May 2019. Mary River Project – Phase 2 Proposal Updated Application for Amendment No. 2 of Type A Water Licence 2AM-MRY1325, Attachment 23 (Part 1): Fresh Water Supply, Sewage, and Wastewater Management Plan, Section 5.4.1 and Appendix F: Polishing Waste Stabilization Ponds (PWSP) Effluent Discharge Plan. Baffinland Iron Mines Corporation. May 2019. Mary River Project – Phase 2 Proposal Updated Application for Amendment No. 2 of Type A Water Licence 2AM-MRY1325, Attachment 18.2: Milne Port Water and Sewage Schematic	Clarify whether there would also be a treatment system for the Polishing Waste Stabilization Ponds (PWSP) at Milne Port (similar to what is at the Mine Site), and, if so, provide details on the system. Update the PWSP Effluent Discharge Plan (Appendix F).	The Port Site PWSP has a treatment system that is used to treat the contents of the PWSP to meet the applicable discharge requirements, before being discharged to Milne Inlet. As at the Mine Site PWSPs, a portion of the treatment occurs naturally, through the growth of algae through the summer season. The treatment system consists of a dissolved air floatation unit (DAF), housed inside an insulated and heated seacan, with an air injection system, sludge removal system, coagulant dosing, and flocculant dosing. There is also provision in the system for acid or caustic dosing, if required for pH adjustment. During the summer season, algae grows in the PWSP, consuming any remaining nutrients in the off-spec water, leaving behind TSS in the form of algae solids. The DAF system uses a saturated air-water mixture, injected into the influent stream, to remove solids through floatation. The influent stream is first dosed with a coagulant and flocculant, to promote the formation of large floc solids. These solids nucleate around the microscopic air bubbles formed by the saturated air-water mixture, and rise to the surface of the main tank. The "float" sludge is then skimmed from the surface of the tank, and pumped to totes for disposal. Clarified effluent overflows from the system into a break tank, which is then pumped to Milne Inlet if it meets the discharge criteria. The PWSP Effluent Discharge Plan is being updated as part of ongoing operations. The updated plan will be included in the next revision of Baffinland's Fresh Water Supply, Sewage, and Wastewater Management Plan.	Resolved			

ECCC 3.2	May 2019. Updated Application Attachment 22: Surface Water, Aquatic Ecosystem Management Plan, Sections 10.2.3.1 and 10.2.3.2.	ECCC recommends that the Proponent provide a detailed description of proposed construction monitoring for the Phase 2 activities.	A detailed outline of construction monitoring is provided as Attachment 05 (*Proposed North Railway Aquatic Monitoring Programs*).	Resolved			
ECCC 3.3	Baffinland Iron Mines Corporation. May 2019. Mary River Project – Phase 2 Proposal Updated Application for Amendment No. 2 of Type A Water Licence 2AM-MRY1325, Attachment 23 (Part 1): Fresh Water Supply, Sewage, and Wastewater Management Plan, Section 7.1, Table 7-2, and Appendix J: Waste Pond Water Treatment Plant Operations – Appendix A. Government of Canada. June 2019. Metal and Diamond Mining Effluent Regulations	ECCC recommends that the Proponent: Update references from the MMER to MDMER. Provide clarification on the discharge criteria that will be applicable.	The need to update discharge criteria and references to the MDMER is acknowledged (Sections 7.1 and 7.2 including Table 7-2; Appendix A of Appendix J; Appendix H). These changes will be completed in the next update to the Fresh Water Supply, Sewage, and Wastewater Management Plan, to be submitted in advance of the NWB technical meetings.	Resolved			
ECCC 3.4	Baffinland Iron Mines Corporation. May 2019. Mary River Project – Phase 2 Proposal - Updated Application for Amendment No. 2 of Type A Water Licence 2AM-MRY1325, Attachment 23 (Part 5): Fresh Water Supply, Sewage, and Wastewater Management Plan.	ECCC recommends that the Proponent clarify pdf pages 52 to 57.	Baffinland appreciates ECCC's thorough review of the Fresh Water Supply, Sewage, and Wastewater Management Plan. Pages 52-58 of Attachment 23 FSWWP (Part 5) have been reviewed and the following clarifications are provided: Page 52: This figure is the final page of Appendix F. It is noted that this figure is upside down in the PDF. Page 53: This is the flysheet for Appendix G - Mobile Oily Water Separator (OWS) Manual. Appendix G has been added to the FWSSWMP - Part 5 file that was included in the Application, provided as Attachment 06 to this response. Page 54: This is the flysheet for Appendix H - MDMER Sampling and Reporting Requirements Memo (Minnow). This Appendix can be found in pages 59-67 of the PDF.	Resolved			

			Pages 55-56: These pages were erroneously included and have been removed from the FWSSWMP - Part 5 file provided as Attachment 06 of this submission. Pages 57-58: These pages are appendices to Appendix G of the FWSSWMP; see Attachment 06 of this submission. All required changes will be made in the next update to the FWSSWMP which will be submitted prior to the technical meeting.				
ECCC 3.2.1	Surface Water and Aquatic Ecosystems Plan Table 5.2 Construction Activities; Site operations including stockpiling snow; Quarry and Borrow Pit Operation; and Landfill Operations			New	ECCC recommends that the Proponent: - Add text in the Low-Risk column that identifies the condition status of elevated concentrations/approaching criteria as a trigger for action. - Clarify that thresholds are triggered by exceedance of any one or more of the regulated parameters.	Baffinland will amend the low-risk condition in the TARP to note any trends in increasing concentrations of regulated parameters, and an exceedance of any discharge limit will trigger action. This will be filed in the next update of the SWAEMP provided ahead of the NWB public hearing.	
ECCC 3.2.2	Surface Water and Aquatic Ecosystems Plan Table 5.2 Water crossing installations and/or modications row.			New	ECCC recommends that the Proponent: - Clarify the purpose for TDS as a performance indicator - Add Oil and Grease as a performance indicator; and - Clarify how comparisons to background will be evaluated.	Total Dissolved Solids (TDS) is a supporting parameter in the Northern Corridor Monitoring Program to assist with interpretation of other monitoring results, including total and dissolved metals. Sedimentation is the primary concern with respect to monitoring during watercrossing installations and modifications. Hence, Baffinland suggests monitoring for evidence of sheen is adequate and testing for oil & grease is not required. The Watercrossing monitoring guidelines specify sampling before, during and following the work, both up- and downstream the crossing. Baffinland uses the weight of evidence of both pre-work and upstream monitoring in comparisons against background.	

ECCC 3.2.3	Surface Water and Aquatic Ecosystems Plan Table 5.2 Road operatoin row.			New	ECCC recommends that the Proponent: - Clarify the performance indicator for metals as “total and dissolved metals”.	The Northern Corridor Monitoring Program includes the analysis of total and dissolved metals. The word "and" was omitted in the TARP, but Table H.2 in Appendix H correctly states "total and dissolved metals" as monitoring parameters.	
ECCC 3.2.4	Surface Water and Aquatic Ecosystems Plan Section 5.6; Table 5.2 Trigger Action Response Plans (TARP); Figure 5.1 Northern Corridor Monitoring Adaptive Management Framework; Appendix H Northern Corridor Monitoring Program			New	ECCC recommends that the Proponent: - Includes a Low-Risk Threshold in the Northern Corridor Monitoring Program, and clarifies whether it is entirely post-construction. - Clarify the comparisons to upstream in Section 5 for TSS Action Thresholds.	A low-risk threshold has been established in the Northern Corridor Monitoring Program. This has been presented in the TARP (Table 5.2) in the SWAEMP. The Northern Corridor Monitoring Program presented in Appendix H, however, does not currently incorporate the low-risk threshold. Appendix H will be amended to incorporate the low-risk threshold presented in the TARP. This includes amending the last sentence of Section 5.6 of the SWAEMP to refer to Section 5 (not Section 6) of Appendix H.	
ECCC 3.2.5	Fresh Water Supply, Sewage, and Wastewater Management Plan; Tables 3.7 and 5.2			New	ECCC recommends the Proponent: - Ensures that all plans that make reference to the requirements of the MDMER be updated in accordance with the amended Regulations.	ECCC's comments about all parts of the MDMER coming into force are noted. Table 3.7 in the next revision of the FWSSWMP will reflect the fact that parts of the latest regulation came into force on June 1, 2021 (for example, the addition of un-ionized ammonia to Schedule 4 of the regulations).	
ECCC 3.2.6	Fresh Water Supply, Sewage, and Wastewater Management Plan; Sectoin 3.5; Table 3.8; Appendix D			New	ECCC recommends the Proponent: - Clarify water management planning at Milne Inlet, addressing the four points - No information is provided in the text on the management of Lump Ore Stockpile Perimeter ditching contact water. Based on diagrams provided in Appendix D, it appears that this water will be trucked to a final discharge point; however, this should be confirmed within the text. - There is an inconsistent use of terminology, as the section refers to stormwater ponds #1 and #2, which are not listed in Table 3.8. It is assumed that the Proponent may be referring to	1. Contact water from the lump ore stockpile perimeter pond will be either trucked or pumped to the East or West Ponds. Alternatively, the water will be discharged at one of the existing final discharge points by bypassing the east/west ponds. 2. ECCC is correct that the Water Licence identifies the Milne Port stormwater ponds as the East and West Ponds. These have been renumbered for clarity given other new ponds are proposed. 3. As noted in the response to item #1, contact water will either by trucked or pumped.	

					Stockpile Sedimentation Ponds East and West, but this is not clear. - There is no information provided on how water will be managed from one location to another at Milne Port. If all waters are to be discharged through the existing final discharge points, information should be provided as to how the water will be transferred to these locations. Based on the diagrams in Appendix D it appears that the Proponent will utilize a combination of trucking and portable pumps, however this information should be explicitly described within the plan. - It is stated that all stormwaters are to be discharged through the existing final discharge points. There is no discussion provided on the capacity of the existing ponds to accommodate additional volumes being transferred from the new ponds and held prior to discharge.	4. As noted in the responses above, both trucking and piping are being considered. The existing final discharge points may be utilized bypassing the East and West Ponds. Baffinland will update the Fresh Water, Sewage and Wastewater Management Plan specifying final plans in terms of conveyance and discharge of contact water at Milne Port.	
ECCC 3.2.7	Aquatic Effects Monitoring Program; Table 3.1 & 3.2; Section 3.1.1.1 - Water Quality Benchmarks			New	ECCC recommends that the Proponent: - Review recent research and guidelines, including for those parameters listed above, and determine the applicability of more recent guidelines to the Project. The benchmarks for the AEMP analysis should be updated accordingly.	Bafflinland has reviewed the recent guidelines indicated by ECCC and will adopt those for cobalt, (dissolved) lead, strontium, and zinc as AEMP benchmarks. The AEMP benchmarks for these parameters will be derived using baseline data (when available) to conform to the same methods used to derive AEMP benchmarks for other parameters. During the development of the AEMP benchmark for copper, the use of 97.5th percentile of copper concentration at the time of baseline for the waterbody of interest was selected as the benchmark because concentrations of copper were naturally elevated above applicable Water Quality Guidelines WQG at these waterbodies. Hence, Baffinland could not be expected to acheive the WQG for copper at these waterbodies. Therefore, the rationale for the AEMP benchmark was that if the 97.5th percentile of baseline concentration was exceeded	

						following commencement of commercial mine production, this may be an indication of mine-related influence on the waterbody of interest. Accordingly, Baffinland does not feel that a change to the existing AEMP benchmark for copper is warranted based on the same rationale provided herein.	
ECCC 3.2.8	Aquatic Effects Monitoring Plan - Section 5.1 & Table 5.1			New	ECCC recommends the Proponent: - Provide additional details on the specific requirements to trigger the action levels - Identify triggers that increase the protectiveness of the proposed moderate action level.	Baffinland is in the process of considering additional details for triggers related to action levels proposed in the existing Data Assessment and Response Framework (Section 5.1, Table 5.1) for the water quality study component.	
ECCC 3.2.9	Attachment 32 - Phase 1 Waste Rock Management Plan - BAF-PH1-830-P16-0029' Phase 2 Proposal Revisions. For Review Purposes Only Rev B; Golder Report - Waste Rock Management Plan - For 2020 through 2021; Section: 10.3 Waste Rock Facility (WRF) Closure			New	Statement: ECCC notes that once a mine is subject to MDMER, it remains subject to MDMER until it acquires the recognized closed mine (RCM) status, and as such, all effluent discharges will have to be discharged through a designated final discharge point (FDP) monitored and reported through Mine Effluent Reporting System (MERS).	ECCC's comment is acknowledged, and Baffinland will adhere to the regulations.	

QIKIQTANI INUIT ASSOCIATION

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QIA-1.1	190502-2AM-MRY1325-Amend2-Applic-Att-29-ICRP	Baffinland's May 2019 submission of the Interim Reclamation and Closure Plan (ICRP) has not yet been approved by QIA through the Commercial Lease. QIA can provide an update on this approval process as requested by the NWB; however, QIA will manage the ICRP through the Commercial Lease and not the Water Licence Process.	Baffinland will continue to engage QIA on the updates to the ICRP, to meet the conditions of both the Commercial Lease and the Type 'A' Water Licence.	Unresolved	QIA and Baffinland have exchanged feedback on the Phase 2 ICRP. At this time, QIA has not approved the current version of the ICRP submitted as part of the Amendment 2 package.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-2.1	190502-2AM-MRY1325-Amend2-Applic-Att-29-ICRP	QIA will work with Baffinland through the Commercial Lease on all matters related to security for Inuit Owned Land. QIA can provide an update on this approval process as requested by the NWB.	Baffinland will continue to engage QIA on the updates to security held for the Project, to meet the conditions of both the Commercial Lease and the Type 'A' Water Licence.	Resolved	QIA is satisfied with Baffinland's August 23, 2019 response.		
QIA-3.1	190502-2AM-MRY1325-Amend2-Applic-Att-2-Applic	Baffinland should be required to come to a new agreement with QIA prior to the amendment being issued as per Article 20.3.1 of the Nunavut Agreement.	Baffinland believes that an amended Water Compensation Agreement is required, and has provided QIA with draft revisions to the Water Compensation Agreement to reflect the Phase 2 Project.	Unresolved	QIA and Baffinland have agreed to work together to develop a revised Water Compensation Agreement for the Phase 2 Project. An agreement has not been established at this time.	Baffinland is committed to working with QIA to draft a new Water Compensation Agreement, with the goal of having a signed Water Compensation Agreement prior to the Public Hearing on the Phase 2 Proposal Water Licence Amendment.	
QIA-4.1	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2 08MN053_BAF-PH1-830-P16-0008_Environment-Protection-Plan-DRAFT-PHASE-2 190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE 190502 2AM-MRY1325 Amend2 Applic-Att-27-AEMP-ILAE	Provide the specifics of how Inuit Qaujimajatuqangit was and will be used and considered in the development of the North Railway, its location, the crossings, and the relevant management and monitoring plans.	The proposed alignment of the North Railway follows the existing Milne Inlet Tote Road for the majority of the distance between the Mine Site and Milne Port, which limits the footprint of the Project and the need for additional access road construction. The section of the North Railway alignment that deviates from the Milne Inlet Tote Road was subject to an exhaustive technical feasibility study, which determined the preferred alignment was the most technically and economically feasible, as well as the safest in terms of operations (grade and distance from water) and Inuit and wildlife crossings (least steep cuts). Based on these considerations Baffinland advanced the preferred alignment for public reviews to be administered by the Nunavut Planning Commission (NPC), Nunavut Impact Review Board (NIRB), and the Nunavut Water Board (NWB). The proposed alignment of the North Railway, as with the Tote Road, does overlap with a primary travel route. The proposed railway deviation does additionally overlap with the travel route to Igloolik. No other	Deferred	This Technical Comment is now addressed by TC 26-33.	n/a	

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			important values were identified in the IQ work that resulted in the map book presented as TSD 5. The proposed alignment of the North Railway occurs entirely within the Mary River Transportation Corridor as defined in Appendix P of the North Baffin Regional Land Use Plan. The modification (Modification No. 3) to this Corridor was subject to a thorough public review process, facilitated by the NPC, and culminated in a Public Hearing in Pond Inlet in December 2017. Issues with the proposed North Railway alignment raised by Inuit through this process were used by Baffinland to identify gaps in existing IQ collection and modify its Phase 2 engagement planning in relation to the NIRB Project Certificate Reconsideration. The primary addition was a series of Community Risk Assessment Workshops, which were intended to identify and integrate Inuit generated mitigations and monitoring measures into Baffinlands environmental management plans relating to the North Railway. The location of special built crossings to facilitate travel by Inuit and caribou across the North Railway was the subject of a Crossing Selection Workshop, held July 29-August 2, 2019 at the Mary River Mine Site. At the Workshop Inuit from the communities of Pond Inlet and Igloolik were asked to identify areas along the proposed North Railway alignment that intersect known travel routes between the two communities or from their communities to known hunting grounds. The results of this Workshop will be provided in a report to the NIRB and NWB before the Public Hearings. The relevant operational (Snow Management Plan and Railway Operations and Maintenance Plan) and environmental (Terrestrial Environment Monitoring and Mitigation Plan) management plans will be updated based on IQ collected through a series of Community Risk Assessment Workshops (January - May 2019) as well as a Crossing Selection Workshop (July 2019). Reports from these two workshops will be				

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			provided to the NIRB and NWB before the Public Hearings. Should the North Railway be approved and constructed, the applicable environmental management plans will be subject to the newly developed Adaptive Management Plan and IQ Collection Framework, which will systematically collect and integrate Inuit input and IQ into Baffinlands decision making processes. Further details on this process will be released prior to the Technical Meetings for review and discussion.				
QIA-4.2	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2 08MN053_BAF-PH1-830-P16-0008_Environment-Protection-Plan-DRAFT-PHASE-2 190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE 190502 2AM-MRY1325 Amend2 Applic-Att-27-AEMP-ILAE	Provide monitoring locations along the proposed North Railway that align with Inuit use.	Road and rail dust are not expected to affect the quality of water in nearby streams and lakes in regard to a potential source of drinking water. Baffinland's IQ study did not identify waters important to Inuit in the vicinity of the Tote Road and Railway (KP Letter dated November 30, 2018; Ref. No. NB18-00785; Appendix A of Attachment 2 of Baffinland's January 2019 response to NIRB advanced technical review comment HC 02 in January 2019). It was acknowledged in that report that it is reasonable to assume that watercourses close to areas used by Inuit may be used as sources of drinking water, including Phillips Creek and the lakes within the Phillips Creek catchment. On June 14, 2019, Baffinland received a copy of the QIA's Tusaqtavut Study for Pond Inlet, which identified approximately 14 values within the Project areas that are used for subsistence (either fishing and/or fresh water) within the Project footprint including a 250 m buffer. Baffinland requests the coordinates and interviewer-assigned description of each value, so that the nature of these subsistence values can be understood. Baffinland is willing to consider modifications to its Tote Road Monitoring Program to monitor water quality at Inuit water use areas, if the appropriate IQ information can be made available.	Deferred	This Technical Comment is now addressed by TC 26-33.	n/a	
QIA-5.1	Fish Passage Risk Assessment Update (KP Ref VA19-00838)	When will the monitoring and adaptive management plan related to flow diversion be shared for review and comment?	Monitoring and adaptive management at stream diversions are outlined in Attachment 05 (*Proposed North Rail Monitoring Programs*).	Unresolved	This Technical Comment will remain unresolved until QIA has approved the relevant water quality thresholds and actions.	The nature of this issue is such that adaptive management will be subject to review by a trained professional, and concrete thresholds and pre-defined responses cannot be	

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						developed. Section 5.9 of the SWAEMP states: The triggers for taking action such as flooding and/or changes to stream morphology, are subjective and will require an exercise of professional judgement regarding action response, as there are no definitive action level triggers.	
QIA-6.1	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2	This plan or another should be resubmitted with the monitoring and mitigation measures to be taken for the construction and operations of the North Railway. This should include adaptive management.	Section 5.2 of the Railway Operation and Maintenance Plan (under the heading Component Inspections) describes the inspections and maintenance work to be undertaken at bridges and culverts. Section 1.3 identifies the relevant management plans for issues related to water quality and fish habitat, notably the EPP and the SWAEMP. These plans will be relied upon for addressing water quality and fish habitat issues that are identified as part of the Component Inspections of bridges and culverts.	Unresolved	This Technical Comment will remain unresolved until QIA has approved the relevant water quality thresholds and actions.	The Railway Operation and Maintenance Plan was created in the environmental assessment led by the Nunavut Impact Review Board, and is not part of the Water Licence Application. As noted in Baffinland's original response, water quality issues during construction will be managed by applying the Environmental Guidelines for Water Crossing Repairs, Modifications and/or Installations (Appendix F of the Surface Water and Aquatic Ecosystems Management Plan [SWAEMP]), with monitoring and adaptive management described in the trigger action response plan (TARP) presented in the Surface Water and Aquatic Ecosystems Management Plan. Similarly, ongoing water quality monitoring during rail operations is covered by the Northern Corridor Monitoring Program (SWAEMP Appendix H), adapted from the Tote Road Monitoring Program to account for rail monitoring. Both these monitoring programs were developed jointly with the QIA.	
QIA-7.1	Multiple, for example: 08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2 190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	Baffinland should be required to update all DRAFT management plans so that all references are clear and easy to access. At a minimum, references should include the section headers or section numbers.	Baffinland proposes to update the Water Licence related management plans in advance of the NWB Technical Meetings. Attachment 07 presents a table that identifies where each management plan references another plan. The references to other plans will be checked and updated the next update to these management plans.	Unresolved	QIA and Baffinland are continuing to jointly review and edit several management plans and Water Licence amendment documents through a separate regulatory process.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-8.1	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	Resubmit the SWAEMP and include the frequency of the assessment of monitoring activities listed in Section 10 and how this will inform and prioritize maintenance activities.	A detailed outline of rail monitoring is provided as Attachment 05 (*Proposed North Rail Monitoring Programs*).	Unresolved	This concern remains outstanding until thresholds are developed for Fish Passage.	Fish passage will be relevant to the Fisheries Act Authorization (FAA) Application that will follow the water licensing process. Baffinland has initiated discussions with DFO regarding fish passage through the FAA process.	

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QIA-9.1	Multiple, including: 190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	Resubmit DRAFT plans and use language for what Baffinland will do should the Project be approved rather than delaying detail or recommending actions be taken.	Baffinland proposes to update the Water Licence related management plans in advance of the NWB Technical Meetings. Attachment 08 presents a table that identifies where each management plan forward-references an action and provides more detail or clarification on each of these commitments. These forward-referenced commitments will be addressed according to the proposed actions in the next update to these management plans in advance of the NWB technical meetings.	Unresolved	QIA and Baffinland are continuing to jointly review and edit several management plans and Water Licence amendment documents through a separate regulatory process.	The management plans presented in the updated Water Licence Application have had varying levels of review by the QIA. Baffinland continues to implement its work plan to update the management plans as agreed to with the QIA.	
QIA-10.1	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE 08MN053_BAF-PH1-830-P16-0023_Roads_Management_Plan-DRAFT-PHASE-2	Present the how, where and to what frequency is calcium chloride monitored to remain in accordance with applicable guidelines to minimize runoff into local watercourses.	As noted in the Roads Management Plan, calcium chloride is mixed with water for application to roads for dust suppression in accordance with its Dust Management Protocol, which is Attachment 6 of the Air Quality and Noise Abatement Management Plan, presented as Attachment 09 of this response. The Dust Management Protocol is consistent with Section 2.3 of the Nunavut Environmental Guideline for Dust Suppression (Government of Nunavut, 2002). This includes using dust suppressants approved by the GN (CaCl is an approved dust suppressant); following manufacturer application instructions; applying the dust suppressant to the roadway; monitoring the application rate to ensure adequate coverage without pooling or runoff of product; not using more dust suppressant than needed to effectively suppress dust; and ensuring the material does not migrate or run off the traveled portion of the roadway. Monitoring to determine if calcium chloride can be detected in local watercourses is not identified in the GN dust suppression guideline. Baffinland notes that in 2018 an alternate dust suppressant called Dust Stop was used on a trial basis, and an expanded trial application is being implemented in 2019. Dust Stop is non-toxic to aquatic life, and is being considered to partially or fully replace the use of CaCl as a dust suppressant at site.	Resolved	Monitoring of calcium outlined in Appendix G and H of the SWAEMP is sufficient assuming no evidence of unexpected effects associated with calcium are identified. If unexpected effects are identified, monitoring will need to be adequately modified through the adaptive management process.		

