REPORT

Environmental Monitoring Completion Report

Milne Port Freight Dock Construction Project, Baffin Island, Nunavut

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Abbreviations and Acronyms	Definition
Baffinland	Baffinland Iron Mines Corporation
CCME	Canadian Council of Ministers of the Environment
CEMP	Construction Environmental Management Plan
DFO	Fisheries and Oceans Canada
EM	Environmental Monitor
FAA	Fisheries Act Authorization
SECP	Sediment Erosion Control Plan
QP	Qualified Professional
rms	root mean square
TSS	Total Suspended Solids

List of Units

Abbreviations and Acronyms	Definition
Mtpa	million tonnes per annum
NTU	Nephelometric Turbidity Unit
dB	Decibel

1.0 INTRODUCTION

1.1 Project Overview

This Environmental Monitoring Completion Report has been prepared by Golder Associates Ltd. (Golder) for Baffinland Iron Mines Corporation (Baffinland) and summarizes environmental monitoring activities undertaken by Golder during the construction of Baffinland's Freight Dock at Milne Port, Baffin Island, Nunavut.

Baffinland owns and operates the Mary River Project which is an iron ore mine on North Baffin Island in the Qikiqtani Region of Nunavut. As part of the Mary River Project, Baffinland is currently authorized to:

- Mine up to 22.2 million tonnes per annum (Mtpa) of iron ore;
- Transport 18 Mtpa of ore by rail to Steensby Port for year-round shipping through the Southern Shipping Route (via Foxe Basin and Hudson Strait); and
- Transport 4.2 Mtpa of ore by truck to Milne Port for open water shipping through the Northern Shipping Route (via Milne Inlet and Eclipse Sound) during the open water season (July – October) using chartered ore carrier vessels.

Baffinland recently constructed a Freight Dock at Milne Port to support the import of containerized supplies, break-bulk, and special cargo throughout the 2019 summer shipping season and beyond. The location of the Freight Dock relative to existing Milne Port infrastructure is shown on Figure 1 and Figure 2.

A *Fisheries Act* Authorization (FAA) (File No. 18-HCAA-00160, dated 21 March 2019) was issued by Fisheries and Oceans Canada (DFO) for the construction of the Freight Dock, and is provided in APPENDIX A. The FAA included the following conditions related to environmental monitoring.

- Installation, use, and maintenance of sediment and erosion control measures/plans.
- Establishment of a 200 m exclusion zone for marine mammals around the site that will be monitored for 30 minutes prior to the commencement of vibratory pile driving, dredging, or infilling activities.
- Noise verification measurements to ensure sound levels are less than 100 dB at the edge of the 200 m exclusion zone. The injury thresholds used for the Freight Dock construction are discussed in Section 3.3 and listed in Table 3.
- Turbidity monitoring must be done in the receiving environment adjacent to the work zone during vibratory pile driving, dredging, and fill placement.
- Canadian Council of Ministers of the Environment (CCME) turbidity guidelines will be applied as the standards for the suspended material monitoring.

1.2 Freight Dock Construction Environmental Monitoring

Golder Associates Ltd. (Golder) was retained by Baffinland to undertake environmental monitoring activities during the construction of the Freight Dock as outlined in the work plan dated 1 April 2019 (Reference No. 1663724-100-L-Rev0-3200). Environmental monitoring activities included preparation of a Construction

Environmental Management Plan (CEMP), preparation of a Sediment and Erosion Control Plan (SECP), full-time environmental monitoring of construction activities, as well as the preparation of this Environmental Monitoring Completion Report. Two to four environmental monitors were on-site on a full-time basis (12 to 24 hours/day; 4 to 7 days/week) for the duration of the construction. This report provides a summary of construction activities, environmental monitoring observations and recommendations, mitigation measure effectiveness, and environmental issues and how they were managed or addressed.

Figure 1: Constructed Freight Dock

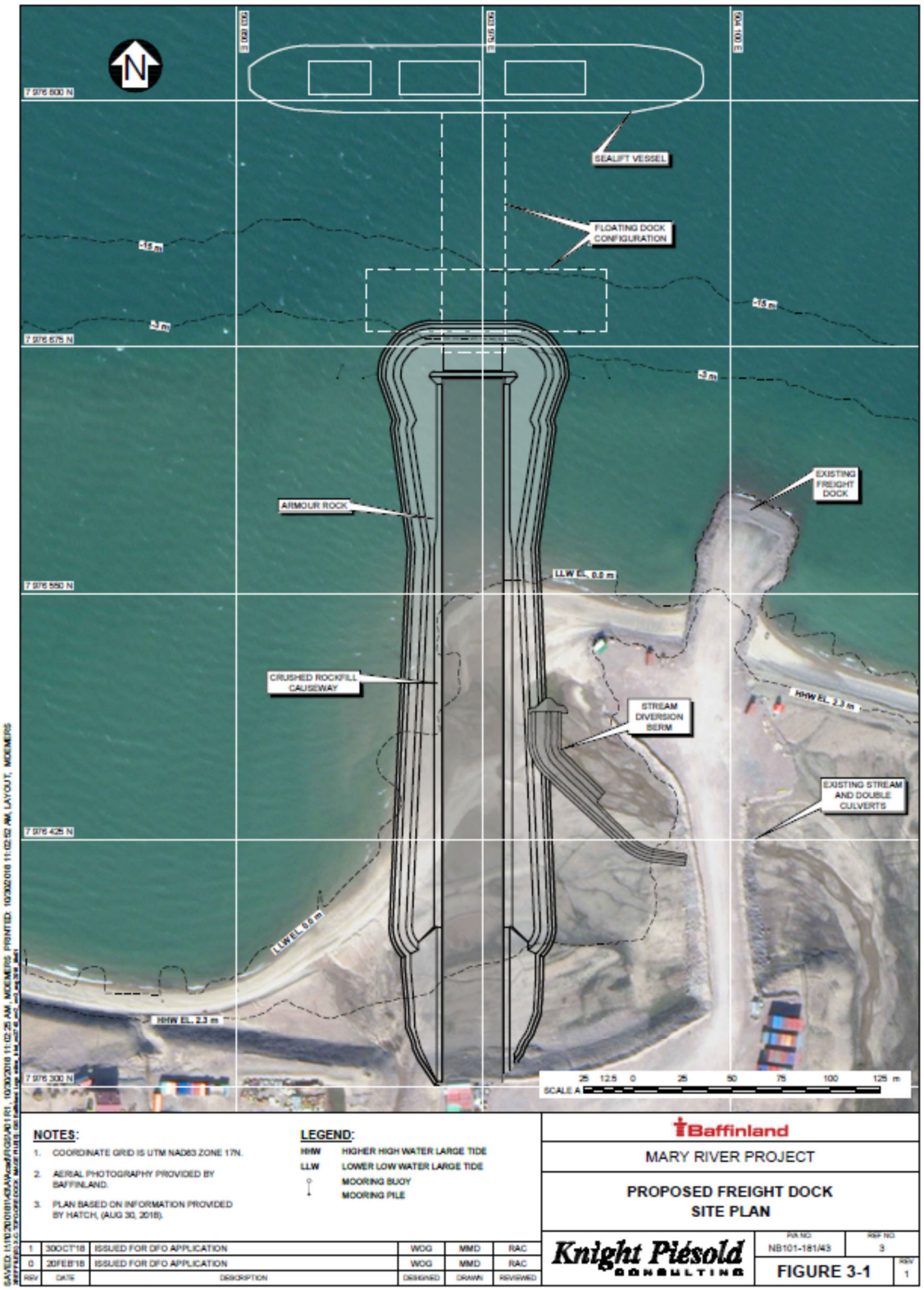


Figure 2: Freight Dock Site Plan

2.0 SUMMARY OF CONSTRUCTION ACTIVITIES

The preliminary Freight Dock construction schedule anticipated a construction start date of 03 April 2019, with construction scheduled to be completed by 30 June 2019. The actual completion dates for all phases of the Freight Dock construction are documented in the daily and weekly environmental monitoring reports submitted to Baffinland (Golder 2020). Construction of the Freight Dock started on 11 April 2019 and was completed on 20 August 2019. The construction was anticipated to be completed within 8 weeks but due to equipment repairs and other unforeseen delays, the project took 19 weeks to complete. The delay in construction was communicated to DFO by Baffinland on 28 May 2019. Due to the construction delay, the program shifted from construction in sea ice conditions to open water construction and additional mitigation was implemented to address potential effects as a result. Additional mitigation details are documented in the environmental monitoring reports submitted to Baffinland (Golder 2020).

Golder environmental monitors were on site full-time from 11 April to 15 August 2019 for monitoring of construction activities. Construction activities, including in-water works, continued after 15 August and were completed 20 August 2019. During this time, monitoring activities were performed by Baffinland Site Environmental staff.

Table 1 provides a summary of roles and responsibilities associated with environmental management and monitoring activities for the Freight Dock construction program.

Table 1: Environmental Roles and Responsibilities

Activity	Company/Contractor
Overall Environmental Management	Baffinland
Project Health, Safety and Environmental Management	Hatch
Construction Management (Construction Manager)	Hatch
Freight Dock Earthworks	Nuna Logistics Ltd.
Project Coordinators	Nuna Logistics Ltd.
Dredging and Piling	BESIX/Vancouver Pile Driving Ltd. Joint Venture (BVJV)
Heavy Equipment Supplier	Toromont
Environmental Monitoring (Turbidity, Noise and Marine Mammal Monitoring)	Golder

The following activities were undertaken as part of the Freight Dock construction by either Nuna Logistics Ltd. (Nuna) or BESIX/Vancouver Pile Driving Ltd. Joint Venture (BVJV). Other activities related to the construction of the Freight Dock were performed by Allnorth Consultants Limited (Allnorth), and Dominion Divers Marine Consulting (Dominion Divers):

- Primary ice removal (Nuna)
- Placement of sediment control structures (Nuna)
- Construction of Stormwater Diversion Berm and Ditch (Nuna)
- Freight Dock rock fill placement (Nuna)
- Filter/Bedding stone placement (Nuna)
- Dredging soft seabed materials and core fill (Nuna and BVJV)
- Scour protection installation (Nuna)
- Armour stone placement (Nuna)
- Upper backfill to final grade placement (Nuna)
- Pile driving (BVJV)
- Installation of structural box beam (BVJV)
- Sonar mapping of seabed and dredge area north of Freight Dock (Allnorth)
- Set up and testing of floating barge anchors (Dominion Divers)

3.0 SUMMARY OF ENVIRONMENTAL MONITORING ACTIVITIES

Golder was retained by Baffinland to undertake the role of Environmental Monitor (EM) during the construction of the Freight Dock. On-site environmental monitoring was conducted by or under the supervision of Qualified Professionals (QP) from Golder. Golder's EM oversaw the environmental monitoring tasks and reported directly to Hatch (Construction Manager) and Baffinland on environmental performance of the Contractors relative to environmental permits and regulatory requirements.

Golder provided environmental monitoring of Freight Dock construction activities between 11 April 2019 and 15 August 2019. Two to four environmental monitors were on-site on a full-time basis (12 to 24 hours/day; 4 to 7 days/week, depending on construction activities). Environmental monitoring activities included environmental site inspections, in-situ water quality monitoring and water sampling for laboratory analysis, underwater noise monitoring, observations of fish, bird and marine mammal presence, and assisting with spill response and reporting as required.

