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Baffinland Iron Mines Corporation

Shipping and Marine Wildlife Management Plan

Document #BAF-PH1-830-P16-0024
Rev 7
July 15, 2020

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Baffinland Iron Mines Corporation

Shipping and Marine Wildlife Management Plan

BAF-PH1-830-P16-0024

Rev 7

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DOCUMENT REVISION RECORD

Issue Date MM/DD/YY	Revision	Prepared By	Approved By	Issue Purpose
02/2012	1	BL	OC	Version submitted in February 2012 FEIS
05/2013	2	BL	OC	Revisions related to the Terms and Conditions in NIRB Project Certificate No. 005
06/2013	3	BL	OC	Updates to Baffinland responsibilities table, updates for submission as supporting material for the FEIS addendum.
10/2014	4	BL	OC	Updated to reflect Early Revenue Phase and the amended NIRB Project Certificate No. 005
03/2015	5	OC	EM	Update to reflect operations
03/2016	6	JS	OC	Update table of contents and concordance
07/2020	7	EM	LK	Updated to reflect 6 MTPA operations and associated mitigations

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1 INTRODUCTION

1.1 Purpose

The Shipping and Marine Wildlife Management Plan (SMWMP) has been developed to:

- Address the issues of concern to Inuit with respect to shipping associated with the Mary River Project (the Project).
- Establish rules and procedures applicable to shipping during the construction, operational and decommissioning phases of the Project.
- Outline the existing mitigation and management measures related to Project shipping designed to minimize potential effects of Project activities on the marine environment, marine mammals, and traditional hunting and harvesting activities.

The SMWMP is a part of the Baffinland Iron Mines Corporation (Baffinland) Environmental Management System (EMS) and reflects Baffinland commitments with respect to shipping activities associated with the Project. Specifically, the SMWMP:

- Describes the means whereby Baffinland ships, fuel and equipment to the site, and exports iron ore from the Milne Port Site.
- Describes the management of the shipping operation, including the commissioning and operation of iron ore carriers. The SMWMP also describes the specifications and procedures in place for charter and operation of suitable vessels to export iron ore on a seasonal basis.
- Addresses the management, routing and operation of ships and describes how the vessels will navigate through and in the vicinity of ice.
- Describes the monitoring and mitigation measures, and adaptive management procedures to be employed in addressing concerns related to marine wildlife, including mammals and birds.

It is noted that in all matters of marine transportation, the Master of the vessel has an overriding obligation to protect the safety of his vessel, crew and the environment for which he is ultimately responsible and, notwithstanding anything contained in this SMWMP, the Master will always be guided by this principle.

1.2 Relationship to Other Management Plans

This plan should be viewed in concert with the following additional plans that have been prepared for the Project:

- Environmental Protection Plan (EPP)
- Emergency and Spill Response Plans (Spill at Sea Response Plan)
- Spill Contingency Plan

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- Oil Pollution Emergency Plan – Milne Inlet (OPEP)
- Marine Monitoring Plan (MMP)
- Shipping Communications Protocol
- Interim Closure and Reclamation Plan
- Ballast Water Management Plan
- Standing Instructions and General Information for Masters of Vessels loading at Milne Inlet Port. (SITM – Managed by Fednav)

1.3 Management Plan Revision

The Shipping and Marine Wildlife Management Plan will be updated as required on the basis of management reviews, incident investigations, regulatory changes or other Project related changes, including the introduction of new adaptive management measures related to shipping.

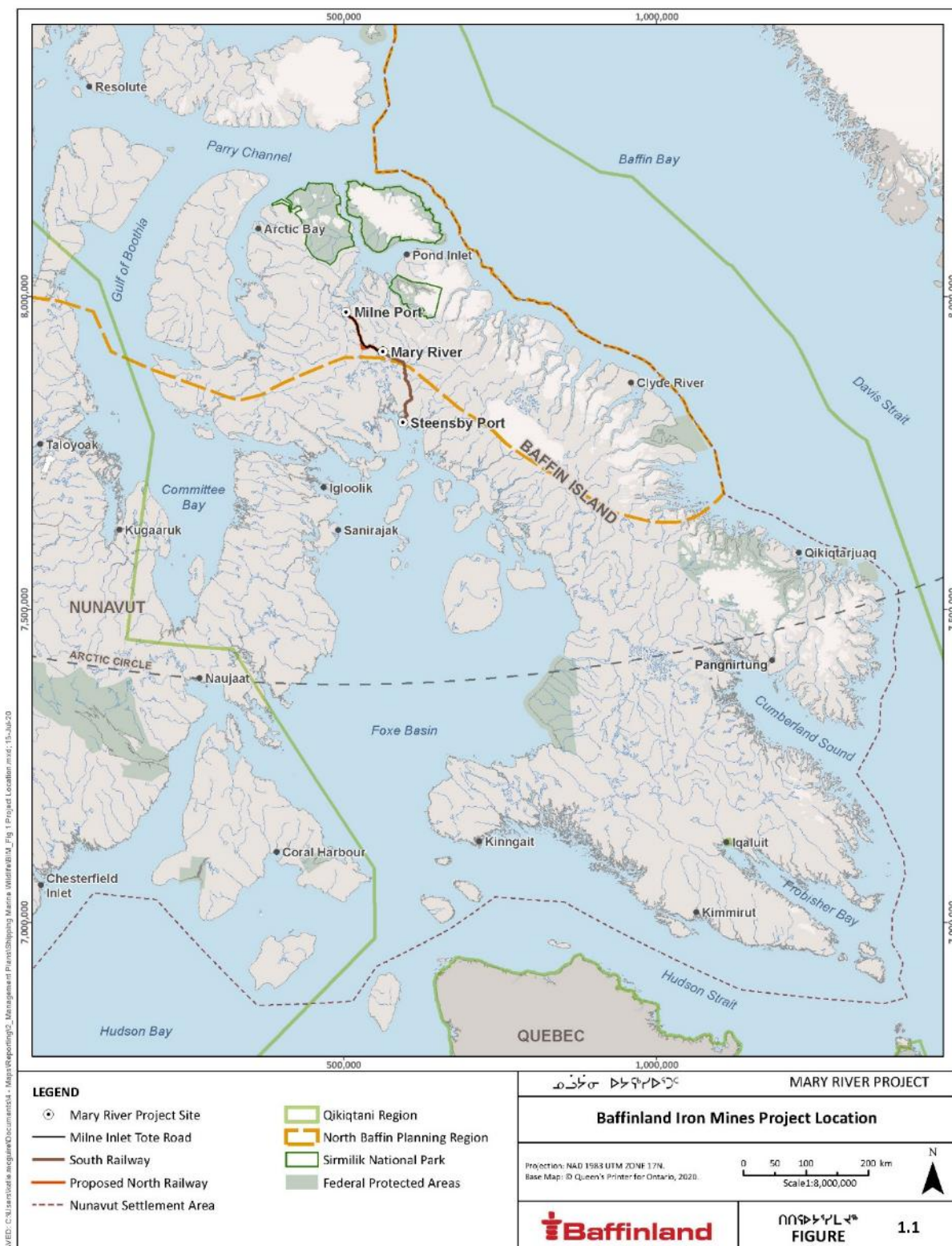
Baffinland will update and modify its Standing Instructions to Masters and Shipping and Marine Wildlife Plan as necessary to reflect the outcomes of simulation modelling, regulatory approvals, and annual engagements with the community of Pond Inlet and the Mittimatalik Hunter and Trappers Organization (MHTO), and in and input on adaptive management and mitigations measures provided by the Qikiqtani Inuit Association (QIA), Fisheries and Oceans Canada (DFO) and the Marine Environment Working Group (MEWG).

1.4 Project Description

In 2012, the Nunavut Impact Review Board (NIRB) issued Project Certificate No 005 which provided approval for Baffinland to mine 18 million tonnes per annum (Mtpa) of iron ore, construct a railway to transport the ore south to a port at Steensby Inlet which operates year-round, and to ship the ore to market. The Project Certificate was subsequently amended to include the mining of an additional 4.2 Mtpa of ore, trucking this amount of ore by an existing road (the Tote Road) north to an existing port at Milne Inlet (see Figure 1.1). In 2018, Baffinland submitted a request for a third amendment to Project Certificate No.005 to allow for a short-term (2 year) increase in production and transport of ore via road through Milne Port from the current 4.2 Mtpa to 6.0 Mtpa. A Production Increase to ship 6.0 Mtpa from Milne Port was subsequently approved by NIRB for 2018 and 2019. In January of 2020, Baffinland applied for an Extension Request to the Production Increase Proposal to ship up to 6.0 Mtpa. The Extension Request was approved by the Responsible Ministers through to December 31 2021, resulting in the fourth amendment to Project Certificate No. 005.

Although Baffinland is approved for shipping through the Steensby route, this component of the Project is not currently active. As Project development continues and in advance of when shipping from the South begins, Baffinland will update and revise this management plan to include relevant mitigations and operational guidance for the southern shipping route.

FIGURE 1.1: PROJECT LOCATION



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1.5 Regulatory Framework

Canada is an active member of the International Maritime Organization (IMO) and is a signatory to IMO agreements such as the International Convention for the Safety of Life at Sea (SOLAS), the International Convention for the Prevention of Pollution from Ships (MARPOL), the International Convention on Load Lines, the International Safety Management Code (ISM), and the IMO International Convention for the Control and Management of Ships' Ballast Water and Sediment. The majority of operations described in this SMWMP are marine or port-related and are federally regulated by Transport Canada through the Canada Shipping Act and various International Regulations augmented by various Shipping Notices and Publications.

Up-to-date versions of these Acts and Regulations are available on Transport Canada's website available at: <http://www.tc.gc.ca> The transportation of all cargoes between Canadian and international ports is regulated by the Government of Canada and the International Maritime Organization (IMO) through a variety of legislation. A list of relevant Acts and regulations is included as Appendix A.

1.5.1 Project Certificate No. 005 Terms and Conditions

The plan addresses Project Certificate No. 005 Terms and Conditions as outlined in Table 1:

TABLE 1: PROJECT CERTIFICATE NO. 005 CONDITIONS RELEVANT TO THE SMWMP

PC Condition #	Term or Condition Description	Applicable to Active Phase of the Project
90	The Proponent shall incorporate into its Shipping and Marine Mammals Management Plan provisions to achieve compliance with the requirements under the International Convention for the Control and Management of Ship's Ballast Water and Sediment (2004) or its replacement and as implemented by the <i>Canadian Ballast Water and Control Regulations</i> as may be amended from time to time.	Yes
100	The Proponent shall update its Shipping and Marine Wildlife Management Plan to include avoidance of polynyas and mitigation measures designed for potential fuel spills along the shipping lane during winter months, with consideration for the impact of spilled fuel on marine mammals when the might be less mobile or able to avoid contact with spilt fuel or fumes.	No
104	Subject to safety considerations and potential for conditions as determined by the crew of transiting vessels, to result in route deviations: <ul style="list-style-type: none"> The Proponent shall require, for shipping to/from Steensby Port, project vessels to maintain a route to the south of Mill Island to prevent disturbance to walrus and walrus habitat on the northern shore of Mill Island. Where project vessels are required to transit to the north of Mill Island owing to environmental or other conditions, an incident report is to be provided to the Marine Environment Working Group and the NIRB within 30 days, noting all wildlife sightings and interactions as recorded by Shipboard Marine Wildlife Observers. 	Part A: No Part B: Yes

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PC Condition #	Term or Condition Description	Applicable to Active Phase of the Project
	<ul style="list-style-type: none"> The Proponent shall summarize all incidences of significant deviations from the nominal shipping routes for traffic to/from Milne Port and Steensby Port as presented in FEIS and FEIS Addendum to the NIRB annually, with corresponding discussion regarding justification for deviations and any observed environmental impacts. 	
105	<p>The Proponent shall ensure that measures to reduce the potential for interaction with marine mammals, particularly in Hudson Strait and Milne Inlet, are identified and implemented prior to commencement of shipping operations. These measures could include, but are not limited to:</p> <ul style="list-style-type: none"> Changes in the frequency and timing (including periodic suspensions) of shipping during winter months in Hudson Strait and during the open water season in Milne Inlet, i.e., when interactions with marine mammals are likely to be the most problematic; Reduced shipping speeds where ship-marine mammal interactions are most likely; and Identification of alternate shipping routes through Hudson Strait for use when conflicts between the proposed routes and marine mammals could arise. Repeated winter aerial survey results showing marine mammal distribution and densities in Hudson Strait would greatly assist in this task. 	Part A: Yes Part B: Yes Part C: No
120	<p>The Proponent shall ensure that, subject to vessel and human safety considerations, all project shipping adhere to the following mitigation procedures while in the vicinity of marine mammals:</p> <ul style="list-style-type: none"> Wildlife will be given right of way; Ships will when possible, maintain a straight course and constant speed, avoiding erratic behavior; and When marine mammals appear to be trapped or disturbed by vessel movements, the vessel will implement appropriate measures to mitigate disturbance, including stoppage of movement until wildlife have moved away from the immediate area. 	Yes
121	<p>The Proponent shall immediately report any accidental contact by project vessels with marine mammals or seabird colonies to Fisheries and Oceans Canada and Environment Canada, respectively, by notifying the appropriate regional office of the:</p> <ul style="list-style-type: none"> Date, time and location of the incident; Species of marine mammal or seabird involved; Circumstances of the incident; Weather and sea conditions at the time; Observed state of the marine mammal or sea bird colony after the incident; and Direction of travel of the marine mammal after the incident, to the extent that it can be determined. 	Yes
125 (a)	<p>The Proponent shall consult with potentially-affected communities and groups, particularly Hunters' and Trappers' Organizations regarding the identification of project vessel anchor sites and potential areas of temporary refuge for</p>	Yes

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PC Condition #	Term or Condition Description	Applicable to Active Phase of the Project
	project vessels along the shipping routes within the Nunavut Settlement Area. Feedback received from community consultations shall be incorporated into the most appropriate mitigation or management plans.	
175	The Proponent shall, in coordination and consultation with the Qikiqtani Inuit Association and the Hunters and Trappers Organizations of the North Baffin communities and Coral Harbour, provide updates to its Shipping and Marine Mammals Management Plan to include adaptive management measures it proposes to take should the placement of reflective markers along the ship track in winter months not prove to be a feasible method of marking the track to ensure the safety of ice-based travelers.	No
177	The Proponent shall enroll any foreign flagged vessels commissioned for Project-related shipping within Canadian waters into the relevant foreign program equivalent to Transport Canada's Marine Safety Delegated Statutory Inspection Program.	Yes
183	The Proponent shall collaborate with the Marine Environment Working Group to develop impact avoidance or mitigation strategies for the protection of the marine environment. The Proponent shall implement any direction from the Department of Fisheries and Oceans for any avoidance or mitigation measures, including cessation of any activity, for the protection of the marine environment.	Yes

1.5.2 Marine Environment Working Group

Baffinland has cooperated with government regulatory and resource management agencies to establish a MEWG for the Project. The group comprises membership from Environment Canada, Fisheries and Oceans Canada, Parks Canada, the Government of Nunavut, the Qikiqtani Inuit Association, and Makivik Corporation.