QIA-10.2		Provide the applicable guideline used to minimize runoff into local watercourses.	The Dust Management Protocol presented as Attachment 6 of the Air Quality and Noise Abatement Management Plan provides the guidance Baffinland staff use to minimize runoff into watercourses. The Dust Management Protocol has been provided as Attachment 09 to this response.	Resolved	QIA is satisfied by the response provided by Baffinland on August 23, 2019.		
QIA-11.1	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm	The Water Licence should require Baffinland to monitor the construction, operations and closure of the North Railway.	Part D, Item 18 of the existing Water Licence requires geotechnical inspections of earthworks. Schedule B, Item 1e.ii of the existing Water Licence requires reporting of results of thermal modelling and/or research carried out in relation to permafrost integrity along the railway alignment.	Unresolved	This concern remains outstanding until TARPs are provided for geotechnical criteria of the railway.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-11.2	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm	The Water Licence should require Baffinland to provide the monitoring program prior to any construction approvals for the North Railway is provided.	Baffinland will provide details on the construction geotechnical monitoring program as part of the Water Licence review process in advance of the technical meeting. The outcome of the construction geotechnical monitoring program will inform the operations phase geotechnical monitoring, to be incorporated into the updated Railway Operation and Maintenance Plan.	Unresolved	This concern remains outstanding until appropriate geotechnical monitoring data is included as reporting criteria within the amended Water Licence.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-12.1	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2	These records should be provided to reviewers as part of Baffinland's reporting requirements under the Water Licence.	Part D, Item 18 of the existing Water Licence requires geotechnical inspections of earthworks. Schedule B, Item 1e.ii of the existing Water Licence requires reporting of results of thermal modelling and/or research carried out in relation to permafrost integrity along the railway alignment.	Unresolved	This concern remains outstanding until appropriate geotechnical monitoring data is included as reporting criteria within the amended Water Licence.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-12.2	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2	Baffinland should be required to disclose the triggers that result in corrective actions being taken.	Thresholds and triggers will be established as appropriate in the future operations geotechnical monitoring program that will form part of the Railway Operation and Maintenance Plan. Triggers that will result in corrective actions will be defined after the completion of the construction monitoring phase, as no detailed site-specific information is currently available to make an accurate assessment of the potential triggers. These triggers will be disclosed once they have been developed.	Unresolved	This concern remains outstanding until TARPs are provided for geotechnical criteria of the railway.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-12.3	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2	Baffinland should be required to update the NWB and reviewers on the effectiveness of the corrective actions.	Comments on the effectiveness of corrective actions can be provided as part of Baffinland's QIA and NWB Annual Report for Operations.	Resolved	QIA is satisfied by the response provided by Baffinland on August 23, 2019.		

QIA-13.1	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	Provide figures that detail the field monitoring proposed to be completed as part of the construction, operation and closure of the North Railway.	Sections 10.2.3.1 and 10.2.3.2 describe the proposed monitoring along the North Railway during the construction and post-construction phases, respectively. For example, Section 10.2.3.1 states, "*Monitoring will occur at active work areas along the North Railway during construction, as prescribed in a future Fisheries Authorization for crossings. This is expected to include turbidity monitoring downstream of active work areas, including crossing locations as well as downstream of quarries and soil spoils disposal areas (mainly former borrow pits and quarries).*"The location of the embankment and water crossings are presented on the detailed railway figures presented as Attachment 10 of the Water Licence amendment Application. A map of proposed monitoring locations for operations will be provided prior to the technical meeting. Monitoring locations associated with quarries will be identified within each quarry management plan.	Unresolved	QIA believes that Table 5.1 should include monitoring activities during closure of the north railway.	The operation phase monitoring locations are presented in the updated Northern Corridor Monitoring Program presented as Appendix H of the SWAEMP (Attachment 22 of the Updated Application). Some monitoring programs listed in Table 5.1 and depicted in the figure will need to continue during the active closure phase (and possibly for a period post-closure). However, this is articulated in the Interim Closure and Reclamation Plan. Section 2.3.1.4 of the ICRP states that a Final Closure and Reclamation Plan will be developed and submitted no later than one year or earlier if possible before scheduled permanent closure, or immediately after notification of an unplanned closure. At this time, figures would be updated to reflect closure phase monitoring of the North Railway.	
QIA 13.2	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	Provide additional details based on Baffinland's current experience from developing a mine with a linear transportation corridor (over 5 years) that would inform the selection of effective sedimentation and erosion controls along the North Railway.	Section 6.4.3 of the SWAEMP presents generic sediment and erosion control measures, with Baffinland's evaluation of performance based on its experience implementing each control measure.	Resolved	Erosion control measures are detailed with installation locations noted, which may be applied to either road or rail water crossings.		
QIA-14.1	08MN053_BAF-PH1-830-P16-0023_Roads_Management_Plan-DRAFT-PHASE-2	Provide the severity of the concern that requires immediate action be taken by Baffinland.	The response action framework for post-construction monitoring is outlined in Appendix C of the Roads Management Plan.	Unresolved	Appendix C was not provided by Baffinland to verify if any changes were made to address this comment.	The referenced text is from the Roads Management Plan, which is not a plan regulated by the NWB under the Water Licence. The referenced response action framework for post-construction monitoring is now presented in Appendix F of the Surface Water and Aquatic Ecosystem Management Plan. Response times cannot be provided on a scale as being requested by the QIA, as they are site-specific and depend upon the available resources and urgency relative to other issues at the time.	

QIA-14.2	08MN053_BAF-PH1-830-P16-0023_Roads_Management_Plan-DRAFT-PHASE-2	Provide the frequency at which Baffinland would determine and prioritize any corrective actions to the Project road network.	Water quality monitoring is conducted per the schedule outlined in Appendix C of the Roads Management Plan, including a response action framework to address issues of sedimentation. Geotechnical inspections of the project are completed bi-annually as required by the Type A Water Licence, and recommendations are provided in the resulting report and are actioned on Site. Fish passage is assessed annually, and generally any identified issues are addressed in the calendar year. The exception is fisheries crossings where QIA has not granted approval for Baffinland to conduct adjustments to the Tote Road under the Commercial Lease.	Unresolved	Appendix C was not provided by Baffinland to verify if any changes were made to address this comment.	As noted in the response to QIA-14.1, Appendix C of the Roads Management Plan now appears as Appendix F of the SWAEMP. The QIA Environmental Monitors are integrated into Baffinland's environmental department, in terms of understanding how issues are prioritized day to day.	
QIA-14.3	08MN053_BAF-PH1-830-P16-0023_Roads_Management_Plan-DRAFT-PHASE-2	Provide what would trigger Baffinland to construct the approved Tote Road to the 2014 Hatch design.	Baffinland continues to upgrade the Tote Road through ongoing operation and maintenance, implementation of the Tote Road Earthworks Execution Program (TREEP) and implementing or restoring sections of the road to the Hatch design.	Unresolved	Baffinland has indicated that a response to this concern is contingent on the NIRB's review of TRC 22 as part of the "Phase 2 Proposal" assessment.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-15.1	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2	Provide the target areas identified as higher risk and validation for this assessment.	The complete list of target areas have not been identified. A study is currently underway to develop a geotechnical monitoring plan for use during the construction phase. The outcome of the construction geotechnical monitoring program will inform the operations phase geotechnical monitoring, to be incorporated into the updated Railway Operation and Maintenance Plan. Examples of high risk areas may include the four rail bridges over rivers, plate arch culverts, high embankments and deep excavations in both ice-rich and ice-poor soil areas.	Resolved	Baffinland has provided the requisite information in the Northern Railway Instrumentation Monitoring Plan.		
QIA-15.2	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2	Provide what additional information will be gathered prior to construction of the North Railway and how that information will be used to inform the construction of the North Railway.	Thermistors for sub-surface temperature profiling, as well as topographical survey markers and settlement plates will be installed at various locations to validate design assumptions and to monitor potential creep and thaw settlement.	Resolved	Baffinland has provided the requisite information in the Northern Railway Instrumentation Monitoring Plan.		

QIA-15.3	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2	Provide how the information gathered during the construction of the North Railway will be used to finalize the operational condition monitoring plan.	Data collected during the construction phase will be used to validate the design assumptions used for design analysis and modelling of thermal behaviour and changes to the permafrost regime. This will assist in identifying operations phase monitoring at representative and high risk locations, for example at deep excavations, high embankments, or plate arch culverts. The operations phase monitoring program will evolve over time should results show a specific need for additional monitoring.	Unresolved	Triggers, Actions and Thresholds have yet to be established for geotechnical monitoring criteria.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-15.4	08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2	Provide the inventory of rail condition monitoring equipment and locations.	The construction geotechnical monitoring program for the North Railway is currently being prepared and will be submitted for review in advance of the technical meeting. A draft list of monitoring equipment and locations are provided in a table presented as Attachment 10 of this response, however this list is subject to change as the monitoring program is finalized. The final monitoring plan for the operations phase of the railway will be finalized following completion of the construction monitoring phase, when data collected has ben analyzed and final recommendations can be provided.	Resolved	Baffinland has provided the requisite information in the Northern Railway Instrumentation Monitoring Plan.		
QIA-16.1	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	Present the triggers based on monitoring data listed in Attachment 1, that will be implemented to mitigate against an exceedance of a water quality criteria, relevant thresholds, and potential impacts to the receiving environment. As committed to by Baffinland in the NIRB process, QIA is willing to work with Baffinland through updating its adaptive management included in monitoring and management plans.	A detailed outline of construction monitoring is provided as Attachment 05 (*Proposed North Rail Monitoring Program*). This includes a description of proposed monitoring of watercourses downstream of active construction areas in accordance with the Environmental Guidelines for Project Water Crossing Repairs, Modifications and/or Installations presented in Appendix C of the Roads Management Plan, which will be adapted for implementation during rail construction. The final monitoring program will be presented in an updated SWAEMP, to be made available in advance of the NWB technical meetings.	Unresolved	This concern remains outstanding until thresholds and responses are developed to include all analytical water quality monitoring parameters.	Baffinland has received from the QIA more than one round of comments on the SWAEMP including the indicators and thresholds in the Trigger Action Response Plan (TARP). The QIA's comments have been addressed in the latest version. Baffinland will continue to work cooperatively with the QIA to finalize these plans under the Water Licence, and will continue to report progress where we can. It is not clear what remains outstanding in regard to to incorporating all analytical water quality monitoring parameters.	
QIA-16.2	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	Update all applicable water quality monitoring plans to include triggers, based on monitoring data, and to implement the mitigation measures to avoid exceedance of water quality criteria, relevant thresholds, and potential impacts to the receiving environment.	The reference to Attachment 1 is not clear as there is no Attachment 1 in the referenced SWAEMP. Baffinland will update the applicable water quality monitoring plans to be consistent with the Adaptive Management Plan currently under development in consultation with the QIA. This includes incorporating the concepts of tiggers, thresholds and actions presented in the	Unresolved	This information has not yet been incorporated into the relevant management plans.	It is not clear what remains outstanding in regard to to incorporating all analytical water quality monitoring parameters. Baffinland included a recent draft update of the SWAEMP (Attachment 22 of the Updated Application) which identifies agreed upon water quality thresholds related to surface runoff.	

			Environmental Guidelines for Project Water Crossing Repairs, Modifications and/or Installations presented in Appendix C of the Roads Management Plan. This is articulated further in the detailed outline of construction monitoring presented in Attachment 05 (*Proposed North Rail Monitoring Programs*).				
QIA-16.3	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	Describe how the proposed measures will mitigate the occurrence of an exceedance to water quality criteria.	See the detailed outline of construction monitoring provided as Attachment 05 (*Proposed North Rail Monitoring Programs*).	Unresolved	This information has not yet been incorporated into the relevant management plans.	Since this original comment was received, Baffinland incorporated the referenced construction monitoring details previously presented as Attachment 05 of the 2019 Water Licence Application into Section 5 of the SWAEMP (Application Attachment 22).	
QIA-17.1	Fish Passage Risk Assessment Update (KP Ref VA19-00838)	Is Baffinland committed to completing these recommendations? If yes, when will the assessment and detailed design be shared for review and comment?	Yes, Baffinland is committed to completing these recommendations. An assessment of the single high-risk diversion will be undertaken in late August 2019, and site-specific modifications to the culvert design will be undertaken if appropriate following this assessment (i.e., through the fall of 2019). The resultant information will be presented in the application for an authorization under the Fisheries Act, to be prepared in late 2019 through early 2020. Baffinland can provide the QIA with this information once it has been developed. This is articulated in more detail on the construction monitoring outline provided as Attachment 05 (*Proposed North Rail Monitoring Program*).	Deferred	Refer to TC 24 1.4.		
QIA-18.1	Fish Passage Risk Assessment Update (KP Ref VA19-00838) 190502 2AM-MRY1325 Amend2 Applic-Att-27-AEMP-ILAE	Is Baffinland committed to completing these recommendations? If yes, when will the monitoring program be shared for review and comment?	Yes, Baffinland is committed to completing these recommendations. An outline of the proposed fish passage monitoring program is presented in Attachment 05 (*Proposed North Rail Monitoring Programs*). The resultant information will be presented in the application for an authorization under the *Fisheries Act*, to be prepared in late 2019 through early 2020. Baffinland can provide the QIA with this information once it has been developed.	Deferred	Refer to TC 24 1.4		

QIA-18.2	Fish Passage Risk Assessment Update (KP Ref VA19-00838) 190502 2AM-MRY1325 Amend2 Applic-Att-27-AEMP-ILAE	Given this statement can Baffinland explain why the North Railway did not cause greater changes to the AEMP? Please also consider the North Railway involved almost 400 stream crossing and 30 new quarries.	The AEMP focuses on the assessment of long-term aquatic effects from multiple stressors within the Potential Development Area of the Mary River Mine. The Mary River Mine site is considered to be the worst case scenario for impacts to the aquatic environment, including fish passage and habitat quality, due to multiple sources including surface runoff, discharges and dust. Baffinland suggests the SWAEMP is more appropriate as the project effects in the Northern Transportation Corridor are associated with construction and the monitoring program will be short-term focusing on validating that fish passage has been maintained.	Unresolved	This concern remains outstanding until triggers from the SWAEMP regarding the North Railway are captured in the AEMP.	Baffinland stands by its original response. The Northern Corridor Monitoring Program (now forming part of the SWAEMP) was developed jointly with the QIA. Baffinland's Commitment #201 in the NIRB review is as follows: Baffinland collects and reports data on fish presence, catch per unit effort, and fork length from 30-60 crossing sites along the Tote Road annually. Baffinland commits to adding observations regarding physical condition of fish (e.g., lesions, injuries, activity level). Baffinland and QIA will determine an appropriate approach to analysis and development of a metric for monitoring fish health for the 2022 reporting period. The program will be evaluated every three (3) years to determine if monitoring locations may be reduced due to no observations of project related impacts. This commitment will be incorporated into the Phase 2 version of the SWAEMP.	
QIA-19.1	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm	These reports should be included in Baffinland's reporting to NWB.	Observations of erosion and sedimentation may be identified during General or Component Inspections described in Section 5.2 of the Railway Operation and Maintenance Plan. As noted in Section 1.3 of the same Plan, water quality issues will be dealt with in accordance with the relevant plans including the EPP and SWAEMP, as with any other erosion and sedimentation issue on the Project.	Unresolved	This concern remains outstanding until reporting criteria inclusive of sedimentation monitoring is provided in the amended Water Licence.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-19.2	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm	Provide the measures and what are the specific triggers to action them.	Rail operations staff will report any erosional events that are or have the potential to cause the release of sediment into watercourses to the Environment Dept. This would be the triggering event. Any remedial measures will be implemented consistent with the SWAEMP. Aside from potentially elevated TSS above thresholds described in the Water Quality Monitoring outline for rail construction presented in Attachment 05 (*Proposed North Rail Monitoring Programs*). Monitoring and sampling of select water crossings in the Northern Transportation Corridor will also include a visual inspection of crossings to assess erosion and sedimentation events, consistent with the monitoring framework outlined in the Tote	Resolved			

			Road Monitoring Program in the Roads Management Plan.				
QIA 20.1	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm 2AM-MRY1325 Baffinland Iron Mines Revised Run of Mine Stockpile and Sedimentation Pond Issued For Construction Drawings	This work should be completed and provided by Baffinland prior to any construction approvals for the North Railway deviation is provided.	Further geotechnical investigations to confirm permafrost conditions along the North Railway deviation are planned in advance of construction, during winter 2019/2020. Any required updates to the Geotechnical Recommendations for Northern Railway report will be filed with the NWB.	Deferred	Refer to TC 24 1.4		
QIA 21.1	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm	The Water Licence should require Baffinland to complete and report on embankment cut test sections. The reporting should describe how the results were included in final designs. This work should be completed and provided by Baffinland prior to any construction approvals for the North Railway is provided.	A report on embankment cut sections cannot be produced unless actual cuts have been constructed and condition monitoring has taken place during construction. Following the construction monitoring phase, long-term monitoring will be proposed based on the findings from the construction monitoring program. Embankment cut sections have been studied in the thermal analysis reports and these have been presented as part of the FEIS Addendum.	Unresolved	This concern remains outstanding until further detail is provided in either the North Railway Monitoring Program or the mentioned drone-based monitoring program.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA 22.1	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm	Additional details regarding the frequency, and extent of the aerial assessments is requested.	Aerial Photosat imagery is already collected on an annual basis as agreed to with QIA. Aerial images from previous years will be compared with new images to identify areas of standing water which may indicate localized settlement has occurred.	Unresolved	This concern is outstanding until reporting criteria inclusive of a satellite imagery assessment is provided in the amended Water Licence.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA 22.2	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm	A specific trigger for when additional insulation is required should be considered in the Water Licence.	Triggers for when additional insulation or soil cover may be required will be determined after the completion of the construction monitoring phase, as no detailed site-specific information is currently available to make an accurate assessment of the potential triggers. Some triggers may relate to the safe operation of the rail line, such as excessive settlement (beyond what can be accommodated in the rail design) or cut slope failure as a result of freeze/thaw action within the active zone and changes to the local permafrost regime.	Unresolved	This concern is outstanding until reporting criteria inclusive of a satellite imagery assessment is provided in the amended Water Licence.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA 22.3	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm	The Water Licence should require Baffinland complete the aerial assessments committed to and report upon them.	Aerial assessments will continue to be undertaken annually with a report provided to the QIA as part of the Commercial Lease.	Unresolved	This concern is outstanding until reporting criteria inclusive of a satellite imagery assessment is provided in the amended Water Licence.	Baffinland's response will be provided in the final response on Nov 5, 2021.	

QIA 23.1	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	Provide what monitoring would be conducted that could lead to mitigation measures.	Further to the QIA's comment on the hydrological modelling completed in 2017 as presented in the FEIS Addendum (Appendix C of TSD 13), the railway design was updated. Ten diversions will now occur, and these were assessed with updated hydrological modelling, presented as Attachment 04 to this response (*Fish Passage Risk Assessment of Water Crossings and Stream Diversions*). Nine of the 10 stream diversions were assessed as low risk and the tenth stream diversion was assessed as medium risk. An outline of a proposed monitoring program is provided in Attachment 05 (*Proposed North Rail Monitoring Programs*).	Unresolved	Refer to 8.1 and 10.1.	Baffinland has responded to QIA-8.1 and QIA-10.1.	
QIA 23.2	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	Provide the monitoring values that would trigger mitigation measures.	Monitoring will consist of visual inspection, survey transects and possibly TSS/turbidity monitoring if elevated TSS is observed as the result of erosion of the stream channel. The only numerical value that would trigger mitigation would be TSS above the thresholds identified in the Rail Monitoring memo provided in Attachment 05 (*Proposed North Rail Monitoring Programs*). Effects to stream morphology will be based on professional judgement with consideration of potential alteration of fish habitat.	Unresolved	Refer to 8.1 and 10.1.	Baffinland has responded to QIA-8.1 and QIA-10.1.	
QIA 23.3	190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE	Provide reasoning when monitoring and adaptive management would not be needed during and post construction.	Monitoring will not be required following a full open water season (plus a preceding partial season, if applicable) indicates that the channel capacity is not being exceeded, subsidence or slope instability is not occurring, and if channel bed scour or sediment deposition is not occurring within what is judged to be normal limits. Proposed monitoring is described further in Attachment 05 (*Proposed North Rail Monitoring Programs*).	Unresolved	QIA is engaged with Baffinland in improving current adaptive management processes as part of a separate regulatory process. QIA will provide an update on this TC when available.	Baffinland is prepared to continue to discuss this issue outside of the NWB process as indicated by the QIA.	
QIA 24.1	190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE	The NWB should develop a new Part of the amended Water Licence devoted to stream crossings, the construction of the North Railway, and subsequent reporting requirements. At a minimum this should consider the following: 24.1.1 - Environmental monitoring for construction 24.1.2 - Construction QAQC programs for the North Railway	Bafffinland suggests that this can be dealt with in Part D of the current licence, through the process of the NWB approving design drawings and reports, requiring the submission of as-builts with construction summary reports, and the implementation of mitigation measures and monitoring as described in the management plans approved under the Water Licence. Baffinland would be amenable to inclusion of water quality criteria for water crossings that consider the	Unresolved	24.1 Unresolved. This TC remains unresolved until applicable reporting criteria are included. 24.1.1 Unresolved. This concern remains outstanding until reporting criteria for monitoring during construction of the North Railway is included. 24.1.2 Unresolved. This concern remains outstanding until quality control considerations of the North Railway are included in Part D, with inclusion of reporting criteria.	Baffinland stands by its August 2019 response to this technical comment. The current Type A Water Licence was issued for construction of the south railway with similar features. Hence, the current licence already contains the appropriate reporting criteria for construction of a railway.	

		24.1.3 - Infield design change reporting 24.1.3 - North Railway As-Built reporting on time frequency basis 24.1.4 - A construction sequence	influence of background or upstream concentrations (i.e. natural conditions).		24.1.3 Unresolved. This concern remains outstanding until reporting of in field design changes for construction of crossings along the North Railway are included in Part D. 24.1.4 Unresolved. In addition to recommendation 24.1, it is requested that as-builts for sections of the North Railway are provided on a more frequent basis (e.g., quarterly).		
QIA 24.2	190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE	This new Part should also provide requirements for construction reporting.	Construction reporting requirements are outlined in Part D, Item 17 of the current Water Licence.	Unresolved	Refer to 24.1.4.	Baffinland has responded to Recommendation 24.1.4.	
QIA 24.3	190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE	QIA is willing to work through the NWB process and review to support the development of draft terms and conditions.	Baffinland is also open to discussing this further with the parties.	Resolved	QIA is in agreement with Baffinland August 23, 2019 response.		
QIA 25.1	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm 190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE 08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2	Provide a timeline for the completion of modelling; additional testing; final design; and final approval of the North Railway.	Thermal modelling have been completed and is provided in Attachments 8.4, 8.5, 8.9, 8.10 and 8.11 of the updated Application. Hydrological modelling is provided in Attachment 04 of this submission. Additional geotechnical testing will occur along the North Railway deviation in winter 2019/2020, and testing will continue through the construction phase. The final design has been completed and is shown on the plan and profile drawings in Attachments 11.1 to 11.3 of the updated Application. While this design is final and approved for construction, it is recognized that there may be local changes due to site conditions.	Resolved	QIA is of the understanding that Baffinland is now solely seeking approval for the construction of Route 3.		
QIA 25.2	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm 190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE 08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2	Baffinland should be required to provide bi-weekly reports during the construction of the North Railway that outline any deviations from the approved construction drawings.	Information on as-built deviations from the approved construction drawings will be provided in Construction Summary Reports to be prepared as required under Baffinland's Type 'A' Water Licence.	Unresolved	Refer to 24.1.4	Baffinland has responded to Recommendation 24.1.4.	