The purpose of the monitoring was to:

- Verify that the environmental protection measures outlined in project documentation and the conditions set out in authorizations and approvals (e.g., the Sediment and Erosion Control Plan, Construction Environmental Management Plan, contractual specifications, the *Fisheries Act* Authorization, etc.) were being met.

- Advise contractors when work practices may need to be modified or improved to achieve the environmental protection requirements of the Project.

Construction activities were documented in daily and weekly environmental monitoring reports provided to Baffinland that documented and summarized environmental issues and recommended actions (Golder 2020). A compilation of representative site photographs from the weekly reports is included in Appendix C.

3.1 Environmental Site Inspections

Environmental site inspections were conducted daily by EM(s). Inspections of the primary equipment used during dredging and backfilling operations, including heavy mobile equipment, were conducted intermittently throughout the program and daily when in use. Equipment stored in and near the work area was regularly visually inspected to verify equipment was clean, free of leaks and spills, and that spill protection was in place. Spill response supplies and spill containment materials were regularly inspected to ensure they were adequately stocked, available for immediate use and stored properly. A visual inspection of the silt curtain during open water construction was conducted during all shifts when in water works were underway. EM inspections were also conducted in the snow, ice and sediment containment areas following active dredge material placement in the containment area, as well as intermittently, to verify containment berms were functional as per the Sediment and Erosion Control Plan (Golder 2019a). The sediment and erosion control measures that were implemented prior to and during construction (e.g. rock containment berms, filter cloth placement and containment areas) were inspected and in some cases upgraded during the spring run-off to improve effectiveness. When fueling of equipment was necessary on the Freight Dock, environmental monitors were present to observe and document that fueling procedures were being implemented.

Observations and issues encountered during environmental site inspections included:

- Spill trays not being present under equipment when not in use or being stored
- Use of an improperly sized or damaged spill tray
- Spill response materials needing resupply
- Billowing, sinking or uplifting of the silt curtain during high tides and or during heavy wave conditions
- Inadequate containment berms at the snow, ice and sediment containment areas
- Worn and leaky hoses on equipment
- Small spills and drips noted around mobile equipment

Where appropriate, environmental observations and recommendations noted during inspections were communicated directly to onsite contractors and their resolutions and responses were documented in the weekly environmental monitoring reports. Observations made during site inspections were noted in a field notebook and included in the daily monitoring reports, where applicable. A summary of environmental issues and recommendations is provided in Appendix B.

3.2 Water Quality Monitoring

Water quality parameters in the marine environment were monitored during the Freight Dock construction, in accordance with the established water quality guidelines as outlined in Table 2. This included daily visual inspections of the work areas and surrounding water for turbidity events and hydrocarbon sheens, in-situ monitoring of turbidity during in-water and nearshore works, and specifically during pile driving and dredging operations (as needed), and the collection of water samples for measurements of total suspended solids (TSS). In-situ measurements and water samples were compared to background level measurements collected from a suitable reference location. Reference locations changed over the course of monitoring due to changes in available access to sites and weather conditions. Primary reference locations were located at the Shiploader, on West Beach, approximately 1000 m west of the Freight Dock, as well as at a bay located north of the hunter's cabin in Milne Port, approximately 800 m east of the Freight Dock construction site (Figure 1). These sites were chosen as reference locations due to their distance from Project effects, as well as their being locations with similar conditions to the Freight Dock construction area.

Table 2: Water Quality Guidelines for the Protection of Marine Aquatic Life

Parameter	Maximum Allowable
Turbidity	■ Change from background of 8 NTU at any one time for a duration of 24 hours in all waters during clear flows or in clear waters ■ Change from background of 2 NTU at any one time for a duration of 30 days in all water during clear flows or in clear waters ■ Change from background of 5 NTU at any time when background is 8 – 50 NTU during high flows or in turbid waters ■ Change from background of 10% when background is >50 NTU at any time during high flows or in turbid waters
Total Suspended Solids (TSS)	■ Change from background levels of 25 mg/L for any short-term exposure (e.g., 24-h period) in all waters during clear flows or in clear waters ■ Change from background levels of 5 mg/L for longer term exposures (e.g., inputs lasting between 24 h and 30 d) in all waters during clear flows or in clear waters
pH	7.0 – 8.7
Oil and Petrochemicals	Not be present in concentrations that: ■ can be detected as a visible film, sheen or discolouration on the surface ■ can be detected by odour ■ can form deposits on shorelines and bottom deposits that are detectable by sight and odour

Adapted from: BC Approved Water Quality Guidelines (BCMOE 2016) and Canadian Water Quality Guidelines (CCME 2018).

Turbidity was monitored, when accessible, at 100 m from the in-water or nearshore Works, during and after construction activities as necessary. In addition, turbidity was measured during any visual turbidity plume event observed in the work area. In-situ measurements were conducted using a portable water quality sonde deployed at multiple monitoring locations around the work site, if accessible. Monitoring locations were positioned both up-current and down-current of in-water works and were adjusted depending on the location of the construction activities and direction of the prevailing current at the time of sampling, when possible. Field measurements for in-situ monitoring were collected at each of the prescribed depths (1 m below surface and mid water column) by lowering the water quality sonde to the desired depth as detailed in the CEMP (Golder 2019b). The water quality sonde used for the turbidity measurements was calibrated daily, following the manufacturer's instructions.

Mitigation measures used to manage turbidity changed during construction as the environmental conditions changed from sea ice to open water. Silt curtains during sea ice conditions were not a feasible option to isolate potential in-water works due to low temperatures and rapid freezing. Monitoring was conducted through ice-augured holes in the sea ice or from shore (if accessible) to confirm that the elevated turbidity was localized within the immediate construction work area. During monitoring weeks 6 through 10, sea ice conditions and safety concerns about access to the ice prevented in-situ measurements in open water at the 100 m monitoring location. During this period, measurements were made where possible from the edges of the Freight Dock. Due to the proximity to the in-water works, this occasionally resulted in short term, elevated turbidity readings and temporary work stoppages, until the elevated turbidity had dissipated. During Week 11 of the Freight Dock construction, an open water silt curtain was deployed prior to the commencement of dredging operations, as a mitigation measure to manage suspended sediment within the water column. During dredging, when open water could not be accessed, measurements were taken inside and outside of the silt curtain to confirm the silt curtain was functioning adequately.

Natural conditions also resulted in elevated turbidity readings near the work area, which included changing tides, rainfall events increasing runoff and sediment loading in streams, or wind driven waves disturbing nearshore sediments. Notably, during week 12, values of up to 92.7 NTU were measured near the work area during a period with no in-water works. This was attributed to high wind and waves that were causing naturally elevated turbidity levels. During this event, the silt curtain excluded the turbid water from the work area, resulting in a lower measured NTU within the silt curtain (work area) than outside.

When an elevated turbidity measurement was recorded, the measurement was compared to the reference location. If elevated more than 8 NTU above the background, turbidity continued to be monitored. Potential sources of turbidity were also monitored to ensure the source of the elevated measurement was not a natural occurrence, such as due to increased wave action disturbing shoreline sediments. In all cases, levels returned to near background levels within 24 hours. No reportable exceedances occurred during the duration of the monitoring program as per the CEMP and *Fisheries Act* Authorization. All in-situ water quality data has been summarized in each of the weekly monitoring reports provided to Baffinland (Golder 2020).

Additionally, on behalf of Baffinland environmental staff, water samples were collected and submitted regularly to the on-site ALS laboratory located at the Mine Site for further analysis of total suspended solids (TSS) and to support in-situ turbidity monitoring. TSS results were compared to measurements in water samples taken from reference locations. TSS was low in the majority of samples, and below detection limits in around 20% of all samples. Five samples had TSS values over the 25 mg/L threshold (Table 2):

- On May 14 (Week 6), TSS in a sample was 34.0 mg/L, in-situ turbidity measurements taken around the same time and location did not appear elevated (0.04 NTU). Water sample was collected during rock infilling for causeway extension. TSS results were lower in the reference sample, which had a TSS below the detection limit. Visual observations within the work area indicated the turbidity was localized within the sea ice and slush.
- June 18 (Week 11), TSS result was 40.8 mg/L (OW 2), collected during impact hammer activities. In-situ measurements taken at the same location and approximate depth was 0.0 NTU. Another water sample was taken approximately 24 hours later, on June 19, during a period of no in-water works with a TSS result of 60 mg/L. Sea conditions were rough and the TSS exceedances likely corresponded to increased wave action disturbing the seabed sediments.

- July 11 (Week 14), a TSS sample was 59.4 mg/L (OW 35). In-situ measurements did not show elevated turbidity levels and water samples collected and submitted before and after this sample, indicate that this was either an anomaly or a short-term elevation.
- July 13 (Week 14), a TSS sample was 50.0 mg/L (OW 38), an in-situ measurement at the same location and similar depth was 0.00 NTU. Sea conditions were rough due to strong winds and the TSS exceedance likely corresponded to increased wave action disturbing the seabed sediments.

3.3 Underwater Noise Monitoring

The *Fisheries Act* Authorization (APPENDIX A) states that underwater noise levels shall not exceed 100 dB re 1µPa root-mean-square (rms) sound pressure level (SPL) at the edge of the 200 m exclusion zone to prevent auditory injury to marine mammals during construction. Previous studies conducted in Milne Inlet have shown that ambient noise levels are naturally above 100 dB, which means using 100 dB as a threshold is not reasonable (ERM 2015). An email was sent from Baffinland to DFO on 02 April 2019, recommending the use of injury thresholds to replace the 100 dB threshold stated in the FAA, as the basis for the marine mammal exclusion zone and supporting this with underwater noise compliance monitoring at the edge of the exclusion zone during in-water works that had the potential to generate underwater noise (pile driving, dredging, etc.)

Underwater noise monitoring was performed during in-water activities that were considered to have potential for injury to marine mammals and fish. Potential noise sources during construction included continuous noise sources from dredging, drilling, vibratory pile driving, and rock infilling, as well as impulsive noise from impact pile driving. Injury management thresholds applied during environmental monitoring of construction activities on the Freight Dock are described in Table 3.

Table 3: Underwater Noise Management Thresholds

Noise Type	Indicator Group		
	Cetaceans (whales)	Pinnipeds (seals)	Fish
Continuous	180 dB rms re 1 µPa	190 dB rms re 1 µPa	207 dB peak re 1 µPa
Impulsive	212 dB peak re 1 µPa	212 dB peak re 1 µPa	207 dB peak re 1 µPa
	180 dB rms re 1 µPa	190 dB rms re 1 µPa	-

Notes: rms = root mean square; dB = decibels relative to 1 µPa.
Injury thresholds from the National Marine Fisheries Services were updated in 2016 to 202 dB and 218 dB for high-frequency cetaceans and pinnipeds exposed to impulsive noise sources. Golder conservatively retained the generic National Oceanic and Atmospheric Administration thresholds of 180 and 190 dB as a management threshold for this program.

Construction noise levels were not measured during all monitoring weeks. During weeks 1 through 4, monitoring was not required due to the type of activities being performed. Monitoring was not required during week 7, and weeks 16 through 19, as the construction activities occurring had been previously shown to be within permitted thresholds and were not anticipated to result in any exceedances. During weeks 6 through 10, sea ice conditions and safety concerns about access to the ice prevented in-situ measurements in open water at the 200 m marine mammal exclusion zone boundary. During this period, measurements were made where possible from the edges of the Freight Dock. Despite the proximity to the in-water works, no exceedances of injury thresholds occurred. During open water conditions, whenever possible, noise levels were measured from a boat at the 200 m marine

mammal exclusion zone boundary. Due to strong drift conditions, lack of a suitable anchor, heavy winds and waves, measurements were not made during all dredging, pile driving and rock infilling events. All measurements were within applicable thresholds, and no exceedances occurred during any monitoring event, and it was considered unlikely an exceedance would have occurred during the times monitoring was not possible. A summary of underwater noise measurements conducted during a variety of construction activities is provided in Table 4.

