

Appendix 59

Shipping Management Plan Version 5



AGNICO EAGLE

MEADOWBANK Complex

Shipping Management Plan

MARCH 2025

VERSION 5

EXECUTIVE SUMMARY

The Shipping Management Plan for the Whale Tail Mine was developed in accordance with federal legislation, notably the *Canada Shipping Act*, the *Arctic Waters Pollution Prevention Act*, and associated regulations. It also recognizes the international conventions and protocols signed by Canada. Agnico Eagle Mines Limited (Agnico Eagle) will provide the necessary human, material, and financial resources to meet or exceed the legal requirements attributable to the company that arise from shipping-related activities. Shipping contractors will be encouraged to do the same. Agnico Eagle and its shipping contractors will carry third party liability insurance.

All shipping will be carried out during the open water season and will follow recommended shipping routes for the annual sealift to Baker Lake and other Kivalliq Region communities. There will not be any ice breaking to extend the shipping season.

Dry cargo multipurpose vessels and fuel tankers will arrive at a lightering point near Helicopter Island where they will anchor approximately 1 kilometer (km) from the island. Dry cargo will be lightered onto tug-assisted barges and fuel will be lightered onto smaller shuttle tankers for transport through the Baker Lake access passage (Chesterfield narrows, south channel) to the Meadowbank Mine barge unloading facilities and laydown area in Baker Lake.

It is Agnico Eagle's intent to prioritize the road transport of hazardous materials, including explosive-related materials, to the Mine site to avoid having such cargo remain in storage in Baker Lake. Other contingency measures associated with shipping-related activities include the Mine's Spill Contingency Plan, Emergency Response Plan, and Oil Pollution Emergency Plan and Oil Pollution Prevention Plan (OPEP/OPPP). Risk and hazard assessments of shore-based marine response activities will be undertaken as part of training by the Emergency Response Team.

Navigation through the Labrador Sea, Hudson Strait, and Hudson Bay is not challenging during the open water season. Navigation through Chesterfield Inlet also does not represent a major risk, with the exception of two locations; at Deer Island and Target Rock where passages are narrow and have strong currents. No major hazards are identified along the shipping and tug-barge routes under normal conditions.

All ship, tug, and tanker Masters will use electronic charts and other electronic navigational aids to provide safety in transit, reduce the risk of accidents, remain within recommended shipping routes and follow their internal navigation charts and guides (e.g., Navigation Arctic Guide) based on their experience. In addition, there are some site-specific measures concerning navigation in Chesterfield Inlet, including careful assessment of the conditions before entering the inlet, travelling during daytime when possible and good visibility, and making bound-up travel with tidal flood when possible.

Passage through locations with shipping and boating traffic will be coordinated to avoid shipping conflicts, and speed will be reduced where possible to ensure safety. To maximize the safety of the

persons travelling in boats near Chesterfield Inlet, Agnico Eagle or the shipping contractor will inform the community of the shipping activities, promote actions that will allow visibility of the ship and the small boats.

On-board waste management (solid and hazardous wastes, sewage) will be the responsibility of shipping contractors. Agnico Eagle will require the shipping contractors to conform to the *Ballast Water Regulations*, which are intended to reduce the risk of invasive and non-indigenous species from being inadvertently introduced into the region as a result of shipping activities. Agnico Eagle expects that shipping contractors and their vessels adhere to applicable environmental regulations and maintain a superior safety record.

Care will be taken to avoid disturbing marine mammals within the shipping lanes as much as possible and a Marine Mammal and Seabird Observer (MMSO) will be assigned to the ship crew. Ship crews will monitor the shipping lane for marine mammals during transits in Hudson Strait up to the lightering point near Helicopter Island. As in the past, monitoring will continue using Inuit Marine Wildlife Monitors aboard the vessels between Helicopter Island and Baker Lake, in accordance with NIRB Project Certificate No.004 Condition 36 (NIRB 2006). Additionally, mitigation measures may comprise, if safe to do so, slowing the ship and maintaining a safe distance from marine mammals.

Vessels contracted by Agnico Eagle will be required to have an approved Shipboard Oil Pollution Emergency Plan (SOPEP). If an environmental emergency occurs along the shipping routes, the SOPEP will be activated. If needed, close coordination will be maintained with Agnico Eagle's shore-based supervisors who can activate Agnico Eagle's Emergency Response Plan and OPEP to provide assistance to a vessel. Accidents or malfunctions during transit will be reported to Transport Canada. Spills would also be reported to the Environmental Emergencies 24-Hour Report Line and, if necessary, advice would be requested from the Regional Environmental Emergencies Team. Assistance could also be sought from nearby ships and the Canadian Coast Guard.

TABLE OF CONTENTS

Executive Summary	i
Table of Contents	iii
Figures and Tables	iv
Appendices	iv
Document Control	v
Acronyms.....	vii
Section 1 • Introduction	1
1.1 Shipping Needs	1
1.2 Shipping Routes	2
1.3 Lightering Procedures.....	2
1.3.1 Dry Cargo	2
1.3.2 Diesel Fuel	4
1.3.3 Explosives and Hazardous Materials	4
Section 2 • Related Documents.....	6
2.1 Spill Contingency Plan	6
2.2 Emergency Response Plan.....	6
2.3 Oil Pollution Emergency and Prevention Plan.....	6
2.4 Shipboard Oil Pollution Emergency Plan	7
Section 3 • Applicable Federal Acts, Regulations and Guidelines.....	8
Section 4 • Marine Wildlife	11
4.1 Interactions and Potential Effects	11
4.2 Mitigation Measures	11
4.3 Monitoring and Reporting	13
Section 5 • Navigational Safety	14
Section 6 • On Board Waste Management	15
6.1 Sewage.....	15
6.2 Solid Waste	17
Section 7 • Ballast Water Management.....	19
7.1 Ballast Water Exchange	21