QIA 25.3	190502-2AM-MRY1325-Amend2-Applic-Att-8.5-Rail-Geotech-Recomm 190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE 08MN053_BAF-PH1-830-P16-0022_railway-ops-maint-DRAFT-PHASE-2	Provide a timeline for delivering the North Railway long term monitoring and maintenance plan for review, comment, and approval.	The long-term monitoring and maintenance plan for the North Railway will be finalized during the first year of railway operations. The development of this plan will take into account information and observations from the construction geotechnical monitoring program.	Unresolved	QIA has not yet received a copy of the draft long term monitoring plan.	As noted in Baffinland's August 2019 response, the long-term monitoring and maintenance plan will be finalized in the first year of railway operations. The short and long-term geotechnical monitoring plan is described in Attachment 8.15 of the Updated Application (Northern Railway - Instrumentation Monitoring Program).	
QIA-26.1	• 190502 2AM-MRY1325 Amend2 Applic Att-2-Applic-ILAE • 190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE • Nunavut Water Board SIGs • 190502 2AM-MRY1325 Amend2 Applic-Att-3.2-SIG-Concord-ILAE • Nunavut Water Board. 2004. “Draft Guide for Community Consultation and Public Participation”. [NWB FTP Site] • 190823-2AM-MRY1325-mrp2-BIM-Tech-Comment-Responses • FEIS Addendum TSD 04 Public Consultation	Please describe all community and other meetings where water and or the water licence amendment were a central topic of discussion. Please also include copies of any plain language materials on the Water Licence Amendment provided at those meetings.		Unresolved		Baffinland’s response will be provided in the final response on Nov 5, 2021.	
QIA-26.2	• 190502 2AM-MRY1325 Amend2 Applic Att-2-Applic-ILAE • 190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE • Nunavut Water Board SIGs And other documents	As required by the SIGs, please list all Inuit concerns to date associated with water and how BIMC intends to mitigate those concerns.		Unresolved		Baffinland’s response will be provided in the final response on Nov 5, 2021.	

QIA-26.2a	Same as above			Supplemental	Baffinland to provide an updated list of all Inuit concerns to date associated with water, including from the Tusaqtavut reports for the five impacted communities, Inuit submissions on the public record for the NIRB Phase 2 process, and from the NIRB hearing transcripts.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-26.3	Same as above	Please describe any forthcoming opportunities provided by BIMC for Inuit communities to provide comment and raise their concerns on Water Licence Amendment changes.		Unresolved		The NIRB review has and continues to provide Inuit communiities with the opportunity to comment on the Phase 2 Proposal including water. The NWB has invited Inuit community representatives to attend the Nov 12, 2021 technical meetings. If additional focused engagement is requested at that time Baffinland will work with the community representatives to schedule additional meetings related to water. Baffinland notes that ongoing work to collect IQ from the communities to develop programs agreed to under the Inuit Certainty Agreement is ongoing. QIA is generally leading engagement, however, there are opportunities for Baffinland to attend in person IQ sessions if participants are comofrtable. Baffinland is open to additional engagement opportunities with Inuit communities but the volume of already planned and relevant engagement activities related to water is substantial, and will look directly to communities to gauge their desire for additional engagement.	
QIA-26.4	Same as above	Baffinland commit to expedite work with QIA and the Inuit communities to identify additional water-related values data collection, monitoring, thresholds of acceptable change, and adaptive management mechanisms.		Unresolved		Baffinland agrees to this commitment. Baffinland has funded the QIA-led freshwater IQ studies currently underway. Additionally, the QIA will be working with the communities to develop Inuit Objectives, Indicators, Thresholds and Responses (OITRs) that Baffinland has committed to incorporating into its water-related management plans.	
QIA-26.5	Same as above			Supplemental	Baffinland to provide more information on remaining Inuit concerns with the proposed Route 3 for the Northern Railway, how IQ informed Baffinland's move to prefer Route 3, and what form of verification of Route 3 as a preferred route for Inuit has been completed by Baffinland.	Baffinland maintains that questions on the routing of the North Railway are outside the scope of the NWB review. This question has already been discussed in detail and is being addressed in the NIRB review.	
QIA-27.1	• 190506 2AM-MRY1325 Amend2	The Proponent is requested to commit to expedite work with affected communities to develop and implement baseline data		Unresolved	Relevant activities related to this topic that have occurred in the interim include: • QIA has completed an additional	Baffinland is not aware of any Inuit concerns regarding the proposed water withdrawal stations. Baffinland has funded a QIA-led	

	Applic Att-22-SWAEMP-ILAE • 190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE • 190502 2AM-MRY1325 Amend2 Applic-Att-23-FWSWMP-Part1-ILAE • 190502 2AM-MRY1325 Amend2 Applic-Att-27-AEMP-Part1-ILAE • Knight Piesold. November 2018. "Mary River Project – Fresh Waterbodies with Unique Value and/or Cultural Significance to Inuit" And other documents	collection including on the ground studies for Inuit Water Values, Water Use, and identification of Waterbodies of heightened importance.			Tusaqtavut IQ study with the communities of Arctic Bay and Clyde River, and filed this work on the public record with NIRB in the summer of 2021. This work was funded by Baffinland. • QIA is working with the community of Pond Inlet to complete a study on IQ on and use of freshwater resources in the area impacted by the Mary River Project. This work has been funded by Baffinland. QIA will be available to provide an update on the status of this work and its implications for the water licensing process at the technical meeting on November 12, 2021. Baffinland provides information in its updated Water Licence filings for each proposed water withdrawal location. However, it is not clear what IQ and Inuit perspectives has informed this work. It is important to determine whether any of the proposed water withdrawal sources and amounts are an issue from an Inuit water use and values perspective. For example, at pg. 22 of 25 of Part 1 of the Water Withdrawal Plan, Baffinland notes "Regarding the extraction of water from lakes during the open water season, the FEIS identified the reduction in lake outflow of 10% as a commonly applied threshold value (FEIS Volume 7, Page 19; Baffinland, 2012)." It is not clear that IQ would agree with this threshold. It also remains unclear what role IQ played in the characterization of fish habitat. That makes statements like the following from the Executive Summary (pg. 18 of 30) difficult to verify: "The railway has been routed to minimize impacts on fish and fish habitat". And while Section 2.7 of the Main Report identifies 30 required quarries and the amounts of material proposed to be removed from them, it is not clear whether these quarries are located in areas of high value and use to Inuit or whether Inuit have verified the acceptability of these quarry locations.	study that is currently underway to collect this information. Impacts to Inuit water use that are identified can be addressed by the new Water Compensation Agreement.	
QIA-27.2		The Proponent is requested to provide further detail on: a. How IQ related to water use and water values was recorded from Inuit community members during any IQ data collection for the Project. b. How IQ related to water use and water values will be integrated into the Project management systems prior to conclusion of the Water Licensing process. c. How IQ related to water use and water values will be integrated into the Project management systems if the Phase 2 amendment is approved.		Unresolved		Response to a. Appendix 1 of this response is a report that Baffinland provided previously to the QIA in support of Water Compensation Agreement negotiations for Phase 2. This report summarized the information collected during Baffinland's earlier IQ studies, and identifies the 20 questions used to collect this information. An important distinction of Baffinland's earlier IQ study was that information was sought on Inuit knowledge and land use within each community's entire land use area. This helped Baffinland understand the relative importance of different areas to Inuit land use, a perspective not gained by studies that focus on a specific area. Response to b and c. Baffinland has provided the QIA with funding to support the QIA's supplemental IQ studies, described in other responses. This information will be used to inform a new Water Compensation Agreement, and will also be used to develop Inuit Objectives, Indicators, Thresholds and Responses (OITRs) that will be integrated into Baffinland's management plans. For almost two years, Baffinland has been revising and incorporating the QIA's feedback on its draft Phase 2 management plans. Most of the management plans attached to the Application have incorporated at least one round of QIA comments. The AEMP and SWAEMP have received multiple rounds of review by the QIA. The basis for the QIA considering this item unresolved is not clear to Baffinland given the QIA's central role in collecting additional project area-specific information on Inuit waters of importance, and the agreed-upon approach to incorporate Inuit OITRs into the Phase 2 management plans.	Appendix 1 - Freshwater Waterbodies with Unique Value and/or Cultural Significance to Inuit

QIA-27.3				Supplemental	Baffinland is requested to update whether it has identified any waterbodies of heightened importance to Inuit in the Regional Study Area for the Mary River Project, and if so: i. provide details about those waterbodies and why they are considered of heightened importance to Inuit, and ii. identify what additional monitoring and mitigation measures Baffinland commits to put in place around waterbodies of heighted importance. Data sources that are available to Baffinland include its engagement with Inuit parties, the results of the Tusaqtavut studies with all five impacted communities, through oral submissions at the technical meetings and hearings for the Mary River Phase 2 Project, and submissions on the public record by Inuit parties.	Baffinland has identified waterbodies of heightened importance within the Regional Study Area is described by KP (20I8) in Appendix 1. This includes the Robertson River / Qurluktuk located northwest of Milne Port, the Tugaat River located east of Milne Port, and the Ikaluit River at the head of Tay Sound. Each of these waterbodies are used to harvest sea-run arctic char. Each of these waterbodies are removed from the Project. Aquatic studies were planned at each of these three waterbodies in 2021 in fulfillment of Project Certificate condition 48a. The 2021 field programs were successfully completed in Qurluktuk and Tugaat systems, but the studies in Ikaluit River were not completed as proposed due to inclement weather preventing access. Results from these studies will be shared with the MHTO. The results of these studies and the QIA's Culture, Resources and Land Use (CRLU) studies currently underway could yield additional waterbodies of heightened importance, and will help to identify potential impacts and mitigation measures. The CRLU studies are the assumed responsibility of QIA, with funding provided by Baffinland.	Appendix 1 - Freshwater Waterbodies with Unique Value and/or Cultural Significance to Inuit
QIA-27.4				Supplemental	Baffinland to identify whether and how IQ and Inuit perspectives were integrated into the siting of quarries, laydown areas, water withdrawal points and amounts, and water crossings associated with the Phase 2 construction and operations, including provision of evidence that Inuit were asked about their concerns and values related to each location currently proposed for each of the above infrastructure-related physical works and activities noted in this Technical Comment. a. In relation to water withdrawals as identified in Baffinland's updated filings, including dust suppression water sources, Baffinland is requested to identify what role Inuit and IQ played in site characterization, what have Inuit said about where it is appropriate to withdraw water from and how much, where, when and under what conditions it is acceptable to do so, and how this has been included in the updated filings.	The siting of the railway is first and foremost influenced by its proximity to the Tote Road (to minimize the overall footprint), also considering geotechnical conditions, Inuit feedback on overall routing, and the absence of archaeological sites of high cultural significance. Bridge and other crossing locations are dictated in large part by permafrost conditions and the rail routing, and repositioning crossings to avoid areas results in a cascade of changes in the alignment in either direction. Because of grade limitations and turning radius constraints, the routing of a railway is much more complicated and constrained than a road. The construction of crossings for wildlife and snowmobiles, for example, has resulted in a wider embankment with a larger footprint and longer culverts that can present an issue for fish passage. There are a number of trade-offs that need to be balanced in siting the railway. Baffinland has spoken to these constraints in both the Phase 2 EIS documentation and at technical meetings and	

						hearings. Routing alternatives including Inuit feedback on routing have been covered extensively in the NIRB review, and such alternatives are considered at the environmental assessment stage, not during licensing. More minor features such as quarries and laydown areas were sited based on the availability of suitable rock or ground, proximity to the railway (reduced footprint and transportation costs), and the absence of important archaeological sites. Water withdrawal locations are largely dictated by the availability of suitable flow, proximity to the existing Tote Road, and distance between each water station (to minimize the distances the water trucks need to travel between the water sources and the sections of road being watered). Since water withdrawals at all locations identified in the Detailed Water Withdrawal Plan (Attachment 16 of the Updated Application) meet DFO's threshold of <10% of instantaneous flow, and the withdrawals are very short term (20-40 minutes) and intermittent, they are not expected to adversely affect Inuit use of the same waterbodies. Inuit were not asked about each and every minor project component (quarry, laydown area, water crossing, etc.) as this is not practical. However, Baffinland remains open to considering Inuit feedback on these features in the NIRB review, this licence amendment process and from the QIA's ongoing CRLU studies. Parties need to understand that there are cascading effects of avoiding specific locations in terms of having to realign a much larger section of the railway, as described above and elsewhere. The railway alignment as proposed represents Baffinland's efforts to optimize all of these considerations.	

QIA-27.5				Supplemental	Baffinland to identify any evidence it has of Inuit verification of fish bearing vs. non fish-bearing waterbodies, and marginal vs. important habitat, as presented by Baffinland in its updated Water Licence filings. a. Baffinland to identify what role IQ and Inuit played in the North Railway Freshwater Habitat Survey: 2018.	IQ collected by Baffinland identified the Phillips Creek watershed, mine site area lakes and the upper part of the Ravn River as containing only land-locked populations of arctic char. Important sea-run lakes that are outside of the immediate Project footprint (i.e., Qurluktuk, Tugaat and Ikaluit) were also identified. Our understanding of what Inuit consider important vs. unimportant fish habitat mainly relates to waterbodies containing sea-run char (important) vs. land-locked char (less important but not unimportant). Inuit were not involved in the 2018 fisheries surveys unfortunately. However, Inuit participated in the 2019 and 2021 field program. Baffinland is pleased to say that one of the Inuit field assistants involved in the 2021 field program is now working fulltime based in Winnipeg for the consultancy that completed the fisheries work.	
QIA-28.1	• 190502 2AM-MRY1325 Amend2 Applic Att-2-Applic-ILAE • 190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE • Nunavut Water Board. No Date. “Draft Mining and Milling Supplemental Information Guideline (SIG) for Mine Development (MM3)”. [Available on request from NWB] • Nunavut Water Board. No Date. “Draft Miscellaneous Supplemental Information Guideline (SIG) for General Water Works (including crossings, trainings, flood control, diversions, and flow alterations) (M1)”. [Available on request from NWB]	The Proponent, in consultation with QIA and the affected Inuit communities, to work with Inuit and provide funding to develop additions to the current water management and monitoring system that include Inuit identified indicators or thresholds for use, water quality, quantity or flow, including any experiential indicators identified by Inuit as important.		Unresolved	Relevant activities related to this topic that have occurred in the interim include: • The completion of a Tusaqtavut study with two additional communities, Clyde River and Arctic Bay, with identification of additional values related to and impacts on freshwater and fishing from the perspectives of these two communities. • Data collection and identification of initial impact pathways on freshwater and fishing by QIA for the ongoing Culture, Resources and Land Use (CRLU) Assessment, using data from the five communities’ Tusaqtavut reports, Baffinland’s FEIS Addendum, NIRB transcripts, and Inuit parties’ submissions on the public record. Notwithstanding that it is primarily the developer’s responsibility to do this work, QIA will be prepared to provide an update to the NWB on impact pathways associated with freshwater and fishing at the forthcoming technical meeting. • QIA worked with Pond Inlet community members in an ongoing IQ Water Values Study. This work, funded by Baffinland, will be an important contribution to TC 28.1 above. QIA will be prepared to provide an update on the implications of and timing for	Baffinland reviewed and considered the Tusaqtavut studies during the NIRB review process. Baffinland has provided funding to the QIA to complete freshwater-specific IQ studies. The intent of the study was to gather information from Inuit about where and how to monitor water, and what actions should be taken to protect the freshwater environment. It is Baffinland’s understanding this work has since been completed by the QIA with the community of Pond Inlet in October 2021. A verification workshop on this study will be held in late November 2021. It is expected that a final report will be completed in December 2021. Study findings will be integrated into the CRLU assessment. Findings from this Study may be used to furhter inform mitigation, monitoring, and compensation, and adaptive management measures in Baffinland's management plans.	

	And other documents				completion of this work at the forthcoming technical meeting. QIA notes that while Tusaqtavut studies for each of the five impacted communities have been filed, there is no reference to them in the SIG Concordance Table (e.g., in relation to sections 33, 40 or 41 of the SIGs at pg. 7 of 24, which still refer only to 2018 TSD filings by Baffinland). At pg. 13 of 24, Baffinland refers to even older data, the original 2012 FEIS, to provide the NWB with information on "traditional uses of water in the project area". Obviously, Inuit use of waters is neither static nor is it something where a comprehensive record was available based on work done prior to 2012. It is critical to update based on input from more community members and changes over time, what we know about "traditional uses of water in the project area". Despite this, QIA has found little evidence that the findings of any of the Tusaqtavut studies, some of which were filed as early as 2019, have been reviewed, incorporated, or even mentioned in the Baffinland updated Water Licence materials. The only exception to this is the very brief mention given to Tusaqtavut in some of the draft monitoring and management plans. Given that the findings of the Tusaqtavut studies are clearly material to determination of impact pathways on water, Culture, Resources and Land Use, and Inuit rights, it is concerning that the Water Licence filings make no reference to them.		
QIA-28.2		The Proponent, in consultation with QIA and the affected Inuit communities, to identify ways in which the ongoing assessment of Project Effects on Inuit Water Use and water quality, quantity, and flow on Inuit Owned Lands can be conducted through an Inuit/IQ enriched lens.		Unresolved	Same as above	Baffinland's response will be provided in the final response on Nov 5, 2021.	

QIA-28.3				Supplemental	Baffinland to provide a supplemental filing prior to the technical meeting, identifying all existing and potential Phase 2 impact pathways from the Mary River Project on Inuit water values and associated Inuit rights, and what Baffinland mitigation and monitoring commitments should be applied to those impact pathways. All of the data sources on the NIRB process public record, including those referred to above, should be considered by Baffinland in developing this list of impact pathways. a. In addition, Baffinland should provide any evidence it has of Inuit verification of Baffinland's findings regarding likely Phase 2 impacts on water.	Baffinland has provided impact pathway breakdowns for all valued components identified in the Tusaqtavut Study, which includes fish and freshwater (refer to Appendix 2). These breakdowns have been considered with the development of the impact pathway database. Additionally, as the QIA is aware, Baffinland has provided funding to the QIA to complete freshwater-specific IQ studies. As QIA outlined, the intent of the study was to gather information from Inuit about where and how to monitor water, and what actions should be taken to protect the freshwater environment. It is Baffinland's understanding this work has since been completed by the QIA with the community of Pond Inlet in October 2021. A verification workshop on this study will be held in late November 2021. It is expected that a final report will be completed in December 2021.	Appendix 2 – Tusaqtavut Pathway Breakdown – Effects Assessment Summary Table (Fish and Freshwater)
QIA-29.1	• 190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE • 190506 2AM-MRY1325 Amend2 Applic Att-22-SWAEMP-ILAE • 190823-2AM-MRY1325-mrp2-BIM-Tech-Comment-Responses • 190513-08MN053-BIMC Draft Mgmt Plans-Snow Mgmt Plan	Describe what IQ was collected during these workshops related to Snow Management and how it informed and or changed the Snow Management Plan.		Unresolved		Snow stockpiles were visited by participants during the 2019 Community Risk Workshops. Snow management was identified as a concern. Specifically, runoff from snow stockpiles during melt periods, and concern about impacts of dust (e.g., along the side of the road; when snow melts, there is a lot of sediment accumulation) were among the issues recorded as concerns. Recommended mitigation included: - Clear snow - Keep culverts functional - Monitor streams Each of these mitigation measures form part of the Snow Management Plan.	
QIA-29.2		Describe any future opportunities for IQ to inform revisions to the Snow Management Plan, and how consultation with QIA and the affected Inuit communities has informed these revisions.		Unresolved		The Snow Management Plan is not currently required under the Water Licence, and was developed at the QIA's request, to address acknowledged runoff quality issues associated with snow stockpiles. The Snow Management Plan in its current form (with adaptive management and a trigger action response plan) was first provided to the QIA for review in mid-2020, and one round of comments have been incorporated in the latest version provided to	

						the QIA in October 2021. Baffinland will continue to work with the QIA to refine this plan over time, as part of the Commercial Lease. This includes incorporating any IQ identified as relevant to snow management collected by the QIA.	
QIA-30.1	• 190502 2AM-MRY1325 Amend2 Applic-Main-Rpt-ILAE • 190502 2AM-MRY1325 Amend2 Applic-Att-27-AEMP • 190502 2AM-MRY1325 Amend2 Applic-Att-28-EPP • 190823-2AM-MRY1325-mrp2-BIM-Tech-Comment-Responses	Describe how IQ has informed aquatic monitoring programs and recent revisions to relevant monitoring and management plans.		Unresolved		Baffinland has agreed to incorporate Inuit Objectives, Indicators, Thresholds and Responses (OITRs) into its management plans including the AEMP as per the QIA's request. This process is still ongoing, and Baffinland awaits additional Inuit input into these plans. Baffinland shared a draft copy of the amendment application on April 14, 2021. QIA did not provide any comments before the draft was finalized and submitted on September 17, 2021. Baffinland suggests that QIA is best positioned to describe how Inuit led monitoring programs to be led by QIA should be considered by the NWB. Baffinland will work with the QIA to ensure these monitoring programs are understood and represented in an amended Water License prior to the Public Hearing.	
QIA-30.2		Commit to working with QIA and the affected Inuit communities to identify opportunities for Water-specific IQ studies and monitoring programs including how Inuit monitors and Inuit observational criteria will be used in Project-related monitoring activities.		Unresolved		This is a comment provided on October 25, 2019 that wasn't responded to previously. Baffinland has made this commitment through the ICA, and the QIA is actively working to engage the communities on water-specific IQ studies and monitoring programs.	
QIA-30.3		Provide further information on what role the Proponent is committed to having Inuit play in developing priority SNP site locations and related monitoring activities.		Unresolved		Baffinland believes the Inuit Stewardship Plan under the ICA provides the mechanism to engage Inuit on monitoring. The SNP program, however, is dictated by the NWB.	
QIA-30.4		Provide further information on how data collected by Inuit and through water monitoring overall will be integrated into the Proponent's committed to Culture, Resources, and Land Use (CRLU) Monitoring Program for the Project, and what role is envisioned for the Proponent's committed to Inuit Committee/Inuit Panel for the Project, in relation to water planning, effects assessment, monitoring and adaptive management.		Unresolved		Baffinland believes the process for accomplishing this has been outlined in the Inuit Certainty Agreement that has been negotiated with the QIA. Baffinland is aware that the QIA has made good progress on the CRLU study and monitoring program.	
QIA-30.5				Supplemental	Baffinland to identify whether it is formally committed to support the development of an	Under Phase 2, an Inuit-led water quality monitoring program is covered in Section	