Table 4: Summary of underwater noise measurements conducted during Freight Dock monitoring, May to July 2019

Date	Horizontal Distance to source (m)	Construction Activity	Noise Measurement Range (dB rms/dB peak)
09 May 2019	100	Ambient background (no construction activities)	97 dB rms
13 May 2019	40	Ice breaking and removal	125 dB rms
14 May 2019	40	Fill placement of Type 22 material into water	126 dB rms
17 May 2019	40	Dredging with excavator and haul trucks removing dredged material	127 dB rms
02, 05, 08, 09,11 June 2019	15 to 54	Vibratory Hammer Pile Driving	137 to 161 dB rms
10 and 12 June 2019	80 to 103	Ice excavation and rock placement (Barge Landing Expansion)	110 to 141 dB rms
13, 14 and 18 June 2019	12 to 53	Diesel Impact Hammer Pile Driving	166 to 189 dB peak
15 and 21 June 2019	40 to 250	Rock placement on Freight Dock	118 to 129 dB rms
01 July 2019	215	Dredging	113 to 116 dB rms

3.4 Marine Mammal Monitoring

Due to the potential of injury to marine mammals during construction activities on the Freight Dock, monitoring was performed for 30 minutes prior to the start of vibratory pile driving, dredging or infilling activities, as per the FAA. If there was any observation of marine mammals within the 200 m marine mammal exclusion zone, all in-water works was immediately ceased. The activity of the marine mammal was monitored until it left the exclusion zone or was last spotted within the exclusion zone. In-water works was allowed to resume 30 minutes following the observed exit from or the last observation of the marine mammal within the exclusion zone.

During the early weeks of the program, seals (presumed to be bearded and ringed) were frequently observed hauled out on the sea ice. These seals were never observed closer than 900 m, and therefore, no stop in work

was required. Following the ice break out, ring seals were occasionally observed within the 200 m marine mammal exclusion zone and in the work area; these observations and the specific responses are summarized in Table 5. During this period, other seals were observed near the work area, but outside of the exclusion zone. These seals were monitored to confirm they did not enter the work area.

Table 5: Summary of marine mammal observations within the 200 m exclusion zone.

Date	Species	Observations and Response
3 July 2019	Ringed seal	Swimming inside and outside of the silt curtain, diving within the dredge area and along the silt curtain edge during a break in dredging activities, In-water works resumed 30 minutes following the last observation of the seal within the exclusion zone.
14 July 2019	Ringed seal	Two seals were observed outside of the exclusion zone, one seal entered the 200 m boundary and the work area. The placement of scour material was halted following the seal entering the exclusion zone. Work resumed 30 minutes following the last observation.
17 July 2019	Ringed seal	Observed within the 200 m exclusion zone, diving and surfacing inside and around the silt curtain. No in-water works was occurring at the time and work did not resume that day.
20 July 2019	Ringed seal	Observed diving and surfacing within the work area. No in-water works was occurring at the time of observation, and in-water works did not commence until two hours following the observation.
24 July 2019	Ringed seal	Observed within the exclusion zone, swimming along the silt curtain during rock placement activities in the dredge area. In-water works was stopped, resuming 30 minutes following the last observation of the seal.
31 July 2019	Ringed seal	Observed within the exclusion zone, swimming within the silt curtain. No in-water works was occurring at the time of observation. In-water works did not commence until 30 minutes following the last sighting within the exclusion zone.

3.5 Fish Monitoring

Fish presence in the work area was documented during in-water works. An observation of large aggregations of fish in the work area during in-water works with a high potential for injury to fish (pile driving) would result in an immediate cessation of in-water works. Known fish habitat that was monitored included the immediate work area north of the Freight Dock and stream M11-1, east of the Freight Dock. During the early weeks of the program, ice cover limited the capacity to observe fish and monitoring was not performed. During ice break out, the ice-free water within the work area was monitored for fish presence. During open water, monitoring occurred in the work area and stream M11-1. A summary of fish observations is presented in Table 6.

Table 6: Summary of fish observations during Freight Dock construction, June to August 2019

Date	Location	Species	Observation
23 June 2019	East of Freight Dock	Sandlance	A juvenile fish (potentially a sandlance) was observed in the ocean, north of the sand and snow disposal area.
28 June 2019	M11-1	Arctic char	Two juvenile char were observed in a pool downstream from the culvert, one swimming in the culvert and the other hiding among the rocks lining the pool.
29 June 2019	M11-1	Arctic char	Two juvenile char and a 15 cm char were observed in the pool below the culvert.
29 June 2019	M11-1	Arctic char	Two 15 cm char were observed swimming together in the pool below the culvert.
30 June 2019	M11-1	Arctic char	A 15 cm char was observed in the pool below the culvert.
30 June 2019	Freight Dock	Sandlance	A 155 mm sandlance was found as an incidental mortality from dredging in sand that was spilled from a haul truck on the Freight Dock.
1 July 2019	M11-1	Arctic char	A juvenile char and a 15 cm char were observed in the pool below the culvert.
2 July 2019	M11-1	Arctic char	A juvenile char was observed in the pool below the culvert.
19 July 2019	North of Freight Dock	Unidentified	A small unidentified fish was observed swimming near the surface of the water during in-situ water measurements, 100 m NW of the Freight Dock.

3.6 Archaeological Monitoring

Archaeological monitoring was not required as part of this monitoring program. A chance find procedure was included in the Freight Dock CEMP and Baffinland's Environmental Protection Plan. If a chance find was to occur during construction, all work would have immediately stopped, and the chance find reported. No archaeological chance finds were encountered during the construction of the Freight Dock.

4.0 SUMMARY OF ENVIRONMENTAL ISSUES

Environmental issues identified by Golder EM's during monitoring were communicated either verbally or by email correspondence to either Hatch, Nuna or Baffinland Site Environment representatives and are documented in environmental monitoring weekly summaries that have been submitted to Baffinland (Golder 2020). Identified environmental recommendations typically were minor in nature and related to worksite housekeeping, equipment maintenance and general construction activities during construction.

A summarized list of environmental issues, recommendations and minor spills reported during the Freight Dock construction are presented below in Table 7. A complete list of environmental issues, recommendations and spills observed during construction of the Freight Dock is provided in APPENDIX B.

Table 7: Summary of environmental issues observed during the Freight Dock construction from April to August 2019

Environmental Issue	Recommendation/Action	Comments
There were occurrences of stationary equipment, as well as oil and fuel, stored on the Freight Dock or B1 pad with inadequate secondary containment as required in Section 2.6.1.2 of the CEMP.	Place secondary containment underneath all stationary equipment as well as any fluid containing drum/storage container.	These observed incidents were immediately reported to responsible parties, including BVJV, Nuna, Hatch and Toromont, and appropriate secondary containment was implemented.
Approximately 1 L of hydraulic fluid was released from a 45-ton haul truck on the Freight Dock (23 April 2019).	Affected soil/rock should be removed and disposed of in a designated area.	The affected material was cleaned up and moved to a designated area as directed by Baffinland Site Environment. An incident report was generated by the contractor, reviewed by Golder and submitted to Baffinland Site Environment.
Approximately 10 L of hydraulic fluid from a hydraulic line failure was spilled along the Freight Dock and causeway from an articulated truck while in motion (3 May 2019).	Affected soil/rock should be removed and disposed of in a designated area.	The affected material was cleaned up and disposed of appropriately. An incident report was generated by the contractor, reviewed by Golder and submitted to Baffinland Site Environment.
1 to 5 L of transmission fluid was released from a 45-ton haul truck along the B1 pad and Freight Dock causeway (26 May 2019).	Contain the release of transmission fluid and segregate affected soils and rock to be removed and disposed of in a designated area.	The leak was contained by a spill tray when the vehicle was parked, and the affected rock and soils were removed by excavation and stored at the W10 laydown. On 27 May, the affected rocks were relocated and disposed of according to Baffinland procedures. The spill was cleaned up and an incident report was generated by the contractor, reviewed by Golder and submitted to Baffinland Site Environment.
Approximately 50 L of coolant was released from the crane operating on the Freight Dock (03 July 2019). The majority of the coolant was captured by the custom-built secondary containment placed underneath the crane.	Place spill pads and other absorbent material around the area to clean up any residual fluid. Affected soil/rock should be removed and disposed of in a designated area.	Spill pads and booms were placed under the crane to contain and absorb any residual coolant. The affected material was cleaned up and an incident report was generated by the contractor, reviewed by Golder and submitted to Baffinland Site Environment.

Environmental Issue	Recommendation/Action	Comments
Multiple incidents of equipment drips/leaks, soil stains and sheens noted on pools of standing water located on Freight Dock and surrounding laydowns.	Place secondary containment underneath all stationary equipment. Remove and appropriately dispose of any stained soils noted on laydown area as well as Freight Dock work area.	Leaks and drips were frequently associated with the crane during Freight Dock construction. These leaks and soiled or stained material were cleaned up when they were found, the source of leaks were addressed where possible, and an improved spill protection system was added to contain any fuels, leaks or spills. A continual leak was discovered that required consistent replacement of spill pads to contain the material. No releases to the environment occurred as a result of these issues.
Inadequate amounts of spill response equipment and materials stored on the Freight Dock.	Multiple spill kits should be appropriately stocked and easily accessible through out Freight Dock construction work area. Inventory of spill response materials should be conducted on a regular basis and additional material supplied if required.	Spill kits were inspected by the onsite Golder EM's on a regular basis. Missing items or items requiring restocking was communicated to Hatch and contractors.
Multiple incidences of stockpiled material exceeding capacity of containment areas and disposed of material spilling over onto containment berms.	Clean up and dispose of material in containment areas. Increase the capacity of containment areas or create additional containment area for stockpiled material.	Inadequately sized containment areas and berms were replaced and spilled stockpiled material was cleaned up.
Following dredging activities, the high tide was overtopping the edge of the Freight Dock and resuspending spilled sediments from dredging within the water column (18 May 2019).	Build the perimeter rock crest higher to delineate Freight Dock pad from the ocean. Perimeter crest will aid in filtering receding tidal waters.	Communicated with Nuna night shift foreman, and he directed excavator to build the perimeter crest higher. EM site inspection after construction of perimeter rock crest indicated constructed crest was aiding in filtering receding turbid tide water.