Section 8 • Safety	23
Section 9 • Hazard Identification Analysis of Marine Routes.....	24
Section 10 • Risk Analysis of Marine Routes	25
Section 11 • Socio-Economic Impact of Shipping.....	27
Section 12 • Public and Media Communications	28
References	29

FIGURES AND TABLES

Figure 1-1 Shipping Route	3
Table 3-1 Applicable Acts, Regulation, and Guidelines	8
Table 3-2 International Conventions and Protocols Signed by Canada	9

APPENDICES

Appendix A • Marine Mammal and Seabird Management and Monitoring Plan

DOCUMENT CONTROL

Version	Date	Section	Page	Revision	Author
1	June 2016	All	All	First draft of plan prepared as part of the FEIS submission.	Golder Associates Ltd.
2	April 2018	All	All	Comprehensive review to ensure plan reflects most up to date information and incorporates Project Certificate 008 Conditions.	Agnico Eagle Mines Ltd.
3_NIRB	December 2018	All	All	Shipping Management Plan as Supporting Document submitted to Nunavut Impact Review Board for review and approval as part of Whale Tail Pit – Expansion Project	Agnico Eagle Mines Ltd.
4	April 2022	Executive Summary	i - ii	Removed references to the Whale Tail Pit – Expansion Project	Agnico Eagle Mines Ltd.
		Section 1	1	Introduction updated to remove references to the Whale Tail Pit – Expansion Project	
		Section 6	15 – 18	Addition of information pertaining to the Arctic Shipping Safety and Pollution Prevention Regulations (ASSPPR)	
		References	28	Updated	
		Appendix B		Updated sheets for MMSO added	
5	March 2025	Acronyms	vii	Updated list of Acronyms	Agnico Eagle Mines Ltd.
		Introduction	1	Updated to include reference to the Ballast Water Regulations.	
		Table 3-1	8	Updated references in table	
		Section 7	19-21	Section updated to include information on <i>The Ballast Water Regulations</i> .	
		Section 7.1	21-22	Inclusion of ballast water exchange standards	
		Appendix A		Appendix A changed to MMSO Monitoring Plan	

Prepared By: *Meadowbank Environment Department*

Approved by: 

Eric Haley
Environment & Critical Infrastructures Superintendent

ACRONYMS

ANFO	Ammonium Nitrate / Fuel Oil
ASSPPR	Arctic Shipping Safety and Pollution Prevention Regulations
AWPPA	Arctic Waters Pollution Prevention Act
BWMC	Ballast Water Management Convention
BWMP	Ballast Water Management Plan
BWMS	Ballast Water Management System
CCG	Canadian Coast Guard
CSA	Canada Shipping Act
ERP	Emergency Response Plan
ERT	Emergency Response Team
FEIS	Final Environmental Impact Statement
IMDG	International Maritime Dangerous Goods
IMO	International Marine Organization
IOPP	International Oil Pollution Prevention
LOA	Length Overall
MARPOL	International Convention for the Prevention of Pollution from Ships
MLA	Marine Liability Act
MMSO	Marine Mammal and Seabird Observer
MPP	Multipurpose Vessels
NIRB	Nunavut Impact Review Board
NWB	Nunavut Water Board
OHF	Oil Handling Facility
OPEP	Oil Pollution Emergency Plan
OPPP	Oil Pollution Prevention Plan
REET	Regional Environmental Emergencies Team
SOLAS	International Convention for the Safety of Life at Sea
SOPEP	Shipboard Oil Pollution Emergency Plan

SECTION 1 • INTRODUCTION

Agnico Eagle Mines Limited – Meadowbank Complex (Agnico Eagle) has gained extensive experience in shipping fuel and dry cargo to the Meadowbank Mine since its construction began in 2008 and commercial production in 2010. The extension of the Meadowbank mine through the Whale Tail Mine utilizes shipping arrangements already in use for the Meadowbank Mine and does not incur a change in shipping procedures (Figure 1-1).

This plan has been updated as per recommendation of Transport Canada to include updated references to the Ballast Water Regulations, SOR/2021-120. This plan was prepared to comply with the Whale Tail NIRB Project Certificate 008 Condition 37 (NIRB 2018) and Nunavut Water Board (NWB) Type A Water License 2AM-WTP1830. In addition, this Plan will be updated as required to reflect any changes in operation or economic feasibility, and to incorporate new information or the latest technology, as appropriate.

1.1 Shipping Needs

A total of approximately 180,000 cubic metres of dry cargo (equipment and supplies) and approximately 95 million liters of diesel fuel will be required annually for the operations of the Mine. To meet these needs, a total of three to eight vessels will annually deliver dry goods, and two to three tankers will deliver diesel fuel annually.

All shipping will be carried out during the open water season (typically from July to late October) and will follow recommended shipping routes¹ that are presently in use for the annual sea lift to Chesterfield Inlet, Baker Lake and other communities. Ice breaking is not conducted by Agnico Eagle shipping providers to extend the shipping season.

The priorities in shipping dry cargo and fuel will be:

- The protection of the crew and others in small boats that the ship may come across;
- The protection of the marine environment; and
- The preservation of the ship and its cargo.

All ships, tugs, and tankers will be equipped with electronic navigational aids. Ships will not be serviced in Chesterfield Inlet and will arrive with enough fuel for the return voyage south.

¹ Agnico Eagle's shipping routes within Nunavut are non-compulsory pilotage areas during the ice free shipping season.

1.2 Shipping Routes

The marine transport of dry cargo will be comprised of five main segments, all within established shipping lanes:

- Bécancour, Québec on the St. Lawrence River, along the coast of Labrador to Hudson Strait;
- Through Hudson Strait to Hudson Bay;
- Across Hudson Bay to the mouth of Chesterfield Inlet;
- Through Chesterfield Inlet to an anchorage point at Helicopter Island at the head of Chesterfield Inlet; and
- Through Chesterfield Narrows to the hamlet of Baker Lake (located on northwest shore of Baker Lake).