The MEWG provides advice to Baffinland in connection with mitigation measures for the protection of the marine environment, monitoring of effects on the marine environment and the consideration of adaptive management plans.

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2 ROLES AND RESPONSIBILITIES

Baffinland's Shipping Team and Contractors are responsible for achieving compliance with applicable regulations and permit requirements. To meet these requirements, Baffinland is committed to working with only the best in class ship operators. Compliance is achieved through continuous monitoring, development and implementation of operational standards and procedures in addition to vessel owner/operator communication and awareness raising strategies.

General responsibilities include:

- To manage and schedule shipments of cargoes in and out of Project ports;
- To ensure, prior to chartering a vessel, that a pre-charter audit and/or document inspection is carried out on the vessel to confirm the condition of the vessel and that it is managed and operated in accordance with the International Safety Management (IMS) system with all certificates up to date, including any relevant foreign program equivalent to Transport Canada's Marine Safety Delegated Statutory Inspection Program.
- To provide vessel owner/operators and masters with a copy of the SITM and to maintain these documents to ensure they contain up-to-date commitments regarding operation of vessels while travelling along Project Shipping Routes;
- To review environmental monitoring and management practices and identify, as required, adaptive management measures to achieve environmental compliance.

Specific responsibilities related to shipping operations are as follows:

Vessel Owners and Operators (External)

- Ensure Project-vessels chartered to perform Baffinland trade meet all federal and international regulations.
- Subject to safety considerations, follow all instructions from Baffinland and or/its contractors for operating the vessel along the Northern Shipping Route.

Head of Shipping

- Communicate requirements of and distribute copies of relevant management plans, including Baffinland's SMWMP to all vessel owners and operators and any contractors hired by Baffinland to support shipping operations.
- Conduct audit and inspections of vessel documents to ensure they meet Baffinland's internal requirements and federal and international regulations, as needed.

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Port Captain (Contractor)

- The Port Captain oversees and organizes efficient operation of the assigned fleet at Milne Port.
- The Port Captain will contact the Head of Shipping if vessels are not following protocols and instructions as outlined in the Standing Instructions to Master.

Shipping Monitors (Baffinland Employee– Resident of Pond Inlet)

- Track Project-related vessels travelling along the Northern shipping route via AIS monitoring and live monitoring stationed out of Pond Inlet.
- Record events where ships have made significant deviations from shipping routes.
- Record environmental conditions, siting of marine mammals and vessel interactions with hunters, when information is available.
- Act as a community liaison between Baffinland and residents and hunters from Pond Inlet to address community concerns related to Project-shipping, if any when these arise.

2.1 Priorities

With respect to shipping, the priorities of the team are:

- The safety of personnel;
- The protection of the marine environment; and
- The preservation of the ship and its cargo.

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3 EMERGENCY MANAGEMENT AND RESPONSE

3.1 Spill Prevention and Management

Vessels procured by Baffinland and Baffinland staff will ensure the following is in place to prevent and respond to spills, in the unlikely even they occur:

- Comply with the *Oil Pollution Prevention Regulations* and maintain an approved Shipboard Oil Pollution Emergency Plan (SOPEP).
- Conduct exercises with the Terminal staff at regular intervals to ensure ship and shore can co-operate to minimize the damage from any spill of fuel.
- Maintain an up-to-date oil transfer record book covering the disposal of engine room sludge and the discharge of oily water through a separator.
- Maintain a separate record book for oil cargo and the treatment and disposal of cargo slops.
- Conduct exercises to test the ship and shore joint capability to handle an oil pollution incident in accordance with the provisions of the Ships' Oil Spill Response Plan and the Oil Pollution Emergency Plan – Milne Inlet (OPEP).
- Ensure that all hazardous materials are stored and handled as per information provided in Material Safety Data Sheets (MSDS).
- Ensure that all dangerous goods are transported as per requirements under the *Transportation of Dangerous Goods Act and Regulations*.

Management plans for the Project related to spill response and management include the following:

- Spill Contingency Plan
- Emergency and Spill Response Plans
- Oil Pollution Emergency Plan – Milne Inlet
- Shipboard Oil Pollution Emergency Plan¹.

Copies of Baffinland's management plans for the Project are available at www.baffinland.com.

3.2 Extreme Weather Conditions

The Ship's Master is responsible at all times for the safe navigation and operation of the vessel within the applicable laws of Canada, having special responsibility for the safety of life, the safety of the ship and the preservation of the environment. In order to meet these responsibilities, the Master has full authority to take whatever action considered necessary to successfully complete the voyage. This includes responding

¹ SOPEPs are developed by and for the Master of the vessel. The SOPEP is not a Baffinland Management plan. SOPEPs must meet external standards as dictated by IMO under MARPOL 73/78.

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to extreme weather conditions and taking actions to adjust speed, seek shelter, accept assistance or deviate to save lives, as required.

3.3 Accidental Events During Shipping and Reporting Procedures

In the event of a malfunction or other incident during shipping operations within Milne Inlet, the Vessel Master will immediately inform the port emergency control system requesting such assistance as may be practical. Outside of Milne Inlet, the Master shall immediately report the incident verbally and later in writing to the nearest Transport Canada reporting station.

In the event any accidental contact occurs between a Project vessel and a marine mammal or an aggregation of seabirds, with resulting death or serious injury, the regional office of Fisheries and Oceans Canada (marine mammals) or Environment and Climate Change Canada (seabirds) is to be notified and supplied with information documenting the incident (date/time/location, affected species and condition, circumstances of the incident, weather and sea conditions, location/travel direction of the affected animal(s)). The Ship's Master will inform Baffinland Site personnel, who will contact the appropriate government agency. Annually, Baffinland will summarize any such incidents in its report to NIRB.

3.4 Unforeseen Events

During shipping operations, unforeseen events or unanticipated interactions with the environment may occur that may require intervention by the Ship's Master. Baffinland has adopted a response management strategy for all phases of the Project that will prepare Project personnel to identify, resolve and learn from any unforeseen events. One of the main principles of an effective response management strategy is to expect the unexpected and to be prepared to act quickly and decisively when it occurs. Examples of unforeseen events associated with Project shipping activities might include unanticipated startle reactions by marine mammals or unexpected attraction to ship's lighting by seabirds. If an unforeseen event were to occur, corrective actions would be taken by the Master of the vessel to avoid or reduce any adverse effects. In the case of the examples provided, these actions might include adjusting ships speed to reduce noise, or to maintain essential lighting only, in sensitive areas. Any such events, the subsequent corrective action taken and the degree of success will be documented to allow others to learn from these experiences to ensure continual improvement.

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4 SHIPPING AND PORT OPERATIONS

Figure 4.1 **Error! Reference source not found.** shows the shipping routes associated with the Mary River Project. These routes have been established based on safe navigation, as well as environmental factors.

In order to ensure that all tonnage chartered for operation in Milne Inlet is in compliance with the Baffinland Shipping and Marine Wildlife Management Plan, all vessels that utilize Milne Port must comply with Baffinland environment, health and safety policies and general site rules while on route to, and while anchored within the Port.

4.1 Charter Vessel Specifications

Baffinland has established a protocol for selecting chartered iron ore carriers. The standard is identical to the specifications for dedicated iron ore carriers and includes the requirement to have appropriate ice class, Canadian Arctic class (or equivalent) and familiarity with AIRSS to operate in the ice conditions forecast to be encountered during the projected periods of the voyages into Milne Inlet.

An Ice Information Contractor will be engaged to forecast ice condition at the time of the vessel's planned loading and will advise what, if any, ice class is required.

The shipping class and types of ore carriers proposed for use are provided below:

- A. Ice class designs for ore carriers include (not an exhaustive list, but based on current knowledge of market availability):
 - i) Non Ice Class (Type E)
 - ii) Ice Class 1C (Type D)
 - iii) Ice Class 1B (Type C)
 - iv) Ice Class 1A (Type B)
 - v) Ice Class 1A Super (PC 7)
- B. Types of ore carriers include (not an exhaustive list, but based on current knowledge of market availability):
 - vi) Supramax
 - vii) Panamax
 - viii) Kamsarmax
 - ix) Capesize

4.1.1 Pre-Charter Audit/Inspection of Iron Ore Carriers

All foreign-registered ships entering Canadian ports are liable to be inspected by Transport Canada to ensure compliance with the regulations and to confirm that the ships are safe for their crew and the environment when they proceed to sea. All of the major shipping countries have similar port state

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inspections. Ships failing to pass inspection can be held until they have been repaired and achieve compliance.

Baffinland will arrange for each candidate vessel (foreign and domestic) to be assessed before being placed on charter, to ensure that the vessel is capable of operating in the ice conditions that are forecast for Milne Inlet during the period of operation. Appendix B provides a copy of the Baffinland pre-charter bulk carrier ice capability assessment. In order to ensure that the chartered vessel can load and carry the iron ores safely and efficiently, vessels that meet the required criteria for navigating in the forecast ice conditions will undergo a limited audit to ensure conformance with the ISM system before the vessel is chartered. This limited audit will be an adaptation of the ISM internal audit and the ship inspection will follow the Transport Canada port state inspection format. A copy of the Baffinland pre-charter bulk carrier inspection checklist and limited audit is provided in Appendix C.

4.2 Vessel Traffic Management

4.2.1 Navigation

Milne Inlet Port is located at latitude 71 53' 23" North, longitude 80 54' 13" West. All Vessels will follow the nominal shipping route as described in the Standing Instructions to Masters (SITM) (see Figure 4.1 and 4.2 below). The Standing Instructions to Masters is a document prepared and distributed to vessel owner/operators and Masters with detailed instructions regarding the shipping route, anchorage locations and Baffinland set restrictions to be followed when navigating through the Project area.

Specific information regarding vessel traffic management for icebreakers and shipping during shoulder seasons is outlined in Section 5 below.

4.2.2 Drifting / Anchoring

Project vessels will not anchor within the RSA along route to Milne Port except at one of the following anchorages near Ragged Island or at Milne Port (see Figure 4.1). The number of Project vessels allowed to wait, drift or anchor near Ragged Island is limited to three vessels.

4.2.3 Routing

The nominal shipping route to Milne Inlet (Figure 4.2) was developed with guidance from experienced Vessel Masters retained by Baffinland to load at Milne Port. Ultimately deviations from the shipping route may occur and as dictated by the over-riding Master's authority and responsibility for safe navigation.

4.2.4 Tug Support

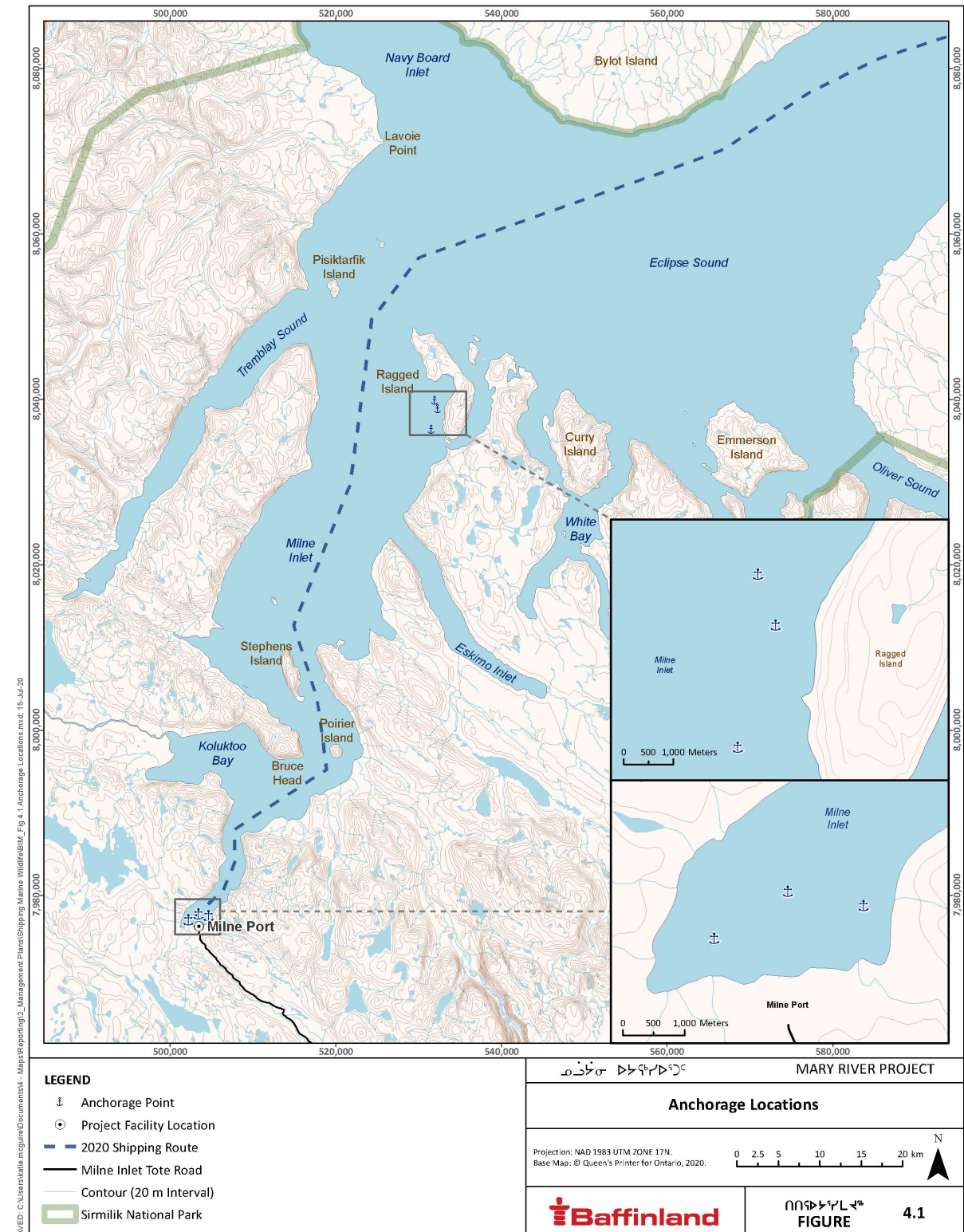
Tugs operate primarily in Milne Port assisting vessels to travel from their anchorage points in Milne Port to the ore dock for loading. However, tugs may occasionally escort ore carriers between Milne Port and Ragged Island.