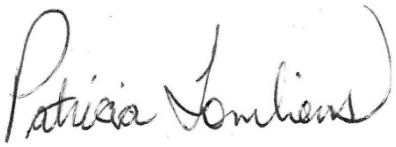
Environmental Issue	Recommendation/Action	Comments
During dredging and other in-water works, elevated turbidity levels were frequently measured within the work area.	Recommended that breaks be incorporated into the dredging activities to allow for dissipation of turbidity levels. Also, recommended avoiding in-water works that result in sediment disturbances when natural turbidity levels were high, such as during high tide or heavy waves, in order to prevent an exceedance of water quality monitoring conditions.	Turbidity monitoring procedure is detailed in Section 3.2 of this report.
Following the addition of the diversion berm for stream M11-1, it was noted that rocks were blocking M11-1 channel, upstream and downstream of culverts, potentially blocking fish passage.	Remove rocks that are blocking flow of water in M11-1 stream.	Rocks were removed and stream was inspected on a regular basis.
Issues noted following the deployment of the silt curtain during open water construction included: billowing panels lifting with waves and tides releasing turbid water, panels being snagged by pilings in the water leading to tears in the fabric, ice pushing against and disrupting the silt curtain, heavy waves and or wind causing panels or anchors to detach, heavy waves and or wind tearing apart sections and removing floats from the silt curtain, rising and falling tides leading to turbidity plumes releasing from the work area due to the curtain being too taut or too loose, sections of the silt curtain submerging and leaving gaps where sediment laden water would release.	Recommend daily inspections of the silt curtain to determine if it is functioning adequately prior to in-water works (i.e., dredging activities).	Silt curtain was inspected and maintained on a regular basis. During periods of heavy waves and wind, the silt curtain was adjusted, when safe to do so, to confirm panels were properly deployed and submerged. The silt curtain was also adjusted accordingly to account for the rising and falling tides.

Mitigation measures detailed in the SECP and CEMP were implemented during both sea ice and open water conditions during the Freight Dock construction. These measures were upgraded and maintained when necessary during the 19 weeks of construction. Golder's onsite EM's conducted daily site inspections which included recommending additional mitigation measures if required and monitoring to confirm the effectiveness of the measures in place. Mitigation measures that were implemented during the construction of the Freight Dock functioned adequately and contingency measures were not required.

5.0 CLOSURE

If you have any questions concerning this environmental completion report, please do not hesitate to contact the undersigned.

Golder Associates Ltd.



Trish Tomliens, BSc, EPt
Benthic Ecologist

Christine Bylenga, PhD
Biologist

Reviewed by:

Kyle Paddon, CTech, EP, CPESC
Environmental Manager

Shawn Redden, RPBio
Associate, Senior Fisheries Biologist

CB/TT/KP/asd

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APPENDIX A

Fisheries Act Authorization

Fisheries and Oceans Canada | Pêches et Océans Canada

PATH No.: 18-HCAA-00160

Other DFO File No.:

PARAGRAPH 35(2)(*b*) *FISHERIES ACT* AUTHORIZATION

Authorization issued to
Baffinland Iron Mines Corporation (hereafter referred to as the "Proponent")

Attention to: Phil Dutoit
2275 Upper Middle Road East Suite 100
Oakville, ON
L6H 0C3

Location of Proposed Project
The project is located at Milne Port, which is located 134 km southwest of Pond Inlet.

Nearest community (city, town, village): Pond Inlet
Municipality, district, township, county: Baffin Region
Territory: Nunavut
Name of watercourse, waterbody: Milne Inlet
Longitude and latitude, UTM Coordinates: 71.889403°, Longitude: -80.887592°, Zone: 17 W, Easting: 503900 m E, Northing: 7976600 m N

Description of Proposed Project

The proposed project is the construction of a Freight dock at the port in Milne Inlet. The work, undertaking or activity authorized is associated with The Mary River Project, an operating iron ore mine located on Baffin Island in the Qikiqtani Region of Nunavut. The Early Revenue Phase of the Mary River Project will involve mining and shipment of iron ore via the port at Milne Inlet. The new freight dock will allow more efficient use of the port for shipping purposes.

Description of Authorized work(s), undertaking(s) or activity(ies) likely to result in serious harm to fish

The work(s), undertaking(s), or activity(ies) associated with the proposed project described above, that are likely to result in serious harm to fish, are:

> The infilling of fish habitat in Milne Inlet resulting from the construction of the freight dock and mooring structures. Construction activities for the Freight Dock include:
> - Construction of a rock-fill berm
> - Removal of Sea Ice
> - Dredging and disposal of dredged material
> - Placement of rock/fill
> - Vibratory Pile driving

The serious harm to fish likely to result from the proposed work(s), undertaking(s), or activity(ies), and covered by this authorization includes

Permanent destruction of 26,449 m^2 ([2,170] Habitat Equivalent Units) of fish habitat in Milne Inlet including:

- 12,829m^2 Intertidal marine habitat
- 12,357m^2 Subtidal marine habitat
- 1,263m^2 Intertidal unnamed stream

Conditions of Authorization

The above described work, undertaking or activity that is likely to result in serious harm to fish must be carried on in accordance with the following conditions.

1. **Conditions that relate to the period during which the work, undertaking or activity that will result in serious harm to fish can be carried on**

   The work, undertaking or activity that results in serious harm to fish is authorized to be carried on during the following period:

   From the date of issuance to June 1, 2020

   If the Proponent cannot complete the work, undertaking or activity during this period, Fisheries and Oceans Canada (DFO) must be notified in advance of the expiration of the above time period. DFO may, where appropriate, provide written notice that the period to carry on the work, undertaking or activity has been extended.

   The periods during which other conditions of this authorization must be complied with are provided in their respective sections below. DFO may, where appropriate, provide written notice that these periods have been extended, in order to correspond to the extension of the period to carry on a work, undertaking, or activity.

2. **Conditions that relate to measures and standards to avoid and mitigate serious harm to fish**

2.1 Sediment and erosion control: Sediment and erosion control measures must be in place and shall be upgraded and maintained, such that release of sediment is avoided at the location of the authorized work, undertaking, or activity.

2.1.1 Before commencing any works, undertakings and/or activities that have the potential to release sediment into Milne Inlet or the unnamed stream, the Proponent shall prepare and implement site specific sediment and erosion control plans for any near or in-water works under the guidance of a certified Professional in erosion and sediment control (CPESC or equivalent). This plan shall be provided to DFO for review and approval before commencement of construction.

2.1.2 The erosion and sediment control plans shall include, but not to be limited to, the following:

- Delineation of areas of work;
- Plan for construction staging and storage logistics, including disposal of spoils;
- Anticipated construction schedule and construction duration;
- A description of erosion and sediment control measures to be used during and following construction (purpose, type, location, dimensions and design considerations);
- A description of the inspection and maintenance program and schedule; and
- Areas of the site susceptible to erosion problems

2.1.3 Turbidity levels shall be monitored in water adjacent to the work zone as the ice melts to evaluate potential movement of sediments. DFO shall be notified immediately of any exceedances of the current version of the Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Aquatic Life for suspended sediment (TSS) levels, temperature, and dissolved oxygen in water released from the site into any fish bearing waterbodies. Monitoring and regular reporting of the incident and corrective actions must be made to DFO until stabilization of the work site and construction areas is completed, and the situation has passed.

2.1.4 A qualified on-site environmental inspector shall be employed by the Proponent and be present throughout construction to ensure adherence to the proper codes of environmentally responsible construction practice. The environmental inspector shall ensure that all mitigation is implemented properly, photograph (with dates) and record construction activities and conduct suspended sediment monitoring. A report detailing the nature of the works or undertakings, the construction methods used, the mitigation measures employed, the effectiveness of the mitigation works, and the results of any monitoring programs undertaken shall be included in the annual report as per Condition 5.

2.2 Measures and standards to avoid and mitigate serious harm to fish resulting from the construction of the freight dock shall be implemented prior to the commencement of in or above water works (in the case of on ice work) as described below and as set out in the Proponent's Baffinland Iron Mines Corp. Mary River Project, Floating Freight Dock Application For *Fisheries Act* Authorization, dated February 27, 2019 or any subsequent, DFO approved, versions (hereafter referred to as the "Freight Dock Application"):

2.2.1 All blasting activities shall be conducted following Cott and Hanna's 'Monitoring Explosive-Based Winter Seismic Exploration in Waterbodies, NWT 2000-2002' (2005).

2.2.2 All construction activities shall be undertaken as outlined in the Freight Dock Application to minimize the potential for stress related behaviour or death of fishes and marine mammals

2.2.3 While conducting vibratory pile driving, dredging and infilling, a marine mammal exclusion zone of 200m radius shall be established. The marine mammal exclusion zone will be monitored for marine mammal presence starting 30 minutes prior to the commencement of vibratory pile driving, dredging or infilling activities. All activities shall cease if marine mammals are observed within the exclusion zone and shall not recommence until 30 minutes after the marine mammal was last observed or 30 minutes after the marine mammal is seen leaving the exclusion zone.

2.2.4 Field measurements shall be undertaken to verify that underwater sound pressure and noise levels at the edge of the exclusion zone shall not exceed 100 dB re 1 μPa root-mean-square (rms) sound pressure level (SPL) to prevent auditory injury to marine mammals during construction. If measured underwater noise levels exceed the 100db threshold, the following contingency measures shall be implemented: expansion of the marine mammal exclusion zone and the installation of bubble curtains.

2.2.5 In-air sound levels during the iced-season shall not exceed the in-air acoustic threshold of 100dB re 20μPa root-mean-square (rms) when pinnipeds are observed on the ice during construction activities.

2.3 Works shall be halted if monitoring required in condition 3 and 4 below indicated that the measures and standards to avoid and mitigate serious harm to fish are not successful.

2.4 Measures and standards to avoid and mitigate serious harm to fish shall be implemented prior to the commencement of construction.

3. **Conditions that relate to monitoring and reporting of measures and standards to avoid and mitigate serious harm to fish from the ore dock construction**

3.1 The Proponent shall monitor the implementation of avoidance and mitigation measures referred to in section 2 of this authorization and provide a report to DFO, by February 28, 2020, and indicate whether the measures and standards to avoid and mitigate serious harm to fish were conducted according to the conditions of this authorization. This shall be done, by:

3.1.1 Providing inspection reports supported by dated photographs to demonstrate effective implementation and functioning of mitigation measures and standards described above to limit the serious harm to fish to what is covered by this authorization.

3.1.2 Providing details of any contingency measures that were followed, to prevent impacts greater than those covered by this authorization in the event that mitigation measures did not function as described.

4. **Conditions that relate to the offsetting of the serious harm to fish likely to result from the authorized work, undertaking or activity**

4.1 Scale and description of offsetting measures:

4.1.1 Course rock substrate will be placed around the perimeter of the freight dock and moorings at Milne Inlet to provide 2729 HEUs of potential fish habitat

4.2 Contingency measures: If the results of monitoring indicates that the offsetting measures are not completed and/or functioning according to the monitoring criteria as outlined in the approved monitoring plan, as referenced in 5.1.1, the Proponent shall give written notice to DFO and shall implement the contingency measures and associated monitoring measures, as contained within an approved contingency plan, to ensure the implementation of the offsetting measures is completed and/or functioning as required by this authorization. The following conditions relate to the contingency measures:

4.2.1 The Proponent shall submit an updated contingency plan to DFO by February 28, 2020. The updated contingency plan shall be agreed by DFO and shall be informed by Inuit and/or indigenous groups and shall demonstrate viability.

4.2.2 The Proponent shall develop a monitoring plan for the contingency measures. The plan shall be developed specifically for monitoring of contingency measures. The plan shall be submitted to DFO and approved, in writing, by February 28, 2020 and shall be reviewed and approved by DFO, in writing, as required.

4.3 The Proponent shall not carry on any work, undertaking or activity that will adversely disturb or impact the offsetting measures.