Dry cargo will be loaded on multipurpose (MPP) vessels, class: GL + 100 A5 E3 (LOA 138.98 m, draft 8 m, freight capacity ~ 19,000 m³) in eastern ports, almost exclusively Bécancour, and delivered directly to the lightering point near Helicopter Island by the contracted shipping company. The first vessels of the year will normally arrive in July or early August. As these ships are too large to navigate Chesterfield Narrows (navigational passage between Chesterfield Inlet and Baker Lake), they will anchor near Helicopter Island (Figure 1-1) at the head of Chesterfield Inlet, where the dry cargo will be lightered onto barges for transport to Baker Lake. Up to eight MPP vessels will arrive throughout the open water shipping season delivering dry cargo. All ships will be equipped with complete electronic navigation aids for navigation in restricted waters.

Fuel (Diesel and Jet A) will be loaded on marine fuel tankers and delivered to the lightering point near Helicopter Island by the contracted shipping company. Once the fuel tankers are securely anchored, fuel is transferred to smaller shuttle tankers. The shuttle tankers then transport the fuel shipment through Chesterfield Narrows to the Meadowbank Mine fuel storage area in Baker Lake.

1.3 Lightering Procedures

1.3.1 Dry Cargo

After dry cargo vessels have anchored at Helicopter Island, dry cargo will be lightered onto the transport barges in preparation for transportation to the Meadowbank barge unloading facilities in Baker Lake. During lightering onto the barges, attention will be directed to ensuring the barges are secured alongside or anchored, with due consideration being given to the prevailing and expected wind, weather, and tide conditions.

The tug-assisted barge used to ferry dry cargo to Baker Lake will be highly maneuverable and capable of transiting the access passage with its changing current patterns. Navigation will proceed at a slow speed in periods of low visibility. Traffic through the access passage will be coordinated through communication between the tugs to avoid shipping conflicts and to ensure safety.

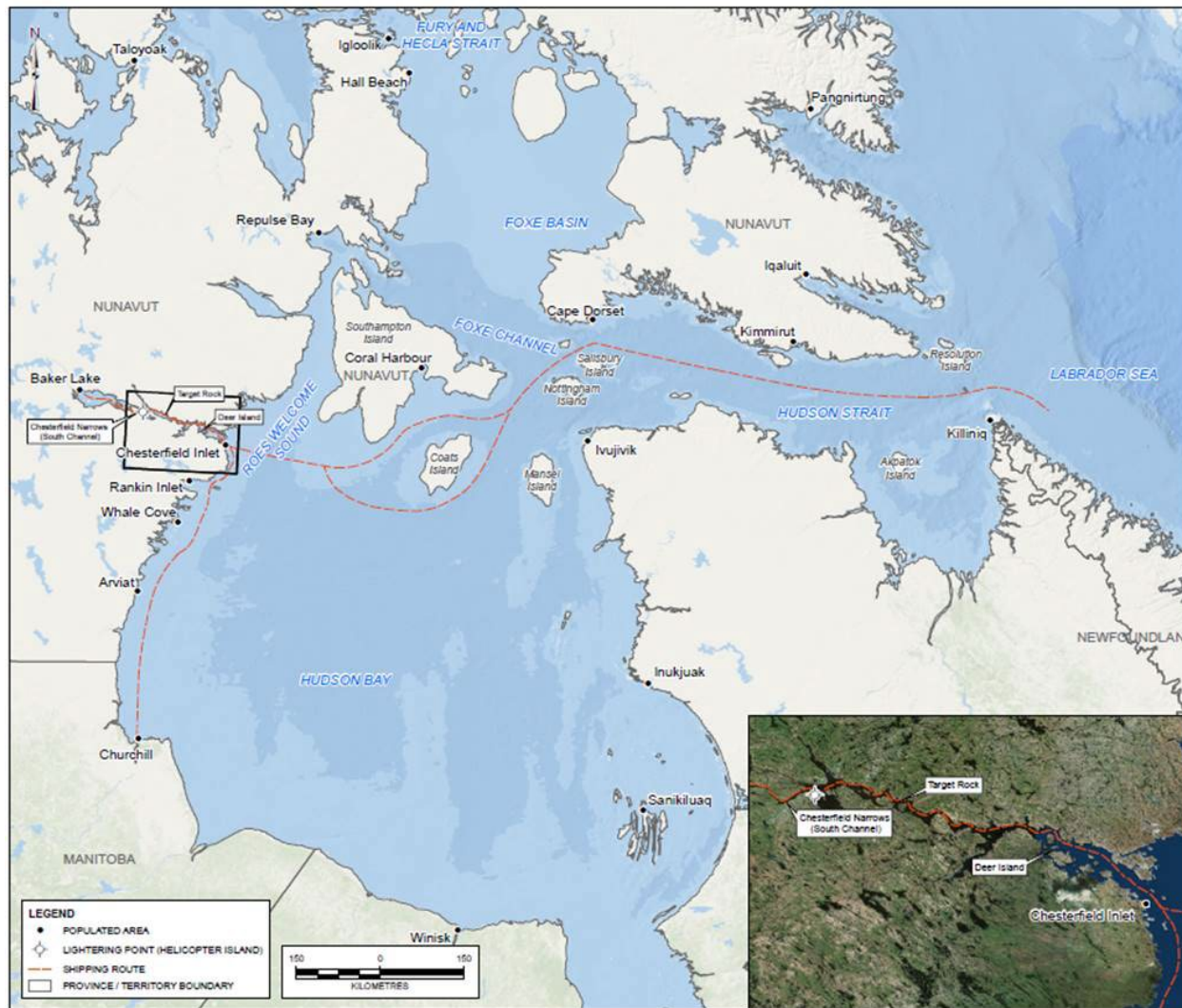


Figure 1-1 Shipping Route

The Master of each vessel (including tugs, barges, large and small tankers, and cargo ships) will be responsible for safe navigation of their vessels between the port of departure and point of destination (Helicopter Island and Baker Lake). For tugs, this also includes responsibility for navigational safety of the barge they are towing or pushing. When a barge is laid alongside a dry cargo vessel for lightering containers or equipment, a loading supervisor on the ship will take charge of the barge.