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4.2.5 Berthing

Ore carriers are berthed with the assistance of two tugs and a Docking Master on board the vessel. All vessels are brought alongside in a safe and efficient manner to avoid contact with the berth or other hazards. A person on the berth assists in properly positioning the vessel to ensure loading operations will be most effective. Linesmen ensure the vessel is properly tied up once in position.

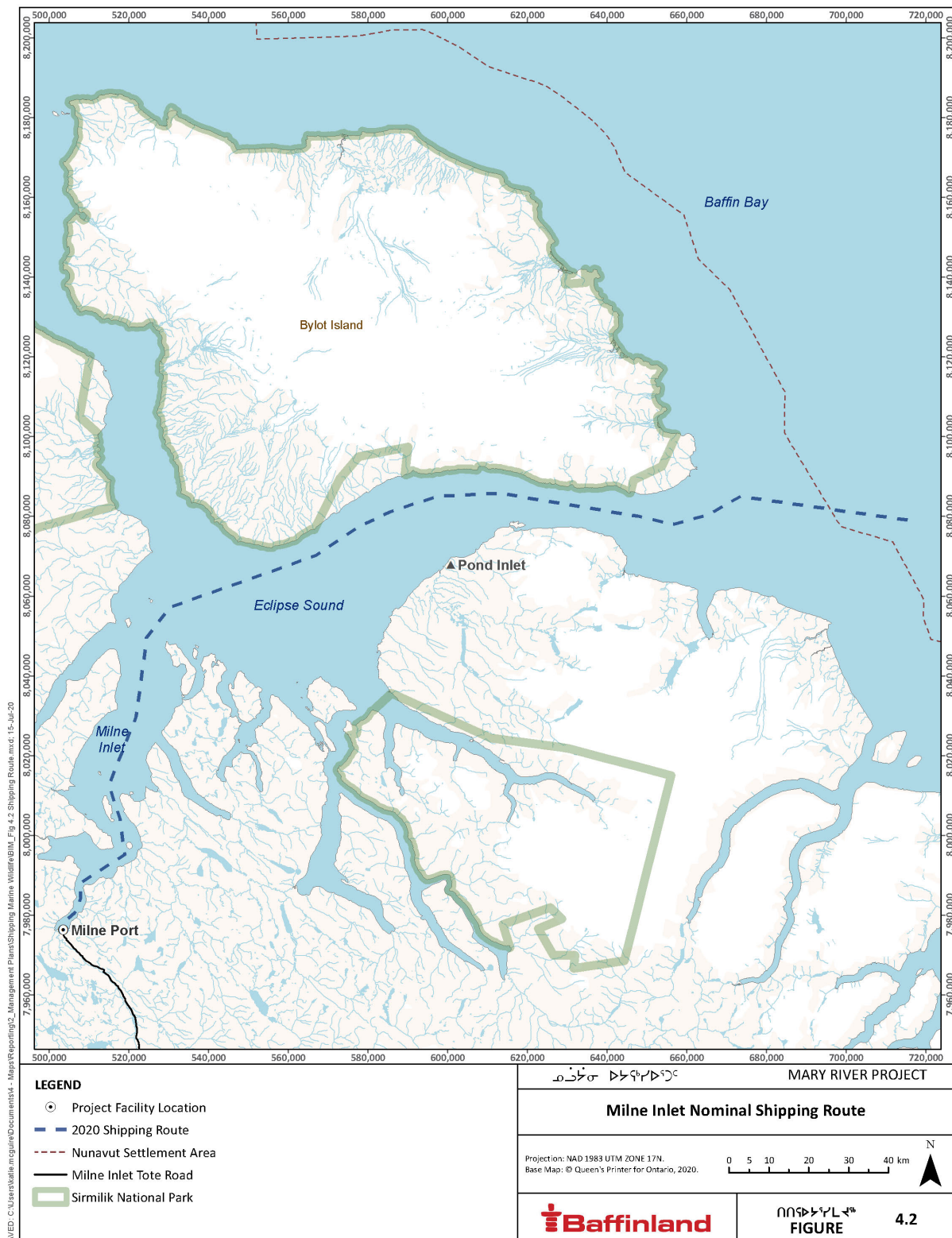
FIGURE 4.1: SHIPPING ROUTE AND ANCHORAGE LOCATIONS AS SHOWN IN THE SITM



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FIGURE 4.2: MILNE INLET NOMINAL SHIPPING ROUTE



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4.2.6 Fueling

Fuel (diesel, gasoline and jet fuel) will be delivered to Milne port by tankers which will be off-loaded into holding tanks using the commonly-employed floating hose fuel transfer method. Milne Port maintains a Transport Canada approved OPEP which is reviewed and resubmitted annually.

Port contingency and vessel-specific response plans exist to address issues relating to:

- Appropriate fuel intake devices that prevent overflows.
- Spill fuel collection and recycling or destruction facilities, where applicable.
- Infiltration and other devices including porous pavement, soak-away pits or dry wells, seepage or infiltration trenches, percolation basins, catch basins, to contain spills.

4.2.7 Summary of Communications Protocol and shipping monitors

Prior to the start of each shipping season, Baffinland will confirm with the Mittimatalik Hunters and Trappers Organization (MHTO) that the floe edge is no longer being used by hunters prior to having the first vessel enter the shipping corridor.

Communications will be maintained with local harvesters and hunters throughout the season by supplying community members with a contact information for Baffinland staff that they can engage with if there are concerns regarding Project-shipping throughout the season.

In accordance with Article 9.4 of the IIBA, Baffinland will hire also hire Inuit ship monitors. The land-based ship monitors will track Project shipping using both observational methods and tracking through AIS monitoring (see Section 6.5). Ship-monitors will also serve as key communications liaisons between community members and Baffinland.

If any incidents require reporting (i.e. fuel spill) to federal or territorial agencies, Baffinland will also contact the Hamlet of Pond Inlet and the MHTO to ensure they are aware of the details of the incident, investigations being undertaken and any actions that will occur to resolve and address the incident.

Prior to the start of each shipping season, Baffinland will consult with MHTO on the protocol for communications, lessons learnt from the past shipping season and whether any modifications to the process are required.

4.3 Construction Shipping

During construction phases of the Project, containerized equipment and materials will be shipped to Milne Inlet. Vessels will be required to follow the same instructions for navigating through Milne Port as they would for the operations phase of the Project.

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4.4 Operations Shipping

During the Operations Phase, dedicated voyages carrying re-supply materials and equipment will travel to Milne Port. Fuel will be delivered by sealift tankers. Iron ore will be shipped from Milne port, using the routes presented in Figure 4.2.

Vessels are provided with specific guidance regarding their travel to site. In the SITM vessel captains are instructed to follow the shipping route and avoid areas such as Koluktoo Bay and the western shoreline near Bruce head to minimize effects on marine mammals and interference with hunting activities. The Standing Instructions to Masters also provide details regarding dedicated anchorage locations at Ragged Island and Milne Port and speed restrictions (9 knots) imposed by Baffinland to be followed while they are transiting the Northern Shipping Route.

Vessels procured for the Project operate in accordance with two primary legal instruments regulating ship traffic in the Canadian Arctic: the *Canada Shipping Act*, and the *Arctic Waters Pollution Prevention Act*, and their associated regulations (See section 1.5).

4.4.1 Ship Loading and Unloading

Ships loaded with equipment and supplies for a full year of Project operation are docked at the Milne Port floating freight dock and unloaded either directly or via lightering barges (see Figure 4.3). Goods are stored in Milne Inlet laydown areas for transfer to vehicles that transport the goods to the Mine Site along the Tote Road. Most goods are transported in containers that will limit spills and facilitate transfer from ship to shore and transport to the Mine Site. Fuel is transported in tankers and offloaded from the moored vessel by means of floating hoses.

Fuel for shipping is to be purchased only from accredited suppliers that can provide assurance that the fuel used for shipping conforms to Canadian regulations (*Benzene in Gasoline Regulations, 1997; Contaminated Fuels Regulations, 1991; Gasoline Regulations, 1990; Fuel Information Regulations, No. 1, 1999; Sulphur in Diesel Fuel Regulations, 2002; Sulphur in Gasoline Regulations, 1999*).

Ship Loading Fines Ore at the Panamax Ore Dock:

The ship loader for the panamax dock is designed as a conveyance system used to fill the holds of the vessels with the ore, and has a capacity of 6,000 t/h.

4.4.2 Schedule

Annual shipping occurs seasonally over a period of approximately 90 days, roughly between July 15 and October 15 of each year. Chartered vessel will typically make one to three round trips per season. Each round trip of a ship from Milne Inlet to a port in Europe is estimated to take 25 to 27. The vessels will travel at a speed of maximum 9 knots when transiting through Eclipse Sound and Milne Inlet.

FIGURE 4.3: MILNE PORT MARINE INFRASTRUCTURE



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4.4.3 Safety

Baffinland requires that the ship-owner/operator of candidate vessels will have as priorities safety of life, protection of the environment, and the preservation of ship and cargo.

While Baffinland and the vessel owner/operators wish to obtain the maximum efficiency in all of the company's chartered ship operations, it is recognized that the Master of a ship has sole responsibility for the safety of the ship, crew and cargo, and the protection of the environment. The Master has the authority to adjust speed, heave to, deviate, seek shelter or enter a port of refuge to re-stow cargo or seek medical assistance should environmental conditions or the condition of the vessel, the machinery, safety of the crew or cargo require such a precaution.

Baffinland requires that candidate ship-owner/operators have a safety and operating management system based on the principles of the International Safety Management Code (ISM Code). The objective of the ISM Code is to ensure safety at sea, prevention of human loss of life or injury and avoidance of marine environment pollution. To achieve this objective, the Code requires that the ship-owner/operator share fully with the vessel personnel the responsibility to maintain a safe ship. The Code establishes a clear and concise safety management system, including, as examples, the following functional requirements:

A safety and environmental protection policy. By considering the nature of the waters that vessels are to travel within, standards of watch keeping are reinforced with additional lookouts on the bridge and engineers in the machinery space. The manoeuvring ability of machinery and the operation of steering gear are tested prior to arrival or departing in a passage where navigation is restricted or where the route is close to shore. Strict measures regarding the handling and transfer of bunker and cargoes are established. Masters will be required to navigate within established channels.

Levels of authority and lines of communication defined. This ensures that safety remains a high priority and that the lines of communication between shore and ship personnel remain open. Responsibilities are clearly defined and contacts to provide the ship with round the clock shore support are mandatory.

Procedures for reporting accidents and non-conformities with the Code. The method of recording non-conformities, establishing corrective measures, and ensuring open dialogue between all parties is to be documented and reviewed.

Procedures to prepare for and respond to emergency situations. Ships must have a set of operating manuals that supplement and support regulatory requirements and vendor instructions. These manuals evolve from standard practices and procedures, and they are to be tailored to individual ships. The objective is to document and provide guidance and instruction on the safe handling and operation of all shipboard equipment. Clear instruction is provided with

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regard to pre-arrival and departure check lists, navigation, handling of cargoes, bunkering, stability conditions, and the stresses imposed and acceptable to each concentrate carrier. The manuals are a concise guide for both ship and shore personnel to ensure safe operation, with emergencies considered and responses planned.

In addition, ship and shore personnel engaged in operations must be aware of hazards arising from cargo operations and from the materials and iron ores being handled. This includes the provision of Safety Data Sheets (SDS) information and any additional training required.

4.4.3.1 Safety of Persons Using Small Boats in the Shipping Route

Subject to ship and human safety considerations, mitigation measures to safeguard the safety of those in small boats will include the following:

- Barge-tugs or ships will restrict themselves to the recommended shipping route thereby not surprising any small boat travelling outside the shipping route;
- The ship will sound its horn if a small boat seems unaware of its presence; and

Baffinland will inform communities of planned shipping transits both prior to the start of the shipping season and in real-time via AIS monitoring data available at MHTO office and on the Baffinland website (www.baffinland.com).

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5 ICE MANAGEMENT AND ICE BREAKING ACTIVITIES

5.1 Standard Definitions

For the purpose of management plan the following definitions of ‘ice conditions’ are applicable:

Landfast Ice (Fast ice): Ice that forms and remains fast along the coast.

Mobile ice/Mobile pack: Ice that is not consolidated and may drift with winds and currents.

Concentration: Ration expressed in tenths (/10) describing the area of water surface covered by ice as a fraction of the whole area.