					Inuit-led water quality monitoring program in relation to the Mary River Project. a. If so, Baffinland is asked to provide more information on how it envisions the Inuit-led water quality monitoring program will work alongside Baffinland's current water quality monitoring program, what level of financial commitment Baffinland has on an annual basis for this program, and what discussions Baffinland has initiated with Inuit about development and implementation of this Inuit-led water quality monitoring program.	17.1.3 of Schedule 17 of the ICA. Baffinland's understanding is that it will be part of the CRLU monitoring program administered under the Inuit Stewardship Plan, which QIA has sole responsibility for developing and implementing. Baffinland will be making fixed annual IIBA implementation payments to QIA to cover the cost of the CRLU monitoring program, among other things. Baffinland understands the QIA has been actively engaging Inuit in freshwater IQ studies, and Baffinland anticipates that the outcomes of that work to contribute to the Inuit led water quality monitoring program for Phase 2. Further discussions around alignment with Baffinland-led programs will occur as QIA is prepared to engage.	
QIA-31.1	NIRB document 210203-08MN053-QIA Inuit Certainty Agreement-IA1E			New	Baffinland to provide for its existing monitoring programs in place, either the average annual costs of its overall monitoring program and the proportion of that which goes to Inuit-led, IQ-driven monitoring, at present; or, if Baffinland deems this financial data to be proprietary; the proportion of average annual monitoring expenditures that go to technical, scientific monitoring works and activities, and Inuit-led, IQ-driven monitoring works and activities, respectively, at present.	Baffinland's position is that there is already a path forward for resolution of this item through the ICA for Phase 2. This information is not required to evaluate the Updated Water Licence Application.	
QIA-31.2	Same as above			New	Baffinland to provide its expectations for what proportion of its monitoring expenditures will be for technical, scientific monitoring works and activities, and Inuit-led, IQ-driven monitoring works and activities, respectively, should Phase 2 proceed, given new committed-to programs.	As described in Section 1 of the Inuit Certainty Agreement, Inuit-led monitoring of the Phase 2 Project will be managed under the Inuit Stewardship Plan (ISP), to be authored by QIA. The proportion of technical/scientific monitoring to Inuit-led monitoring initiatives in the future will depend on the scope of activities put forth in the ISP, and while Baffinland will provide input into the development of this plan, and has committed to fund the ISP for the life of the Mary River Project. it would not be appropriate for Baffinland to prescribe the scope of monitoring to be undertaken under the ISP. Baffinland is committed to implementing both technical/scientific monitoring works and activities, as well as Inuit-led, IQ-driven monitoring works for the Mary River Project and will continue to work with QIA on these	

						initiatives, however Baffinland considers this to be outside the scope of the NWB process.	
QIA-32.1	210917-2AM-MRY1325-Amend2-Applic-Att-3.2-SIG-Concord-IAAE				Baffinland provide an update or supplemental filing to TSD-01 that provides its current comparison of all technically and economically feasible alternative means to transport ore to Milne Port, including alternative rail routes, which should be altered from the 2018 TSD given that additional information has come forward in the interim.	Alternatives assessment is a key focus of the NIRB review, not water licensing. It should be noted that everything in the public record in the NIRB review process relating to alternatives builds on TSD-01; it is not necessary to update the document.	
QIA-32.2	Same as above				Baffinland provide an update on the position of Inuit parties in relation to Route 3 to the NWB, and results of all engagement meetings on this topic to date.	Alternatives assessment, including rail routing, has been a subject area discussed at length in the NIRB review, and is available on NIRB's public registry.	
QIA-33.1	• 210923-2AM-MRY1325-Amend2-Applic-Att-30-ICRP-Pt1of3-IAAE • 210923-2AM-MRY1325-Amend2-Applic-Att-30-ICRP-Pt3of3-IAAE			New	Baffinland to provide a supplemental filing indicating where it has integrated prior input from QIA and any other Inuit party into revisions to the Interim Closure and Reclamation Plan.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-33.2	Same as above			New	Baffinland to identify whether Inuit parties and IQ have played any role in the development of the residual effects characterization methodology used in Appendix G, and/or have verified the findings in Appendix G.	Appendix G includes excerpts from the FEIS, which incorporated IQ and the results of Inuit engagement. The methodology for community-based research undertaken for the FEIS is presented in FEIS Appendix 2B, and the public consultation report is FEIS Appendix 2C. Collected IQ was presented throughout the various FEIS volumes. This question is not relevant to water licensing.	
QIA-33.3	Same as above			New	Baffinland to identify any plans it has to engage Inuit parties moving forward in the steps outlined in #2 above.	The Nunavut Impact Review Board process for the review of the Phase 2 Proposal has provided and continues to provide opportunities for Inuit to share input on the residual effects characterization methodology and the findings of the environmental assessment.	

QIA-34.1	Mary River Project Phase 2 Proposal Updated Application for Amendment No. 2 of Type A Water Licence 2AM-MRY1325 Section 2.5.3 North Railway Stream Diversion page 26 of 66			New	QIA requests involvement in developing habitat features and selecting appropriate habitat compensation both in kind and otherwise as necessary.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-35.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G • Section 2.1 Objectives • Table 2.1 Objectives and Performance Indicators page 11 of 109			New	It is recommended that Baffinland include discharge in the list of performance indicators for the mitigation of potential impacts to water, the protection of aquatic ecosystems and maintaining receiving environment water quality.	Discharge volumes from surface water management ponds are recorded in accordance with Water Licence requirements and this allows for Baffinland or reviewers to determine mass loadings as referenced. Baffinland does not consider discharge volume to be a useful performance indicator as the volumes of effluent discharged from surface water management ponds are a function of the amount of runoff reporting to these facilities, which is largely dependent on precipitation levels which are out of Baffinland's control. The effluent is discharged in accordance with Baffinland's management plans governed under the Water Licence.	
QIA-36.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan Rev G • Section 2.4.4 Preventative Design Measures for Ground Disturbances. • Table 2.4 Comparison of Soil Spoils Volumes with Available Capacities at Borrow Pits and Quarries Page 19 of 109			New	Indicate where additional storage will be provided and the volume of extra storage available in the event that estimates of spoils generated are greater than anticipated or volume of available storage is underestimated.	The priority is to place soil spoils in borrow pits along the Tote Road and exhausted quarries adjacent the railway. Section 4.9 of the Updated Application discusses the volumes of soil spoils requiring disposal in relation to the available space in quarries. It is expected that all the soil spoils generated along the railway (estimated to be 1.8 Mm3) can be placed in borrow pits and quarries (available capacity ~5.5 Mm3). Therefore, there is more than enough capacity available with contingencies. This approach will reduce the use of dedicated disposal sites that would occupy additional land.	
QIA-36.2	Same as above			New	Clarify if spoils will be stored in such a way as to permit access to promote revegetation at closure.	Soil spoils disposal areas will be constructed for closure and will naturally revegetate. Future access will not be required.	

QIA-37.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G • Section 3.3.2 Working Near Waters page 30 of 109 and • Section 5.1 Monitoring During Construction page			New	Baffinland develop and implement a monitoring program for all stages of the project including background, construction and operational monitoring and provide a parameter list that is indicative of all potential parameters of concern.	Reference to contractors developing general construction monitoring procedures in no way relinquishes Baffinland's responsibility for environmental compliance. Contractors will be required to develop their own procedures and processes to meet the requirements of the Water Licence, legislation, and Baffinland's own management plans (which are approved under the Water Licence). The QIA stated, "all components of the aquatic environment monitoring program and Surveillance Network Program (SNP) must be presented for each stage of the project." Not all components of the Project at all stages will form part of the SNP. Temporary construction fronts are an example of this, and why the terminology is included in the management plans. The QIA requested, "Baffinland develop and implement a monitoring program for all stages of the project including background, construction and operational monitoring and provide a parameter list that is indicative of all potential parameters of concern." This monitoring program exists in the form of the Water Licence which includes the SNP, the AEMP and other monitoring programs. These programs and management plans have been in place since 2013, and thus do not require development.	
QIA-38.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G • Section 3.3.3.2 Fish Protection page 32 of 109			New	Baffinland clarify the criteria they will use to determine if quarries have the “potential” for acid rock drainage or metal leaching.	Thresholds for acid rock drainage and metal leaching are presented in Table 3.1 of the Borrow Pit and Quarry Management Plan (Attachment 26 of the Updated Application).	
QIA-38.2				New	Baffinland should also describe what measures will be used to prevent and manage ARD/ML at source so that the integrity of vegetation in the 100m buffer is not damaged.	The first preventative measure is regular testing of rock in quarries against the ARD/ML testing thresholds in Table 3.1 of the Borrow Pit and Quarry Management Plan (Attachment 26 of the Updated Application). Based on testing of quarry rock along the railway to date, the likelihood of ARD or ML is low. However, small pockets of potentially acid generating or metal leaching rock could still be encountered. This material will be handled in accordance with Section 3.4 of the Borrow Pit and Quarry Management Plan.	

QIA-39.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan Rev G • Section 5.0 Monitoring • Table 5.1 Monitoring Programs page 56 of 109			New	It is recommended that the table and monitoring programs be updated to include: A defined period of record that will be used as baseline data to compare with for monitoring programs for Phase 2.	Baseline data for monitoring is presented in the FEIS as well as the AEMP. Baffinland has accummulated baseline (pre-rail construction) water quality through implementation of the Tote Road Monitoring Program.	
QIA-39.2				New	Dates or timelines to determine when each phase is expected to take place to understand how much data will be collected for each phase of the mine. A definition of the "post-construction verification phase" and how it differentiates from the operations phase	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-39.3				New	Collection of data for the SNP, NCMP, snow management monitoring, groundwater monitoring, Type B Water Licence Monitoring and AEMP during all four phases of the mine (baseline, construction, post-construction verification and operation)	Each of the referenced monitoring programs (SNP, NCMP, snow management monitoring, groundwater monitoring, Type B Water Licence Monitoring and AEMP) are already established and will continue through construction of Phase 2 components of the Project and the Project's entire operation phase, in accordance with Water Licence and Commercial Lease requirements.	
QIA-40.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan Rev G • Section 5.0 Monitoring • Table 5.2 Surface Water and Aquatic Ecosystems Trigger Action Response Plan			New	Propose more conservative thresholds for their low, moderate and high-risk thresholds. Add fish health measures including fish length, fork length, lesions and injuries into their response-action framework for road operation activities. Add iron and chloride to the response-action framework for road operation activities and add total ammonia nitrogen, nitrate and total nitrogen to the response-action framework for quarry and borrow pit operations activities.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-41.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan Rev G • Section 5.2 Routine Inspections • Table 5.3 Routine Inspections and Monitoring Requirements page 61 of 109			New	QIA requests the aforementioned items be included in the inspection routine or an explanation be provided for their absence.	With respect to adding flow meter readings to monitoring under the SWAEMP, effluent discharge volumes are recorded as required by the Water Licence but under the Fresh Water Supply, Sewage and Wastewater Management Plan (not the SWAEMP).	

QIA-42.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan BAF-PH1-830-P16-0026 Phase 2 Proposal Revisions for Review Purposes Only Rev G • Section 5.4 Monitoring at Project Quarries and Borrow Sources page 64 of 109			New	Provide the criteria Baffinland utilizes to determine when a berm or other drainage control measure is considered necessary.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-43.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan Rev G • Section 5.6 Northern Corridor Monitoring Program • Figure 5.1 Northern Corridor Monitoring Program Adaptive Management Framework • Appendix H Northern Corridor Monitoring Program • Section 5. TSS Water Quality Criteria and Response-Action Framework • Figure H.4 TSS Response-Action Framework			New	Baffinland propose a more conservative threshold for action with regard to the Northern Corridor Monitoring Program.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-44.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan Rev G • Section 5.7 Fish Passage Monitoring			New	Baffinland include fish health data including fish presence, catch per unit effort, fish length, fork length, lesions and injuries in their adaptive management plan.	Baffinland's response will be provided in the final response on Nov 5, 2021.	

QIA-45.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan Rev G • Section 5.7 Fish Passage Monitoring			New	Request commitment to annual inspections for life of mine.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-46.1	• Surface Water, Aquatic Ecosystem Management Plan Rev G • Appendix C Site Drainage and Monitoring Figures 6.1 and 6.2 • Appendix G Surveillance Network Program Schedule • Schedule G.1 – Construction Phase SNP Stations – Milne Port			New	Clarify what is considered a significant precipitation event and update maps to ensure all sites are included and have been labelled for evaluation of the SNP monitoring program.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-47.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan Rev G • Appendix F Environmental Guidelines for Project Water Crossing Repairs and/or Installations • Section 4. Water Sampling and Monitoring Frequency • Table C-1 – Summary of Water Quality Monitoring Frequency			New	Baffinland commit to sampling for three years after water crossing construction or disturbance with monitoring during operations considered acceptable.	Baffinland's response will be provided in the final response on Nov 5, 2021.	

QIA-48.1	• Surface Water, Aquatic Ecosystem Management Plan Rev G • Appendix F Environmental Guidelines for Project Water Crossing Repairs and/or Installations • Section 5. Water Quality Action Levels • Table C-1 – Water Quality Action Levels • Section 7. Action Response Framework During Construction			New	Identify a single exceedance as a trigger to investigate mitigative actions (i.e., sediment control fencing or rip rap placement).	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-49.1	Surface Water, Aquatic Ecosystem Management Plan Rev G Appendix G Surveillance Network Program Schedule Schedule G.3 – Operation Phase SNP Stations – Milne Port Schedule G.4 – Operation Phase SNP Stations – Mine Site			New	Weekly monitoring of water discharge volume from the Mine and Milne Port contaminated snow dumps during freshet and monthly during the remainder of the open water season.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-49.2				New	Iron be added to the parameter list for contaminated snow dumps.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-49.3				New	Confirm water being transferred between water control ponds is being measured.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-49.4				New	Increase monitoring of stockpile surface runoff to weekly to confirm compliance.	Baffinland's response will be provided in the final response on Nov 5, 2021.	

QIA-50.1	• Surface Water, Aquatic Ecosystem Management Plan Rev G • Appendix H Northern Corridor Monitoring Program • Section 4. Monitoring Frequency			New	Group 3 parameters be collected at the same frequency as Group 4 and allow a lab technician who is trained in the detection of oil and grease to determine its presence.	In the preamble of this technical comment, the QIA states the following: "While water quality is not considered a VEC, Article 20 of the Nunavut Land Claims Agreement (the Nunavut Agreement) states that Inuit are entitled to unaltered water quality, quantity and flow." This is not accurate. Section 20.3.1 of Article 20 states: "No project or activity within the Nunavut Settlement Area which may substantially affect the quality of water flowing through Inuit Owned Lands, or the quantity of such water, or its flow, shall be approved by the NWB unless the applicant for a licence has entered into a compensation agreement with the DIO for any loss or damage which may be caused by the change in quality, quantity or flow of the water or the NWB has made a determination in accordance with Section 20.3.2." The Northern Corridor Monitoring Program has been adapted from the Tote Road Monitoring Program developed jointly between the QIA and Baffinland. The QIA approved this sampling program. The focus was on managing erosion and sedimentation, and monitoring of oil and grease when visual evidence warrants is appropriate adaptive management.	
QIA-51.1	• Attachment 22 • Surface Water, Aquatic Ecosystem Management Plan Rev G • Section 5.6 Northern Corridor Monitoring Program • Appendix H Northern Corridor Monitoring Program • Section 5. TSS WQ Criteria and Response-Action • Figure H.4 TSS Response-Action Framework			New	Include iron and chloride in addition to TSS in the adaptive management framework and response-action framework for the Northern Corridor Monitoring Program.	Baffinland's response will be provided in the final response on Nov 5, 2021.	

QIA-52.1	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • Section 2.1.1.1 North Rail Crossings			New	Provide a reference to the specific protocols that were developed.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-53.1	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • Section 1.0 Introduction			New	Provide site specific data for each crossing	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-54.1	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • Section 2.1.2 North Rail Bridges			New	Provide rationale for this change in methodology.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-55.1	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • Section 2.1.1.1 North Railway			New	Provide explanation on how barriers greater than 15° were classified, such as how the gradient measured (i.e. clinometer, visual observation, surveyor, using desktop analysis such as digital elevation model).	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-55.2				New	Provide references that indicate that a stream gradient of 15° is difficult or impassable for Arctic Char.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-56.1	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • 2.1.3 North Rail Lake/Pond Encroachments/Infilling – page 13 of 62			New	Was the waterbody classified as non-fish bearing if fish were not captured after completing the 100 m long section using the backpack electrofisher? Were other capture methods utilized?	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-57.1	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • 2.1.4 North Rail Stream Diversions – page 14 of 62			New	What additional studies were completed to address the reduction in flow to the unnamed lake downstream of CV-90-4?	The unnamed lake downstream of CV-90-4 was assessed with a sidescan echosounder to determine bathymetry and substrate distribution. The lake is assumed to include seasonal use by Arctic char but may include overwintering. The railway design has changed and there currently is no expected flow reduction downstream of CV-90-4.	
QIA-57.2				New	How will water levels in the unnamed lake be mitigated from the diversion at CV-90-4?	The railway design has changed and there currently is no expected flow reduction	

						downstream of CV-90-4. The affected tributary includes a barrier at its mouth and the crossing location is non fish bearing.	
QIA-57.3				New	Have studies been completed to understand the contribution of water from this upper reach to the lake?	No. There is no diversion currently planned at CV-90-4.	
QIA-57.4				New	Will the diverted water ultimately flow back into the unnamed lake or a different receiving waterbody?	The railway design has changed and there currently is no expected flow reduction downstream of CV-90-4.	
QIA-58.1	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • 3.2.1 North Rail Crossings			New	Confirm if fish sampling surveys were completed at these sites.	Fish sampling surveys were completed at all stream crossings along the North Railway. More recent study results are provided in the attached memo by North/South Consultants dated March 17, 2021.	
QIA-59.1	• Attachment 13.2 • North Railway Freshwater Habitat Survey: 2018 – Part 1 • 3.5 North Rail Stream Diversions			New	Confirm if all engineered drawings have been provided for the stream diversions.	Diversions are shown on the detailed plan and profile drawings in Attachment 11.3 of the Updated Application. Engineered drawings have not been developed for the diversions themselves.	
QIA-59.2				New	Confirm if the drawings show the reconstruction channel and tie in to the downstream waterbody.	The engineered drawings for the diversions have not been developed.	
QIA-60.1	• Attachment 16 • Detailed Water Withdrawal Plan Part 1 of 4– page 17 of 25			New	What monitoring will be completed to ensure there is no impact to fish and fish habitat?	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-60.2				New	How will stream flow be measured during the time of any withdrawals to establish what the 10% flow rate is?	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-60.3				New	What is the monitoring and mitigation plan if the maximum pumping rate was over estimated for a waterbody?	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-61.1	• Attachment 16 • Detailed Water Withdrawal Plan Part 2 of 4– pages 1& 2 of 30			New	Confirm if a monitoring program has been developed to monitor the pump intakes/screen for sediment, debris and impinged fish on a routine schedule (i.e. inspection frequency should be increased during periods when the maximum pumping rate is used)?	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-61.2				New	If it is determined that a site is not appropriate for pumping (i.e. sediment uptake, fish impingement) what steps will be taken to identify a new pumping location?	Baffinland's response will be provided in the final response on Nov 5, 2021.	

QIA-62.1	• Attachment 16 • Detailed Water Withdrawal Plan Part 2 of 4– pages 8 of 30			New	A detailed fish habitat assessment be completed and submitted for review prior to this location being used for water taking.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-63.1	• Environmental Protection Plan • Baf-Ph1-830-P16-0008 • Phase 2 Proposal Revisions - For Review Purposes Only >Rev B • Section 4.4.3 Environmental Protection Measures – page 40 of 85			New	Integration of a monitoring threshold for turbidity such as CCME guidelines for the Protection of Aquatic Life. Turbidity clear flow - Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period). High flow or turbid waters - Maximum increase of 8 NTUs from background levels at any one time when background levels are between 8 and 80 NTUs. Should not increase more than 10% of background levels when background is 80 NTUs.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-64.1	• Environmental Protection Plan • Baf-Ph1-830-P16-0008 • Phase 2 Proposal Revisions - For Review Purposes Only >Rev B • Section 4.7.3.1 Environmental Protection Measures – page 44 of 85			New	Confirm if culverts that contain baffles will be monitored to ensure rock movement/accumulation or winter ice build up in the culverts do not create fish barriers during low flow periods or freshet.	Confirmed. These will be monitored to ensure fish passage during freshet and summer low flows.	
QIA-65.1	• Environmental Protection Plan • Baf-Ph1-830-P16-0008 • Phase 2 Proposal Revisions - For Review Purposes Only >Rev B • Section 4.7.3.1 Environmental Protection Measures – page 44 of 85			New	Provide further details on mitigation measures to ensure that culverts >50 m do not become fish barriers.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-65.2				New	Confrim if a monitoring program will be developed to ensure that fish are using and able to pass through these extended culverts.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-65.3				New	Please describe means by which longer culverts can be illuminated	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-66.1	Same as above			New	Provide the results of the fish passage potential for each culvert.	Baffinland's response will be provided in the final response on Nov 5, 2021.	

QIA-67.1	• Environmental Protection Plan Rev B • Section 4.7.3.3 Environmental Protection Measures			New	What is Baffinland's course of action if spawning sites are identified within 20 m upstream and/or 20 m downstream of the work area?	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-68.1	• Attachment 31 - Surface Water Sampling Program - QA/QC Plan • 5.2.2 River and Grab Sampling			New	Please clarify the exact procedure for sediment sampling.	The procedures for sediment sampling in streams are provided in Section 5.2 of the Sampling Program - QA/QC Plan.	
QIA-69.1	• Attachment 13 • Watercourse Crossings – Attachment 13.1 Phase 2 Proposed Infrastructure Interactions with Watercourses			New	Clarify which Table is the most up to date with the project interaction and corresponding watercourse, pond/lake.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-69.2				New	Update both tables to ensure fish habitat is correctly defined and include 'potential' habitat for Arctic Char and Ninespine Stickleback.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-70.1	• Aquatic Effects Monitoring Plan • Section 3.3.5 Benthic Invertebrates			New	Provide the full comments referenced above in the AEMP.	The QIA may be referring to the Minnow Recommendations presented in Appendix C (Appendix A are Baffinland's corporate policies). Appendix C is the Part 2 file (210917-2AM-MRY1325-Amend2-Applic-Att-28-AEMP-Part 2).	
QIA-71.1	• Attachment 28 Aquatic Effects Monitoring Plan Rev 2 • Section 3.1.2 Nutrient/Eutrophication Indicators and Benchmarks			New	Baffinland commit to continuing to use TP as an indicator of changes in trophic status.	Baffinland has consistently included the analysis of total phosphorus (TP) in water samples collected at all lotic and lenthic waterbodies under the AEMP. Total phosphorus will continue to be assessed as part of the AEMP Rev 2 water quality monitoring program to support the evaluation of changes in trophic status.	

QIA-72.1	• Attachment 28 Aquatic Effects Monitoring Plan Rev 2 • Section 3.1.2 Nutrient/Eutrophication Indicators and Benchmarks			New	Baffinland continue to monitor nutrients and add sampling of primary producers, in the form of periphyton, in lotic systems (such as the Mary River) receiving discharge of treated sewage effluent.	Baffinland will continue to monitor concentrations of nutrients including total ammonia, nitrate, nitrite, Total Kjeldahl Nitrogen (TKN), dissolved organic carbon (DOC), total organic carbon (TOC), and total phosphorus in surface waters at all lotic and lentic water quality monitoring stations under the AEMP Rev 2. In addition to monitoring nutrient concentrations in water at all AEMP lotic water quality monitoring stations, Baffinland monitors chlorophyll a concentrations at these stations as a surrogate for the assessment of phytoplankton abundance and as a basis for evaluating changes in trophic status. Furthermore, because benthic invertebate communities are sensitive to nutrient enrichment, benthic invertebrate community monitoring conducted annually at all AEMP lotic systems (including Mary River at three areas upstream, and two areas downstream, of the primary mine camp STP discharge) provides an additional tool for assessing potential nutrient enrichment influences of the project on biota of lotic environments. The collective monitoring of nutrients, chlorophyll a as a proxy for phytoplankton abundance, and benthic invertebrate connunities at AEMP lotic environments provides sufficient information (through weight-of-evidence analysis) for assessing nutrient enrichment effects and the tracking of potential changes in trophic status at lotic systems adjacent to the project. Therefore, based on the ability of the AEMP to assess and track changes in trophic conditions at lotic stations, Baffinland deems that additional phytoplankton or periphyton sampling in lotic systems is not warranted.	