5. **Conditions that relate to monitoring and reporting of implementation of offsetting measures (described above in section 4):**

5.1 The Proponent shall conduct monitoring of the implementation of offsetting measures according to the approved timeline and criteria in the Freight Dock Application, Section 9 in addition to an approved updated monitoring plan as follows:

5.1.1 The Proponent shall submit an updated offsetting monitoring plan for the proposed offsetting for review by DFO on or before May 31, 2019. The monitoring plan must satisfy DFO's requirements to demonstrate through clear and measurable criteria, fisheries productivity changes as a result of the offsetting measures. To address uncertainty in the effectiveness of the proposed offsetting measures, the proposed monitoring must have sufficient statistical power to determine if changes to productivity are occurring as a result of the offsetting measures within a defined timeframe, and must employ the most up-to-date and proven methodologies demonstrated to be effective under Arctic conditions.

5.1.2 Monitoring of offsetting shall be conducted over ten years, with a five year monitoring program (years 1, 2, 5, 8, 10) as outlined in the Freight Dock Application, Section 8, or as outlined in an updated monitoring plan and/or subsequent versions and as approved by DFO.

5.1.3 In addition to the outlined criteria, a digital photographic record of pre-construction, during construction and post-construction conditions using the same vantage points and direction to show that the approved works have been completed in accordance with the Freight Dock Application and subsequent plans approved by DFO

5.2 List of reports to be provided to DFO: The Proponent shall report to DFO on whether the offsetting measures were conducted according to the conditions of this authorization by providing the following:

5.2.1 Post-construction evaluation report shall be submitted to the DFO-Yellowknife Office within three months of the completion of the Freight Dock construction.

5.2.2 Monitoring reports shall be submitted to the DFO-Yellowknife Office by March 31 following each monitoring year, as will be outlined in the approved monitoring plan.

6. **Conditions that relate to the letter(s) of credit as part of the application for this authorization**

6.1 Letter of credit: DFO may draw upon funds available to DFO as the beneficiary of the letters of credit provided to DFO as part of the application for this authorization, to cover the costs of implementing the offsetting measures required to be implemented under this authorization, including the associated monitoring and reporting measures included in section 6, in instances where the Proponent fails to implement these required measures.

6.1.1 A letter of credit in the amount of $3,000,000 has been provided to cover the costs of implementing the offsetting measures required to be implemented under this authorization.

6.1.2 A letter of credit in the amount of $500,000 has been provided to cover the costs of implementing the monitoring required to be implemented under this authorization.

6.1.3 A letter of credit in the amount of $250,000 has been provided to cover the costs associated with the development and implementation of an adequate offsetting monitoring plan, which will be returned to the Proponent once an approved monitoring plan is finalized and approved in writing by DFO as referenced in section 5.1.1.

6.1.4 A letter of credit in the amount of $500,000 has been provided to cover the costs of the development and implementation of contingency measures, which includes costs associated with Indigenous consultation. If the Proponent fails to provide a feasible and acceptable contingency plan, this letter of credit shall be used for the cost of DFO to solicit, consult, and hire a consultant to develop a contingency plan. This will be returned to the Proponent once an approved contingency plan is finalized and approved by DFO as referenced in section 4.3.

Authorization Limitations and Application Conditions

The Proponent is solely responsible for plans and specifications relating to this authorization and for all design, safety and workmanship aspects of all the works associated with this authorization.

The holder of this authorization is hereby authorized under the authority of Paragraph 35(2)(*b*) of the *Fisheries Act*. R.S.C., 1985, c.F. 14 to carry on the work(s), undertaking(s) and/or activity(ies) that are likely to result in serious harm to fish as described herein. This authorization does not purport to release the applicant from any obligation to obtain permission from or to comply with the requirements of any other regulatory agencies.

This authorization does not permit the deposit of a deleterious substance in water frequented by fish. Subsection 36(3) of the *Fisheries Act* prohibits the deposit of any deleterious substances into waters frequented by fish unless authorized by regulations made by Governor in Council.

This authorization does not permit the killing, harming, harassment, capture or taking of individuals of any aquatic species listed under the *Species at Risk Act* (SARA) (s. 32 of the SARA), or the damage or destruction of residence of individuals of such species (s. 33 of the SARA) or the destruction of the critical habitat of any such species (s. 58 of the SARA).]

At the date of issuance of this authorization, no individuals of aquatic species listed under the *Species at Risk Act* (SARA) were identified in the vicinity of the authorized works, undertakings or activities.

The failure to comply with any condition of this authorization constitutes an offence under Paragraph 40(3)(*a*) of the *Fisheries Act* and may result in charges being laid under the *Fisheries Act.*
This authorization must be held on site and work crews must be made familiar with the conditions attached.

This authorization cannot be transferred or assigned to another party. If the work(s), undertaking(s) or activity(ies) authorized to be conducted pursuant to this authorization are expected to be sold or transferred, or other circumstances arise that are expected to result in a new Proponent taking over the work(s), undertaking(s) or activity(ies), the Proponent named in this authorization shall advise DFO in advance.

Date of Issuance: March 21, 2019

Approved by: 

Scott Gilbert
A/Regional Director General
Central and Arctic Region
Fisheries and Oceans Canada

APPENDIX B

Emerging Issues Table

Environmental Issues Observed from 12 April through 15 August During Freight Dock Construction at Milne Port, NU

Date Noted	Environmental Issue	Recommendation/Action	Completed	Comments
12 April 2019	Concerns with safe access of Nuna and Golder personnel to sampling locations on sea ice were discussed.	Golder and Nuna to discuss potential options and determine safe work requirements for working on sea ice once the ice is broken for in-water works.	Completed	Further discussions between Hatch, Nuna and Golder will take place moving forward with construction activities.
15 April 2019	Fueling area was not set up for refueling of portable equipment such as the ice auger. Fueling is currently taking place 31 m from the high-water mark and near a spill kit.	Set up refueling area at least 31 m away from the high-water mark with drip tray, spill kit, and fueling supplies.	Completed	Spoke with Scott Mackenzie (Site Superintendent with Nuna) to recommend setting up fueling area for ice profiling and CPT on ice drilling activities.
17 April 2019	Heavy equipment operators working in Freight Dock area not responding on radio channel used by other staff in the area.	Asked Nuna Health and Safety representative to clarify which channel equipment operators would be on.	Completed	Nuna Health and Safety Representative confirmed the radio channel to be used by equipment operators working near the sea ice as A4. This channel is to be used by anyone working on or near the sea ice to call a 'Code 1' if required. This information was included in the Job Hazard Analysis for driving on sea ice.
20 April 2019	Due to strong winds, snow was drifting on to the ice access road causing driving difficulties and the blowing snow caused low visibility conditions.	Vehicle traffic on the road was limited to mitigate the hazards with driving on the sea ice access road in poor weather.	Completed	Hatch health and safety limited the activities on the road for the day. The IT department was planning to test communication signals in the area, but the trip was postponed until tomorrow when conditions improve. Snow clearing on the sea ice access road was also stopped and equipment was moved off the road and back on to land.
21 April 2019	Due to increased heavy equipment activity in Freight Dock area, the A4 radio channel being used for this area was busy.	Nuna Health and Safety Representative switched the radio channel so that construction activities were on channel A20 and A4 was being used to check in/out with security when working on the sea ice.	Completed	
23 April 2019	Hydraulic oil spill from 45 ton haul truck.	Follow up with Darren (Hatch) for more information regarding incident.	Completed	April 24 – Received additional information regarding the reported spill, 1 L of hydraulic oil spilled from a 45 ton haul truck. Spill was cleaned up and an incident report was generated and submitted to Baffinland Environment.
26 April 2019	Stationary equipment on the B1 pad near the crane work area operating without secondary containment.	Vanpile crew placed drip trays under equipment.	Completed	
28 April 2019 – Day shift	Snow and sand stockpile is not completely contained by constructed berm.	Extend berm or move excess snow to an upland snow management area.	Ongoing	Ken Umby (Nuna Site Superintendent) confirmed that a berm extension is planned and will be completed before the pile begins to melt.
	Forecasted warm weather may affect ice stability and potentially affect the ability for Golder monitors to access monitoring locations.	Nuna ice profilers to continue monitoring ice conditions.	Ongoing	

Environmental Issues Observed from 12 April through 15 August During Freight Dock Construction at Milne Port, NU

Date Noted	Environmental Issue	Recommendation/Action	Completed	Comments
28 April 2019 – Night shift	Only one spill kit observed near Freight Dock.	Emailed Hatch (Stephane) requesting extra spill kits and location adjustment.	Ongoing	Add/move spill kits onto Freight Dock so that they are accessible to working machinery (next to life buoys) and at causeway entrance (where crane is currently parked).
30 April 2019	Small hydraulic fluid leak from crane (not actively leaking during inspection).	Place additional drip tray under leak to catch any splashes. Segregate snow containing leaked hydraulic fluid.	Ongoing	David Garcia (VanPile) is aware of the issue and already working on an improved drip tray.
1 May 2019 – Night Shift	A few areas with trace amounts of black stains (grease/oil in appearance) appearing as snow melts on B1 pad where trucks park.	Continue monitoring as snow melts. Clean up larger stains with shovel and spill pads.	Ongoing	Appears to be buried beneath snow/ice from activities prior to freight dock construction.
2 May 2019 – Day Shift	Small oil drip approximately 20 metres north of snow and sand containment berm.	Cleaned up by Golder EM. Total soil volume removed was less than one shovel full.	Completed	
3 May 2019 – Night Shift	Spill on the freight dock was not immediately communicated to EM.	Spoke with Hatch general manager to clarify chain of communication.	Completed	Obtained preliminary incident report. Awaiting final incident report.
3 May 2019 – Day Shift	Rock thermal transmittance experiment has left two 20 L pails full of rocks on the seafloor. Lines for rock buckets are embedded in sea ice.	Recommended that if the lines can't be freed, the ends be tied to floats so they can be located and retrieved after ice breakup.	Ongoing	
4 May 2019 – Night Shift	Snow was deposited on top of and outside the rock containment berm in a 2 m x 8 m area (approximate).	Recommended clean-up of snow outside the containment area, re-grading the snow/sand stockpile to improve access for haul trucks, and reducing the height of the stockpile to improve the integrity of the containment.	Completed	Spilled snow was relocated within the containment area during the May 5-6 night shift. Golder EMs to continue monitoring containment area. Nuna site superintendent expects that little to no additional snow will need to be deposited.
5 May 2019 – Day Shift	The crane used for dredging is old and likely to leak. Hatch and VanPile are working on a containment system that could be kept in place during operation.	Monitor and advise design of the secondary containment. Inspect secondary containment prior to in-water work.	Ongoing	
5 May 2019 – Night Shift	Oil jugs and diesel-powered heater operating near the crane without secondary containment.	Secondary containment is being located by Nuna. Emailed Hatch (Kevin) about sharing containment procedures with the mechanics.	Ongoing	
	Crane was started a few times for limited periods of time. Exhaust produced heavy smoke. Exhaust minimization may be difficult.	Continue monitoring as crane repairs progress.	Ongoing	
	Stationary equipment located on B1 pad without secondary containment.	Place secondary containment underneath all stationary equipment and clean up any stained snow/sediment.	9 May 2019	Spoke with Stephen Nugent (Nuna PM) and Ken Humby (Nuna Site Superintendent).