Grey-White Ice: Sea ice between 15cm and 30cm

Break-up: Moment when ice starts to fracture in late spring or summer.

Freeze-up: Moment when the freezing process begins in fall or early winter.

Open Water: Are of freely navigable water in which ice can be seen in concentrations less than 1/10 (traces)

5.2 Ice Management and Icebreaking Activities

A combination of ice management and icebreaking activities will be required to allow for the safe passage of vessels at the start and end of the shipping season. Ice management is considered the act of preventing ice floes or icebergs from making contact with vessels and port infrastructure at Milne Port. Icebreaking activities will involve the use of a designated icebreaking vessel to facilitate the passage of lesser ice class vessels through prevailing ice conditions (i.e. ice escort services). Ice management will typically occur when there are icebergs or smaller ice floes in an area while icebreaking will be necessary to facilitate passage through much heavier ice concentrations.

Icebreakers aim to avoid the heaviest ice concentrations areas during transits along the Northern Shipping Route. During the periods of ice freeze-up and ice break-up during the shipping shoulder seasons, the Master or Ice Navigator on the icebreaker optimizes the use of leads in the ice to facilitate safe vessel passage and to limit fuel consumption. Interaction of the icebreaker with very close ice and compact ice is possible during the shoulder seasons but only if the ice is mobile (comprised of mobile ice floes as opposed to landfast ice). Ice thickness is another critical component of an icebreaker’s ability to engage ice.

Refueling of icebreakers will occur at Milne Port using ship-to-ship fuel transfer between the icebreaker and a fuel tanker. Once Project tug vessels arrive at Milne Port, they will remain there for the duration of the shipping season. In addition to ice management services, the tug vessels will escort Project vessels

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between Milne Port and Ragged Island during the open water season as a precaution against other possible risks and malfunctions associated with shipping (e.g., vessel loss of power).

FIGURE 5.1: EXAMPLE OF ICE MANAGEMENT ACTIVITIES



5.2.1 Shipping Routes During Shoulder Seasons

Along the Northern Shipping Route, the Icebreaker Master or Ice Navigator will determine the best travel route between the entrance of Pond Inlet and Milne Port based on local ice conditions at the time of transit. As ice conditions will vary from year to year, it is not possible to define a permanent route during the shoulder seasons with any level of accuracy. It is possible that transits during the shoulder seasons may deviate from the nominal open water shipping route (as defined in the Standing Instructions to Masters) by > 5 nautical miles (nm) if dictated by ice conditions. However, ships will not enter any restricted areas unless it is a matter of safety from extreme conditions (i.e. storms, large multi-year ice floes that become mobile and threaten navigational safety).

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5.2.2 Icebreaker Operations During Shoulder Seasons

Icebreakers will maintain sustained travel speeds of no greater than nine (9) knots within the prescribed area, however, temporary and localized increases in speed may be required from time to time to break through larger ice floes and allow vessels under escort to safely follow. As aforementioned, up to two icebreakers and ten tugs will be required to support shoulder season shipping. Vessels will be sourced from the available market and could be either domestic or international.

The shoulder season shipping windows will vary from year to year based on local ice conditions. Since ice conditions vary from year to year, it is not possible to predict an accurate number, frequency and duration of expected transits for each shoulder season. The concept is to begin each season as soon as break-out of the landfast ice has occurred and continue until the landfast ice consolidates in the fall. Local ice conditions at the time of transit will dictate which vessels can enter the region, how many vessels can be escorted by the icebreaker, and how long the transit will take.

5.2.3 Vessel Information

The suite of vessels for the shipping season will be a function of vessel commercial availability required for the anticipated ice conditions at different points of the shipping season. As such, an exact shipping schedule which outlines the number of vessels during each period of the shipping season year over year is not possible to provide. The shipping season will be maximized each year based on commercial availability of vessels and weather conditions. The shipping class and types of icebreakers and ore carriers proposed for use are provided below:

- a) Ice class designs for ore carriers include (not an exhaustive list, but based on current knowledge of market availability):
 - i) Non Ice Class (Type E)
 - ii) Ice Class 1C (Type D)
 - iii) Ice Class 1B (Type C)
 - iv) Ice Class 1A (Type B)
 - v) Ice Class 1A Super (PC 7)
- b) Types of ore carriers include (not an exhaustive list, but based on current knowledge of market availability):
- c) Supramax ~55,000 DWT
- d) Panamax ~75,000 DWT
- e) Kamsarmax ~80,000 DWT
- f) Post Panamax ~95,000 DWT

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5.2.4 Ice Navigation

Ice conditions along the Northern shipping route to Milne Inlet (Enfotec 2016) are as follows:

- The nominal open water season is from August 5th to October 15th (71 days).
On some years, it is expected that a shoulder window will allow the shipping season to be extended beyond the high confidence shipping window for certain classes of ships. This will need to be assessed on a year-by-year basis as there is high variability in terms of length and timing of the shoulder period. Provision for access to icebreaking services will be strongly recommended for all 'Type' vessels as well as Polar Class 6 and 7 ships during the shoulder periods at the beginning and the closing of the season. In comparison, Polar Classes 5 and higher can engage ice and face a certain amount of pressure on the ice cover.
Type E vessels (no ice class) are not meant to encounter any significant amount of ice at all. The high confidence shipping window is therefore defined as the average period of open water, about August 5th to October 15th (71 days), with a shoulder window possibly extending the season by about a week. Extending the season will likely require an icebreaker escort.
Type B, C and D and Polar Class 7 vessels can encounter a certain amount of ice. The high confidence window is from August 5th to October 15th (71 days), with an additional shoulder window that can add 10 to 30 days to the season, depending on the ice class. Extending the season will likely require an icebreaker escort.
Type A and Polar Class 6 vessels have a slightly longer high confidence shipping window, from July 25th to October 15th (82 days) and the shoulder window can extend the season by up to 25 days. Extending the season might require an icebreaker escort.
Polar Class 5 vessels can navigate with high confidence from July 20th to December 31st (164 days), with a shoulder window possibly extending the season through January. Vessel speeds are expected to be lower from mid-November onward.
Polar Class 4 vessels can navigate with high confidence from June 15 to February 15 (246 days), with a shoulder window covering the rest of the year. Indeed, the combination of substantial ice thickness and heavy pressure in western Baffin Bay is likely to result in slow progress and possible interruptions through the voyages from early or mid-February to late May or even mid-June.

5.2.4.1 Ice Navigators

When regulations and safe operation require an Ice Navigator will be placed aboard each vessel. An Ice Navigator is a qualified Officer who has several years of experience navigating vessels in ice infested waters, Canadian Arctic Waters, and elsewhere. Onboard the chartered ship, his duties are advisory only and his principal responsibility is to provide the Master with advice with regard to the navigation of the vessel into and outward from Milne Inlet, in the areas north of 60 degrees latitude, as well as anywhere sea ice can be present. It is intended that the Ice Navigator will join each chartered vessel at the last port of discharge, prior to the vessel's departure for Milne Inlet. The Ice Navigator will remain onboard for the duration of the voyage, leaving the vessel after the vessel arrives in the designated discharge port. Among

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the Ice Navigators duties will be to ensure the chartered vessel is capable of entering and safely operating in Milne Inlet.

After boarding, the Ice Navigator will convene a meeting with all watchkeepers wherein they may wish to discuss various aspects of their role onboard and general information regarding navigating in potential ice. The Ice Navigator shall verify that the vessel has up to date charts and nautical publications required to be onboard in accordance with governing regulations. Ultimately it is the Owners' responsibility to ensure the proper charts and publications are onboard. The Ice Navigator will witness the safe and reliable operation of the machinery and familiarize themselves with the manoeuvrability of the vessel, the change out of ballast, and will report any apparent deficiencies to Fednav International. The Ice Navigator shall provide the Master with advice on safe navigation in ice covered Canadian waters, coastal navigation and environment protection procedures in Canadian Arctic Waters & loading at Milne Inlet.

Furthermore, an Ice Navigator may among other duties:

- Assist the Master to understand and complete the required environmental procedures.
- Verify that the vessel has the required Canadian Charts and Publications as specified by Canadian Regulations, and that all are the latest edition and corrected up to date.
- Advise the Master in the navigation of the vessel through ice prone areas en route to Milne Inlet.
- Coach and train the crew as necessary on detecting and avoiding glacial ice features, in a variety of sea and ice conditions.
- Assist the Master in completion of navigation safety and ice entry checklists; and
- Assist the Master in establishing communications with ECAREG and/or NORDREG and with the Milne Inlet site personnel.
- Advise/assist the Master in berthing the vessel alongside the Milne Inlet facility in the event the Milne Inlet Port Docking Master cannot attend on-board.
- Act as facilitator between ship and shore reloading procedures.
- Assist the Master in cargo, customs and immigration documentation for arrival and sailing from Milne Inlet.

5.2.4.2 Transiting In Ice-Infested Waters

It is expected that ice could be present on the approaches to Milne Inlet at any time during the season (especially at the beginning and at the end of the shipping season).

In the event of ice being present in the approaches to Milne Inlet, the vessel is to be navigated according to the principles defined in the *Canadian Ice Regime Shipping Control System*. The Ice Navigator will be conversant with this system and will provide information as to its application.

For the purpose of implementing icebreaking mitigation measures (see Table 6 below), ice conditions in the RSA will be verified by the Ice Navigators onboard vessels, on a daily basis, using up to date ice charts, satellite imagery and ice reconnaissance from the bridge. In addition, ice conditions in the RSA will be verified by Fednav on a daily basis using the Canadian Ice Service's Daily Ice Charts and satellite

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imagery. For the avoidance of doubt and to ensure more timely information on ice conditions, the daily ice charts will be used as a guide, however the ultimate opinion of ice coverage will be made by Ice Navigator onboard vessel.

It should be noted that while there may be an Ice Navigator onboard who is familiar with the conditions the vessel might encounter, the responsibility for the safe prosecution of the voyage rests solely with the vessel's Master.

When landfast ice is present, operations will not be executed along the Northern Shipping Route, and ore carriers will be prevented from rendering a positive ice numeral.

5.3 CRITERIA USED BY BAFFINLAND TO INITIATE SHIPPING SEASON

Baffinland will rely on several criteria for determining the start of each annual shipping season, including information on prevalent ice conditions based local land use activities and several technical and environmental determinants, as defined further below:

5.3.1 COMMUNITY

Baffinland's first priority is to confirm shipping activities will not pose a safety issue for local land users.

- Before commencing shipping operations Baffinland (Sustainable Development) must receive written confirmation from the Mittimatalik Hunter and Trappers Organization (MHTO) that the sea ice is no longer being used by community members. No transits to Milne Port will be permitted until a letter of confirmation is received from MHTO.

5.3.2 ENVIRONMENTAL

Each season's shipping activities will be governed by prevailing ice conditions and a commitment that landfast ice must have broken along the entire shipping corridor prior to commencement of icebreaking and ice management operations.

- Upon receipt of letter from MHTO, Baffinland Shipping Department must confirm that landfast ice has broken along the entire Northern Shipping Corridor. Baffinland's Shipping Department will use up to date ice charts and satellite imagery to make this determination.

5.3.3 VESSEL SAFETY

Navigation in waters under Canadian Jurisdiction north of 60° North Latitude is governed by the Arctic Shipping Safety and Pollution Prevention Regulations (ASSPPR), under the provision of the Arctic Waters Pollution Prevention Act (AWPPA). ASSPPR incorporates by reference the international Polar Code.

ASSPPR includes the obligation to employ an approved risk assessment tool to validate the capability of a vessel to navigate safely in prevailing ice conditions. The Arctic Ice Regime Shipping System (AIRSS) and POLARIS were developed as tools to be used by each ship's Captain or Ice Navigator (i.e., ice pilot) to

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validate accessibility of a vessel through a given area based on prevailing sea ice conditions. This process is described in more detail in Section 3 of TSD 16 (Enfotec 2016).

- Define Regimes present along the Northern Shipping Route through review of satellite imagery, Canadian Ice Service's Daily Ice Charts, Canadian Coast Guard Ice Conditions reports, and ice observations conducted by Ice Navigators on board.
- Calculate the Ice Numerals for all Ice Regimes present along the Shipping Route by calculating the sum of the concentration in tenths of each Ice Regime and the Ice Multiplier associated with the ice type and the class or type of vessel.
- Vessel Captain transmits Ice Regime Routing Message to NORDREG to obtain permission for navigation along the route.
- Vessel Captain and Ice Navigator confirm passage with Port Captain and Vessel Captain of Ice Breaker escort.

5.3.4 ECOLOGICAL

No icebreaking operations will occur during the ringed seal parturition, nursing, or breeding period (i.e. between March to April). There will be some overlap between icebreaking operations and narwhal during their seasonal migratory movements (i.e. between early-July to mid-August) in the Regional Study Area and the mitigation measures in the following subsection have been developed to reduce the potential effects of this overlap.

- Baffinland will not break ice during the ringed seal parturition, pupping and nursing periods and will manage its vessel traffic during the Eclipse Sound narwhal summer stock spring migratory period

5.4 INSTRUCTIONS TO ESCORT VESSELS

The following instructions assume all the criteria Baffinland uses to initiate the shipping season have been met.

- 1) The Vessel Captain on-board the ice breaker will assess the concentrations of ice using best available resources to determine vessel escort limitations.
- 2) Once the concentration is assessed, the on-board personnel will report the concentration to the Port Captain to enable the Port Captain to properly manage the vessel traffic. The possible scenarios are as follows:
 - a. If the ice breaker encounters 6/10 concentration of ice or more, and ice cannot be avoided during the transit, once the icebreaker has finished its transit, the vessel will wait until 24 hours has passed since escort operations began before commencing a new transit.
 - b. If the ice breaker encounters 4/10 or 5/10 concentration of ice along a transit but no greater, the ice breaker may complete the transit and start a second transit immediately thereafter. If both

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transits are completed in less than 24 hours, the icebreaker will wait until a period of 24 hours has passed since the first transit began before commencing a third transit. That third transit will be the first in a new cycle (i.e. a 24-hour period).