Outgoing containers, cargo and materials will be loaded on barges in Baker Lake and then transported to Helicopter Island where it will be loaded onto the cargo ship for the return trip to southern ports. Outgoing cargo could include demobilized construction equipment, hazardous and non-hazardous waste sent to a certified waste management facility for treatment, recycling or disposal in another provincial or territorial jurisdiction.

1.3.2 Diesel Fuel

It is expected that the large tankers delivering diesel fuel will anchor in the same general location as the dry cargo vessels (i.e., near Helicopter Island; Figure 1-1). Transfer of fuel will occur from the tanker to a smaller shuttle tanker that can navigate the passage between Helicopter Island and Baker Lake. The shuttle tanker will be offloaded at the Meadowbank Complex barge unloading facilities and the fuel will be transported to the Meadowbank and Whale Tail tank farms. Contingency measures related to the transfer of fuel are described in the Oil Pollution Emergency Plan and Oil Pollution Prevention Plan (OPEP/OPPP).

1.3.3 Explosives and Hazardous Materials

Explosive management and blasting practices will be consistent with the practices already in place for the Mine. Explosives will be stored at the Whale Tail site, where an emulsion storage facility and plant will continue to be used. The existing emulsion plant at the Meadowbank Mine may be maintained with deliveries on an as need basis during operations. The Mine will primarily use emulsion-based explosives during construction and operations to minimize the use of ammonium nitrate/fuel oil (ANFO).

It is Agnico Eagle's intent to prioritize the road transport of hazardous materials, including explosive-related materials, to the Mine site to avoid having such cargo remain in storage at Baker Lake. Sensitive products such as explosives, boosters and caps will be transported directly to the Mine site. However, in the possibility of a delay in their transit to the mine site, these products will be temporarily stored at the Meadowbank Complex laydown area in Baker Lake according to applicable regulations, which include locked storage under constant surveillance. All handling, transport, storage, manufacture and use of explosives will be subject to federal approval under the *Explosives Act*, and the *Nunavut Mine Health and Safety Act*.

Sodium cyanide is used to optimize gold recovery from the ore. This product will continue to be used at the Mine. Due to transportation restrictions, a full year's supply of sodium cyanide will generally be transported and stored on site. The product will be transported, stored, handled, transferred and used

in compliance with appropriate legislation and applicable Best Management Practices. Agnico Eagle is a signatory to the International Cyanide Management Code.

Hazardous waste and contaminated soil will be managed on a yearly basis consistent with the management approach in place for the Mine; consequently, there will be little to no accumulation of such wastes at the Mine site during operations, subject to seasonal shipping considerations. Hazardous waste will not be incinerated but returned south via a dry-cargo vessel for treatment, recycling and/or disposal in a certified waste management facility. Agnico Eagle will contract shipping companies that are certified under the International Maritime Dangerous Goods (IMDG) code.

SECTION 2 • RELATED DOCUMENTS

The Shipping Management Plan (the Plan) covers the scope of shipping activities for the Mine.

Management and monitoring plans for the Mine that provided input into the Shipping Management Plan include the following:

- Spill Contingency Plan;
- Emergency Response Plan;
- Oil Pollution Emergency Plan and Oil Pollution Prevention; and
- Shipboard Oil Pollution Emergency Plan (shipping companies).

2.1 Spill Contingency Plan

The cornerstone of spill planning for Agnico Eagle is the Spill Contingency Plan covering all spills on land, water, and ice. The Spill Contingency Plan, coupled with the Emergency Response Plan, describes the processes to be followed when responding to a spill to the environment.

2.2 Emergency Response Plan

The Emergency Response Plan (ERP) focuses on responding to emergencies in a timely and adequate manner. It commits Agnico Eagle to being prepared for and providing adequate resources - qualified personnel and equipment - to handle a wide variety of emergency situations.

Risk and hazard assessments of shore-based marine response activities will be undertaken as part of training for the Agnico Eagle Emergency Response Team (ERT).

2.3 Oil Pollution Emergency and Prevention Plan

The Oil Pollution Emergency Plan and Oil Pollution Prevention Plan complement the Spill Contingency Plan and only provides contingency planning for storage of hydrocarbon products at the Baker Lake Oil Handling Facility (OHF).

The OPEP/OPPP complies with the requirements for procedures, equipment and resources as set out in the *Canada Shipping Act* (s.s. 660.2(4)) specific to the fuel handling facility, the bulk incoming transfer of fuel from ship-to-shore and spill scenarios directly relating to this operation. Further, the OPEP/OPPP provides direction to Agnico Eagle personnel and/or contractors, and to Agnico Eagle's ERT in emergency spill response situations. It also contributes in developing oil pollution scenarios, defining the roles and responsibilities of management and responders, and outlining the measures taken to prevent spills. The OPEP/OPPP seeks to minimize potential health and safety hazards, and environmental damage.

Spills resulting from ship-to-ship fuel transfer will be the responsibility of the shipping companies contracted by Agnico Eagle and the vessel's Master. Agnico Eagle will provide assistance wherever possible in the event of a spill in these instances.