QIA-73.1	• Attachment 28 Aquatic Effects Monitoring Plan BAF-PH1-830-P16-0039 Phase 2 Proposal Revisions for Review Purposes Only Rev 2 • Section 3.1.2 Nutrient/Eutrophication Indicators and Benchmarks • Table 3.8 Reference Areas for the Mary Lake System			New	In Table 3.8 it is indicated that phytoplankton are not sampled at the Mary River Reference sites G0-09-A, G0-09, G0-09-B. Given that Mary River is the primary receiver of treated sewage effluent and Baffinland wants to evaluate nutrient enrichment primarily by chlorophyll-α, it is recommended that Baffinland collect samples of phytoplankton and periphyton at the reference sites G0-09-A, G0-09 and G0-09-B.	Baffinland regrets that the information presented in Table 3.8 related to the sampling of phytoplankton at Mary River G0-09-A, G0-09, and G0-09-B reference stations was misrepresented. Phytoplankton sampling (based on using chlorophyll a as a proxy for phytoplankton abundance) will be included as a monitoring component of the AEMP at Mary River G0-09-A, G0-09, and G0-09-B stations. Table 3.8 will be updated accordingly. As outlined in the response to QIA comment #72.1, the sampling of nutrients, phytoplankton (chlorophyll a), and benthic invertebrates at the G0-09 series stations is deemed by Baffinland to be sufficient for evaluation of project-related enrichment and trophic status effects. Therefore, no addtional measures of phytoplankton or periphyton are required at lotic stations under AEMP Rev 2.	
QIA-74.1	Attachment 28 Aquatic Effects Monitoring Plan BAF-PH1-830-P16-0039 Phase 2 Proposal Revisions for Review Purposes Only Rev 2 Section 3.3.3 Sediment Quality Study Design page 53 of 105 Table 3.12 Profundal Sediment Quality Stations page 55 of 105 Figure 3.3 page 57 of 105			New	Clarify if the number of profundal sediment stations in Sheardown Lake SE is being reduced to two or if profundal sediment stations are being eliminated entirely.	The maximum depth attained in Sheardown Lake SE is approximately 14 metres (m). The depth throughout the majority of this basin of Sheardown Lake (i.e., >95%) is estimated to be less than 12 m deep, which was the cut-off depth assigned to distinguish 'littoral' from 'profundal' lake stations under the CREMP. Therefore, a minimal amount of profundal habitat occurs in Sheardown Lake SE, and that which is present is at the threshold between classification as littoral or profundal. Hence, no 'profundal' stations are proposed for sampling in Sheardown Lake SE. Figure 3.3 provided in the AEMP Rev 2 will be updated to reflect no profundal stations sampled in Sheardown Lake SE. It is noteworthy that the five stations proposed for sediment sampling in Sheardown Lake SE under the AEMP Rev 2 have been evenly distributed throughout the lake and reflect depths ranging from approximately 6.8 to 13.2 m, the later of which is within the deepest portion of the lake. Therefore, although no profundal stations are included at Sheardown Lake SE for sediment sampling, the proposed design considers proper spatial coverage and variable water depths to ensure that sediment sampling conducted at Sheardown Lake SE meets the AEMP objectives.	

QIA-75.1	• Attachment 28 Aquatic Effects Monitoring Plan Rev 2 • Section 2.4.5.3 Tote Road and Northern Railway (WMA 48)			New	Provide further details on the anticipated discharge location, the monitoring site label, the parameters to be sampled and the frequency of sampling.	The temporary ore stockpiling area at KM57 was removed from the Project. References to this component were removed from the Updated Water Licence (Main Report). That reference to this project component was not removed from the AEMP is an oversight. It will be removed from the next revision of this plan.	
QIA-76.1	• Attachment 28 Aquatic Effects Monitoring Plan BAF-PH1-830-P16-0039 Phase 2 Proposal Revisions for Review Purposes Only Rev 2 • Section 3.5.3 Fish page 65 of 105			New	Confirm that fish ageing structures will also be aged by an accredited laboratory with expertise in processing fish ageing structures to confirm technician results.	Baffinland confirms that fish ageing will be conducted at a qualified analytical laboratory by personnel specialized in processing and ageing of fish using scientifically accepted approaches. As part of the quality control process, Baffinland confirms that a second qualified fish ageing specialist will be used to independently evaluate ages provided by the initial specialist. The age confirmation samples will be selected at random, with a total of 10% of the number of samples submitted undergoing a second, independent analysis. Results within one year of the original age estimate will be considered acceptable.; In the event of discrepancies, addtional (secondary) age structures will be assessed by each ageing specialist to arrive at an assigned age for the sample(s) in question.	
QIA-77.1	• ICRP – 1. Plain Language Summary • PROJECT AND CLOSURE SUMMARY, p. 13			New	How will feasibility of restoring natural drainage be assessed as reasonably possible or not and how will the decisions be documented?	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-77.2	• ICRP Section Plain Language Summary • PROJECT AND CLOSURE SUMMARY, p. 14			New	What factors will be considered and what would prevent re-establishment of natural drainage at closure?	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-78.1	Same as above			New	Please clarify the number of quarries in the Phase 2 project.	Thirty aggregate sources (29 rock quarries and one borrow pit) are proposed to support Phase 2 construction (Section 2.7 of the Updated Application Main Report). An additional 79 quarries were previously identified to support construction of the South Railway and Steesnby Port.	
QIA-78.2	Same as above			New	How many are anticipated to remain as visible landforms following closure?	Baffinland's response will be provided in the final response on Nov 5, 2021.	

QIA-79.1	• ICRP • Plain Language Summary • PROJECT AND CLOSURE SUMMARY, p. 18 and Table 1.1 • Section 5 – Permanent Closure and Reclamation, Table 5.1 • Sect. 5.2.1.2 p.102			New	In the event that refinements do not reduce risk to acceptable levels, what mitigation options are available and when could they implemented?	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-80.1	ICRP Sect 5.2 p. 100 Permanent Closure and Reclamation Requirements			New	If docks are left in place but not maintained, are they likely to deteriorate over time?	Geotechnical analyses and monitoring of the docks at Milne Port will be undertaken prior to closure to confirm long-term stability and maintenance requirements (if any).	
QIA-80.2				New	How does this fit the Closure Objective of physical stability?	Undertaking geotechnical analyses and monitoring to confirm the long-term stability of docks at Milne Port is consistent wtith the Closure Objective of physical stability. It is incorrect to suggest that an absence of active maintenance will necessarily result in long-term physical stability issues for the docks at closure.	
QIA-81.1	• Sect. 5.2.1.4 CONSIDERATION OF CLOSURE OPTIONS AND SELECTION OF CLOSURE ACTIVITIES. Enhanced Pit Filling Alternative Table 5.2 p.103-104 • Sect. 5.2.1.7 p. 106			New	Please provide a schedule and source of water for pit refilling that Baffinland considers to be feasible and which can be used to predict pit water quality at closure.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-82.1	p. 10-6 Sect. 5.2.17 Uncertainties			New	Provide feasible mitigation and closure options for the open pit that address the need for chemical stability and acceptable water quality.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-83.1	ICRP Sect 5.2.1.9 Contingencies p. 107			New	Are the options provided feasible for batch treatment of the pit or for ongoing treatment of pit discharge at closure?	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-83.2				New	Does Baffinland foresee a scenario in which ongoing treatment of pit discharge is required over the long term at closure?	Baffinland's response will be provided in the final response on Nov 5, 2021.	

QIA-84.1	ICRP Sect. 5.2.2.1 p. 108 Waste Rock and Overburden Piles			New	Confirmation if the overburden be isolated and used to promote revegetation of disturbed sites at mine closure.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-85.1	• ICRP Section 5.2.2. Waste Rock and Overburden Piles • D.3 Reclamation Research Program - Waste Rock Stockpile Seepage/Runoff Water Quality, p. 303			New	What climate change scenarios have been considered in the modelling?	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-85.2	Same as above			New	What sensitivity assessments have been made on rate and magnitude of permafrost and runoff?	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-85.3	Same as above			New	Compare the climate change predictions from 2007 that were used in the closure plan development with the most recent modelling completed in 2019 and comment on the implications to permafrost development and runoff management at closure.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-86.1	ICRP 5.2.2.2 PRE-DISTURBANCE, EXISTING, AND FINAL SITE CONDITIONS p. 116			New	Was this predicted from geochemical modelling and testing?	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-86.2	Same as above			New	How has this development been considered in the closure planning?	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-87.1	ICRP 5.2.2.6 PREDICTED RESIDUAL EFFECTS p. 119			New	Please describe the mitigation options available to control Hg, Se and Ag in seepage and runoff from the site and whether these are suitable for long term deployment or batch/short term mitigation.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-87.2	Same as above			New	Please include a Response Framework, Triggers and Action Levels for implementing enhanced mitigation for site runoff and seepage in the closure and post closure environment.	Baffinland's response will be provided in the final response on Nov 5, 2021.	

QIA-88.1	ICRP Sect. 5.2.5.2 PRE-DISTURBANCE, EXISTING, AND FINAL SITE CONDITION ICRP 5.2.8.5 p. 152 Issue / Concern "Dock infrastructure			New	Will infrastructure be removed from the site or disposed on site (i.e. in waste rock piles or open pits)?	Selection of the final disposal option(s) will be made after receiving input from the Mine Closure Working Group, the QIA, and other regulatory agencies and stakeholders. The selected options will be described in the Final Closure and Reclamation Plan.	
QIA-88.2	Same as above			New	What criteria will be used to determine fate and disposal?	Criteria used to determine whether non-hazardous materials are disposed of on-site or off-site will include: - space required/available in on-site landfills or other approved waste disposal locations - logistical constraints/level of effort required for on-site vs. off-site disposal options - cost of on-site vs. off-site disposal options - input from the Mine Closure Working Group	
QIA-89.1	ICRP 5.2.6.2 PRE-DISTURBANCE, EXISTING, AND FINAL SITE CONDITIONS p. 135 ICRP 5.2.6.5 p. 136			New	What community uses have been identified for structures that are >100km from any existing communities?	Specific community uses for remaining structures at closure have not yet been identified. As indicated in Section 2.4 of the ICRP, Baffinland has proposed to establish a Mine Closure Working Group (MCWG) to best incorporate considerations for post-closure land use of the Project site. Future discussions with the MCWG will include potential future uses for remaining structures at closure.	
QIA-89.2				New	Has Baffinland documented whether a community has specifically identified a need for the dock post closure?	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-89.3				New	Have CIRNAC or the communities indicated any agreement to assume liability for the ore docks?	Section 5.2.6.2 of the ICRP states "Ongoing engagement with communities and discussions with QIA will occur to confirm an approach for the Tote Road and water crossings such that an acceptable level of liability exists for transfer of these remaining structures." Similar engagement and discussions will be held with communities and CIRNAC for the Milne Port docks prior to closure.	
QIA-90.1	ICRP 5.2.7.2 p. 144 and 5.2.7.5 p.146 Landfills			New	Confirm if the proposed depth of overburden cover incorporate predictions for a warmer climate to accommodate a deeper active layer over time?	Baffinland's response will be provided in the final response on Nov 5, 2021.	

QIA-91.1	ICRP 5.2.8.5. p. 152 ENGINEERING WORK ASSOCIATED WITH CLOSURE ACTIVITY			New	What are the proposed effluent criteria for closure and what is the predicted timeline to meet the criteria?	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-92.1	ICRP 6.2.1.1. Land Farm Operation, p. 155			New	Explain why the CCME (2008) risk-based methodology may be preferable to guidelines that are specific to Nunavut?	Section 2.4: Application of Remediation Criteria at Contaminated Sites in the Government of Nuanvut Guideline for Contaminated Site Remediation (Government of Nunavut, 2019) is based heavily on the Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil (CCME, 2008). The three tiers of approaches provided in the two documents (Tier 1: Criteria-Based Approach, Tier 2: Modified-Criteria Approach, and Tier 3: Risk-Based Approach) are essentially identical. The guidelines provided in the Nunavut Guideline are not specific to Nunavut, and in fact the Tier 1 Guidelines in both documents are exactly the same. Both the Government of Nunavut and CCME guidelines provide information on when a modified-criteria or risk-based approach may be suitable. Per the Government of Nunavut guideline: - "In general, this modified-criteria approach is utilized in situations where site conditions, land use, receptors or exposure pathways differ only slightly from those assumed in the development of Tier 1 criteria." - "In certain circumstances, neither the criteria-based or modified-criteria approach may be suitable for a site because pathways of exposure, target chemicals, receptors or other site characteristics differ significantly from those used to develop these more generic approaches." This guideline notes that Tier 2 or Tier 3 approaches may be more suitable for large, complex or remote industrial sites. The Tier 1 Criteria-Based Approach is the most simple approach for assessing hydrocarbon-contaminated soils following treatment in the landfarm. However, as noted in the Government of Nunavut guideline, Tier 2 or Tier 3 approaches may be more suitable for large, complex or remote industrial sites, so Baffinland may pursue these options if necessary in the future.	

QIA-92.2				New	What criteria would influence a decision to use the CCME protocol?	As noted in the response to QIA 92.1, the Tier 1, Tier 2 and Tier 3 approaches in the Government of Nunavut guideline are identical to those in the CCME guideline. Using a Tier 2 modified-criteria or Tier 3 risk-based approach would be considered if there were significant issues managing hydrocarbon-impacted soil in the landfarm using the Tier 1 criteria-based approach, such as if soil treated in the landfarm was not able to consistently meet the Tier 1 guidelines. The Tier 1 guidelines were developed based on generalized assumptions for site conditions, receptors, and exposure pathways, and some of these assumptions may differ slightly or significantly from the site conditions, receptors and exposure pathways at the Mary River Project sites. Using a Tier 2 or Tier 3 approach would utilize site-specific information rather than generalized assumptions, and would generate site-specific soil quality guidelines for the Project that are protective of human health and the environment.	
QIA-93.1	ICRP 7.1 SHORT-TERM TEMPORARY MINE CLOSURE – CARE AND MAINTENANCE p. 159			New	Confirm if Baffinland has developed a list of all necessary temporary closure activities in order of importance to guide execution of temporary closure and inform the level of effort required.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-94.1	ICRP Figure 8.1 Final Closure Schedule			New	Confirm where and how will rails and ties be disposed. Will they be disposed of on-site or off-site?	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-95.1	• ICRP Pit Flooding • Also See QIA TC "Enhanced Pit Filling"			New	Which enhanced flooding scenario does the 10 year timeline assume and what are the associated sources and water withdrawal rates?	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-96.1	ICRP Section 9.6 Environmental Site Assessment p. 190			New	Confirm which guidelines will be used in the ESA process and that the guidelines chosen are protective of the environment.	Tier 1 Guidelines provided in the Environmental Guideline for Contaminated Site Remediation will be used, however site-specific guidelines will be used if they have been developed during the life of the mine. Tier 1 Guidelines or site-specific guidelines (if available) are protective of human health and the environment.	
QIA-97.1	ICRP Appendix D1 Reclamation Research Program –			New	Describe what elements of conservatism in the pit water quality model result in the predicted water quality at closure.	Baffinland's response will be provided in the final response on Nov 5, 2021.	

QIA-97.2	Open Pit Water Quality p. 293			New	Describe the origin of the conservative model inputs and compare with realistic measured values.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-97.3				New	Provide a range of modelling outcomes based on a realistic range of pit conditions (or varying conservatism) at closure and explain which scenarios are most likely.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-97.4				New	Provide a comparison of the short term and long term water quality in the pit lake at closure and describe how the chemistry of the lake may change once the pit is flooded.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-98.1	ICRP Research Task – Pit Lake Meromixis p. 297			New	Provide an update on the status of the meromixis research program, any findings to date and comment on whether meromixis is proposed as a closure option for the pit lake.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-99.1	ICRP Research Task Open Pit Water Quality Research Results p. 297			New	What geochemical tests have been completed on the ore body to date?	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-99.2				New	Provide the status of any humidity cell tests on ore characteristics.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-99.3				New	Compare the above results to the inputs to the pit lake model and comment on the conservatism of the pit water quality model.	Baffinland's response will be provided in the final response on Nov 5, 2021.	
QIA-99.4				New	What existing results could be used to test the conservatism of the water quality model?	Baffinland's response will be provided in the final response on Nov 5, 2021.	

APPENDIX

APPENDIX 1: FRESHWATER WATERBODIES WITH UNIQUE VALUE AND/OR CULTURAL SIGNIFICANCE TO INUIT

November 30, 2018

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Mr. Christopher Murray
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Dear Christopher,

RE: Mary River Project - Freshwater Waterbodies with Unique Value and/or Cultural Significance to Inuit

1.0 INTRODUCTION

Baffinland Iron Mines Corporation (Baffinland) requested that Knight Piésold Ltd. (KP) identify freshwater waterbodies with unique value and/or cultural significance to Inuit that occur on Inuit Owned Land (IOL) and have the potential to be affected by the Mary River Project. The Mary River Inuit Knowledge Study (MRIKS); (Baffinland, 2014) was identified as a key information source in this regard. This work will assist Baffinland in its interpretation of the Water Compensation Agreement (WCA) between the company and the Qikiqtani Inuit Association (QIA).

2.0 BACKGROUND

Article 20 of the *Nunavut Agreement* is titled Inuit Water Rights, and Section 20.3.1 states the following:

> *"No project or activity within the Nunavut Settlement Area which may substantially affect the quality of water flowing through Inuit Owned Lands, or the quantity of such water, or its flow, shall be approved by the NWB [Nunavut Water Board] unless the applicant for a licence has entered into a compensation agreement with the DIO [Designated Inuit Organization] for any loss or damage which may be caused by the change in quality, quantity or flow of the water or the NWB has made a determination in accordance with Section 20.3.2."*

Baffinland and the QIA signed a WCA in 2013, in accordance with Section 20.3.2 of the *Nunavut Agreement*, and Section 63 of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*. Section 20.3.3 of the *Nunavut Agreement* provides guidance in regard to determining compensation for loss or damage caused by the change in quality, compensation, or flow of water through IOL:

> *"In determining the appropriate compensation for loss or damage under Section 20.3.2, the NWB shall take into account the following:*
>
> - *the adverse effects of the change in quality, quantity or flow of water on Inuit Owned Lands, owned or used by the person or group affected*
> - *the nuisance, inconvenience, disturbance or noise caused by the change in quality, quantity or flow of water to the person or group affected*
> - *the adverse effects of the change in quality, quantity or flow of water in combination with existing water uses*

- *the cumulative effect of the change in quality, quantity or flow of water in combination with existing water uses*
- *the cultural attachment of Inuit to Inuit Owned Lands, including water, adversely affected by the change in quality, quantity or flow of water*
- *the peculiar and special value of Inuit Owned Lands, including water, affected by the change in quality, quantity or flow of water, and*
- *interference with Inuit rights, whether derived from this Article or some other source."*

We understand that it is bullets 5 and 6 above (the cultural attachment and peculiar and special value of IOL including water) that Baffinland would like to identify in relation to the Project.

Overlap of the Project footprint with IOL is shown on Figure 1. Milne Port, the Mine Site, most of the Northern Transportation Corridor, and the northern 30 km of the South Railway is situated on IOL. As such, this review will focus on potential interactions of these project components with waters important to Inuit.

3.0 INUIT KNOWLEDGE STUDIES

Community based research programs were undertaken by Baffinland to obtain community input, socio-economic information, and Inuit knowledge. The MRIKS was conducted by Baffinland from 2006 through 2010 (Baffinland, 2014). Objectives of the study included obtaining local knowledge of wildlife, land use, and areas of cultural significance to support Project decision-making and the environmental assessment process. Inuit have a unique knowledge about their local environment, how it functions, and its characteristic ecological relationships. Inuit knowledge is recognized as an important part of project planning, resource management, and environmental assessment.

Workshops and interviews with elders were undertaken in the communities of Arctic Bay, Clyde River, Hall Beach, Igloolik, and Pond Inlet in 2007 and 2008, and workshops were held in the South Baffin communities of Cape Dorset and Kimmirut in 2010. The results of Inuit knowledge studies were incorporated to the Final Environmental Impact Statement (FEIS) report (Baffinland, 2012) and FEIS Addendum report (Baffinland, 2013) for the Early Revenue Phase (ERP). A database was eventually assembled that consists of research agreements, interview questions, audio recordings of interviews, written interview transcripts in Inuktitut and English, and the keyword summaries and maps that were the main products of the study (Baffinland, 2014). The study methodology is summarized in Appendix A.

4.0 METHODOLOGY

KP led the study and developed the study products, and hence has a familiarity with the MRIKS database. KP reviewed the database with the aim of identifying those waters that were identified as important to Inuit that may potentially be affected by the Project. A number of interview questions produced information on areas of importance to Inuit. This included questions regarding travel routes and camps, water, and areas important for fishing. The interview questions assessed as having information on the importance of freshwater bodies in the region are provided in Appendix B.

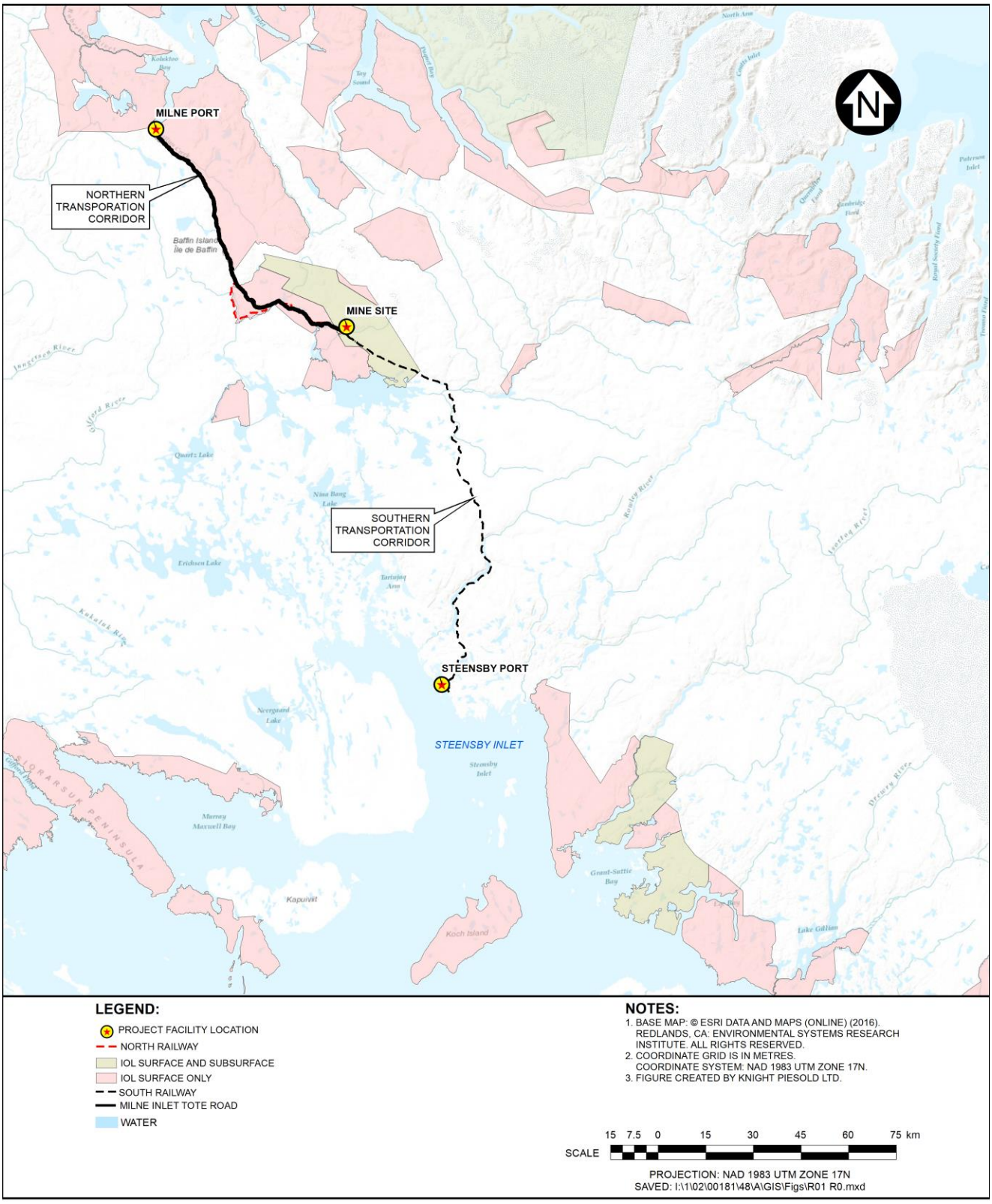


Figure 1 Project Location Relative to Inuit Owned Lands

In completing this review, KP undertook the following:

- Identified and reviewed the applicable maps that show the following information:
  - Camps
  - Travel routes
  - Lakes and rivers of importance
  - Special places and resource collection areas
  - Fishing areas
- Reviewed keyword summaries related to the above topics
- Reviewed individual transcripts corresponding to mapped features discussing lakes and rivers of importance

Relevant figures presenting the above information are included in Appendix C, as follows:

- Figure 1.4 Travel Routes - Project Study Area (Interview Results)
- Figure 1.6 Berry Picking Locations - Project Study Area (Workshop Results)
- Figure 1.8 Camping Locations - Project Study Area (Workshop Results)
- Figure 1.12 Special Places - Project Study Area (Interview Results)
- Figure 1.16 Stone Quarry Locations - Project Study Area (Workshop Results)
- Figure 3.20 Water and Ice Features - Project Study Area (Interview Results)
- Figure 5.2 Fish Locations - Project Study Area (Interview Results)

The results of the review are provided below.