- c. If the vessel encounters 3/10 or less of ice, or is able to transit without breaking ice, normal operations will resume, which may or may not include using the icebreaker to escort vessels.

3) The 24-hour period under these mitigation measures commences at the time the vessel crosses into the RSA and/or departs Milne Port.

4) A record of transits undertaken during ice conditions greater than 3/10 will be kept by the ice analyst aboard the ice breaker.

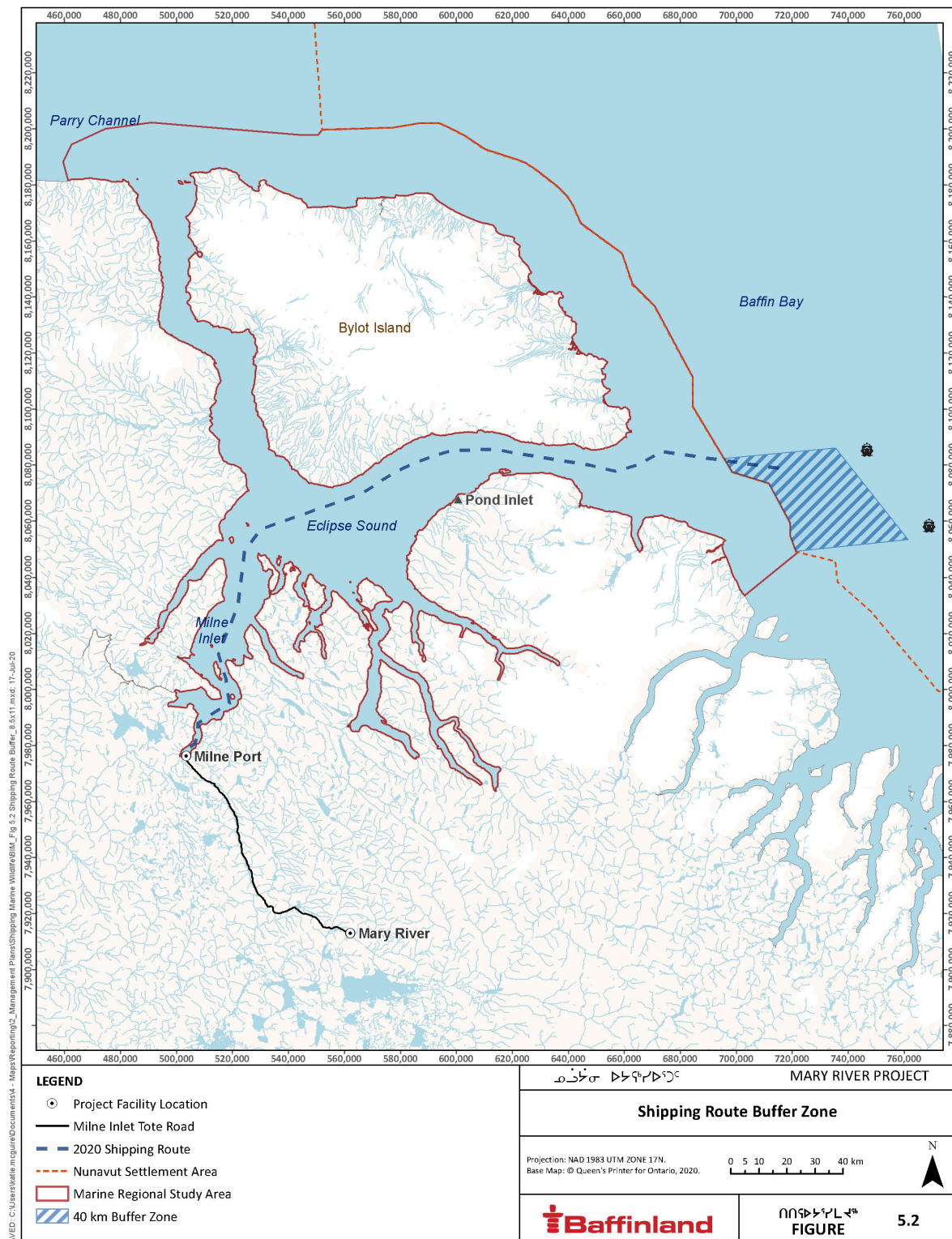
5.5 INSTRUCTIONS TO VESSELS ENTERING/EXITING THE RSA DURING IMPLEMENTATION OF MITIGATION MEASURES

The following instructions assume all the criteria Baffinland uses to initiate the shipping season have been met.

- The vessels will inform the Port Captain when they are permitted to enter the RSA based on the ice class of their respective vessels.
- The Port Captain will issue and adjust the vessel schedules and instructions depending on the ice concentrations and associated transit limitations.
- For the vessels being escorted, the Port Captain will notify them as to when and where to meet the icebreaker to begin escort operations.
- For the vessels sailing without icebreaker assistance, the Port Captain will notify them at which time they can enter the RSA or depart from Milne Inlet.
- When more than one vessel is entering or exiting the RSA at a given time, the vessels shall proceed in a single line-up, while keeping a safe distance between vessels.

Vessels awaiting an icebreaker escort, or vessels awaiting instructions from the Port Captain to enter the RSA will be instructed to wait in Baffin Bay at least 40 km east of the Nunavut Settlement Area (see Figure 5.2). If an entrance delay is expected, vessel captains may anchor, at their own discretion, at a known anchorage location within Baffin Bay identified as Store Hellefiskebank (see Figure 5.3).

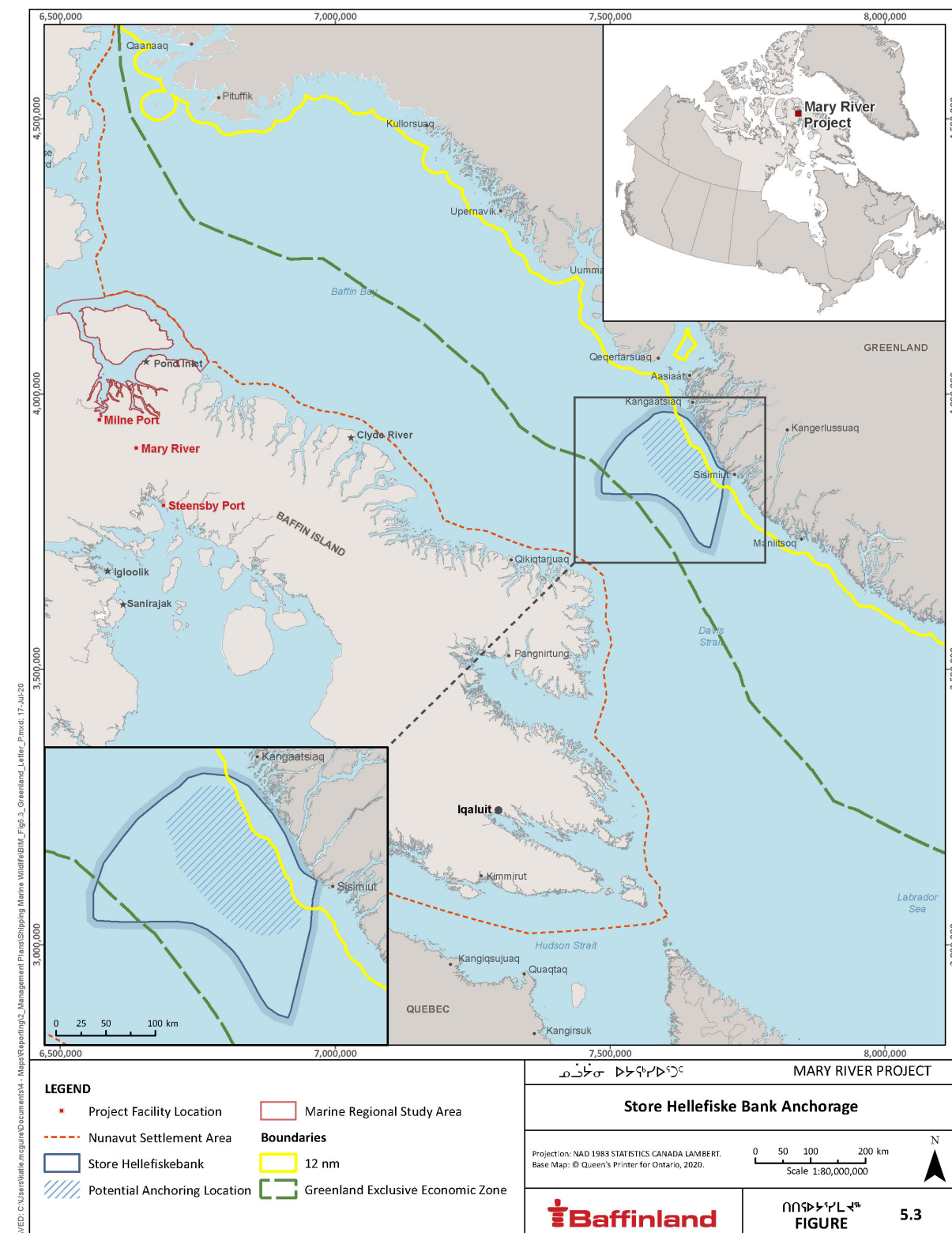
FIGURE 5.2: SHIPPING ROUTE BUFFER ZONE



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FIGURE 5.3: STORE HELLEFISKEBANK ANCHORAGE LOCATION



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6 ENVIRONMENTAL MANAGEMENT

6.1 Fish Habitat Protection

The authority for the management and conservation of fish and fish habitat in Canada is contained in the federal *Fisheries Act*. DFO is the federal agency responsible for managing Canada's fisheries through the *Fisheries Act*. The fisheries protection provisions of the *Fisheries Act* establish regulatory requirements for the protection of fish and fish habitat through the prohibition of serious harm to fish that are part of, or support, a commercial, recreational, or Aboriginal (CRA) fishery set out in subsection 35(1) of the Act.

Serious harm to fish is defined under Section 2 of the *Fisheries Act* as "the death of fish or any permanent alteration to, or destruction of, fish habitat". This definition is refined in the Fisheries Protection Policy Statement (DFO 2013a) as follows:

- A permanent alteration to fish habitat of a spatial scale, duration, or intensity that limits or diminishes the ability of fish to use such habitats as spawning grounds, or as nursery, rearing or food supply areas, or as a migration corridor, or any other area in order to carry out one or more of their life processes; and
- The destruction of fish habitat of a spatial scale, duration, or intensity that fish can no longer rely upon such habitats for use as spawning grounds, or as nursery, rearing or food supply areas, or as a migration corridor, or any other area in order to carry out one or more of their life processes.

6.2 Marine Mammals

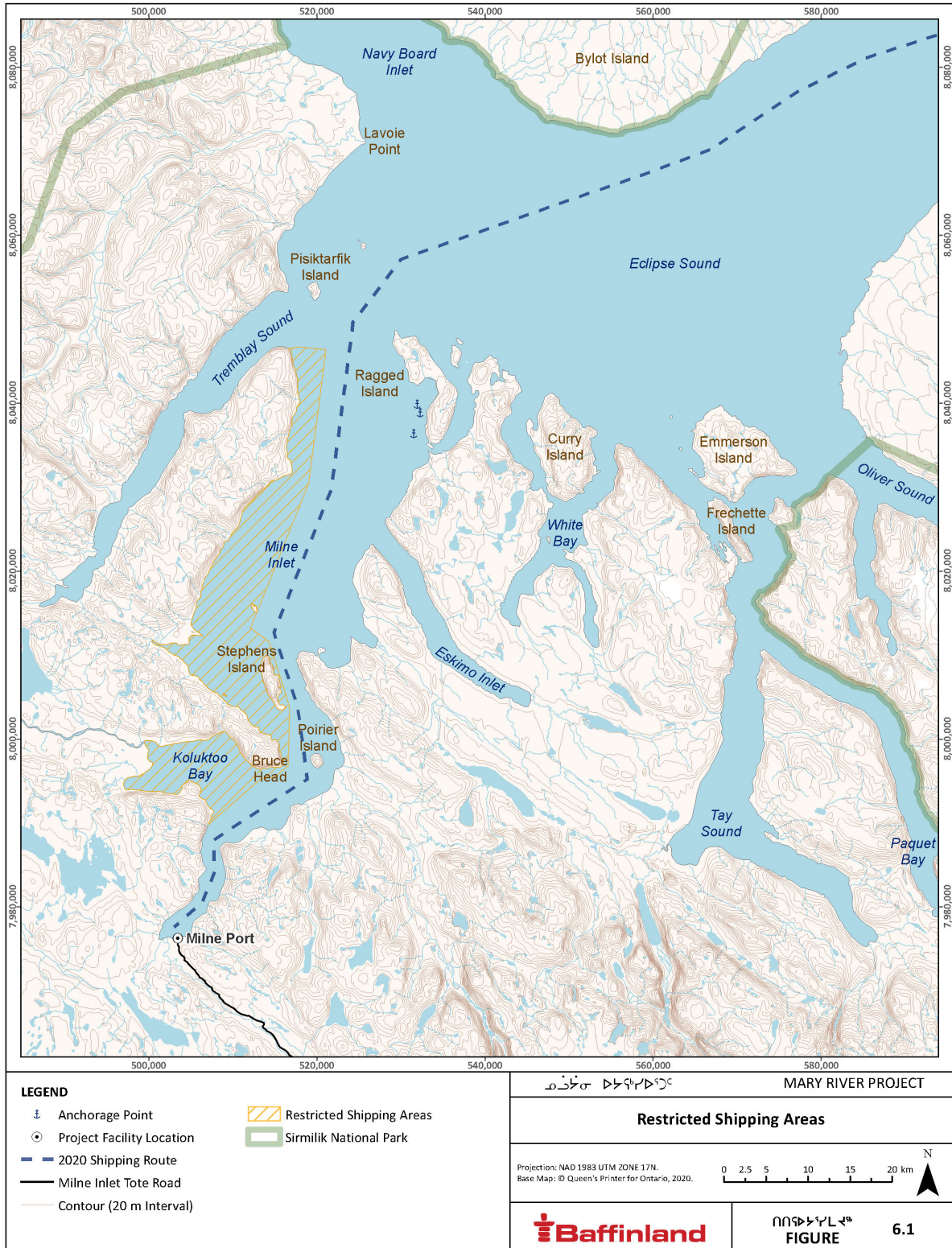
Project shipping and port operations have the potential to interact with marine mammals and their habitats with potential for adverse effects on these receptors. Project activities of concern include vessel discharges (ballast water), vessel movements, vessel noise and vibration, and accidental spills and releases. Vessel strikes on marine mammals have the potential to result in direct mortalities or injury.