Environmental Issues Observed from 12 April through 15 August During Freight Dock Construction at Milne Port, NU

Date Noted	Environmental Issue	Recommendation/Action	Completed	Comments
7 May 2019	Observed grease drips underneath 349F excavator.	Place secondary containment underneath all stationary equipment and clean up any stained snow/sediment.	9 May 2019	Spoke with Stephen Nugent and Ken Humby. Both went to B1 pad to investigate the concern adressed
	Hydrocarbon-like sheen observed on surface of run-off water between two stationary excavators (~5 x 0.20 m).	Determine source of sheen (potentially from grease drops observed on ground) and remove any stained snow/sediment.		Spoke with Stephen Nugent and Ken Humby. Both went to B1 pad to investigate the concern adressed. Spoke with Robert Kennedy regarding sheen and he followed up with Toromont to clean up area and move the excavator into their shop for repairs.
11 May 2019	Inspection of equipment used in dredging operations is required prior to dredging activities commencing.	Golder EM inspected 45-ton haul truck #16, #18 and 374 (#03) excavator.	11 May 2019	All three pieces of equipment were clean and free of visible leaks.
12 May 2019	Nuna dozer #2, packer #1 and Blaze cube 1100 #5 stationary within B1 pad.	Place secondary containment underneath all stationary equipment. Will discuss with Nuna Site Foreman.	12 May 2019	Equipment had been removed from B1 pad during 12 May 2019 site inspection.
13 May 2019	Hydrocarbon staining on ground near clam bucket located on the B1 pad within the crane work area (0.40 x 0.15 m).	Remove/clean up stained soil and dispose of appropriately.	13 May 2019	Discussed the staining with Adrian (VanPile). They will clean up area once it has been identified where to place the stained soil.
14 May 2019	Packer #01 was parked in B1 pad without secondary containment.	Place secondary containment underneath all stationary equipment.	14 May 2019	Drip tray was immediately placed under equipment following communication between EM and Nuna foreman (Dave).
16 May 2019	Rock haul truck #16 and 18 and Packer #01 stationary without drip trays within B1 pad.	Place drip trays under equipment when stationary in B1 pad.	16 May 2019	Spoke to Dave (Nuna night shift foreman) to recommend placing drip trays under equipment. He will mention this to crew.
17 May 2019	Sediment observed on causeway from dredging operations (from dewatering of excavator bucket and haul truck)	EM to inspect potential for resuspension at next high tide when water level surpasses height of freight dock.	17 May 2019	-
18 May 2019	High tide is rising above the height of the existing freight dock and perimeter rock crest at leading edge has gaps allowing for free flow of tide water to mix with sediment deposited from dredge dewatering on top of causeway. Continued haul truck and excavator use of the high tide water pool during ROQ filling (and other construction activities) is making high tide pooling water turbid that has access into the environment via gaps in perimeter rock crest.	Build the perimeter rock crest higher to delineate freight dock pad from the ocean. Perimeter crest will filter receding tide water.	18 May 2019	Communicated with Dave (Nuna night shift foreman), and he directed excavator to build the perimeter crest higher. EM inspection later deemed newly build crest to aid in filtering receding turbid tide water.
18 May 2019	Visible high turbidity in the dredging area had not dissipated after approximately 24 h.	Golder EMs to discuss with BIM Environment to determine if additional mitigations are required.	19 May 2019	Golder EMs recommended avoiding construction activity during the high tides and incorporating breaks between periods of dredging to allow induced turbidity to dissipate.
	Fluid spill under the 2250 crane on the B1 pad.	Remove and segregate contaminated soil from under the crane.	28 May 2019	Stained soil was removed from the B1 pad, segregated, and stored as directed by BIM Environment.

Environmental Issues Observed from 12 April through 15 August During Freight Dock Construction at Milne Port, NU

Date Noted	Environmental Issue	Recommendation/Action	Completed	Comments
21 May 2019	History of leaks from the 2250 crane that will be used for pile driving.	Replace worn or old hoses, perform comprehensive testing and inspections before the crane is moved to the freight dock causeway.	26 May 2019	BIM Environment and Golder EM inspected the crane while the engine was running, and no leaks were observed. Vanpile agreed to check spill trays daily as part of pre-operation checks. Golder EMs will also check the crane and spill trays daily for signs of leaking. Vanpile stated they will test hydraulic systems for pile driving equipment on B1 pad prior to mobilizing to freight dock and will allow Golder EMs to witness.
26 May 2019	A spill of transmission fluid (Nuna first reported the material as hydraulic oil but later changedrevised to transmission oilfluid) from a 45-ton haul truck (unit # 32 58 18) was observed on the B1 Pad and along the freight dock causeway. Approximately 1 - 5 L of transmission fluid was spilled. A few areas with trace amounts of black stains (grease/oil in appearance) appearing as snow melts on B1 pad where trucks park.	The leak was contained into a spill tray once the unit was parked on the B1 Pad. Contaminated rock along the freight dock causeway was removed by excavating the material and placing in a 45-ton haul truck. Continue monitoring as snow melts. Clean up larger stains with shovel and spill pads.	27 May 2019	Contaminated rock originally stockpiled at the W10 laydown was relocated to the appropriate storage area, as directed by BIM Environment . Incident report Appears to be buried beneath snow/ice from activities prior to freight dock construction.was completed by Nuna and provided to BIM and Golder
21-23 May 2019, 25 May 2019 (day shift), 26 May 2019 (day shift)	Golder EMs were unable to measure turbidity to assess compliance with the Fisheries Act Authorization, because an ice profile report was not available, or an ice safety advisor was not available to accompany the Golder EMs during sampling events.	In lieu of additional monitoring, limit dredging activity to shorter periods to allow induced turbidity to dissipate.	Ongoing	Limited in situ water quality monitoring was conducted during the night shifts on 24 May 2019, 25 May 2019, and 26 May 2019.
27 May 2019	Approximately 5 cu. m of rock contaminated with transmission fluid stockpiled at W10 laydown.	Move contaminated rock to the designated area.	28 May 2019	Contaminated rock was relocated to the appropriate area as directed by BIM Environment.
	Soil staining under the previous location of the crane (first observed on 21 May) had not been cleaned up.	Excavate and segregate contaminated soil.	28 May 2019	Stained soil was removed by BIM Maintenance. BIM Environment and Golder EMs inspected the area after cleanup was complete.
29 May 2019	Extensive pooling water visible on the surface of the sea ice.	Complete a new ice profile prior to any further work on the sea ice.	31 May 2019	As of 31 May 2019, Hatch stated that there will be no more work on ice due to unsafe conditions, and will arrange for the use of a man-basket for Golder EMs to conduct monitoring until there is enough open water to safely use a boat.
31 May 2019	Potential for a spill of hydraulic fluid into water during pile driving activity.	Recommended that 50 m of additional spill containment booms be ordered and pre-connected for easy deployment in the event of a spill.	Ongoing	Sent the recommendation to purchase more spill containment booms to Hatch via email on 01 June 2019

Environmental Issues Observed from 12 April through 15 August During Freight Dock Construction at Milne Port, NU

Date Noted	Environmental Issue	Recommendation/Action	Completed	Comments
2 June 2019	Pile driving began today and to assess compliance with the Fisheries Act Authorization, underwater noise monitoring was required as described by the CEMP. Due to unsafe sea ice conditions access to the 200 m extent of the marine mammal exclusion zone was not possible.	Continue underwater noise monitoring and plan for access to better quality monitoring locations.	Ongoing	Golder attempted noise monitoring during pile driving on June 02, 2019 from a location approximately 4 m southeast of the east bund of the Freight Dock. The location was considered the best available without being able to access the sea ice. Water depth at the monitoring location was approximately 1 m. The shallow depth and proximity to the active pile driving was not ideal for monitoring. At this location the highest sound level recorded during vibratory hammer pile driving was 137 dB RMS re 1 µPa. The shallow water may have also influenced the data. A sampling location in deeper water is required to adequately conduct underwater noise monitoring.
6 June 2019	Access to turbidity and noise monitoring locations compromised by melting sea ice.	Followed through on Hatch and Nuna delivering gear and boat work.	Yes	Boat use to proceed once safety plan developed and necessary equipment is in place.
7 June 2019	Excavator and haul trucks were working in approximately one foot of water on the west beach of Freight Dock due to high tide.	Recommended to perform work outside of water during high tide or work in that area during low tide.	Yes	Spoke with Stephen Nugent and Scott McKenzie (Nuna). Excavator continued work on high ground out of water. Haul trucks were rerouted and a berm was placed to capture sediment.
10 June 2019	Excavator and 45-ton haul trucks working in water on the west beach of the Freight Dock resulting in a significant increase in turbidity	Recommended Nuna to halt the in-water works in that area until turbidity decreased	Yes	Turbidity returned to acceptable limit when in-water work ceased for two hours
18 June 2019	Noted a bulldozer with no spill protection and a drip that appeared to contain dirty water	Requested a spill tray be placed under the drip	18 June 2019	
20 June 2019	Silt fence at ditch outlet onto the beach west of the snow disposal area is at capacity. No erosion on beach observed.	Continue to monitor	Ongoing	
22 June 2019	Elevated turbidity east of FD due to rocks falling in water during rock placement by Nuna	Continue to monitor	22 June 2019	A small turbidity plume (102 NTU) was observed east of the Freight Dock due to rock placement on FD access road berm/bank. Localized in a small area, as adjacent monitoring station was <2 NTU. Turbidity levels were <3 NTU less than 3 hours later. As such, turbidity did not exceed guidelines.
	Burnt diesel observed dripping off diesel hammer. The spill tray under the fuel/oil tank did not extend far enough	Request additional tray be placed under the drip	22 June 2019	
23 June 2019	Rocks blocking M11-1 channel, upstream and downstream of culverts, potentially blocking fish passage	Move rock in channel	23 June 2019	
	A hole in a spill tray was observed during fueling of the crane	Requested a new spill tray be sourced for fueling	24 June 2019	

Environmental Issues Observed from 12 April through 15 August During Freight Dock Construction at Milne Port, NU

Date Noted	Environmental Issue	Recommendation/Action	Completed	Comments
24 June 2019	Rocks were moved in the M11-1 stream without environmental monitors present.	Environmental monitors must be present for any in-water work. Methods of contacting the monitors were restated and communicated to personnel involved	24 June 2019	Further movements of rocks in M11-1 stream were performed with environmental monitors present, following proper communication through the established channels
27 June 2019	Ice was observed pressing against the northern edge of the silt curtain	Monitor ice approaching silt curtain, perform regular maintenance	Ongoing	
	One panel on the silt curtain dropped before deployment and was draped over a mooring pile following tide change, a small tear could be observed	Secure the curtain away from the pile. Continue to monitor and repair if necessary	28 June 2019	Wind and wave conditions prevented safe access to water, the issue was resolved during full deployment of the curtain
29 June 2019	A turbidity plume was observed on the west side of the silt curtain during dredging, approaching the 100 m mark	Monitor plume and pause dredging if plume continues. Maintenance and repair curtain	Ongoing	Wind and wave conditions prevented safe access to water to take turbidity measurements and TSS samples
	Silt curtain detached from the Freight Dock during heavy waves and tide	Repair and re-anchor curtain, replace components as needed or deploy back up curtain. Discontinue dredging until functional curtain is in place	30 June 2019	
30 June 2019	A hole and slumping material was observed on the western bund, indications of a potential sinkhole	Monitor and repair as soon as possible to prevent further slumping or collapse	Ongoing	Communicated to Hatch, currently does not affect dredging program
	Sections of the silt curtain submerged due to floats lost during detachment on 29 June. Large gap present on the west end of the curtain	Monitor and repair as soon as possible, tie in end to bund	Ongoing	
	Turbidity plumes observed on western side where silt curtain is lifting with waves and tide, and on the eastern side where floats are missing	Monitor plume and silt curtain condition and repair as soon as possible, consider replacement of floats	Ongoing	
1 July 2019	During inspection of FD in morning, it was noticed that the manlift had a spill tray sitting beside it rather than under it.	Requested the spill tray be moved under the manlift, and it was moved into place.	1 July 2019	
2 July 2019	During inspection of FD in morning, it was noticed that the manlift had a spill tray sitting beside it rather than under it. Same observation as yesterday.	Requested the spill tray be moved under the manlift, and it was moved into place.	2 July 2019	
	Silt curtain was not anchored on the West side of the Freight Dock.	Requested day shift to communicate this to Hatch.	6 July 2019	
3 July 2019	Spill on Freight Dock.	Nuna to do an internal spill report. Van Pile to clean up the spill. Nuna to pick up the used spill equipment.	3 July 2019	Crane engine failed and approximately 50L of coolant was released. Most of the coolant was captured in the secondary containment under the crane. Spill pads and spill booms were placed under the crane to contain and absorb the residual coolant.
4 July 2019	Contaminated spill response materials still on the Freight Dock.	Nuna to remove and dispose.	8 July 2019	