5.0 RESULTS

5.1 THE IMPORTANCE OF WATER

A number of study participants stated that good drinking water was of primary importance for well-being, and water is also an important source of food (fish).

> *It's vitally important you get some water for drinking purposes. But, lakes are also important because when I go fishing to a lake and I stay there for a long time and when I become thirsty I can drink the water from the lake. Yea, there are a whole lot of lakes in this area here. For example, the residents of Pond Inlet we go to this lake to go fishing.* (PI-03, Pond Inlet)

Several elders emphasized the need to have a good water source near to camp sites.

> *We made sure to camp nearby water sources such as lakes, rivers and streams so we had water nearby our camp… This has always been one of the case for all time, when choosing a camp site, we had to be sure to have a water source nearby… Lakes and rivers are all important as we camp or live around those for our water source and we fish off the lakes and rivers during the run… Having water is essential to us and water keeps us alive.* (Elijah Panipakoocho, Pond Inlet)

> *We have always had to live nearby lakes for our water source and we even use it as storage or deep freeze with our meat supplies. This lake is where the river runs from where we fish. … These lakes are very, very important to me. Some campers camp where there are no lakes, and in early fall they have no water source at all, so it is important to live or camp nearby lakes.* (Ikey Kigutikkarrjuk, Arctic Bay)

While out on the land, hunters and travellers consume water from ice, snow, lakes and rivers. In winter, snow is relied upon as a water source. Water from glaciers was identified by many study participants as the best available water.

> *Only when you have good drinking water are you more livelily and when you don't have good drinking water it is unpleasant and you always look for a source of good drinking water… When you're at Qaurnak in the summertime and the icebergs arrive you have an excellent source of drinking water… When we were camping out there we had excellent drinking water. Water is very important to our livelihood.* (Jochabed Katsak, Pond Inlet)

> *Our waters are frozen for longer periods of time. There is a lot of snow that we can also use for water. They are clean as they are frozen more than half the time. Outside of the community there are lakes that have clean water. Lakes up here freeze often and there is an abundance of it to be used for drinking. There is a lot of that in our environment. We can get our water anywhere. We can either use ice or snow.* (AB-13, Arctic Bay)

The lakes and rivers are an important source of food, fish are caught from their depths and mammals are hunted from the water. During the open water period, major rivers are generally preferred over smaller watercourses, and in particular, rivers with a gravel bottom, with an awareness that smaller streams or streams with finer substrate (and hence lower flow) are more likely to contain harmful bacteria. Inuit commonly observe the water to see if it is foggy or murky, since it is believed that clear water is the best water to consume.

> *After there's no longer some ice we didn't just fetch water from ordinary streams but major rivers seemed to have better drinking water source and also rivers have little germs… we were discouraged from drinking from small streams or lakes. Only we were told to drink water from major rivers such as if the river had gravel bottom. That's a very good drinking water and everyone has known that for a long time… if it's for making tea then you can easily identify if it's poor source of drinking water and the tea tends to turn black and you can tell that it is not good drinking water by sampling the tea you can notice it right away so tea is an excellent source of identifying the quality of drinking water because they tend to turn black and then you know.* (Jochabed Katsak, Pond Inlet)

Tea is said to be a good indicator of water quality. Also, nowadays people reportedly boil their water before consuming.

5.2 PROJECT AREAS

Table 1 summarizes the Inuit land uses including the identification of important waters within the Project's development areas on IOL, as established by the mapping developed from the MRIKS (Appendix C).

Table 1 Geographic Areas with Cultural or Land Use Importance

Project Areas	Travel Routes	Camps	Water (specific locations)	Harvesting Food (specific locations)	Special Places (includes carving stone deposits)
Milne Port	Yes	Yes	No	No	No
Northern Transportation Corridor	Yes	Yes	No	No	No
Mine Site	Yes	Yes	No	No	Yes

A summary of the land uses and likely presence of waters of importance to Inuit is provided below for each of the Project Areas. Although the first 30 km of the South Railway is located on IOL, this area has been incorporated into the discussion on the Mine Site.

5.3 MILNE PORT

Milne Port is an important entrance into the interior of northern Baffin Island, mainly for the people of Pond Inlet. It is also along the main travel route between Pond Inlet and Igloolik (Figure 1.4). It is an area historically and currently used for camping (Figure 1.8). Important waterbodies were not identified at the port site as part of the MRIKS (Figure 3.20). Important waters nearest to Milne Port include the Robertson River system to the northeast, which drains into Koluktoo Bay, and the Tugaat River system to the east. Both these rivers are important for harvesting anadromous Arctic Char.

An old outpost camp is located on the beach at Milne Port to the east of Baffinland's port facilities. The camp was originally constructed during mineral exploration activities in the early 1960s, and while the building is in poor condition and not habitable, it continues to serve as a refuge for land users, and the area continues to be where hunters will land their boats, sometimes offloading all-terrain vehicles (ATVs) to travel inland. It is reasonable to assume that land users use the stream adjacent to the HTO cabin, though this stream beyond the influence of the Project.

Prior to development of Milne Port, hunters would also land boats at the mouth of Phillips Creek, anchoring them inside the sand spit that crosses part of the mouth of the river. The lowest reach of the river behind the sand spit has been found to be brackish and not suitable for drinking, though further upstream at Baffinland's approved water withdrawal location, the water is fresh with no evidence of salt intrusion. Baffinland's Hunter and Visitor Site Access Procedure (Baffinland, 2015) directs hunters to land on the east end of the beach in the vicinity of the HTO cabin mentioned above, and as such, presumably land users no longer land boats at Phillips Creek and depart inland from this location.

5.4 NORTHERN TRANSPORTATION CORRIDOR

Phillips Creek and the Milne Inlet Tote Road (Tote Road) is part of the corridor into the interior of the island, as referenced above (Figure 1.4), and a number of camp sites have been identified (Figure 1.8). No important waters were identified within the corridor (Figure 3.20). The lakes within this corridor were noted to support land-locked Arctic Char.

Given the amount of travel and camps found along Phillips Creek, as well as archaeological sites that demonstrate its historic use as a travel corridor, it is reasonable to assume that Phillips Creek and the lakes within the river system (i.e., KM26 Lake, KM32 Lake and Katiktok Lake) have been and may continue to be used by Inuit as a water source. As noted in Section 5.1, Inuit strategies to obtain good drinking water includes seeking larger waterbodies with gravel substrate, and hence it is unlikely that land users (at least experienced land users) would seek to obtain drinking water from the many small tributaries of Phillips Creek that are crossed by the Tote Road.

5.5 MINE SITE

Deposit No. 1 (Nuluujaak) is used as a landmark for navigation while traveling on the land, being about 500 m above the surrounding ground to the south, and highly visible from afar. It is removed from the main Pond Inlet to Igloolik travel corridor. Nonetheless, Inuit have traditionally traveled through the Mine Site area to reach lands further east via the Ravn River valley (Figure 1.4), or to hunt caribou or collect carving stone (Figure 1.16).

> *Yes …Hunters would hunt for caribou there as there would be a lot of caribou in early spring. I would be able to see Mary River from there. We knew Mary River all along as we would be able to see it from there. We weren't aware of the fact that it has minerals but the mountains would become visible and we could tell that it was Mary River. We knew where Mary River is but weren't aware that it has minerals in it.* (Sakiasie Qaunaq, Arctic Bay)
>
> *We used to go [to Mary River] to go pick up soapstone. We would take the soapstone to Pond Inlet. The soapstone at Mary River is good quality stone.* (Ipeelie Koonoo, Arctic Bay)
>
> *The only place that I know is at Nulujaak (Mary River) near the camp they had set up, up at the hill, in a gully there is some variety carving stones that some people quarried and stones for making pots can be found at Tuapak, and marble, Nallua has some marble.* (Calab Ootoova, Pond Inlet)

No important waters were identified in the Mine Site area, or along the first 30 km of the South Railway (Figure 3.20). Although not identified in the IQ studies (Figure 1.8), there was a cabin at the Mine Site, originally constructed as part of mineral exploration in the early 1960s, which was used by hunters until construction of the mine in 2013. At the start of mine construction, Baffinland replaced this cabin with a new cabin, positioned on the west side of Camp Lake near its outlet at the request of the Mittimatalik Hunters and Trappers Organization. Based on the location of the new cabin, Camp Lake is the obvious water source for camp occupants, at least during the period of open water. The outlet stream of Camp Lake is not expected to be used for water, as it is shallow with sometimes limited flow. Water could be withdrawn from the Tom River, which is similar in size to the Mary River, though it is further removed from the cabin. Snow is likely the source of water during periods of ice cover, which is much of the year.

6.0 CONCLUSIONS

The MRIKS (Baffinland, 2014) is a useful resource for identifying waters that are important to Inuit, i.e., with a cultural attachment and peculiar and special value. Though waters on IOL that are important to Inuit were identified from the study, none of the identified locations are close to the Project.

It is reasonable to assume, however, that watercourses close to areas used by Inuit may be used as sources of drinking water. This includes:

- The stream next to the HTO cabin on the east side of the Milne Inlet beach
- Phillips Creek and the lakes within the Phillips Creek catchment
- Camp Lake
- Possibly the Tom River

These watercourses are not thought to qualify as having a cultural attachment and peculiar and special value, as described in Section 20.3.3 of the *Nunavut Agreement*.

7.0 REFERENCES

Baffinland Iron Mines Corporation (Baffinland), 2012. *Mary River Project - Final Environmental Impact Statement*. February.

Baffinland Iron Mines Corporation (Baffinland), 2013. *Mary River Project - Addendum to the Final Environmental Impact Statement for the Early Revenue Phase*. June.

Baffinland Iron Mines Corporation (Baffinland), 2014. *Mary River Inuit Knowledge Study, 2006-2010*. Compiled by Knight Piésold Ltd.

Baffinland Iron Mines Corporation (Baffinland), 2015. *Hunter and Visitor Site Access Procedure*. February 17. Doc. No. BAF-PH1-830-PRO-0002, Rev. 1.

Knight Piésold Ltd. (KP), 2015. Letter to: Oliver Curran, Baffinland Iron Mines Corporation, Re: *Mary River Project's Inuit Knowledge Study Database*. February 6. Ref. No. NB14-00411.

8.0 CLOSURE

Please contact the undersigned if you have questions or comments about the content of this letter.

Yours truly,
Knight Piésold Ltd.

Prepared:

Richard Cook, P.Geo. (Ltd.)
Specialist Environmental Scientist | Associate

Reviewed:

Oscar Gustafson, R.P. Bio.
Specialist Environmental Scientist | Associate

Approval that this document adheres to the Knight Piésold Quality System:

Attachments:

Appendix A	MRIKS Study Methodology
Appendix B	Select Interview Questions
Appendix C	Select MRIKS Figures

/rc

APPENDIX A

MRIKS Study Methodology

(Pages A-1 to A-4)

APPENDIX A
MRIKS STUDY METHODOLOGY

1.0 INFORMATION SOURCES

Community based research programs were undertaken by Baffinland to obtain community input, socio-economic information, and Inuit knowledge. The Mary River Inuit Knowledge Study (MRIKS) was undertaken by Baffinland from 2006 through 2010. Inuit have a unique knowledge about their local environment, how it functions, and its characteristic ecological relationships. Inuit Qaujimajatuqangit (IQ) is recognized as an important part of project planning, resource management, and environmental assessment. In 2006, the study started in Pond Inlet. Workshops and interviews with elders were undertaken in the communities of Arctic Bay, Clyde River, Hall Beach, Igloolik, and Pond Inlet between 2007 and 2010. Workshops were held in the South Baffin communities of Cape Dorset and Kimmirut during 2010. The objectives of the IQ study were to obtain local knowledge of wildlife, land use, and areas of cultural value to support Project decision-making and the environmental assessment process. The results of IQ studies conducted from 2006 through 2010 were incorporated to the Final Environmental Impact Statement (FEIS) report (Baffinland, 2012) and FEIS Addendum report (Baffinland, 2013) for the Early Revenue Phase (ERP).

Research agreements were negotiated between each of the five North Baffin community working groups and Baffinland as follows:

- Pisiksik Working Group (Pond Inlet) - 2006
- Qaatiliit Working Group (Igloolik) - 2007
- Inuksuligarjuk Working Group (Arctic Bay) - 2007
- Tikkuu Working Group (Hall Beach) - 2008
- Ukkakkut Working Group (Clyde River) - 2008

These agreements outline the following:

- Roles and responsibilities of the parties
- Purpose and methods of the IQ study
- Clarification on matters of privacy, informed consent and ownership of data

IQ workshops were initiated to provide another source of community-based data, to help verify results from other data sources (e.g. IQ interviews, working group meetings), and to engage a broader community audience. Workshops on caribou, marine mammals and Inuit land use were conducted in the North Baffin and South Baffin communities to identify areas of importance and use to Inuit and to identify potential project interactions with these things. In the North Baffin, these workshops were structured to have both ‘public’ and ‘invited persons’ components. Workshop minutes were recorded for all meetings. In some cases, additional public outreach was made, in the form of radio call-in shows and staffed tables set up in public places (e.g., Co-op stores).

Baffinland has continued to consult with Inuit communities for the existing operations and Phase 2 Proposal. These discussions have not provided new information specific to the designation of new and/or culturally important freshwater waterbodies.

2.0 INTERVIEW QUESTIONS AND WORKSHOPS

2.1 METHODOLOGY

IQ interviews with elders were held in Arctic Bay, Igloolik and Pond Inlet over the period of late 2006 into 2008. Working groups identified the key knowledge holders in the community.

Interviews were carried out using a set list of interview questions. The Pisiksik Working Group developed an initial list of 168 interview questions based on an example provided by Knight Piésold from another Project. Questions focused on Inuit use and understanding of the land, caribou, marine mammals, fish, birds, and other land mammals. For Arctic Bay and Igloolik a shorter questionnaire was developed, containing only 83 questions. Questionnaires in Arctic Bay and Igloolik were shortened after it was recognized the Pond Inlet questionnaire was cumbersome and the length of interviews and subsequent transcribing was difficult for the interviewer and elder consultant to complete.

Interviews were recorded on either recordable mini-disc or by digital recorder and relevant information mapped at a 1:1,000,000 scale. The audio recordings of the interviews were transcribed into Inuktitut and then translated into English.

Data verification sessions were held in each of the three communities after all the interviews had been completed. During these visits, the interviewees were invited to review draft GIS IQ maps. Interviewees commented on the accuracy of the data that had been produced. Data features were deleted, added or modified on the maps to reflect interviewee wishes.

The types of data collection during interviews and workshops included marine mammals, caribou, land use, fish, birds, and other land mammals.

Land use data were collected during workshops in Arctic Bay, Clyde River, Hall Beach, Igloolik, Pond Inlet, Kimmirut and Cape Dorset, although only a selection of questions were asked in the South Baffin communities. Land use data were also collected through individual interviews with elders in Arctic Bay, Igloolik and Pond Inlet. Questions asked during the interviews and workshops pertained specifically to:

- Travel routes
- Camps
- Archaeological sites
- Traditional plant use
- Resource collection areas (including carving stone and berry picking areas)
- Ice and water conditions
- Special places on the land

Lines of questioning focussed on:

- Inuit land use (e.g. locations, uses of locations, stories and/or legends)
- Interaction of Project components with land use activities (e.g. location of Project components in regards to land use activities)

Fish data were collected during individual interviews with elders in Arctic Bay, Igloolik and Pond Inlet. Additionally, some fish data were collected during workshops in Kimmirut and Cape Dorset. Questions asked during the interviews pertained specifically to fish interviewees were familiar with. Lines of questioning focussed on:

- Life cycle activities (e.g. migrations, areas of concentration, spawning areas) of fish
- Inuit use of fish (e.g. harvesting locations, harvesting methods)
- Interaction of Project components with fish (e.g. ship traffic)

These questions were asked in an effort to better understand potential impact pathways and opportunities for mitigation.

2.2 MAPS

A number of maps were produced during both the IQ interviews and workshops. Sheets of transparent Mylar were placed over large (1.1m x 1.6m) topographic regional maps, so geographic and other features of interest could be marked directly onto the sheets. The sheets of Mylar were then hand digitized by Knight Piésold staff (i.e., the mapped information was copied into a computer database using a digitizing table) using the AutoCAD software program. Once digitizing was complete, files were transferred over to the Geographic Information System (GIS) software package ArcView for more detailed data analysis and presentation.

A separate series of maps were produced for the workshops and interviews. For example, maps from each of the communities' workshops were digitally combined and then presented according to theme (e.g. Inuit travel routes, ringed seal locations, berry-picking locations). Similarly, maps from each of the individual interviews were digitally combined and also presented according to theme. Presenting data in this fashion allowed for data from all the communities to be displayed at once and facilitated comparison between the two data sources (i.e. workshops and interviews).

These maps have been released in a separate mapbook (KP, 2015). The relevant maps from the mapbook related to freshwater waterbodies are included as Attachment A.

2.3 IQ DATABASE

All interview transcripts, workshop notes and working group meeting minutes were incorporated into a central database and coded to sort by topic. Coding was completed using the NVivo 7 software package, a commonly used application for analyzing qualitative research data. The IQ database contains over 500 topic 'directories', often organized according to major themes. As an example, 'caribou' is one major theme, while 'calving locations', 'migrations' and 'reaction to disturbance' are a few examples of caribou sub-themes. Other major themes include: 'marine mammals', 'birds', 'fish', 'Inuit and the land', 'shipping' and 'terrestrial mammals'. There also exists a directory for all other topics not covered under a major theme. All topic reports were made available on a password-protected FTP site for the various scientists and specialists involved in the Project to use. IQ data from these topic reports is then available to be incorporated into the impact assessment, and for other long-term Project needs.

Keywords were used to code the interview transcripts, workshop notes and working group meeting minutes, as well as the number of references associated with each keyword. The keywords and sub-keywords related to the unique value and/or cultural significance of freshwater waterbodies include:

- Inuit and the Land - camps and living areas, places names, water, water quality, song and stories, and importance of lakes and rivers
- Fish - Arctic char, land-locked (nutilliarjuit), locations and harvesting locations, non-migrating fish, and fish living only in rivers, and stories

The IQ database was compiled and issued to the participating communities and the QIA in 2014. The information can be used by the public, in accordance with the research agreements Baffinland negotiated with the working groups that led the study in each community.

APPENDIX B

Select Interview Questions

(Pages B-1 to B-2)

APPENDIX B
SELECT INTERVIEW QUESTIONS

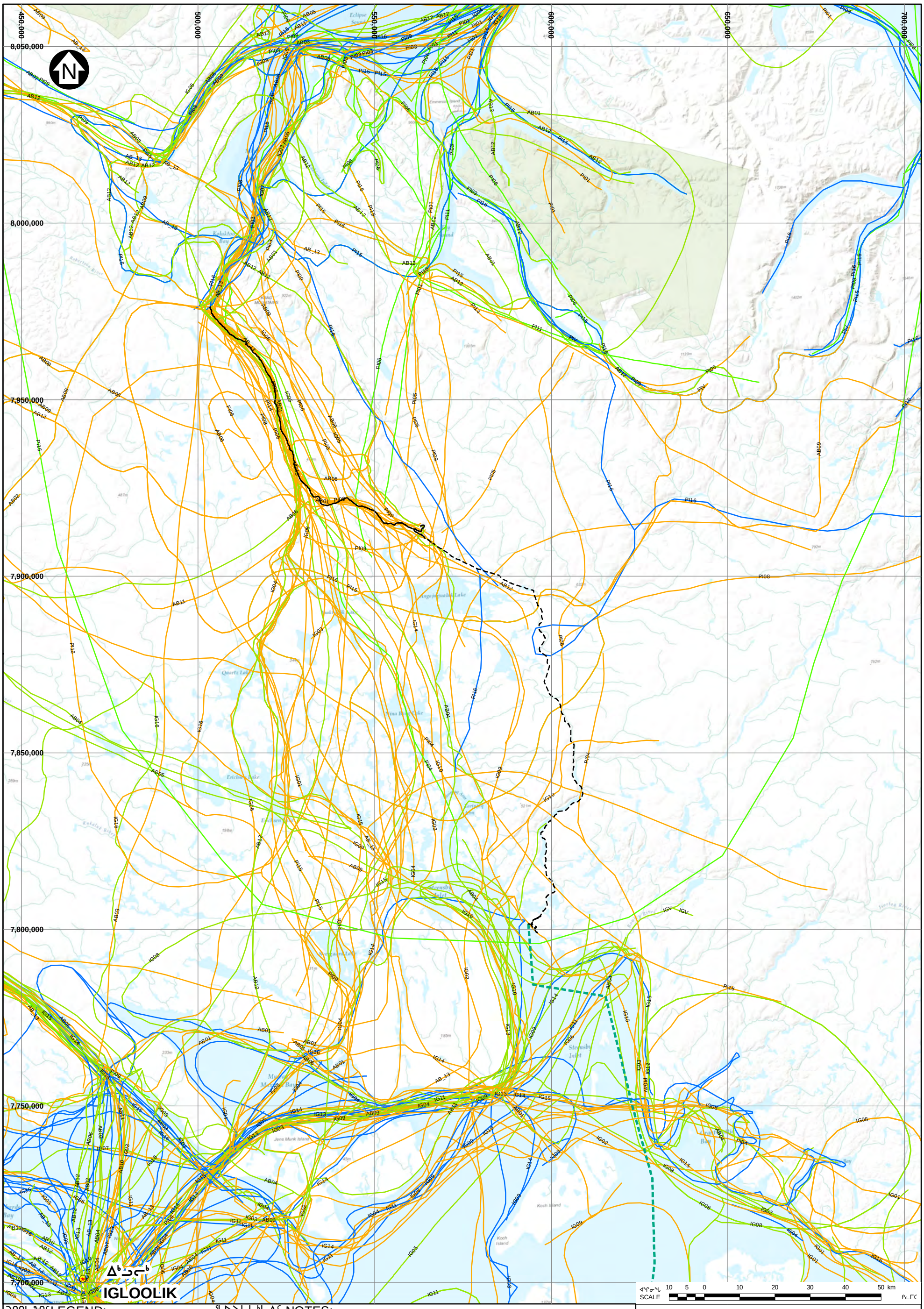
1. Can you show me [on the map] the major camps you used for the areas you will talk about today? Seasons: spring, summer, fall, and winter. Why are these places important?
2. Can you show me [on the map] special areas on the land? These might include sacred places, mythical events, giant sites and supernatural areas that might cause disorientation or where people would receive visits. Other important places would include archaeological sites and burials places.
3. We are interested in place names. Can you give us the names for the major land and water features [on the map] for the areas you know?
4. Where did you go to collect other significant resources such as water, wood, carving stone, stone for fire starters, etc. Did this differ by season - spring, summer, fall, and winter? [Use map]
5. Can you show me [on the map] the areas you traveled with your family when you were young?
6. Can you show me [on the map] the areas you traveled during your adult life up to now? It would be use full to us if you could talk about the seasons you used the land (spring, summer, fall, and winter).
7. Can you show me [on the (map) the major] Inuit travel routes in Mary River area around it? Did these vary by seasons - spring, summer, fall and winter?
8. Could you show me [on the map] which lakes and rivers are most important in your area? Why are they important?
9. What does good water mean to you?
10. Do the places you set nets change by season? [Use map]
11. Where are the best places to jig for fish? [Use map]
12. Are there Arctic char in the _____ River (Individuals may want to discuss several rivers in their traditional lands). Are the fish land locked, or sea run? Do the sea run fish move every year? How far up river do the fish run? Do the fish hold over the winter in the river? [Use map]
13. How did people in the past catch fish in rivers? Do people fish in rivers today?
14. Are the mouths of rivers important fishing areas? Please show me on the map which rivers are important for fishing.
15. Are there areas that were important for fishing in the past but are no longer used?
16. Which lakes do people regularly fish in your area? [Use map] What time of year do people fish on the lakes?
17. Which lakes have Arctic char in your area? [Use map]. Are they sea run or land locked fish? If they migrate when do they return to the lake? When do they return to the sea?