In addition to the mitigation measures for marine mammals outlined in **Error! Reference source not found.** below, potential adaptive environmental management measures that might be considered could include4/ such actions as:

- a) Changes in the frequency and timing of shipping during periods of the year when interactions are found to be most common; or
- b) Identification of alternate routing.

All vessels are to follow the nominal shipping route (See Figure 4.2) to the fullest extent possible and avoid such areas such as Koluktoo Bay and the western shoreline near Bruce Head (see Figure 6.1) to minimize effects on marine mammals and interference with hunting activities.

FIGURE 6.1: RESTRICTED SHIPPING AREA



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All Project vessels will restrict speed to 9 knots when transiting along the established shipping corridor, and will be operated in such a way as to avoid separating an individual member(s) of a group of marine mammals from other members of the group. When marine mammals appear to be trapped or disturbed by vessel movements, the vessel will implement appropriate measures to mitigate disturbance, including stoppage of movement until wildlife move away from the immediate area.

TABLE 2: MITIGATION MEASURES FOR MARINE MAMMALS

Project Activity	Mitigation Measure(s)	Species
Vessel traffic to/from Milne Port (open-water period)	<ul style="list-style-type: none"> • Maintain constant speed and course when possible. • Reduce vessel speed to 9 knots. • Reduce vessel idling. Vessel to be designed to limit noise output. • Project vessels shall not approach within 300 m of a walrus or polar bear on observed sea ice. 	Ringed Seal, Bearded Seal, Walrus, Beluga, Narwhal, Bowhead Whale, Polar Bear
Icebreaking and Ice Management Activities (shoulder seasons)	<ul style="list-style-type: none"> • Between the period of 01 July and 30 July, a maximum of one icebreaker transit (with escorted vessels) will occur per day (24-h period) where ice concentrations of 6/10 or greater cannot be avoided along the shipping route. • Between the period of 01 July and 30 July, a maximum of two icebreaker transits (with escorted vessels) will occur per day (24-h period) where ice concentrations less than 6/10 but greater than 3/10 greater cannot be avoided along the shipping route. • When a continuous sailing route of uninterrupted ice concentrations of 3/10 or less is available between the entrance of Pond Inlet and Milne Port, then icebreaker transits in the RSA will proceed according to the normal shipping schedule; • All Project vessels will reduce speeds to a maximum of nine knots when transiting along the established shipping corridor; • All icebreaking, ice management and ice escort activities will be conducted outside of the period of ringed parturition, nursing, and breeding periods; • When marine mammals appear to be trapped or disturbed by Project vessel movements, the vessel will implement appropriate measures to mitigate disturbance, including stoppage of movement until wildlife move away from the immediate area (as safe navigation allows). • All Project vessels will be provided with standard instructions to not approach within 300 m of a walrus or polar bear observed on sea ice; • All Project vessels will be provided with standard instructions to operate their vessel in a manner that avoids separating an individual member(s) of a group of marine mammals from other members of the group; and • Baffinland will place Marine Wildlife Observers (MWOs) on icebreaking vessels during the shoulder seasons that will be 	Ringed Seal, Bearded Seal, Walrus, Beluga, Narwhal, Bowhead Whale, Polar Bear

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Project Activity	Mitigation Measure(s)	Species
	<p>responsible for recording relative abundance, group composition and behaviour of marine mammals relative to icebreaker transits along the Northern Shipping Route. MWOs will also be responsible for recording any incidences of marine mammal strikes or near misses with Project vessels, including icebreaker vessels.</p> <ul style="list-style-type: none"> Vessels awaiting an icebreaker escort, or vessels awaiting instructions from the Port Captain to enter the RSA will be instructed to wait in Baffin Bay at least 40 km east of the Nunavut Settlement Area 	
Aircraft Overflights	<ul style="list-style-type: none"> Maintain altitude of 450 m over marine waters when possible. Aircrafts prohibited from flying over marine mammals for sightseeing or photography. 	Ringed Seal, Bearded Seal, Walrus, Beluga, Narwhal, Bowhead Whale, Polar Bear
Operation of worker camps	<ul style="list-style-type: none"> Educate workers on bear safety. Work areas to be kept clean of garbage, food scraps and toxic materials. Use of bear deterrent devices. 	Polar Bear

It is important to note that none of the aforementioned mitigations related to vessel movement, should be read in any way as over-riding the Master's authority and responsibility for safe navigation and management of the vessel.

6.3 Onboard Waste Management

All vessels are to have Waste Management Plans for sewage and solid waste.

6.3.1 Sewage and Grey Water

All ore carriers are to be fitted with a holding tank with sufficient capacity to meet the grey and black water requirements of the ship for the duration of its time in the RSA. Ore carriers are not to discharge effluent from treated or untreated sewage or grey water while in the RSA.

6.3.2 Solid Waste

In accordance with MARPOL and the *Arctic Waters Pollution Prevention Act*, no solid waste materials or garbage is to be disposed of in Canadian waters. As no facility exists to dispose of foreign or Canadian ship waste materials or garbage at Milne Port, such materials will either be incinerated or retained onboard and later disposed of in accordance with Canadian and International regulations.

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6.4 Invasive Species Management

6.4.1 Ballast Water Management

In order to reduce or eliminate the risk of invasive aquatic species and pathogens being introduced into Canadian waters as a result of shipping, all ships will exchange ballast water in accordance with the *Ballast Water Control and Management Regulations* (Transport Canada 2006). The regulations require that ships transiting to Canadian ports exchange ballast water at sea in deep water away from coastal zones. This measure limits the potential for foreign harmful aquatic organisms or pathogens to be released in Canadian waters where they may colonize. Vessels are required to adhere to the Ballast Water Control and Management Regulations and will follow their own Ballast Water Management Plan (BWMP). Additionally, chartered vessels will be required to follow protocols for ballast water management and discharge as outlined in Baffinland's Ballast Water Management Plan.

6.4.2 Anti-Fouling Management

In order to reduce or eliminate the risk of invasive aquatic species and pathogens being introduced into Canadian waters as a result of ship hull biofouling, an anti-fouling coating will be applied to the hulls of all Project vessels that will arrive and depart from Milne Port. The anti-fouling coating used will comply with the anti-fouling convention as well as be approved under the Pest Management Regulatory Agency of Canada and Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals (2007-86). This convention prohibits the use of dangerous organotin chemicals in anti-fouling systems. Any anti-fouling system that has a component listed under Annex I of the convention will not be used. The potential anti-fouling systems include:

- Organotin-free polishing type paint
- Organotin-free ablative type paint
- Organotin free conventional type paint
- Biocide-free silicon type paint
- Other biocide-free paints

As the iron ore carriers commissioned for operations will exceed 400 gross tonnes and will be undertaking international voyages, these vessels will require an international anti-fouling system certification. Baffinland is committed to ensuring all vessels procured for the Project meet the IMO International Convention on the Control of Harmful Anti-fouling Systems on Ships. As per Annex I of the convention (and Schedule 6 of the Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals [2007-86]), the anti-fouling system will:

- Not bear organotin compounds on their hulls or external parts or surfaces; or
- Bear a coating that forms a barrier to such compounds leaching from the underlying non-compliant anti-fouling systems.

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6.5 Automated Identification System (AIS) Vessel Tracking

Project vessel transits along the Northern Shipping Route are tracked and recorded using a combination of shore-based and satellite-based Automated Identification System Data. Automated Identification System transponders are mandatory on all commercial vessels >300 gross tonnes and on all passenger ships. Information provided by the AIS includes vessel name and unique identification number, vessel size and class, position and heading, course, speed of travel, and destination port.

Satellite-based Automated Identification System data acquired from exactEarth Ltd. was used to track Project vessel movements along the shipping corridors in real-time. In 2018 Baffinland also installed a shore-based real-time satellite-based Automated Identification System vessel tracking system at the Pond Inlet HTO main office.

6.5.1 Culture, Resources and Land Use

Ship locations are posted on the Baffinland Iron Mines website (www.baffinland.com) and available at the MHTO main office in Pond Inlet.

Additionally, Baffinland employs 2 land-based shipping monitors to work in Pond Inlet who will be responsible for conducting live monitoring throughout the shipping season and has established communication protocols and designate contact information to respond to community concerns.

These processes will help to increase response time to correct vessel movement or speed in the event of non-adherence to vessel management protocols.

6.6 Environmental Monitoring

Baffinland's marine-based monitoring programs are focused on the interaction between Project activities and the receiving marine environment, and in the establishment of cause-effect relationships that flow from these interactions. Monitoring results provide information that serve to modify, add, or eliminate mitigation measures. Additional monitoring programs may be developed, if required, and could lead to the implementation of adaptive environmental management measures.

Environmental monitoring is conducted at three levels:

- **Research** – studies to establish basic monitoring parameters (e.g. natural variability; potential for project-environment interaction), or to establish a baseline for future monitoring;
- **Surveillance** – studies to record natural environment phenomena and act as an “early warning” of changes, which, while not attributable to the Project, could require attention and possible design of a specific EEM program;
- **EEM** –environmental effects monitoring (EEM) based on a statistically robust study design capable of accepting or rejecting a Null Hypothesis, and focused on establishing a cause/effect relationship between environmental phenomena and Project attributes.

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Environmental compliance monitoring is also carried out to demonstrate that the conditions of applicable permits and approvals (e.g. with respect to limits on concentrations of discharges) have been met during in-water or near-water marine-based Project works.

Detailed information on Baffinland's monitoring programs are outlined in Baffinland's Marine Monitoring Plan. This plan is intended to provide detailed information on program design and monitoring procedures for all of Baffinland's monitoring programs. This Plan is intended to be regularly updated based on program design modifications that are required based on annual monitoring results and/or recommendations provided by the MEWG and the NIRB.

In design and execution of its monitoring programs, Baffinland is committed to applying rigorous standards for study design, analysis and reporting. All study designs are provided to the MEWG for review and comment. All monitoring data are analyzed rigorously by experienced analysts, and all draft monitoring reports are circulated to the MEWG for comment prior to issuance as final documents. Additionally, affected communities will continue to be consulted on study design and provided opportunities to participate in implementation of the monitoring programs. Monitoring results are regularly presented to community advisory groups for discussion. In all monitoring programs, Baffinland engages direct Inuit participation in study planning, execution and interpretation of results.

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7 ENVIRONMENTAL REPORTING

7.1 Reporting Requirements

All marine and Project operations monitoring activities and reports pursuant to the Project Certificate and various regulatory requirements of the Project will be submitted annually to the NIRB. All results are to be kept and maintained throughout the life of the Project and EIS and EEM predictions will be updated as new baseline information is collected. A Project-specific web page (www.baffinland.com) has been developed as a means of making all non-confidential monitoring and reporting information available to the general public. To the fullest extent possible, all results will be available in English and Inuktitut.

Additionally, prior to the start of each shipping season, Baffinland will provide to the NIRB a Marine Shipping and Vessel Management Report informing the Board of the following:

- Anticipated number of ship transits along the approved shipping route;
- Identification of specific areas to be used for drifting and anchorage of vessels with details of how community feedback and comments from the MEWG has been used to inform the selection of suitable areas;
- Timelines for organizing pre- and post-shipping meetings with the community;
- Plans for preventing or mitigating vessel interference with marine mammals and traditional hunting activities pursuant to Term and Condition 125(as) of the Project Certificate;
- Evidence of community involvement to review preliminary results of the monitoring programs, and to compare results with experiences of community members and hunters with respect to the marine environment and marine mammals during the shipping season; and
- Evidence of reporting new or non-native species identified as a result of Aquatic Invasive Species Monitoring to the MHTO and DFO with confirmation of whether or not this species had been observed in the past or through other community or regional monitoring initiatives.

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8 REFERENCES

1. Baffinland, 2012. Mary River Project – Final Environmental Impact Statement. Volume 8: Marine Environment. Appendix 8A-2. Marine Mammal Baseline. February 2012.
 2. Baffinland, 2013. Mary River Project – Addendum to the Final Environmental Impact Statement.
 3. Baffinland 2015. *Spill at Sea Response Plan*. August 7. Document # BAF PH1 830 P16 0042, Rev. 0.
 4. Baffinland 2016. *Marine Monitoring Plan*. March 17. Document # BAF-PH1-830-P16-0046 Rev 0.
 5. Baffinland 2016a. *Oil Pollution Emergency Plan - Milne Inlet*. July 10. Document # BAF PH1-830-P16-0013 Rev.2.
 6. Baffinland 2017. *Emergency Response Plan*. March 31. Document # BAF PH1 840 P16 0002, Rev. 2.
 7. Baffinland 2017a. *Spill Contingency Plan*. March 30. Document # BAF-PH1-830-P16-0036, Rev. 3.
 8. Baffinland. 2018a. *Mary River Project – Addendum to the Final Environmental Impact Statement for the Phase 2 Proposal*. August 2018. Revised September 2018.
 9. Baffinland. 2018b. Phase 2 Proposal Information Request Supporting Document: Overview of Marine Operations. Baffinland 2019. Ballast Water Management Plan. March 31. Document # BAF-PH1-830-P16-0050 Rev 1.
 10. Baffinland 2019. Ballast Water Management Plan. March 31. Document # BAF-PH1-830-P16-0050, Rev. 1.
 11. Enfotec Technical Services Inc. 2016. Technical Supporting Document (TSD) No. 16: Ice Conditions and ship access to the Milne Inlet port site – Update. Mary River Project – Phase 2 Proposal. Report submitted to Baffinland Iron Mines Corporation. Reference No. 2016-BAFFINLAND-01. December, 2016.
 12. Transport Canada Site – www.tc.gc.ca.
 13. Transport Canada. 2007. A guide to Canada's ballast water control and management regulations. TP 13617E. Environmental Protection. 46p.
- WMO (World Meteorological Organization).2014. *Sea Ice Nomenclature*. volume 1 – Terminology and Codes, Volume II – Illustrated Glossary and III – International System of Sea-Ice Symbols) No.259.