Environmental Issues Observed from 12 April through 15 August During Freight Dock Construction at Milne Port, NU

Date Noted	Environmental Issue	Recommendation/Action	Completed	Comments
5 July 2019	Crane engine is sitting on Freight Dock	Remove, clean and store in proper location	6 July 2019	Failed crane engine is currently sitting next to the crane with secondary containment underneath it. A vac truck removed most of the fluid from the engine. Should be moved to a proper storage location (e.g., landfill)
7 July 2019	Two Quatrex bags with contaminated spill response equipment were sitting on the Freight Dock. Plastic barrel of engine coolant (approximately 90L) was sitting beside quatrex bags that require removal and appropriate disposal.	Remove Quatrex bags from Freight Dock and dispose of contaminated material in proper location. Obtain services of a vacuum truck to remove the engine coolant from plastic barrel.	8 July 2019	Spoke to Dave (Nuna nightshift foreman) and let him know this needs to be completed.
12 July 2019	Crane engine was leaking fluid very slowly and was being captured by spill pads, caused some ground staining.	Advised Nuna/Van Pile to periodically switch out contaminated spill pads	12 July 2019	
	Excavator in dredge material storage area is piling dredge material in NE corner close to containment berm, minor encroaching of rock berm ledge	Recommended removing dredge material from ledge and maintaining a free zone between containment of material and berm	13 July 2019	
17 July 2019	Increased oil leakage on Freight Dock crane.	Clean up rocks with oil after each shift and dispose in containment area on B1 pad.	On-going	Additional containment isn't ideal due to continuous movement of crane and health & safety issues.
18 July 2019	Turbidity plume noted coming off the west end of the Freight Dock at high tide.	Repair silt curtain or don't place material under these conditions.	18 July 2019	
	Welding wire and electrodes, some cast-off and grinding wheels left around B1 pad.	Tidy up workspace after work.	18 July 2019	
	Oil sheen on ground.	Clean up area and dispose of material appropriately.	18 July 2019	Cleaned up area with spill pads. Grader operator removed surface soil, which was collected and put in the contaminated area.
19 July 2019	Silt curtain maintenance.	Silt curtain north of Freight Dock under water. Recommended to add additional floats to curtain.	On-going	Nuna will go out on boat as soon as weather permits to fix middle section of silt curtain.
21 July 2019	Tear in silt curtain.	Fix tear in silt curtain so that curtain is functioning adequately.	21 July 2019	Nuna repaired silt curtain with extra silt curtain material.
22 July 2019	The silt curtain appeared to be twisted at the west bund where it entered the ocean.	Monitor silt curtain to confirm it is functioning adequately.	22 July 2019	Nuna checked silt curtain and it appeared that the curtain was hung up due to the very low tide and would deploy on its own at high tide.

Environmental Issues Observed from 12 April through 15 August During Freight Dock Construction at Milne Port, NU

Date Noted	Environmental Issue	Recommendation/Action	Completed	Comments
23 July 2019	A turbidity plume was observed in M11-1 stream which appeared to be due to runoff from the barge lander during a heavy rain event.	Turbidity plume was shown to Hatch who indicated they would make modifications to the barge lander area within the next few days.	25 July 2019	Turbid water no longer observed running from the dredge containment area into M11-1 stream.
	A turbidity plume was formed by turbid runoff from the snow and ice containment area.	It was recommended that Hatch build a sump to the left of the existing berm as well as a second berm across the road.	24 July 2019	The additional berm that was constructed was made of sand and should be replaced with a more permanent material soon.
24 July 2019	New berm in the snow containment area is made of sand and not filtering water optimally.	It was recommended that the berm be reconstructed out of a more permanent material and filter cloth to increase filtration.	25 July 2019	
26 July 2019	A turbidity plume was observed in the sea lift area on 26 and 27 July. The plume appeared to be caused by barge loading and unloading activities (not project related).	Additional baseline measurements were taken to exclude barge landing activity from construction monitoring.	27 July 2019	
28 July 2019	The silt curtain was observed to be missing some floats and remained under the surface of the water, north of the Freight Dock.	It was requested that Nuna add additional floats to the silt curtain.	28 July 2019	
2 August 2019	High winds from north, high tide, and activity from Horizon Star vessel caused silt curtain disturbance. At 02:45, silt curtain ropes untied and caused an approximately 5 m gap.	VanPile (BVJV) stopped in-water work activities until silt curtain placement was fixed on 02 August.	4 August 2019	High winds on August 03 also caused a gap in the silt curtain. On-going silt curtain maintenance is required.
7 August 2019	Elevated turbidity (8.2 NTU).	Continued monitoring for 24 hours, increasing monitoring frequency.	8 August 2019	Turbidity decreased within 24 hours and did not exceed monitoring guidelines.
8 August 2019	Elevated turbidity (13.0 NTU).	Continued monitoring for 24 hours, increasing monitoring frequency.	9 August 2019	Turbidity decreased within 24 hours and did not exceed monitoring guidelines.
12 August 2019	Elevated turbidity levels created by 374F excavator conducting in-water work from Freight Dock around west fender.	Continued monitoring for 24 hours, increasing monitoring frequency.	13 August 2019	Turbidity levels decreased within 24 hours and did not exceed monitoring guidelines (20.9 NTU at 03:53 and dissipated to 1.2 NTU 07:59)

APPENDIX C

Photos

Photo 1 - Snow clearing for snow/sand rock containment berm to be built along the high-water mark shown at right side of the photo, 11 April 2019

Photo 2 - Filter cloth placement and rock berm for snow/sand containment berm (looking west), 12 April 2019

Photo 3 - Construction of the snow/sand containment berm (looking west), 12 April 2019

Photo 4 - Spill kit location for the snow/sand containment berm construction, 12 April 2019

Photo 5 - Placement and compaction of fill material for causeway extension of the proposed Freight Dock (looking south), 23 April 2019

Photo 6 - Quatrex bag containing spill material following reported spill from 45-ton haul truck, 23 April 2019

Photo 7 - Snow removal to clear access to existing Freight Dock and ConeTec's laydown area (looking north), 13 April 2019

Photo 8 - Ice auger to be used in ice profiling, 13 April 2019

Photo 9 - Ice profiling hole showing 0.7 m of ice thickness. The minimum ice thickness required for the necessary equipment load is 0.55 m, 13 April 2019

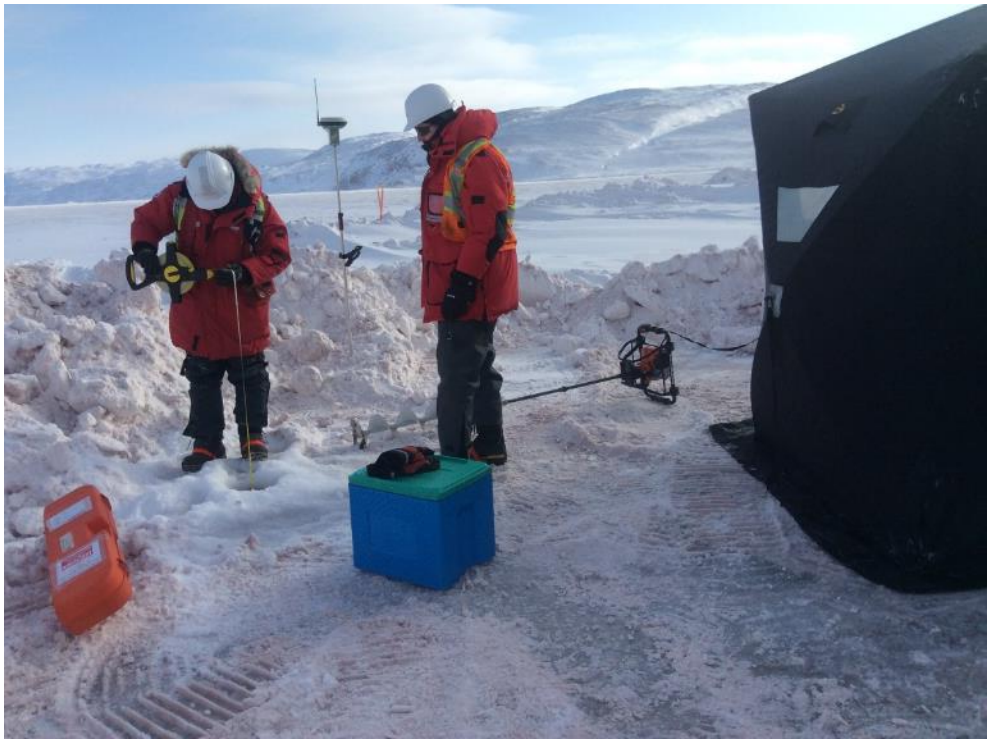

Photo 10 – Golder EM's sounding depth at geotechnical CPT BH, 24 April 2019

Photo 11 - ConeTec conducting geotechnical CPT testing, 25 April 2019

Photo 12 - Secondary containment placed under stationary and inactive crane, 24 April 2019

Photo 13 - Augering of a hole through sea ice at a turbidity monitoring location, 25 April 2019

Photo 14 - Snow clearing at the north end of the extent of Freight Dock causeway on 17 April 2019

Photo 15 - Placement and compacting of fill material at the Freight Dock causeway, 25 April 2019

Photo 16 - Snow/sand stockpile extending beyond the containment berm, with excavator working to move material inside the bermed area (looking south), 28 April 2019

Photo 17 - Rock placement on the Freight Dock causeway (looking north), 3 May 2019

Photo 18 - Spill of hydraulic fluids on the Freight Dock, approximately 120 m from the causeway entrance (looking south), 3 May 2019

Photo 19 - Vehicle access ramp construction and snow removal at the stream diversion berm area, east of the existing Freight Dock (looking north), 5 May 2019

Photo 20 - Freight Dock causeway construction, as of 5 May 2019, looking north

Photo 21 - Spill containment material on hand during engine removal work on the 2250 Manitowoc crane, 9 May 2019

Photo 22 - Pooling surface water on top of sea ice at newly established foot path and monitoring locations, 12 May 2019

Photo 23 - Ice breaking and removal with a 374 excavator at high tide, 13 May 2019