18. Please tell me about fish in lakes and rivers.
19. In which lakes are landlocked char found?
20. In which lakes is migrating char found? When do these fish migrate to the sea? When do they return to lakes?

APPENDIX C

Select MRIKS Figures

Figure No.	Revision	Description
Figure 1.4	0	Travel Routes - Project Study Area (Interview Results)
Figure 1.8	0	Camping Locations - Project Study Area (Workshop Results)
Figure 3.20	0	Water and Ice Features - Project Study Area (Interview Results)
Figure 1.6	0	Berry Picking Locations - Project Study Area (Workshop Results)
Figure 5.2	0	Fish Locations - Project Study Area (Interview Results)
Figure 1.12	0	Special Places - Project Study Area (Interview Results)
Figure 1.16	0	Stone Quarry Locations - Project Study Area (Workshop Results)



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🟦	●	ᓯᑯᒥ ᐃᓚᓐᓂᐅᒃᓯᒋᖅ SEA ICE MAIN TRAVEL ROUTE
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■ ■ ■		ᓄᓇᓯᐅᑎᑯᑦ ᐊᖁᑎᒋᓂᐊᑕᖓ PROPOSED RAILWAY ALIGNMENT
- - -		ᐃᓚᓐᓂᑯᑦ ᐅᒥᐊᖅᐊᓐᓂᑦ ᐊᖁᑕᐅᖃᑦᑕᓂᐊᕐᑐᖅ NOMINAL SHIPPING ROUTE

ᖃᐅᔨᒪᔭᒃᓴᐃᑦ NOTES:

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IMAGERY: © ESRI DATA & MAPS [ONLINE] (2014). REDLANDS, CA: ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE. ALL RIGHTS RESERVED.
2. ᓄᓇᖑᐊᖅ ᑎᑎᕐᓯᒪᓂᖓ ᒪᓕᒃᑐᖅ UTM (NAD83) ZONE 17 AND IS IN METRES.
COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
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THIS MAP WAS PRODUCED FROM INFORMATION COLLECTED DURING INUIT QAUJIMAJATUQANGIT INTERVIEWS WITH LOCAL RESIDENTS. THIS INFORMATION SHOWS PATTERNS OF LAND USE AND LOCAL KNOWLEDGE OF THE LAND. THE MAP IS NOT INTENDED TO BE A COMPLETE REPRESENTATION OF WHAT IS KNOWN.

BAFFINLAND IRON MINES CORPORATION

ᓄᓘᔭᓂ ᐅᔭᕐᖃᓯᐅᕐᑐᑦ MARY RIVER PROJECT

ᓇᓗᓇᐃᖅᑕᐅᓂᒋᑦ ᐃᖏᕋᓗᓐᓂ ᐊᖁᑕᐅᕙᒃᑐᑦ (ᑕᕆᐅᒃᑯᑦ ᐊᒪᓗ ᓄᓇᒃᑯᑦ) ᖃᐅᔨᓴᐅᓂᒃ ᐊᐱᖅᓱᖅᑕᐅᓗᑎᒃ
TRAVEL ROUTES - PROJECT STUDY AREA
(INTERVIEW RESULTS)

Knight Piésold
CONSULTING

P/A NO.	REF NO.	REV
NB102-181/35	NB14-00411	0

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FIGURE **1.4**

Family camping

Family camping

Old and current camping routes

Clyde River, Pond Inlet, Arctic Bay and Igloolik people would all meet here and camp in this area while on inland caribou hunt - Aug-Sept

Old camping sites throughout

Clyde River, Igloolik, Pond Inlet and Arctic Bay people meet here and camp in this area.

NOTE: Almost anywhere there is a camp site, there is a cache site. Caches can be found anywhere on the land and on the coast. After a hunt, hunters would travel to the closest location they could to cache food.

People travel all this area for caribou hunting - camps throughout & places where people would sleep & pile rocks around them to protect them

People traditionally camped all along this area

DIO outpost camp

Re-supply route (Camp to community)

Hunting and camping travel route

Hunting and camping travel route - Dec-May

Hunting & re-supply the camps

Hunting and camping travel route

IGLOOLIK

SCALE 10 5 0 10 20 30 40 50 km

LEGEND:

PLACES THAT YOU HAVE CAMPED IN YOUR LIFETIME

PLACES THAT YOU KNOW YOUR FAMILY AND FRIENDS HAVE CAMPED IN THE PAST

CAMPS THAT WERE OCCUPIED SO LONG AGO THAT YOU DON'T KNOW WHO CAMPED THERE

MILNE INLET TOTE ROAD

PROPOSED RAILWAY ALIGNMENT

NOTES:

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3. THIS MAP WAS PRODUCED FROM INFORMATION COLLECTED DURING INUIT QAUJIMAJATUQANGIT WORKSHOPS IN THE COMMUNITIES OF ARCTIC BAY (JULY 22-23, 2008), CLYDE RIVER (JULY 18-19, 2008), HALL BEACH (JULY 8-9, 2008), IGLOOLIK (JULY 10-12, 2008) AND POND INLET (JULY 15-17 AND SEPTEMBER 4, 2008). THIS INFORMATION SHOWS PATTERNS OF LAND USE AND LOCAL KNOWLEDGE OF THE LAND. THE MAP IS NOT INTENDED TO BE A COMPLETE REPRESENTATION OF WHAT IS KNOWN.

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MARY RIVER PROJECT

CAMPING LOCATIONS - PROJECT STUDY AREA (WORKSHOP RESULTS)

Knight Piésold CONSULTING

P/A NO.	REF NO.	REV
NB102-181/25	NB14-00411	0

FIGURE 1.8

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7900000
7850000
7800000
7750000
MARY RIVER MINE SITE
IG08
Tremblay Sound
Milne Inlet
Eskimo Inlet
Koluktoo Bay
KRAG MOUNTAINS
Emmerson Island
Tay Sound
Angajurjualuk Lake
Inuktorfik Lake
Quartz Lake
Nina Bang Lake
Erichsen Lake
Tariuliaq Arm
Steensby Inlet
Neergaard Lake
Murray Maxwell Bay
Jens Munk Island
Steensby Inlet
Koch Island
Grant-Suttie Bay
Eqe Bay
N
SCALE 10 5 0 10 20 30 40 50 Km

LEGEND:
FLOE EDGE LOCATION
SEA-ICE LEADS LOCATION
SEA-ICE OPEN YEAR ROUND
LAKES AND RIVERS OF IMPORTANCE
BAD FLOOD OR EXTREMELY HIGH TIDE LOCATION
SEASONAL WATER QUALITY CHANGE LOCATION
GENERAL WATER QUALITY CHANGE LOCATION
MILNE INLET TOTE ROAD
PROPOSED RAILWAY ALIGNMENT
NOMINAL SHIPPING ROUTE

NOTES:
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BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT
WATER AND ICE FEATURES - PROJECT STUDY AREA (INTERVIEW RESULTS)
Knight Piésold CONSULTING
P/A NO. NB102-181/35 | REF. NB14-00411 | REV. 0
FIGURE 3.20

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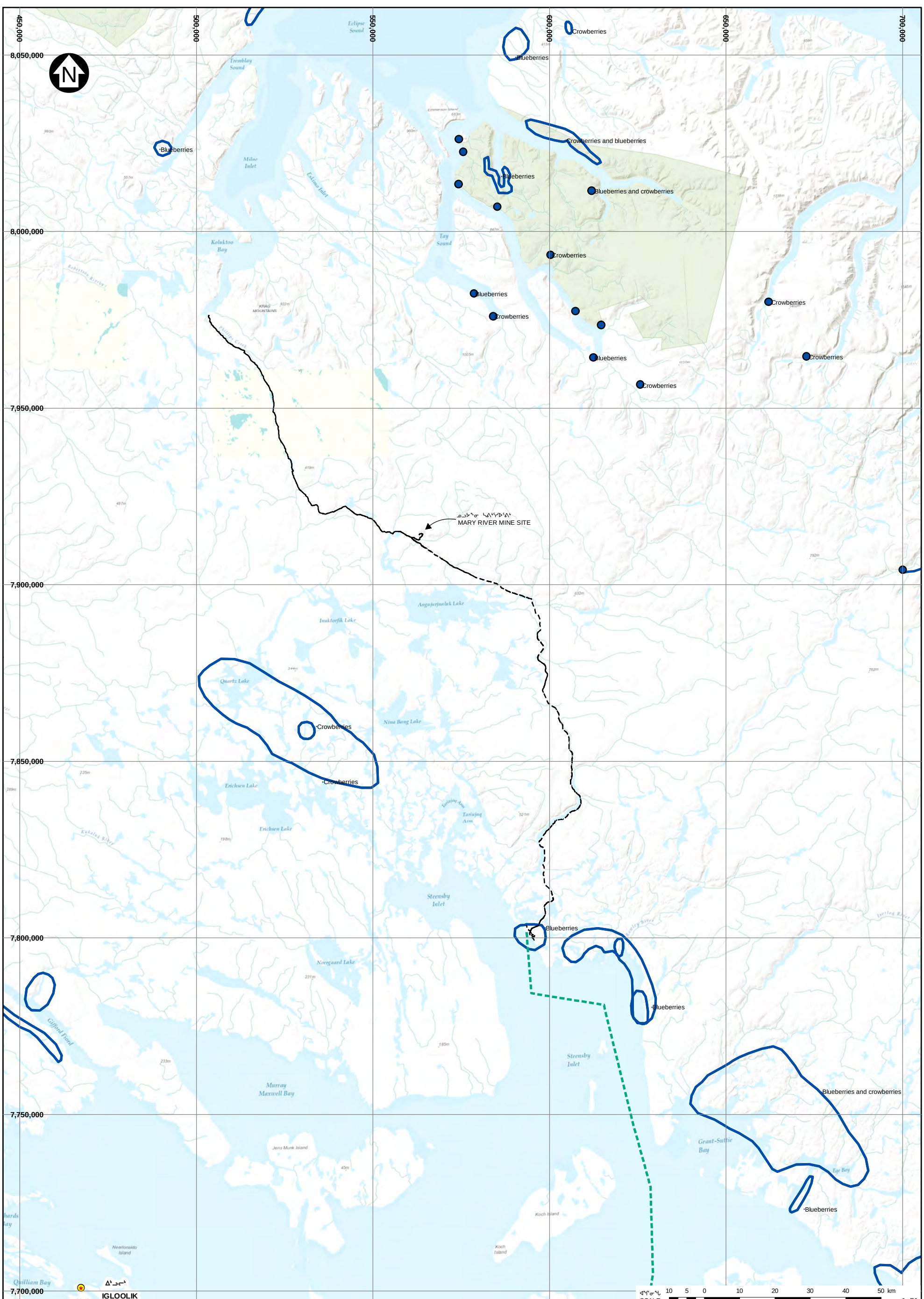

LEGEND:

- BERRY PICKING PLACES
- MILNE INLET TOTE ROAD
- PROPOSED RAILWAY ALIGNMENT
- NOMINAL SHIPPING ROUTE

NOTES:

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BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

BERRY PICKING LOCATIONS - PROJECT STUDY AREA (WORKSHOP RESULTS)

Knight Piésold CONSULTING

P/A NO.	REF NO.	REV
NB102-181/35	NB14-00411	0

FIGURE 1.6

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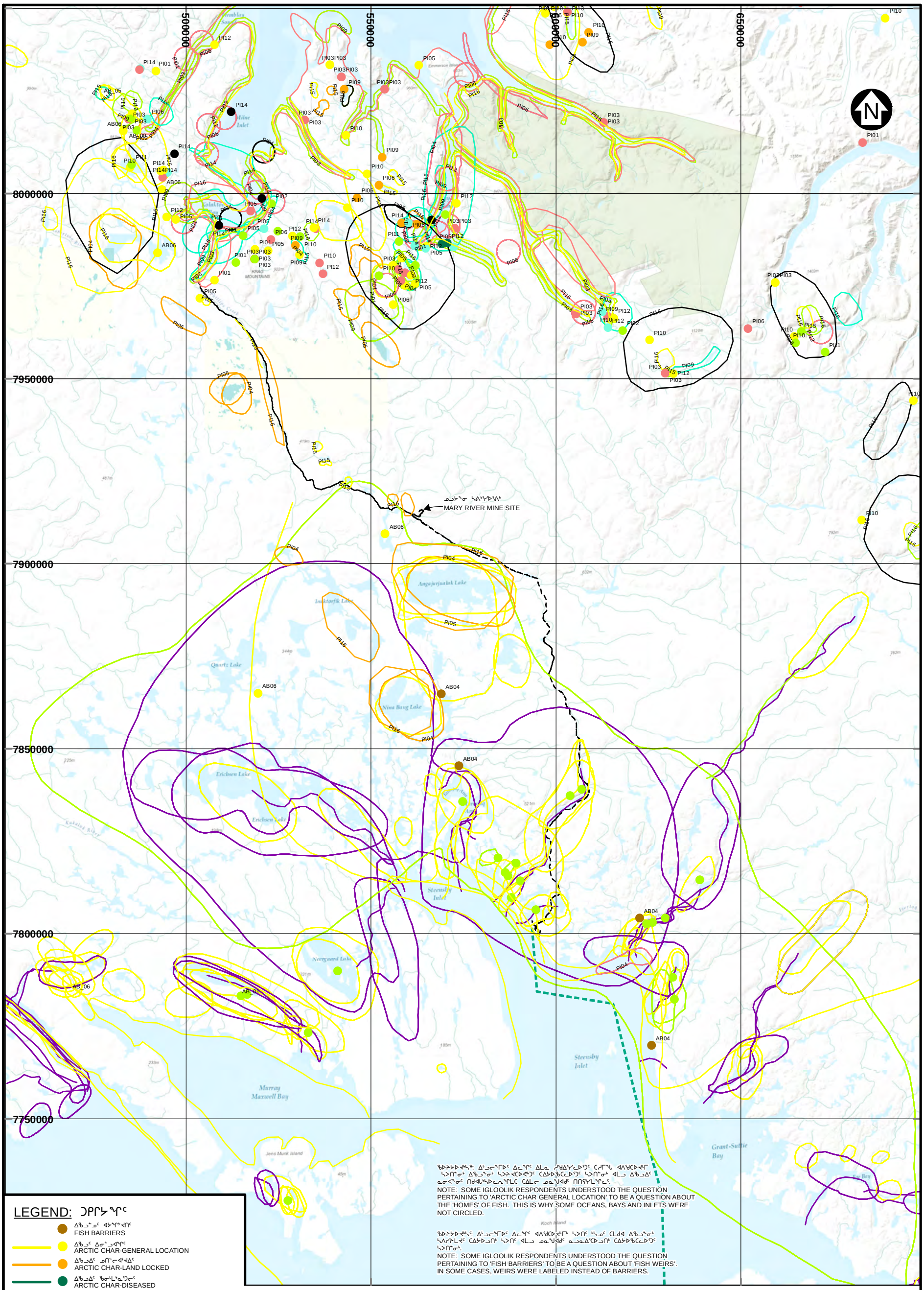
550000
600000
650000
8000000
7950000
7900000
7850000
7800000
7750000
MARY RIVER MINE SITE
Milne Inlet
Angajurjualuk Lake
Inuktorfik Lake
Quartz Lake
Nina Bang Lake
Erichsen Lake
Steensby Inlet
Neergaard Lake
Murray Maxwell Bay
Jens Munk Island
Grant-Suttie Bay
Koch Island
Kakaluq River
KRAG MOUNTAINS
N
NOTE: SOME IGLOOLIK RESPONDENTS UNDERSTOOD THE QUESTION PERTAINING TO 'ARCTIC CHAR GENERAL LOCATION' TO BE A QUESTION ABOUT THE 'HOMES' OF FISH. THIS IS WHY SOME OCEANS, BAYS AND INLETS WERE NOT CIRCLED.
NOTE: SOME IGLOOLIK RESPONDENTS UNDERSTOOD THE QUESTION PERTAINING TO 'FISH BARRIERS' TO BE A QUESTION ABOUT 'FISH WEIRS'. IN SOME CASES, WEIRS WERE LABELED INSTEAD OF BARRIERS.
LEGEND:
FISH BARRIERS
ARCTIC CHAR-GENERAL LOCATION
ARCTIC CHAR-LAND LOCKED
ARCTIC CHAR-DISEASED
ARCTIC CHAR-POPULATION FLUCTUATING
RIVER OF IMPORTANCE
FISHING LOCATION YEAR-ROUND
JIG AND NET FISHING LOCATION
OCEAN FISHING LOCATION
MILNE INLET TOTE ROAD
PROPOSED RAILWAY ALIGNMENT
NOMINAL SHIPPING ROUTE
NOTES:
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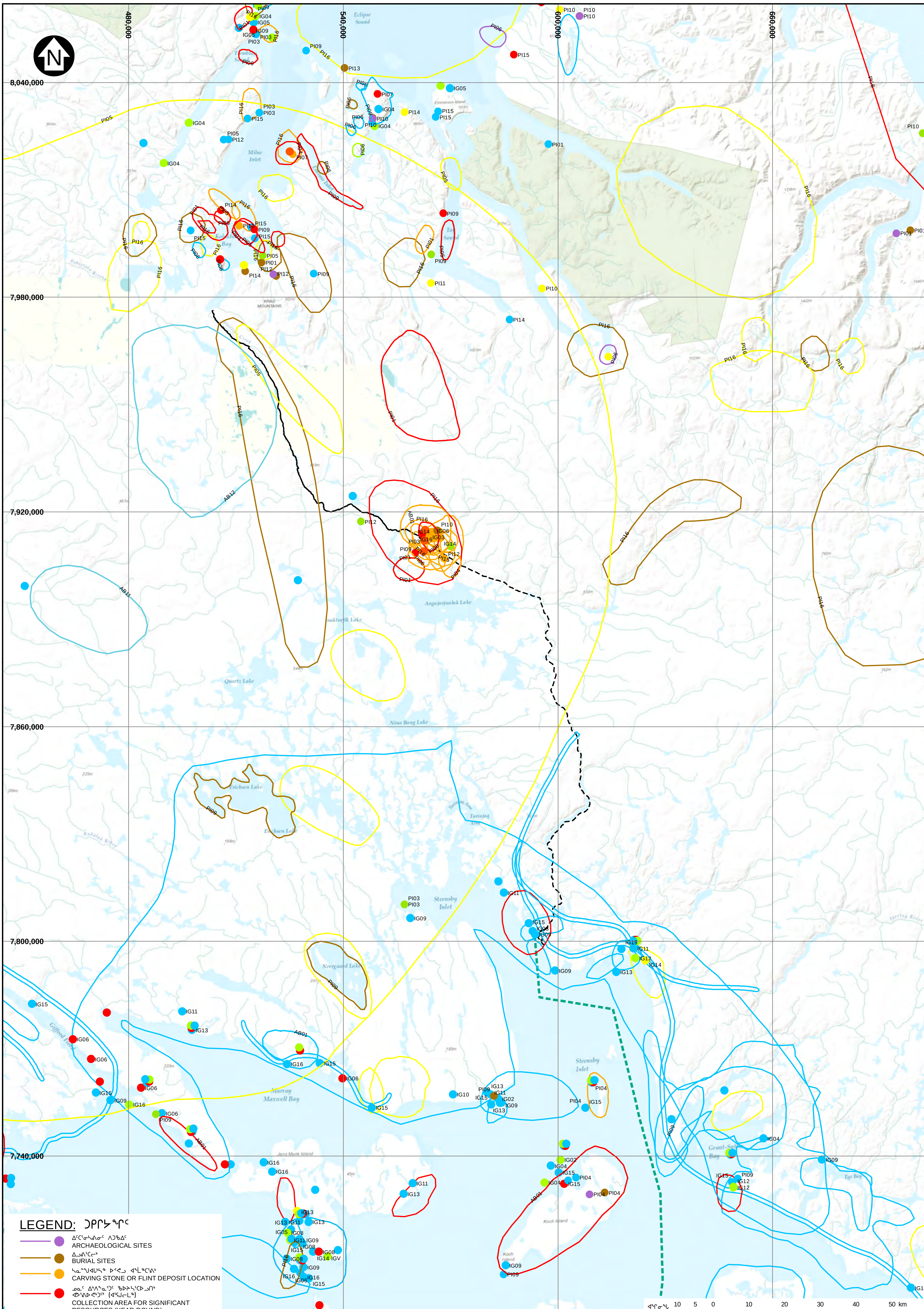
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. THIS MAP WAS PRODUCED FROM INFORMATION COLLECTED DURING INUIT QAUJIMAJATUQANGIT INTERVIEWS WITH LOCAL RESIDENTS. THIS INFORMATION SHOWS PATTERNS OF LAND USE AND LOCAL KNOWLEDGE OF THE LAND. THE MAP IS NOT INTENDED TO BE A COMPLETE REPRESENTATION OF WHAT IS KNOWN.
SCALE 10 5 0 10 20 30 40 50 Km
BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT
FISH LOCATIONS - PROJECT STUDY AREA (INTERVIEW RESULTS)
Knight Piésold CONSULTING
P/A NO. NB102-181/35
REF. NB14-00411
REV. 0
FIGURE 5.2
SAVED: I:\1102\00181\35A\GIS\Figs\Figures_IQ\8.38_r0.mxd; Sep 08, 2014 11:50 AM; asimpson



LEGEND: ᑐᑭᓯᒋᐊᕐᕕᒃ

- ᐃᑦᑐᕐᓂᖅᓴᓂ ᐱᑐᖃᐃᑦ
  ARCHAEOLOGICAL SITES
- ᐃᓗᕕᑦᑕᕐᕕᒃ
  BURIAL SITES
- ᓴᓇᙳᐊᒐᒃᓴᖅ ᐅᑉᐱᓗ ᐊᒻᒪᖅᑕᕕᒃ
  CARVING STONE OR FLINT DEPOSIT LOCATION
- ᓄᓇᑦ ᐃᑲᔪᖅᑕᐅᓲᑦ ᖃᐅᔨᓴᖅᑕᐅᓗᑎᒃ
  COLLECTION AREA FOR SIGNIFICANT RESOURCES (YEAR-ROUND)
- ᐊᐱᖅᓱᖅᑕᐅᔪᖅ ᐃᓅᕕᖓ
  CONSULTANT'S BIRTH LOCATION
- ᐊᐱᖅᓱᖅᑕᐅᔪᖅ ᑕᒫᓂᕕᓂᖓ ᐊᒻᒪ ᐊᑐᖅᑕᐅᒐᔪᒃᑐᕕᓂᑦ ᑕᒫᕕᑦ ᐊᕐᕌᒍᓕᒫᖅ ᐊᑐᖅᑕᐅᔪᓂᒃ
  CONSULTANT'S CAMP LOCATION AND MAJOR YEAR-ROUND CAMPS
- ᐊᓂᒍᐃᓐᓇᕆᐊᖃᕈᓐᓇᖏᑦᑐᑦ ᓄᓇᐃᑦ ᑕᑯᒃᓴᐅᔪᑦ
  SPECIAL AREAS
- ᒥᓪᓂ ᐃᓂᖓᓂ ᐊᖅᑯᑎ ᐅᓯᒃᑕᕐᕕᒃ
  MILNE INLET TOTE ROAD
- ᓄᓇᓯᐅᑎᑯᑦ ᐊᖁᑎᓯᐊᖅᑕᖓ
  PROPOSED RAILWAY ALIGNMENT
- ᐃᒡᓗᓂᒃ ᐅᒥᐊᕐᔪᐊᓂᑦ ᐊᖁᑦᑐᖃᑦᑕᕐᓂᐊᖅᑐᖅ
  NOMINAL SHIPPING ROUTE

ᖃᐅᔨᒪᔭᒃᓴᐃᑦ NOTES:

1. ᓄᓇᙳᐊᖅ ᐊᑐᖅᑕᐅᔪᖅ: ᑯᐃᓐ ᑲᓇᑕᒥ
   BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA, DEPARTMENT OF NATURAL RESOURCES (2004). ALL RIGHTS RESERVED.
2. ᓄᓇᙳᐊᑉ ᑎᑎᕋᕐᓂᖓ UTM (NAD83) ZONE 17 AND IS IN METRES.
   COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. THIS MAP WAS PRODUCED FROM INFORMATION COLLECTED DURING INUIT QAUJIMAJATUQANGIT INTERVIEWS WITH LOCAL RESIDENTS. THIS INFORMATION SHOWS PATTERNS OF LAND USE AND LOCAL KNOWLEDGE OF THE LAND. THE MAP IS NOT INTENDED TO BE A COMPLETE REPRESENTATION OF WHAT IS KNOWN.