2.4 Shipboard Oil Pollution Emergency Plan

The Shipboard Oil Pollution Emergency Plan (SOPEP) will contain all information and operational instructions as required by the International Marine Organization's (IMO) *"Guidelines for the Development of the Shipboard Marine Pollution Emergency Plan"*. Vessels contracted by Agnico Eagle are required to have an approved SOPEP. The preparation of the SOPEP is the responsibility of the shipping company and is maintained by the vessel's Master. However, close coordination will be maintained with Agnico Eagle's shore-based supervisors who can activate the ERP and OPEP to provide assistance to a vessel in the near-shore area. These two plans will have close links to the SOPEP and, as required, will include training exercises at regular intervals to ensure ship and shore can cooperate in response to spills of fuel or other hazardous product in the immediate vicinity of Baker Lake. SOPEP(s) will be required to include how vessel contractor(s) will maintain spill equipment, and the frequency and framework for training vessel personnel in vessel-based spill response. This may include, but not be limited to:

- Spill equipment audits;
- Maintaining posted list of spill equipment;
- Requirements for spill response drills; and
- On-going training refreshers (e.g., annual renewals).

Accidents or malfunctions during transit will be reported to Transport Canada. If the accident involves the loss of fuel or chemicals, the SOPEP would be activated and on-board spill response materials and equipment put to use. Spills would also be reported to the Government of Nunavut Spill Line and to the Environmental Emergencies 24-Hour Report Line and, if necessary, advice would be requested from the Regional Environmental Emergencies Team. Assistance could be sought from nearby ships and the Canadian Coast Guard (CCG). Spill response resources such as those maintained by the CCG at select locations along the Kivalliq Region coast could be dispatched to the spill site.

Outside assistance could be requested for major accidents such as accidental grounding/stranding of a vessel. Under these circumstances, the safety of the crew and responders, as well as maintaining the integrity of the vessel is the priority.

SECTION 3 • APPLICABLE FEDERAL ACTS, REGULATIONS AND GUIDELINES

The Shipping Management Plan was prepared in accordance with federal legislation outlined in Table 3-1. Numerous regulations exist under the *Canada Shipping Act* and these can be found at www.tc.gc.ca. The regulations included here are most relevant to the environment and the Plan.

Table 3-1 *Applicable Acts, Regulation, and Guidelines*

Acts	Regulations	Guidelines
<i>Canada Shipping Act</i> , 2001 (S.C. 2001, c. 26) [An Oil Pollution Emergency Plan is required under the Act (168(1)d)]	<i>Response Organizations Regulations</i> (SOR/95-405) <i>Environmental Response Regulations</i> (SOR/2019-252) <i>Ballast Water Regulations</i> (SOR/2021-120) <i>Vessel Pollution and Dangerous Chemicals Regulations</i> (SOR/2012-69)	Environmental Prevention and Response National Preparedness Plan 2008 – TP13585 Guidelines for Reporting Incidents Involving Dangerous Goods, Harmful Substances and/or Marine Pollutants 2009 – TP9834E Arctic Waters Oil Transfer Guidelines, 1997 - TP10783E Response Organizations Standards – 2019 TP 14909E List of Canada’s Designated Alternate Ballast Water Exchange Areas and Fresh Waters, 2024 – TP 13617E
<i>Canadian Transportation Accident Investigation and Safety Board Act</i> (S.C. 1989, c. 3)	<i>Transportation Safety Board Regulations</i> (SOR/2014-37)	
<i>Marine Liability Act</i> (S.C. 2001, c. 6)	<i>Marine Liability and Information Return Regulations</i> (SOR/2016-307)	
<i>Arctic Waters Pollution Prevention Act</i> (R.S.C., 1985, c. A-12)	<i>Arctic Shipping Safety and Pollution Prevention Regulations</i> (SOR/2017-286) <i>Arctic Waters Pollution Prevention Regulations</i> (C.R.C., c. 354)	
<i>Transportation of Dangerous Goods Act</i> (1992, c.34)	<i>Transportation of Dangerous Goods Regulations</i> (SOR/2001-286)	
<i>Safe Containers Convention Act</i> (R.C.C. 1985, c. S-1)		
<i>Oceans Act</i> (S.C. 1996, c. 31)		
<i>Navigable Waters Protection Act</i> (R.S. 1985 c. N-22)		
<i>Canada Water Act</i> (1985 c.11)		
<i>Fisheries Act</i> (R.S.C. c. F-14)	<i>Marine Mammal Regulations</i> (SOR/93-56)	

Acts	Regulations	Guidelines
<i>Species at Risk Act (2002 c.29)</i>		Species at Risk Policies
<i>Canadian Environmental Protection Act (1999 c.33)</i>	<i>Environmental Emergency Regulations (SOR/2003-307)</i> <i>Interprovincial Movement of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2002-301)</i> <i>Release and Environmental Emergency Notification Regulations</i> <i>Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (SOR/2008-197)</i>	

Table 3-2 lists international conventions and protocols signed by Canada. Canada is a signatory to IMO International Convention for the Prevention of Pollution from Ships (MARPOL) and International Convention for the Safety of Life at Sea (SOLAS). As such, Canadian marine laws, regulations and guidelines rules are a reflection of these international conventions, protocols and agreements.

Table 3-2 International Conventions and Protocols Signed by Canada

Conventions	
International Convention for the Prevention of Pollution from Ships MARPOL 73/78 Annexes	
	Objective of Annex is to Prevent Pollution from:
Annex 1	Oil from ships
Annex 2	Noxious liquid substances carried in bulk
Annex 3	Harmful substances carried by ships in packaged form
Annex 4	Sewage treatment and disposal
Annex 5	Garbage handling
Annex 6	Air Pollution from Ships
International Maritime Dangerous Goods Code	
International Convention for the Safety of Life at Sea, 1974, SOLAS 74	

At this time, Agnico Eagle has contracted NSSI and Woodward Group of Companies to be used in Mine site shipping to Baker Lake. However, the shipping companies could change over the construction, operations and closure phases of the Mine. It is required that the shipping contractors to be used by Agnico Eagle abide by Canadian laws and regulations, applicable MARPOL 73/70 annexes, and international conventions. This is also a requirement of NIRB Project Certificate 008 Condition 43. Inspections carried out by federal inspectors will ensure that all applicable statutes are followed. This could include the review of required plans (SOPEP), an audit of the emergency response equipment

carried by the vessel, and the means to prevent the discharge of any oil, oily water or other hazardous waste in Arctic waters.