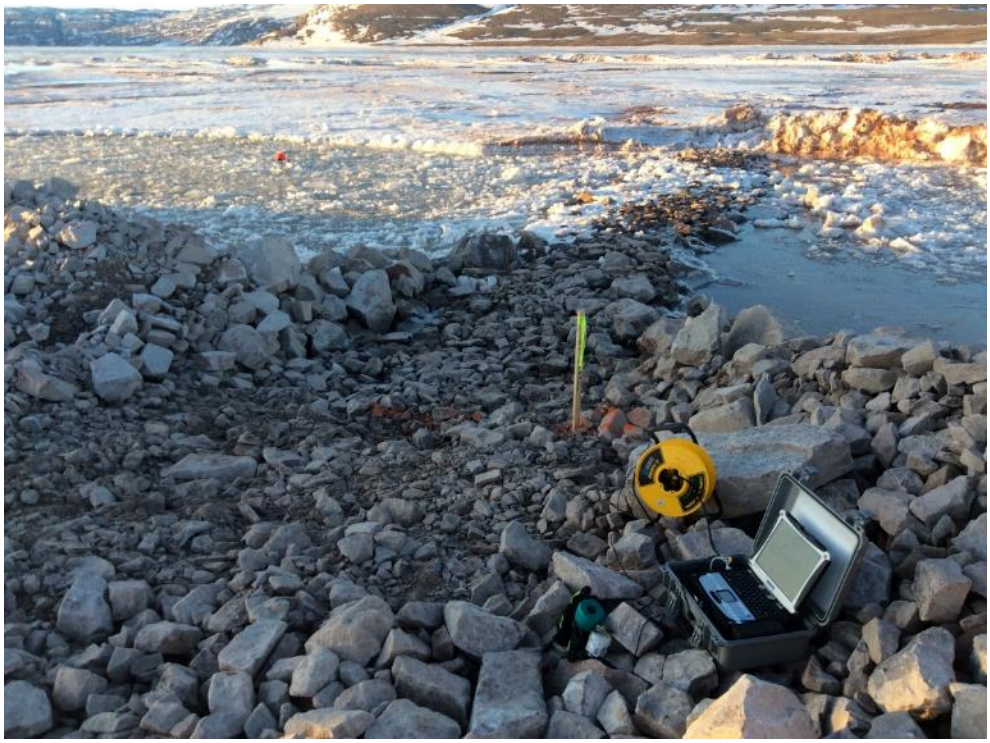

Photo 24 - Underwater noise monitoring conducted during ice breaking and removal activities with an excavator. Hydrophone deployed from red buoy within cleared ice area, 13 May 2019

Photo 25 - Excavator dredging at the leading edge of the Freight Dock causeway, 14 May 2019

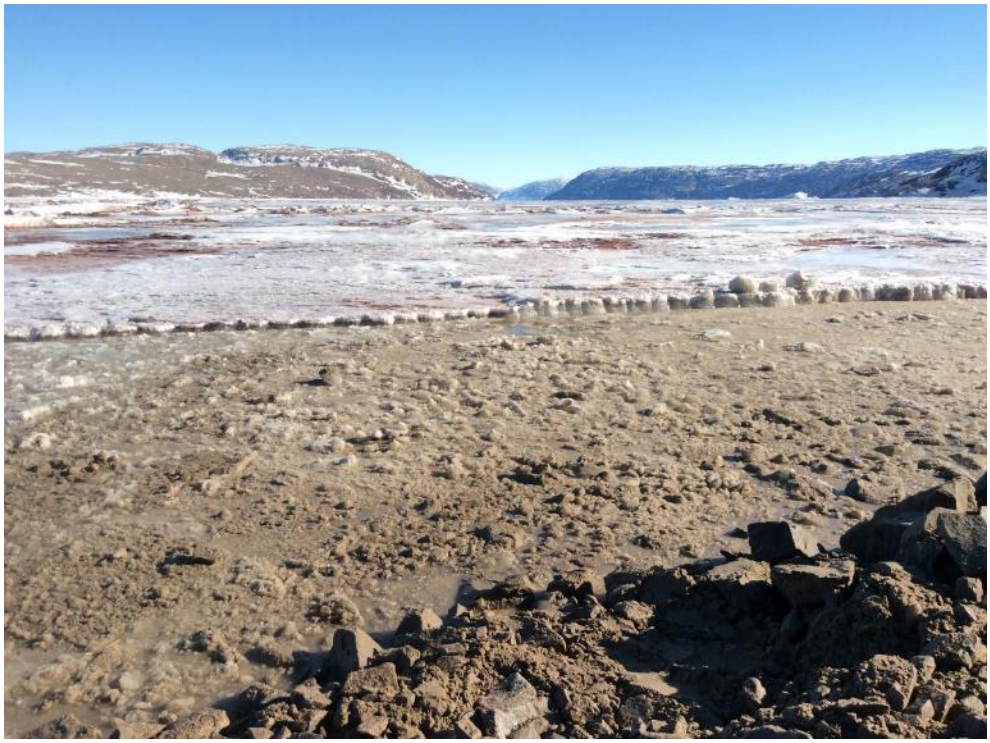

Photo 26 - Turbidity being contained within ice and slush on the water surface during dredging activities with an excavator, 16 May 2019

Photo 27 - Completed SWD7 stream diversion berm, with stream M11-1 flowing along planned diverted course, 15 May 2019

Photo 28 - Previously reported spill left without proper cleanup. Spill tray added to contain further drips was improperly anchored against wind, 22 May 2019

Photo 29 - Previously noted spill tray following clean up and maintenance efforts, 22 May 2019

Photo 30 - Turbid water in the work area (looking east), 27 May 2019

Photo 31 - Stream M11-1, looking downstream from the twin culverts at the old barge lander, 27 May 2019

Photo 32 - Full time spill containment (black tarp and yellow rope) attached to underside of 2250 crane, 31 May 2019

Photo 33 – Custom secondary containment built to contain the vibratory hammer hydraulic powerpack for future work near water, 31 May 2019

Photo 34 – Vibratory hammering of piles at the north end of the Freight Dock (looking west), 4 June 2019

Photo 35 – Vibratory hammer hydraulic power pack in the purpose-built secondary containment (looking east), 4 June 2019

Photo 36 - Fueling of the vibratory hammer hydraulic power pack, 5 June 2019

Photo 37 - Aerial view of ongoing construction of the Freight Dock (top) and Barge Lander (bottom), as of 11 June 2019. Photo provided by BIM.

Photo 38 - Golder environmental monitors measuring water parameters during ice breakout, north of the Freight Dock (right), 16 June 2019

Photo 39 - Sea ice breaking out with southerly wind, during active diesel hammer pile driving (looking north northeast), 16 June 2019

Photo 40 - Diesel hammer performing impact pile driving on pile #1 on the Freight Dock (looking northwest), 17 June 2019

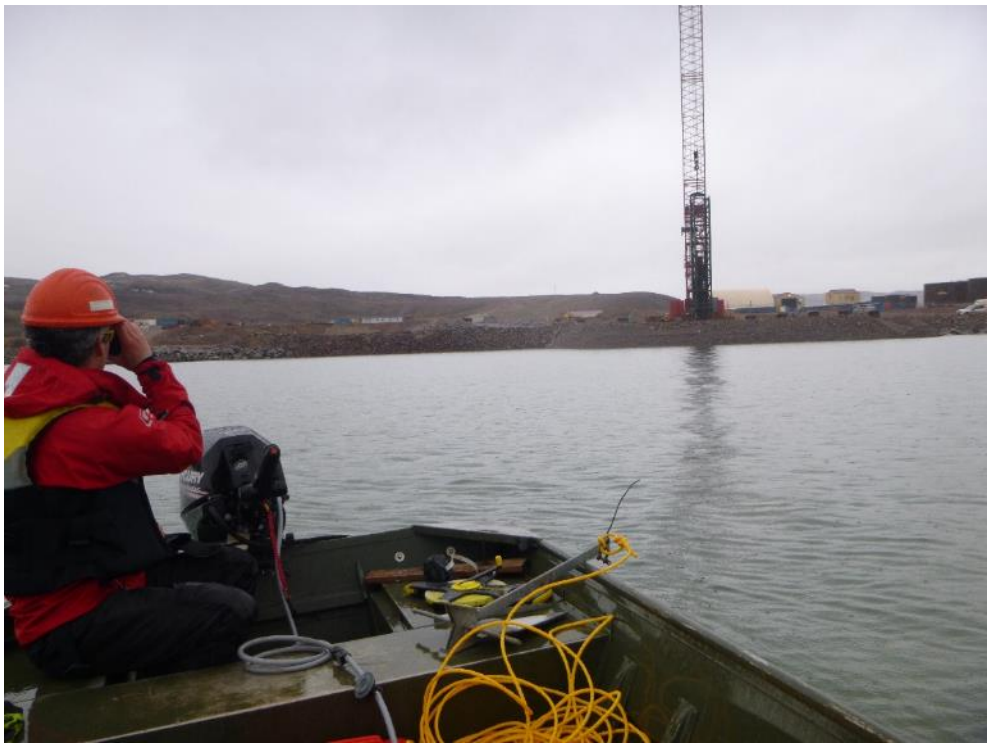

Photo 41 - Monitoring of construction activities during impact pile driving, 18 June 2019

Photo 42 - Collection of water samples and measurements at the reference location north of the Hunter's Cabin, 19 June 2019

Photo 43 - Placement of the mooring piles (looking southwest), 20 June 2019

Photo 44 - Restored flow in stream M11-1 following removal of rocks that were blocking fish passage, 24 June 2019

Photo 45 - Tear observed in spill tray located under equipment on the Freight Dock during fueling. A new spill tray was sourced for future fueling, 24 June 2019

Photo 46 - Nuna deploying panels on the silt curtain prior to dredging activities, 28 June 2019

Photo 47 - Falling tide and currents lifting panel on silt curtain off of the west bund on the Freight Dock, 28 June 2019

Photo 48 - Silt curtain containing the turbid water within the work area during active dredging, 29 June 2019

Photo 49 - Two 15 cm Arctic char observed in a pool in stream M11-1, 29 June 2019

Photo 50 - Billowing panels on the silt curtain releasing plumes of turbid water from the work area, 30 June 2019

Photo 51 - Dead sandlance found in dredge material spilled on Freight Dock, 30 June 2019

Photo 52 - Aerial view of the Freight Dock during dredging activity showing the silt curtain containing turbid water in the work area, 1 July 2019. Photo provided by BIM

Photo 53 – 45-ton haul truck transporting dredged material to the dredge disposal area, 2 July 2019

Photo 54 - Loading dredged material into a rock truck for hauling to the dredge material disposal area, 9 July 2019

Photo 55 - Clean up and crane maintenance following spill on the Freight Dock during dredging, 3 July 2019

Photo 56 - Allnorth surveyors performing bathymetry survey of dredge area, 11 July 2019

Photo 57 - Ringed seal observed in the dredge area during a break in in-water activity, 3 July 2019

Photo 58 - Boom lowered on crane to be reconfigured, 29 July 2019

Photo 59 - Dive boat, the Horizon Star on site during dive operations north of the Freight Dock, 6 August 2019

Photo 60 - Lifting of the silt curtain during removal, 10 August 2019

Photo 61 - Looking north from the Freight Dock, following removal of the silt curtain, 10 August 2019

Photo 62 - View of the Freight Dock following construction and removal of equipment (looking north), 11 August 2019

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