BAFFINLAND IRON MINES CORPORATION

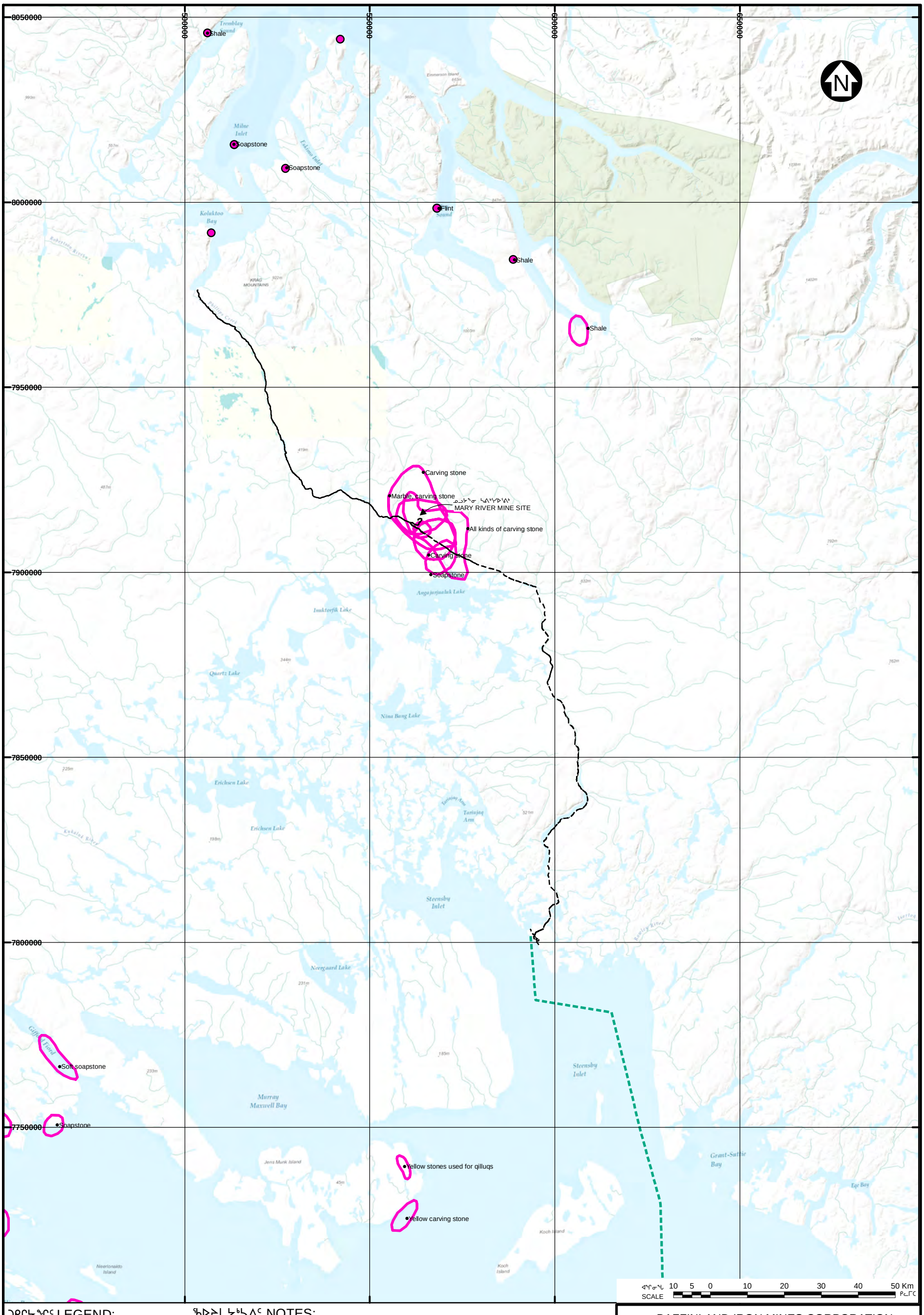
ᓄᓗᔾᔭᓂ ᐅᔭᕋᖕᓂᐊᕐᕕᒃ MARY RIVER PROJECT

SPECIAL PLACES - PROJECT STUDY AREA (INTERVIEW RESULTS)

Knight Piésold CONSULTING

P/A NO.	REF NO.	REV
NB102-181/35	NB14-00411	0

FIGURE 1.12



LEGEND:

- STONES USED BY PEOPLE
- MILNE INLET TOTE ROAD
- PROPOSED RAILWAY ALIGNMENT
- NOMINAL SHIPPING ROUTE

NOTES:

1. IMAGERY: © ESRI DATA & MAPS [ONLINE] (2014). REDLANDS, CA: ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE. ALL RIGHTS RESERVED.
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. THIS MAP WAS PRODUCED FROM INFORMATION COLLECTED DURING INUIT QAUJIMAJATUQANGIT WORKSHOPS IN THE COMMUNITIES OF ARCTIC BAY (JULY 22-23, 2008), CLYDE RIVER (JULY 18-19, 2008), HALL BEACH (JULY 8-9, 2008), IGLOOLIK (JULY 10-12, 2008) AND POND INLET (JULY 15-17 AND SEPTEMBER 4, 2008). THIS INFORMATION SHOWS PATTERNS OF LAND USE AND LOCAL KNOWLEDGE OF THE LAND. THE MAP IS NOT INTENDED TO BE A COMPLETE REPRESENTATION OF WHAT IS KNOWN.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

STONE QUARRY LOCATIONS - PROJECT STUDY AREA (WORKSHOP RESULTS)

Knight Piésold CONSULTING

P/A NO.	REF.	REV
NB102-181/35	NB14-00411	0

FIGURE 1.16

SAVED: I:\1\102\00181\135A\GIS\Figs\Figures_IQIB13_r0.mxd: Sep 05, 2014 10:42 AM; asimpson

APPENDIX 2: TUSAQTAVUT PATHWAY BREAKDOWN – EFFECTS ASSESSMENT SUMMARY TABLE (FISH AND FRESHWATER)

Tusaqtavut Pathway Breakdown - Effects Assessment Summary Table (Fish and Freshwater)

Primary Pathway	FEIS/FEIS Addendum (ERP) Prediction Source – FEIS/FEIS Addendum (ERP)	FEIS/FEIS Addendum (ERP) Mitigation Source – FEIS/FEIS Addendum (ERP)	Tusaqtavut Report Concern – Pond Inlet Source – Tusaqtavut Report (Pond Inlet)	Tusaqtavut Report Concern – Hall Beach & Igloolik Source - Tusaqtavut Report (Hall Beach & Igloolik)	High level Summary of Monitoring Results Source – Relevant Monitoring Reports (various)	Relevant Phase 2 Effect Pathway Source – Updated Phase 2 PD Overview (submitted Jan 6th)	FEIS Addendum (Phase 2) Prediction Source – FEIS Addendum (Phase 2)
Impact to quality and quantity of water from the Tote Road and mine site	The project will not have significant adverse residual effect on water quantity (FEIS, Volume 7, Section 2.4, p. 88). Ground preparation and earthworks may result in changes to surface water and sediment quality in the five freshwater aquatic LSAs (FEIS, Volume 7, Section 3.4.2.1, p. 120). However, residual effects are predicted to not be significant (FEIS, Volume 7, Table 7.3-12, p. 120). the effects of dust deposition are predicted to be restricted to a thin surficial layer in depositional areas (primarily deeper areas of lakes), and the CCME SQGs are recommended to be applied to the upper 5 cm of sediments, effects of this pathway on Arctic Char have been ranked as of low magnitude for arsenic and cadmium, of moderate magnitude for iron, and negligible for nickel. Effects on sediment quality will be long-term (Level III), continuous (Level III), and limited to portions of the LSA (Level I) (FEIS, Volume 7, Section 4.5.5.1, p. 219).	Detailed stormwater management plans, water balances and sediment and erosion control plans prepared during the detailed design phase as part of a future update to the Surface Water, Aquatic Ecosystems, Fish and Fish Habitat Management Plan will be important for the management of water resources (FEIS, Volume 7, Section 3.4.4.1, p. 174).	participants also expressed concerns about water contamination in the Study Area. One interview participant explained that since they have been advised to not drink fresh water within the vicinity of the Mary River mine site, they will only collect water from a filtered tap located at the mine when travelling on the land. One reason stated for not drinking fresh water near the mine site is the rising observance of sediment in the water (Section 4.4.3, p. 95). The decline in water quality near the existing mine site has raised concerns about the quality of water within Pond Inlet. One interview participant described how even through a home filtration system, the clarity of the water has declined and rendered its potability questionable (Section 4.4.3, p. 96).		<u>Quantity:</u> Although the total daily water withdrawal limit for Camp Lake was not exceeded in 2018, there were four (4) incidents where the daily water volume withdrawn for domestic purposes exceeded Camp Lake's domestic daily water withdrawal limit. These incidents are believed to be a result of the mis-categorization of water volumes withdrawn for industrial purposes. To prevent similar incidents from re-occurring, Baffinland plans to improve the documentation and categorization of water volumes withdrawn to support Project activities. No other water withdrawal incidents or exceedances for domestic and industrial water uses were noted in 2018 (2018 NWB annual report, Section 4.1, p. 16). 4 exceedances in daily water withdrawal limits; however, weekly and monthly limits were not exceeded (2018 NWB annual report, Section 4.2, p. 16). <u>Quality:</u> one exceedance of effluent discharge criteria for treated sewage effluent (2018 NWB Annual Report, Section 7.1, p. 26).	Trucking – daily round trips for ore hauling and servicing will be in excess of 350 transits (Table 2.6, p.6). Once North Railway is operational, ore haulage by road will be discontinued, Section 2.2.1.2, p.6).	Effects to water quantity resulting from the South Railway and Steensby Port remain unchanged from what was assessed in the FEIS (TSD 13, Section 2.5, p. 9). The Phase 2 Proposal will not involve any meaningful changes to how water is managed at the Mine Site, as there are no changes to the mine plan or how waste rock will be managed. The volume of mine effluent stormwater to be discharged from the ore crusher pad at the Mine Site will increase because the size of the crusher pad and stockpiles will increase (TSD 13, Section 2.5, p. 10). Residual water quantity effects are predicted to be not significant (TSD 13, Section 2.5.4, p. 21). Incremental increase in annual stormwater runoff associated with the Phase 2 Proposal will not result in adverse impacts to downstream water quality in the Mary River (TSD 13, Section 3.5.1.1, p. 32).

Primary Pathway	FEIS/FEIS Addendum (ERP) Prediction Source – FEIS/FEIS Addendum (ERP)	FEIS/FEIS Addendum (ERP) Mitigation Source – FEIS/FEIS Addendum (ERP)	Tusaqtavut Report Concern – Pond Inlet Source – Tusaqtavut Report (Pond Inlet)	Tusaqtavut Report Concern – Hall Beach & Igloolik Source - Tusaqtavut Report (Hall Beach & Igloolik)	High level Summary of Monitoring Results Source – Relevant Monitoring Reports (various)	Relevant Phase 2 Effect Pathway Source – Updated Phase 2 PD Overview (submitted Jan 6th)	FEIS Addendum (Phase 2) Prediction Source – FEIS Addendum (Phase 2)
					One lead exceedance during discharge of treated effluent from Mine site, otherwise metal concentrations were within acceptable range for discharge (NWB Annual report, Section 7.2, p. 28). One exceedance of applicable water quality criteria involving surface water runoff downstream of landfill facility. One exceedance of applicable water quality discharge criteria from the WRF Pond (NWB Annual Report, Section 7.3.3, p. 30). Overflows and release of non-compliant runoff discovered along WRF west perimeter ditch (2018 NWB Annual Report, Section 7.3.3, p. 31).		Relative to the Approved Project, the annual TSP deposition within the contributing catchments of Camp Lake and Sheardown Lake will be reduced by an estimated 31% and 25%, respectively, with the implementation of the Phase 2 Proposal. The reduction in dust deposition within the immediate Mine Site area will result in a corresponding reduction in the quantity of ore dust that is potentially available to runoff into local watercourses. (TSD 13, Section 3.5.2.1, p. 35). Based on this assessment, the effect of the Phase 2 Proposal on surface water quality is assessed to be not significant (TSD 13, Table 3.6, p 52).
Impact to the health and condition of fish (arctic char) due to changing water quality and impacts from the Milne Port and Northern Shipping Route	The freshwater distribution of Arctic Char in the Milne Port LSA is limited, hence potential effects on health and condition as a consequence of water quality changes, are limited. There will be no point sources discharged to freshwater habitat in the Milne Port LSA (FEIS, Volume 7, Section 4.5.3, p. 212). Overall, effects of water quality changes due to discharge of the West Waste Rock Stockpile runoff on Arctic Char health and condition are considered to be of Low to Medium magnitude (FEIS, Volume 7, Section 4.5.5.4, p. 220).	Minimize the footprint of disturbance; • Schedule ground preparation to maintain adequate ground cover during periods of expected rainfall; • Install and maintain water management features, designed to segregate and prevent co-mingling of offsite water and onsite water; • Install and maintain adequately designed erosion control features; • Install and maintain adequately designed sediment transport control features;		During interviews, community members also expressed concerns about the impact of dust on fish health. The potential for windborne dust to impact fish in a number of watersheds surrounding the Project was identified by a number of participants during the verification meetings (Section 4.4.3, p. 69).	Although arctic char captured at the nearshore of Camp Lake exhibited significantly lower condition compared to those captured at Reference Lake 3 in 2018, as well as to those captured at Camp Lake during the mine baseline studies, the magnitude of these differences were generally within the range of variability expected to occur naturally (2018 CREMP, Section 3.3.7, p. 79).	Route 3 has been subject to additional fisheries field work, and it has been confirmed the alignment falls within the spatial scope of previous assessments related to air quality, wildlife and archaeology (Section 2.2.2.1, p. 9).	Effects of dust on TSS are therefore expected to have a Level I magnitude of effect on Arctic Char health and condition (TSD 14, Section 2.5.4, p. 32). The effects of the Phase 2 Proposal on Arctic Char are predicted to be not significant (TSD 14, Table 2-9, p. 35).

Primary Pathway	FEIS/FEIS Addendum (ERP) Prediction Source – FEIS/FEIS Addendum (ERP)	FEIS/FEIS Addendum (ERP) Mitigation Source – FEIS/FEIS Addendum (ERP)	Tusaqtavut Report Concern – Pond Inlet Source – Tusaqtavut Report (Pond Inlet)	Tusaqtavut Report Concern – Hall Beach & Igloolik Source - Tusaqtavut Report (Hall Beach & Igloolik)	High level Summary of Monitoring Results Source – Relevant Monitoring Reports (various)	Relevant Phase 2 Effect Pathway Source – Updated Phase 2 PD Overview (submitted Jan 6th)	FEIS Addendum (Phase 2) Prediction Source – FEIS Addendum (Phase 2)
		• Capture and treat potentially contaminated site run-off to applicable water quality standards prior to discharging to the receiving environment; and • Erosion control measures (FEIS, Volume 7, Section 3.4.2.1, p. 121).			No significant changes in length-to-weight relationships were observed when comparing 2017 and 2018 data for char and sculpin (2018 MEEMP, Section 5.1.5, p. 98). 2 previously identified fish-bearing sites were dry during the spring 2019 survey due to low fresehet (Tote Road Fish Habitat Monitoring 2019, Section 3.3, p. 4). All other surveyed streams were fish-bearing (Tote Road Fish Habitat Monitoring 2019, Section 3.3, p. 6).	The North Railway will cross several watercourses along the Northern Transportation Corridor. Bridges will be installed at four railway water crossings. Culverts will be installed at other water crossings along the railway (Section 2.2.2.2, p. 10).	Predicted residual effects of the Phase 2 Proposal on Arctic Char are of low magnitude (Level I), medium term to permanent (Level II – Level III), infrequent to continuous in frequency (Level I – Level III), and confined to the LSA (Level I) (TSD 14, Section 2.5.6, p. 34).
Habitat loss and alternation in both the marine and freshwater environments for arctic char due to mining-related activities, leading to the decline in fish populations	Effects related to Project footprints in the Milne Port LSA on Arctic Char habitat are expected to be negligible (FEIS, Volume 7, Section 4.5.3.3, p. 213). Potential effects of the Project on direct mortality of Arctic Char are limited to potential for stranding of eggs due to water withdrawals (FEIS, Volume 7, Section 3.5.3.6, p. 215). As such, effect of water withdrawals on char habitat is considered to be negligible (FEIS, Volume 7, Section 4.5.3.7, p. 215). Construction, Operation and Closure activities in the Railway/Access Road LSA are expected to result in Negligible to Low magnitude of effects on Arctic Char habitat (FEIS, Volume 7, Section 4.5.6.10, p. 242).	Same as above, and: Mitigation measures to avoid or minimize Project footprints and habitat alteration in waterbodies (FEIS, Volume 7, Table 7-4.13, p. 249).	Participants have observed a decrease in available char near the existing mine site and Tugaat River, as well as a decline in fish counts and quality of fresh water along the Tote Road and Mary River (Section 4.4.3, p. 94). In addition to the disruption of peaceful fishing practices, the quantities of available fish species have been observed to be in decline in the past decade. One participant highlighted how in the past, char used to be in greater abundance. The declines in char remain noticeable today (Section 4.4.3, p. 94). Valued fishing locations, such as the Mary River and Tugaat River, were specifically observed to have fewer fish than in the past (Section 4.4.3, p. 95).	Concerns about impacts on fish populations and fish migration routes in and around Ikpikitturjuaq, which is a high-value area for harvesting arctic char (Section 4.4.3, p. 69).	Analysis of Camp Lake arctic charr populations suggested greater fish abundance compared to Reference Lake 3 in 2018, and no decline in the numbers of arctic charr in 2018 compared to the Camp Lake baseline studies (2018 CREMP, Section 3.3.7, p. 79). Habitat upstream and downstream of the road at these two (2) crossings is similar, suggesting no natural barriers or uneven distribution of preferred habitat types that could be affecting fish movements (Tote Road Fish Habitat Monitoring Report 2019, Section 3.3, p.7). Despite a shorter total deployment period and the recovery of only one set of settlement baskets in 2019, total encrusting organisms and total unique taxa counts	The North Railway will cross the existing Tote Road at 8 locations. The Tote Road will be modified at these crossing locations. There is potential for the aquatic environment to be impacted by modifications (Section 2.2.1.1, p. 6). The North Railway will cross several watercourses along the Northern Transportation Corridor. Bridges will be installed at four railway water crossings. Culverts will be installed at other water crossings along the railway (P2 Proposal Project Description Overview January 6 Submission, Section 2.2.2.2, p. 10).	The multiple water takes from Phillips Creek and from Muriel Lake will have minimal impact on stream flows, and on fish and fish habitat (TSD 13, Appendix C, Section 3.2, p. 8). The phase 2 Proposal will not result in residual impacts to freshwater fish and fish habitat at Milne Port (TSD 15, Section 5.4, p. 21). Effect is expected to result in a negligible decrease in the productive capacity of char habitat (i.e., < 1% of overall available habitat will be affected). Lake/pond encroachments/infilling are expected to result in low magnitude reduction in habitat and productive capacity (i.e., < 4%) (TSD 14, Table 2-9, p. 35).

Primary Pathway	FEIS/FEIS Addendum (ERP) Prediction Source – FEIS/FEIS Addendum (ERP)	FEIS/FEIS Addendum (ERP) Mitigation Source – FEIS/FEIS Addendum (ERP)	Tusaqtavut Report Concern – Pond Inlet Source – Tusaqtavut Report (Pond Inlet)	Tusaqtavut Report Concern – Hall Beach & Igloolik Source - Tusaqtavut Report (Hall Beach & Igloolik)	High level Summary of Monitoring Results Source – Relevant Monitoring Reports (various)	Relevant Phase 2 Effect Pathway Source – Updated Phase 2 PD Overview (submitted Jan 6th)	FEIS Addendum (Phase 2) Prediction Source – FEIS Addendum (Phase 2)
					were higher in 2019 than 2018. Deployments of each of the settlement baskets and plates in 2018 extended over a period of 24 months and 12 months, respectively. A total of 1,733 encrusting epifauna from 8 unique taxa were identified in 2018. Epifauna counts in 2019 represent a 34% increase in total organisms and a 125% increase in unique taxa (2019 Milne Ore Dock Fish Offset Monitoring Report, Section 4.2.1, p. 10).	In order to accommodate the shipment of 12 Mtpa and the North Railway operation, the Milne Port PDA must be expanded (i.e. shiploader) Section 2.3, p. 12). A second ore dock capable of berthing capesize ore carriers will be required to deliver 12 Mtpa of ore to market via Milne Port (Section 2.3.2, p. 14).	
Species avoidance of areas due to impacts to fish habitat and diminished water quality	The effect of loss of habitat due to impeded fish passage is expected to be negligible (FEIS, Volume 7, Section 4.5.6.4, p. 240). Effects of water withdrawals on fish passage in outflow streams are also considered negligible (FEIS, Volume 7, Section 4.5.6.5, p. 240).	Same as above.			Habitat upstream and downstream of the road at these two (2) crossings is similar, suggesting no natural barriers or uneven distribution of preferred habitat types that could be affecting fish movements. It was, therefore, determined that the highly perched culvert at CV-111 and the combination of perched culvert and high culvert velocities at CV-225 were limiting or obstructing fish movements (Tote Road Fish Habitat Monitoring 2019, Section 3.3, p. 6).		Fish-bearing culverts that have been identified as potential fish passage barriers will be assessed on a case-by-case basis (TSD 13, Section 2.5.2, p. 16). With implementation of design and mitigation measures, effects of culvert installations on fish passage are assumed to be negligible (TSD 14, Section 2.5.1.2, p. 23).