All vessels transiting through and operating in Canadian Arctic waters are required to comply with the *Arctic Waters Pollution Prevention Act* (AWPPA), the *Canada Shipping Act 2001* (CSA 2001), the *Marine Liability Act* (MLA) and their associated regulations, including requirements for vessel construction and operations (see Table 3-1). While the provisions of the CSA 2001 apply in all Canadian waters, vessels in Arctic waters north of 60°N and out to the 200 nautical mile limit of Canada's Exclusive Economic Zone are also subject to the provisions of the AWPPA. The AWPPA prohibits discharges of oil, chemicals, garbage and other waste generated onboard vessels. It does allow for the discharge of untreated sewage². The MLA sets out a regime that requires vessels operating in Canadian jurisdiction, including Arctic waters, to carry insurance to pay for damages from oil spills.

Two vessel control systems are established under the *Arctic Shipping Pollution Prevention Regulations* – the Zone/Date System and the Arctic Ice Regime Shipping System, which provide for operational safety by taking into account the vessel's capability to operate safely by virtue of ice strengthening, and the ice conditions it will encounter³.

Vessels servicing the Mine will be required to comply with the AWPPA and regulations while in a Shipping Safety Control Zone.

The certified shipping companies contracted by Agnico Eagle must have an approved SOPEP, and must verify that equipment and operating procedures are consistent with Canadian Marine laws, regulations and guidelines, and with IMO agreements to which Canada is a signatory.

Agnico Eagle will provide the necessary human, material, and financial resources to meet the legal requirements attributable to the company that arise from shipping. Shipping contractors will be encouraged to do the same.

² AWPPA allows for the discharge of untreated sewage, however Ships are to only discharge gray water and treated sewage when the ship is at least 50 km from Chesterfield Inlet.

³ Agnico Eagle will only ship dry goods and fuel during the open water season.

SECTION 4 • MARINE WILDLIFE

Marine mammals have been the basis of the Inuit economy for over 4,000 years. They provide meat, fat, oil, leather, tools and materials for fabrication of arts and crafts. The top layers of the skin yield "muktuk", which is still highly prized as a food rich in vitamin C and high in energy content (DFO,1990).

The reaction of marine wildlife to vessel traffic is predicted not to be significant and, providing mitigation measures are employed, marine vessel traffic associated with the Mine should not lead to any residual effects to marine wildlife (refer to the FEIS Addendum: Whale Tail Pit – Expansion Project, Volume 3, Appendix 3-A). Agnico Eagle requires ships to be mindful of marine areas having a high density of marine mammals and birds. Agnico Eagle will include shipping tracks as part of annual reporting.

4.1 Interactions and Potential Effects

Vessel discharges (e.g bilge water, ballast water), the sight of the vessels and their movement, vessel noise, as well as accidental spills and releases have the potential to interact with and disturb marine wildlife and affect life cycle activities. Possible interactions between shipping and marine wildlife can have the following potential effects:

- marine mammals may retreat to the water should a vessel pass too close to an island or reef where they have pulled themselves out of the water;
- the foraging of marine birds and mammals may be interrupted when vessels approach and pass them in the shipping lanes;
- the improper treatment and release of ballast water, grey water and bilge water could alter the water quality;
- mammal mortalities may result from collisions with the ship; and
- fuel and/or oil spills could result in mortalities and, for marine birds, could lead to the loss of foraging and brood rearing habitat.

4.2 Mitigation Measures

As part of shipping companies' standard operating procedures, ship crews will monitor for marine mammals from the Hudson Strait to the lightering point near Helicopter Island. Since 2010, the Meadowbank Complex has implemented a vessel-based Marine Mammal and Seabird Observer (MMSO) program, which will continue to be implemented during all routine shipping activities along the shipping route, in accordance with Meadowbank Mine NIRB Project Certificate No. 004 Condition 36 (NIRB 2006).

The ship's Master will be notified if there is a concern of the ship striking a marine mammal. Ship personnel will make a decision if actions are required to avoid a possible collision. This may include, if safe to do so, slowing the ship until the animal has travelled clear of the ship's course. Subject to

vessel and human safety considerations, ship personnel shall take every precaution to avoid disturbance, harassment, injury or mortality of marine wildlife by implementation of the following mitigation measures:

- Adherence to monitoring requirements as outlined in the vessel-based MMSO program (Appendix A);
- Ships will, when possible, maintain a straight course and constant speed, and avoid erratic behaviour;
- Use a routing south of Coats Island as the primary shipping route (Figure 1-1)⁴;
- Marine mammals will be given right of way as safe navigation allows; under no circumstances, other than in the case of an emergency, will ships approach within 300 m of a walrus or polar bear observed on sea ice⁵;
- Ships will maintain a setback distance of at least 500 meters from colonies and aggregations of seabirds and marine mammals during Mine shipping transiting through Hudson Strait, Hudson Bay, and Chesterfield Inlet⁶;
- If marine mammals approach within 500 m of a ship, the vessel will reduce its speed and, if possible, cautiously move away from the animal;
- If it is not possible for the ship to move away from or detour around a stationary marine mammal or group of marine mammals, the ship will reduce its speed and wait until the animal(s) move to the side and remain at least 500 m from the ship prior to resuming speed;
- When marine mammals appear to be trapped or disturbed by ship movements, the ship will implement appropriate measures to mitigate disturbance, including stoppage of movement until the marine mammal has moved away from the immediate area;
- The ship will not be operated in such a way as to separate an individual member(s) of a group of marine mammals from other members of the group;
- When weather conditions require, such as when visibility decreases, the ship will adjust its speed accordingly to avoid the likelihood of the ship striking an animal;
- Barge-tug or shipping vessels would only travel through the near shore islands and reefs when there is good visibility or adjust their speed according to the conditions;
- Monitoring and reporting procedures for ship-bird collisions will be implemented, and any incidents of bird mortalities associated with ship operations will be recorded and reported to Environment and Climate Change Canada (Canadian Wildlife Services);
- Ballast water will only be released as allowed under the current regulations and if there is no marine wildlife in the area; and