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Appendix A: International and Federal Shipping Regulation and Act

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Federal and/or International Acts and Regulations	Reference
Aids to Navigation Protection Regulations	https://laws-lois.justice.gc.ca/eng/regulations/C.R.C., c. 1403/index.html
Arctic Waters Pollution Prevention Act and Regulation	http://www.tc.gc.ca/eng/marinesafety/debs-arctic-acts-regulations-awppa-494.htm
Ballast Water Control and Management Regulations.	https://laws-lois.justice.gc.ca/eng/regulations/sor-2011-237/
Canada Labour Code	https://laws-lois.justice.gc.ca/eng/acts/L-2/
Canada Shipping Act	https://laws-lois.justice.gc.ca/eng/acts/c-10.15/
Canadian Transportation Accident Investigation and Safety Board Act	https://laws-lois.justice.gc.ca/eng/acts/c-23.4/
Canadian Transportation Act	https://laws-lois.justice.gc.ca/eng/acts/c-10.4/
Canadian Transportation of Dangerous Goods Act	http://www.tc.gc.ca/eng/tdg/act-menu-130.htm
Cargo, Fumigations and Tackle Regulations	https://laws-lois.justice.gc.ca/eng/regulations/sor-2007-128/
Charts and Nautical Publications Regulations	https://laws-lois.justice.gc.ca/eng/regulations/sor-95-149/
Classed Ships Inspection Regulations	https://laws-lois.justice.gc.ca/eng/regulations/SOR-89-225/
Collision Regulations	https://laws-lois.justice.gc.ca/eng/regulations/c.r.c., c. 1416/
Crew Accommodation Regulations	https://laws-lois.justice.gc.ca/eng/regulations/C.R.C., c. 1418/
Dangerous Bulk Materials Regulations	https://laws-lois.justice.gc.ca/eng/regulations/SOR-87-24/index.html
Dangerous Chemicals and Noxious Liquid Substances Regulations	https://laws-lois.justice.gc.ca/eng/regulations/sor-93-4/page-1.html
Department of Transport Act	https://laws-lois.justice.gc.ca/eng/acts/t-18/index.html
Fire and Boat Drills Regulations	https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2010-83/index.html
Fire Detection and Extinguishing Equipment Regulations	https://laws-lois.justice.gc.ca/eng/Regulations/C.R.C., c. 1422/index.html
Fisheries Act	https://laws-lois.justice.gc.ca/eng/acts/f-14/
Garbage Pollution Prevention Regulations	https://laws-lois.justice.gc.ca/eng/regulations/C.R.C., c. 1424/index.html
Home-Trade, Inland and Minor Waters Voyages Regulations	https://laws-lois.justice.gc.ca/eng/regulations/C.R.C., c. 1430/
Hull Inspection Regulations	https://laws-lois.justice.gc.ca/eng/Regulations/C.R.C., c. 1432/index.html
International Convention for the Control and Management of Ships' Ballast Water and Sediment	http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Control-and-Management-of-Ships'-Ballast-Water-and-Sediments-(BWM).aspx
International Convention for the Prevention of Pollution from Ships (MARPOL)	http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx

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Federal and/or International Acts and Regulations	Reference
International Convention on Load Lines	http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-on-Load-Lines.aspx
International Maritime Dangerous Goods (IMDG) Code	http://www.imo.org/en/Publications/IMDGCode/Pages/Default.aspx
International Maritime Solid Bulk Cargoes (IMSBC) Code	http://www.imo.org/en/OurWork/Safety/Cargoes/CargoesInBulk/Pages/default.aspx
International Safety Management Code	http://www.tc.gc.ca/eng/marinesafety/dvro-4066.htm
Life Saving Equipment Regulations	https://laws-lois.justice.gc.ca/eng/Regulations/C.R.C., c. 1436/index.html
Marine Certification Regulations	https://laws-lois.justice.gc.ca/eng/regulations/SOR-97-391/index.html
Marine Liability Act	https://laws-lois.justice.gc.ca/eng/acts/M-0.7/
Marine Machinery Regulations	https://laws-lois.justice.gc.ca/eng/regulations/sor-90-264/
Marine Transportation Security Act	https://laws-lois.justice.gc.ca/eng/acts/m-0.8/
Marine Transportation Security Regulations	https://laws-lois.justice.gc.ca/eng/regulations/sor-2004-144/
Navigation Protection Act	https://laws-lois.justice.gc.ca/eng/acts/n-22/
Oceans Act	https://laws-lois.justice.gc.ca/eng/acts/o-2.4/
Oil Pollution Prevention Regulations	https://laws-lois.justice.gc.ca/eng/regulations/SOR-93-3/index.html
Response Organizations and Oil Handling Facilities	https://laws-lois.justice.gc.ca/eng/regulations/SOR-95-405/index.html
Safe Containers Convention Act	https://laws-lois.justice.gc.ca/eng/acts/S-1/
Safe Working Practices Regulations	https://laws-lois.justice.gc.ca/eng/Regulations/C.R.C., c. 1467/index.html
Safety Management Regulations	https://laws-lois.justice.gc.ca/eng/regulations/SOR-98-348/
Ship Station Radio Regulations	https://laws-lois.justice.gc.ca/eng/regulations/SOR-2000-260/
Shipping Casualties Reporting Regulations	https://laws-lois.justice.gc.ca/eng/Regulations/SOR-85-514/index.html
Shipping Inquiries and Investigations Rules	https://laws-lois.justice.gc.ca/eng/regulations/C.R.C., c. 1479/index.html
Ships' Elevator Regulations	https://laws-lois.justice.gc.ca/eng/regulations/C.R.C., c. 1482/
Standards for navigating Appliances and Equipment	http://www.tc.gc.ca/eng/marinesafety/tp-tp3668-menu-391.htm
Steering Appliances and Equipment Regulations	https://laws-lois.justice.gc.ca/eng/Regulations/SOR-83-810/index.html
Transportation of Dangerous Goods Program	http://www.tc.gc.ca/eng/tdg/safety-menu.htm
Vessel Traffic Services Zones Regulations	https://laws-lois.justice.gc.ca/eng/regulations/SOR-89-98/
VHF Radiotelephone Practices and Procedures Regulations	https://laws-lois.justice.gc.ca/eng/regulations/SOR-81-364/

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Appendix B:

Baffinland Pre-Charter Bulk Carrier Ice Capability Assessment

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B.1 Baffinland Pre-Charter Bulk Carrier Ice Capability Assessment

B.1.1 GENERAL

The Baffinland pre-charter bulk carrier ice capability assessment will be carried out prior to finalization of any charter.

B.1.2 APPLICATION OF THE VESSEL SELECTION PROTOCOL

The vessel selection protocol applies to vessels engaged in the export of iron ore according to the season during the planned period of the charter.

B.1.3 MINIMUM SPECIFICATIONS FOR VESSEL SELECTION

These are the minimum requirements for vessel selection according to the season during the planned period of the charter.

B.1.4 CRITERIA FOR DETERMINING VESSEL PERFORMANCE IN ICE

This is based on the Arctic Ice Regime Shipping System (AIRSS) calculation of ice numerals and Canadian Arctic Class or equivalent.

B.1.5 MINIMUM REQUIREMENTS FOR CARRIERS AND ALTERNATE IRON ORE CARRIERS

The minimum requirements will be specified in the Baffinland original request to brokers for proposals for vessels, taking account of the season and projected ice conditions during the period of the charter.

B.1.6 VESSEL ICE CAPABILITY ASSESSMENT

The main concern is to ensure that the carriers and alternate iron ore carriers selected are capable of operating in the ice conditions which are forecast for the period when the vessel will be operating in the approaches to Milne Inlet or within Milne Inlet.

The ice capability requirement is dependent on updated ice forecasting, based on current radar satellite information, related to the vessel's design, construction, ice performance, and operating procedures. The calculation is based on the following:

- i. The ice numerals of a vessel being considered for operations into Milne Inlet ice, which will be calculated under the Arctic Ice Regime Shipping System (AIRSS).
- ii. The vessel's Class and Type in accordance with Canadian Regulations (i.e., Canadian Arctic Class or equivalent).
- iii. The thickness and character of the ice in Milne Inlet during the period of the charter.

B.1.7 ICE CONDITIONS FORECASTS AND ICE CAPABILITY ASSESSMENT

The following summary is provided as an aid to understanding Baffinland's vessel selection process for selecting vessels for operation into Milne Inlet.

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1. An Ice Information Contractor, with expertise in ice measurement, forecasting and routing, will be contracted to provide a forecast of the ice conditions expected in the Milne Inlet area at the time of the proposed shipping.
2. The Owner and Managers of a vessel being considered for a charter shall be required to provide full details of the vessel's design, ice construction, machinery, class, etc. to the Baffinland Independent Contractor responsible for assessing the vessel's ice capability.
3. The Independent Contractor engaged by Baffinland shall consider the vessel's ice design and construction, ice performance and certificates to confirm if the vessel's ice numerals are positive and sufficient to enable the vessel to safely transit the forecast ice conditions in Milne Inlet during the projected time frame.

This contract shall be established well in advance of the first charter vessel assessment to enable the Independent Contractor to provide Baffinland with a list of information required to carry out their assessment of the proposed vessel's ice capability.

4. Providing the vessel meets all of the required criteria for navigating in the forecast ice conditions, the Independent Contractor shall determine that the vessel under consideration is structurally and mechanically capable of safely completing the contemplated voyage and will provide that determination to Baffinland.
5. Providing the vessel meets all of the above requirements for the charter, the vessel shall be subject to a general inspection to confirm that the vessel remains in good condition, meeting all of the equipment requirements and operating procedures necessary for vessels operating into Canadian ports. The Surveyor will also ensure that the equipment requirements and operating procedure requirements listed out in the Baffinland Inuit Impacts and Benefits Agreement (IIBA) are satisfied. These equipment requirements and operating procedure requirements are all included in the Baffinland pre-charter bulk carrier inspection checklist (refer to Appendix C).

The above inspection will be coupled with a limited audit to ensure that the vessel is operated in conformance with the International Safe Management regulations.

Providing that the vessel satisfies all of the above inspections and the limited audit, the vessel may be placed on charter.

Note: Surveyors conducting the pre-charter inspection will be informed of any special inspection requirements related to ice procedures and route planning not otherwise included in the Baffinland IIBA. The provision of a Berthing Master provides the necessary source of information and advice to a Master unfamiliar with the conditions in Milne Inlet.

6. Twenty-four hours before the chartered vessel enters the ice outside Milne Inlet, the Ice Information Contractor shall provide an updated estimate and forecast of the ice conditions which the vessel will encounter in and outside of Milne Inlet. The vessel's AIRSS ice numerals will again be calculated.

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If the ice numerals remain positive for the updated ice report, the vessel may enter Milne Inlet.

If the ice numerals are negative, the vessel may not enter port until ice conditions improve and positive numeral results.

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Appendix C:

Baffinland Pre-Charter Inspection Checklist and Limited Audit

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C.1 BAFFINLAND PRE-CHARTER BULK CARRIER INSPECTION CHECKLIST AND LIMITED AUDIT

C1.1 INTRODUCTION

Baffinland Iron Mines Corp. has developed an Iron Ore mine at Mary River, Baffin Island, and shipping terminals at Steensby Port Site and Milne Inlet on Baffin Island in Nunavut.

In order to preserve the environment and the Inuit way of life, Baffinland have signed the Inuit Impacts and Benefits Agreement (IIBA) which, among other things, provides for the shipment of Iron Ore.

C.1.2 SHIPPING OPERATIONS

Carriers and alternate Iron Ore Carriers (should these be required) must be classed for ice navigation according to the expected ice conditions.

C.1.3 COMPLETION OF PRE-CHARTER BULK CARRIER INSPECTION AND LIMITED AUDIT

It is not the intention that the Baffinland inspector/surveyor inspect a bulk carrier and carry out a complete ISM Type audit in the course of the vessel's normal turn-around in port.

However, an experienced surveyor can examine the vessel's documentation or computerized safety and maintenance programs in sufficient depth to satisfy themselves as to the standard of operation and management of the vessel. This information coupled with a visual inspection of the hull and superstructure, machinery spaces, deck and safety equipment is normally sufficient for the Charter to decide whether the vessel is capable of working safely in Canada or otherwise. In order to save time we suggest that the surveyor uses a digital camera to photograph points of interest, general layout of the vessel, hull condition, etc., or any items which cause concern.

The following pre-charter bulk carrier inspection checklist is a combination of a Transport Canada Ship Safety Checklist, which is the standard required for all foreign ships entering Canada, to which we have added the requirements as identified by Baffinland as the outcome of the Environmental Assessment Process.

The limited audit outlined is sufficient to confirm that the vessel is maintaining ISM Standards.