4 In accordance with Condition 38 of NIRB Project Certificate 008

5 As all shipping will occur during the open water season, collision with young seals in liars will not happen.

6 In accordance with Condition 39 of NIRB Project Certificate 008

- Bilge water, grey water and sewage will be properly treated and only released as allowed under the current regulations in areas where no marine wildlife is present.

Marine wildlife could be negatively affected by coming in contact with any petroleum product spilled from ships in transit. In the event of a spill, the ship personnel will discourage marine wildlife from coming in contact with the spilled material. The product most likely to be spilled from Mine-related shipping would be diesel fuel, which floats on the water surface and has a high rate of evaporation. These occurrences are expected to be rare and the activation of the SOPEP in the unlikely event of a spill would significantly reduce their impact. Preventive and contingency measures already in place substantially reduce the risk to marine wildlife from spills.

Adaptive management will allow mitigation measures to be modified in response to new information arising from monitoring carried out by the vessel crews and from traditional knowledge.

4.3 Monitoring and Reporting

As in the past, monitoring will continue using Inuit Marine Wildlife Monitoring aboard the vessels between Helicopter Island and Baker Lake, in accordance with Meadowbank Mine NIRB Project Certificate 004 Condition 36 and Whale Tail NIRB Project Certificate 008 Condition 42. In addition, as per Condition 40 of Project Certificate 008, a vessel-based MMSO program will be implemented during all routine shipping activities in the shipping route. This program, described in further detail in Appendix A, will be executed by assigned observers stationed on-board vessel(s). Agnico Eagle will continue to report the observations annually to the Nunavut Impact Review Board (NIRB).

SECTION 5 • NAVIGATIONAL SAFETY

The most likely areas where interactions may occur between vessels are:

1. Chesterfield Inlet;
2. The passage between Chesterfield Inlet and Baker Lake; and
3. Where the ship is transiting through the near shore islands and reefs offshore of Chesterfield Inlet.

Mitigation measures to safeguard the safety of those in small boats will include the following:

- Agnico Eagle and/or the shipping operator will consult with the community members mooring or beaching their boats in Chesterfield Inlet regarding scheduled ship transits throughout the Regional Study Area, including Hudson Bay and Chesterfield Inlet⁷; protocols will be developed to minimize the interaction between barge-tug or ship and small boats;
- Vessels would only travel through the near shore islands and reefs when there is good visibility or adjust their speed according to the conditions, which would allow the ship and the small boats to be in visual contact;
- Vessels will restrict themselves to the recommended shipping routes thereby not surprising any small boat travelling outside the shipping lanes; and
- Vessels will sound its horn if a small boat seems unaware of its presence and has not responded to communication attempts.

⁷ In accordance with Condition 41 of NIRB Project Certificate 008

SECTION 6 • ON BOARD WASTE MANAGEMENT

The six (6) annexes of MARPOL promote the elimination of deliberate, negligent or accidental discharge of ship-source pollutants into the marine environment (see also Transport Canada 2009). The list of harmful ship-source discharges includes: oil, noxious liquid substances and dangerous chemicals, sewage, garbage and air pollution. Canadian laws and regulations mirror the MARPOL annexes and conventions. The Arctic Shipping Safety and Pollution Prevention Regulations (ASSPPR), developed under the CSA 2001 and Arctic Waters Pollution Prevention Act, incorporates the International Code for Ships Operating in Polar Waters with the addition of specific Canadian modifications designed to provide clarity on discharge requirements for the prevention of pollution by oil, sewage, and garbage from vessels, as well as the control of pollution by noxious liquid substances in bulk. The pollution prevention sections of the ASSPPR apply to all Canadian vessels operating in polar waters and it is the vessel's responsibility to be in compliance with the regulation. The primary objectives of the Regulations are to (Transport Canada, 2018):

- Introduce a new safety and pollution prevention requirements through the application of the Polar Code to certain Canadian flagged vessels operating in Polar Regions
- Ensure the continuation of existing levels of safety and pollution prevention currently applicable to certain vessels operating within the Canadian Arctic (e.g. complete prohibition of most discharges); and
- Modernize existing elements of the safety and pollution prevention regime for certain vessels operating in the Canadian Arctic and for Canadian flagged vessels operating in the Polar Regions

Agnico Eagle will contract vessels that meet applicable environmental requirements in addition to being reliable and having a superior safety record.