PART 1 — PRE-CHARTER BULK CARRIER (INSPECTION AS PER THE FOLLOWING CHECKLISTS)

Section 1: General Information

Section 1: General Information		
1.1	Date this document completed	
1.2	Name of ship	
1.3	LR/IMO No.	
1.4	Date of name changes	
1.5	Flag	

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1.6	Call sign	
1.7	INMARSAT number	
1.8	Ship's fax number	
1.9	Ship's telex number	
1.10	Ship's e-mail address	
1.11	Type of hull: (1) Single Hull, (2) Double Hull, (3) Double Bottom (4) Double Side, (5) Other (if Other, Specify)	
Section 1.2: Ownership and Operation		
1.12	Registered Owner	
1.13	Full Address	
	Office telephone number	
1.14	Name of Operator (if different from above)	
1.15	Full Address	
	Office telephone number	
	Office fax number	
	Office email address	
	Contact person	
1.16	Contact person after hours telephone number	
	Emergency callout number	
	Emergency callout pager number	
	Contact details for person responsible for oil spill response.	
1.17	Total number of ships operated by this Operator	
Section 1.3: Builder		
1.18	Builder	
1.19	Date delivered	
1.20	If applicable, date of completion of major hull changes	
1.21	If major hull changes, what changes were made?	
Section 1.4: Classification		
1.22	Classification Society	LLOYDS REGISTER
1.23	Class Notation	
1.24	Date of last dry-dock	
1.25	Date next dry-dock due	
1.26	Date of last special survey	
1.27	Was last special survey an enhanced special survey?	
1.28	Date next special survey due	
1.29	If ship has Condition Assessment Programme (CAP) rating, what is the latest rating?	
1.30	Date of last annual survey	

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1.31	Date of last boiler survey - port boiler	
1.32	Date of last boiler survey – starboard boiler	
1.33	If machinery on Continuous Survey are any item overdue or	
1.33.1	If Yes give details:	
1.34	Is ship subject to any conditions of class, class extensions, outstanding Memorandums or class recommendations?	
1.34.1	If Yes, give details:	

Section 1.4: Dimensions

1.35	Length overall (LOA)	
1.36	Length between perpendiculars (LBP)	
1.37	Extreme breadth	
1.38	Moulded breadth	
1.39	Moulded depth	
1.40	Does ship have a bulbous bow?	

Section 1.5: Tonnages

1.41	Net Registered Tonnage	
1.42	Gross Tonnages	
1.43	Moulded depth	

Section 1.6: Loadline Information

		Freeboard	Draft	Deadweight	Displacement
1.44	Summer				
1.45	Winter				
1.46	Lightship				
1.47	Normal Ballast Condition				
1.48	Segregated Ballast Condition				

Section 1.7: Recent Operational History

1.49	Has ship been involved in a pollution incident during the past 12 months?	
1.50	Has ship been involved in a grounding incident during the past 12 months?	
1.51	Has ship been involved in a collision during the past 12 months?	

Section 2: Certification and Documentation

	Certificates	Issue Date	Expiry	Last Annual
2.1	CERTIFICATE OF REGISTRY			
2.2	SAFETY EQUIPMENT CERT			
2.3	SAFETY RADIO CERTIFICATE			
2.4	SAFETY CONSTRUCTION CERTIFICATE			
2.5	LOAD LINE CERTIFICATE			
2.6	IOPP			
2.7	ISM			
2.8	INTERNATIONAL SEWAGE POLLUTION			

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2.9	USCG (LETTER OF COMPLIANCE) CFR			
2.10	UNATTENDED MACHINERY SPACE CERTIFICATE			
2.11	INTERNATIONAL TONNAGE CERTIFICATE			
2.12	MINIMUM SAFE MANNING CERTIFICATE			
Documentation - Are the latest editions of the following publications tted on board?				
2.13	IMO <i>Safety of Life at Sea Convention (SOLAS 74)</i>			
2.14	IMO <i>International Code of Signals (SOLAS V-Reg 21)</i>			
2.15	IMO <i>international Convention for the Prevention of Pollution from Ships (MARPOL 73/78)</i>			
2.16	IMO <i>Ships Routing</i>			
2.17	IMO <i>International Regulations for Preventing Collisions at Sea (COLREGS)</i>			
2.18	IMO <i>Standards of Training, Certification and Watch Keeping (STCW Convention)</i>			
2.19	Does the Vessel carry a SOLAS Safety Manual available to Crew?			
2.20	ICS <i>Guide to Helicopter/Ship Operations</i>			

Section 3: Crew Management

Date of Minimum Manning Certificate			
	Minimum Manning	Officers	Rating
3.1	Minimum manning required		
3.2	Actual required		
3.3	Nationality		
	Nationality		
	Nationality		
3.4	Common language used		

Section 4: Navigation Equipment

4.1	Is the vessel equipped With the following equipment?	Yes/No	Type	No Of Units
4.2	Standard Magnetic Compass			
4.3	Steering Magnetic or Periscope compass			
4.4	Gyro Compass			
4.5	Gyro Repeaters			
4.6	Radar 1 X Band (9 GHz)			
4.7	Radar 2 S Band (4 GHz)			
4.8	Are radars gyro stabilized?			
4.9	Radar plotting equipment			
4.10	ARPA			
4.11	Depth sounder with recorder			
4.12	Speed/distance indicator			
4.13	Doppler log			
4.14	Docking approach Doppler			
4.15	Rudder angle indicator			
4.16	RPM indicator			
4.17	Controllable pitch propeller indicator			
4.18	Bow thruster indicator			
4.19	Rate of turn indicator			
4.20	Radio direction finder			

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4.21	Navtex receiver			
4.21	Satellite navigation receiver			
4.22	GPS			
4.23	Differential GPS			
4.24	ECDIS (Electronic Chart Display and Information System)			
4.25	EPIRB			
4.26	GMDSS Installation			
4.26	VHF Dual Installation			
4.28	VHF Portable hand Sets			
4.29	MFIHF Installation			
4.30	Inmarsat Installation			
4.31	Loran C receiver			
4.32	Course recorder			
4.33	Off — course alarm — gyro			
4.34	Off — course alarm — magnetic			
4.35	Engine order printer			
4.36	Anemometer			
4.37	Several pairs of binoculars			
4.38	Weather fax			
	Other Equipment			
4.40	Does vessel carry sextant(s)?			
4.41	Does vessel carry a signal lamp?			
4.42	Are steering and machinery controlled from the bridge?			
4.43	Are bridge controls available on bridge wings?			
4.44	Internal communications system?			
4.45	P.A. system?			
4.46	Sound signals, whistle, and fog horn?			
4.47	Navigation lights?			
4.48	Two powerful searchlights?			
4.49	Does the vessel have properly equipped pilot ladder clw manropes?			
4.50	Does the vessel have a substantial accommodation ladder either side?			
4.51	Does the vessel have a short light weight gangway with side ropes?			
4.52	Does the vessel have current navigational charts for the port and route?			

Section 5: Pollution Prevention

5.1	Is spill containment fitted under the cargo manifold?	
5.2	Is spill containment fitted under all bunker manifolds?	
5.3	Is containment fitted under the bunker tank vents?	
5.4	Is containment fitted around the deck machinery?	
5.5	Specify type of scupper plugs	
5.6	Are means provided for draining or removing oil from deck area/containment?	
5.7	Does the vessel have on board the equipment, procedures and resources for use in event of an oil spill?	
5.8	Does the vessel have a shipboard oil pollution emergency plan (SOPEP) that complies with the requirements of the MARPOL convention?	

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5.9	Is the following pollution control equipment available to clean up oil spilled on deck?	
5.9.1	Sorbents?	
5.9.2	Non-sparking hand scoops/shovels?	
5.9.3	Containers?	
5.9.4	Emulsifiers?	
5.10	Does the vessel have a certified sewage system?	
5.11	Does the vessel have a sewage storage tank?	
5.12	Does the vessel have on board holding of bilge water?	
5.13	Does the vessel have on board holding of oily waste?	
5.14	Does the vessel have on board holding of solid wastes?	
5.15	is a garbage incinerator fitted?	

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Part 2: LIMITED AUDIT OF THE OUTBOARD OPERATION OF THE ISM SYSTEM

International Safety Management Certificate	
Issued By Classification Society Name	
Last 5 year renewal	Date:
Intermediate audit	Date:
Internal audit	Date:
Name of Designated Person Ashore (DPA)	
Contact Phone Number	
Contact email address	

General	Yes /No
Are the ISM system manuals available to the crew?	
Are the Master, officers and crew familiar with the ISM system?	
Are crew familiar with the Ship's Contingency Plans & their responsibilities?	
Are crew familiar with safe working practices required onboard?	
Are crew wearing Personal Protective Equipment and Clothing as appropriate?	
Are safety signs exhibited throughout the vessel?	
Are ear defenders/plugs used in the machinery spaces?	
Are eye protectors available near burning and grinding gear?	
Is the Safety Officer named and familiar with his responsibilities?	
Are minutes of safety meetings kept and forwarded to Safety Officer/DPA?	
Are concerns raised at meetings dealt with effectively onboard?	
Are concerns beyond the ship's capacity attended to promptly by the ship's management?	
Is the secondary emergency control center maintained?	
Does the vessel have a Material Safety Data System (MSDS) in place?	
Accommodation	
Are the ship's accommodations clean, tidy and hygienic?	
Are lifejackets and survival suits stored in each cabin?	
Are fire extinguishers, alarms, etc. in place and in date?	
Are public rooms, mess rooms etc. clean, tidy and hygienic?	
Are the galley and food stores clean with refrigerators operational?	
Is proper food handling and food hygiene in effect?	
General Exterior Inspection	
Is the ship's hull in good external condition & well coated?	
Is the visible lower hull free from fouling?	
Is an organotin, tributalin or biocide based anti-fouling coating used?	

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Machinery Spaces

Machinery Space						
Main Engines						
Generators						
Boilers						
Inert Gas System		Nitrogen		CO ₂	Yes	
General Cleanliness	Good					
Bilge Cleanliness	Good					
Oily Water Separator						
Oil Sludge Tank		Capacity	21.7 m3			
Ballast Pumps			Capacity	cu. metres/Hr		
	Type					
Sewage Holding Tank	Capacity		m ³		Days	

Engine Rooms Records

Engine Room Log Book (Note engine/generator/bolier breakdowns in port or shut downs at sea during the last two voyages)	
Fuel consumption per day	Mt/Day
Lube oil consumption	Ltrs/Day
Planned Maintenance System (Note if up to date and any outstanding work)	
Oil record book (Must be up to date and signed by C/E and Master)	

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Deck Log Book – For Last Voyages

Average Speed	kts
Weather	
Are charts and publications corrected up to date?	
Has the Master been provided with a Port Information Book?	
Is the Master aware that he must carry all the necessary Canadian charts and publications before arrival in Canada?	
Are ballast transfer/changes recorded in a ballast log book records (Last Voyage)?	

Life Saving Appliances

Lifeboats	Total No		Open/Enclosed			
	Type		Motor		Enclosed	
Davits	Type					
No. of Survivors	Capacity					
Rescue Boat	Condition					
Davits						
Life Rafts	Date		Capacity:			
Life Raft Davits for above						
Survival/Immersion Suits	Total					
SARTS						
Records of Lifeboat Drills, Fire Drills, etc.						
Are post exercise debriefings held after each exercise and are all crew invited to comment as to how to improve the effectiveness of the fire team, first aid teams, etc.?						

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CREW CERTIFICATION

Requirements:

All crew to have Certificate of Training in Emergency Duties and Fire Fighting issued by an accredited institution. The Master, 1st Mate and two Senior Engineers shall be certified for all Emergency Command and Control Issues. At least two Officers shall be qualified GMDSS operators.

All new crew shall be provided with an orientation of the ship on joining. This will include an introduction to his duties, the emergency signals and his emergency station under the various contingencies.

A booklet setting out details of the vessel should be provided in each cabin along with notices showing how to don a lifejacket and or survival/immersion suit.

Every vessel shall have a SOLAS manual onboard available to all crew members. This manual describes in the common language(s) of the crew, each piece of safety equipment, its position onboard and how to operate it.

Check make up and qualifications of all watch-keeping Officers and Engineers.

Can the vessel operate with the machinery spaces unmanned (UMS)? If so, the machinery space must be manned by at least one watch-keeping engineer when the vessel is reduced to manoeuvring speed for entering or leaving port.

Qualification of Master and Watch Keepers

Crew First Aid Training: Numbers:

Advanced First Aid Training: Numbers:

Rescue Craft Training: Numbers:

Crew	Certificate of Competency			Basic Safety Certificate		Adv. Safety Certificate	
	Level	State	Date	State	Date	State	Date
Master							
1 st Mate							
2 nd Mate							
3 rd Mate							
Chief Eng.							
1 st Eng.							
2 nd Eng.							
3 rd Eng.							
4 th Eng.							
Seamen							

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Other Information	Yes/No	Comments
The suitability of the winterization of the vessel's onboard systems and equipment, including deck and cargo equipment, evacuation craft, etc. for operation in cold temperatures and icing according to all expected conditions.		
The provision of clear vision systems for unimpaired forward and astern vision in cold temperatures, icing, etc		
The suitability of the vessel's navigation equipment and appliances for safe navigation through ice in all expected conditions.		
The suitability of key safety-related and survival equipment for cold temperatures, ice and icing conditions – including survival kits and immersion suits.		
Confirmation that the vessel's officers and crew are familiar with cold weather survival procedures and the environmental conditions which they can expect to encounter.		
Confirm that the vessel's ice navigation history has established that the vessel has a record of successful navigation in ice conditions comparable to those expected in Anaktalak Bay during the voyage.		
Confirm that the vessel's operating manuals include a clear statement of the operating limitations for the vessel and its essential systems in all anticipated ice conditions, temperatures and other environmental conditions.		
Confirm that the vessel's operating manuals include passage planning procedures accounting for anticipated ice and other environmental conditions and transit speeds having due regard to the vessel's class and type in the anticipated conditions.		
Confirm that the vessel's operating manuals include deviations from standard operating procedures when navigating in ice-covered waters, including the operation of machinery systems, remote control and warning systems, electric and electronic systems.		
Confirm that the vessel has appropriate escape and evacuation procedures into cold water and ice, etc		
Confirm that the vessel is adequately equipped and its crews are properly trained to provide effective damage control and minor hull repair under all expected conditions.		