6.1 Sewage

Vessels are to have an approved sewage treatment plant that meets Canadian standards⁸. Holding tanks with the capacity for grey and treated sewage while in port are expected to be part of the ship's infrastructure. The ASSPPR states a Canadian vessel of a gross tonnage of 400 or more of a Canadian vessel that is certified to carry more than 15 persons – must not discharge sewage in polar waters other than arctic waters, unless the discharge is made in accordance with the below conditions:

- a) When the sewage is comminuted and disinfected, the deposit is made in accordance with regulation 11.1.1 of Annex IV to MARPOL and the vessel is located at a distance of at least

⁸ If all sewage is to be incinerated, there will not be any need for sewage treatment.

three nautical miles from an ice-shelf or fast ice, and is as far as practicable from areas of ice concentrations exceeding 1/10;

b) When the sewage is not comminuted or disinfected, the deposit is made in accordance with regulation 11.1.1 of Annex IV to MARPOL and the vessel is located at a distance of at least 12 nautical miles from an ice-shelf or fast ice, and is as far as practicable from areas of ice concentration exceeding 1/10; or

c) When the vessel operates a sewage treatment plant of an approved type, the deposit is made in accordance with regulation 11.1.2 of Annex IV to MARPOL and the vessel is as far as practicable from the nearest land, ice-shelf, fast ice or areas of ice concentration exceeding 1/10.

A vessel of a gross tonnage of more than 15 and less than 400 and that is not certified to carry more than 15 persons — or a person on board such a vessel — may deposit sewage if:

a) The sewage is comminuted and disinfected using a marine sanitation device that meets the requirements of section 90 of the Vessel Pollution and Dangerous Chemicals Regulations and the deposit is made at a distance of at least one nautical mile from shore, an ice-shelf or fast ice, and is as far as practicable from areas of ice concentrations exceeding 1/10;

(b) The deposit is made while the vessel is en route at the fastest feasible speed, at a distance of at least three nautical miles from shore, an ice-shelf or fast ice, and is as far as practicable from areas of ice concentration exceeding 1/10; or

(c) The requirements of paragraph (b) cannot be met because the distance between any shore, ice-shelf or fast ice is less than six nautical miles, and the deposit is made while the vessel is en route at a speed of at least four knots, or if the deposit is not feasible at this speed, the deposit is made

(i) During an ebb tide, while the vessel is en route, at the fastest feasible speed into the deepest waters that are located the farthest from shore, or

(ii) While the vessel is en route at the fastest feasible speed and into the deepest and fastest moving waters that are located the farthest from shore.

In adherence to the ASSPPR regulations, Agnico Eagle will advise ships that disposal of wastewater into the environment is to be avoided within 50 km of Chesterfield Inlet.

Sewage sludge from the sewage treatment plant can be incinerated in the on-board incinerator.

6.2 Solid Waste

If deemed necessary by the carrier, solid waste materials are to be incinerated on board, disposed of in an approved landfill or shipped south for safe disposal to a certified waste management facility. No solid waste materials will be disposed of in the marine environment.

As per the ASSPPR, operations in polar waters must be taken into account in the Garbage Record Book, the garbage management plan, and the placards as required by the Vessel Pollution and Dangerous Chemicals Regulations. It is the vessel's responsibility to ensure that the regulation is being followed.

For the purposes of subsection 4(1) of the Arctic Waters Pollution Prevention Act, waste may be deposited if:

- (a) The deposit is necessary for the purpose of saving a life, securing the safety of a vessel or preventing the immediate loss of a vessel;
- (b) The deposit occurs as a result of an accident of navigation in which a vessel or its equipment is damaged, unless the accident occurs as a result of an action that is outside the ordinary practice of seafarers;
- (c) In the case of oil, the deposit is a minimal and unavoidable leakage that occurs as a result of the operation of an underwater machinery component;
- (d) In the case of fishing gear, the deposit is an accidental loss and all reasonable precautions were taken to prevent such a loss;
- (e) In the case of fishing gear, the deposit is for the protection of the marine environment or for the safety of that vessel or its crew; or
- (f) In the case of garbage, the deposit is the result of damage to a vessel or its equipment, when all reasonable precautions were taken before the occurrence to prevent and minimize the deposit, and after the occurrence to minimize it

The design and operation of shipboard incinerators in Canada are specified under the IMO, Marine Environmental Pollution Committee 76 (40), Annex V. Standard specifications for shipboard incinerators allow for the incineration of solid wastes approximating in composition to household waste and liquid wastes arising from the operation of the ship, e.g., domestic waste, cargo-associated waste, maintenance waste, operational waste, cargo residues, and fishing gear. Operating temperatures are similar to those for the incinerator at the Mine, and flue gases are cooled rapidly to limit the *in vivo* formation of dioxins.

Tugs will remain in Baker Lake for the duration of the shipping season. Their waste will be incinerated and the ash will be shipped to a certified waste management facility at the end of the shipping season for treatment, recycling, and/or disposal.

Hazardous waste will shipped to a certified waste management facility for treatment, recycling, and/or disposal.

SECTION 7 • BALLAST WATER MANAGEMENT

Ballast water is essential to control trim, list, draught, stability, and/or stresses on a vessel. The *Ballast Water Regulations* came into force on June 3, 2021, and are intended to outline proper management and treatment of ballast water to minimize the probability of introduction of harmful aquatic organisms and pathogens from vessels' ballast water while also protecting the safety of vessels. The Regulations apply to the management of any quantity of ballast water that may be released from a vessel.

The Regulations repeal the *Ballast Water Control and Management Regulations* and:

- (a) Apply to Canadian vessels everywhere and all vessels in waters under Canadian jurisdiction;
- (b) Impose requirements based on the vessel's length, its ballast water capacity, its date of construction, and its area of operation; and
- (c) Maintain foundational requirements from the former regulations that can still be applied to the amended regime, such as reporting requirements.

Vessels to which the Regulations apply are divided into four groups:

1. **International vessels:** Vessels that operate internationally will be required to be in compliance with the International Convention for the Control and Management of Ship's Ballast Water and Sediments (Convention) regime, which requires that vessels:
 - Have on board and implement an approved vessel-specific Ballast Water Management Plan (BWMP);
 - Be surveyed and carry a Ballast Water Management Certificate (BWMC);
 - Meet a performance standard that limits the number of organisms capable of reproducing in order to reduce the risk of aquatic species invasions (vessels are expected to use a Ballast Water Management System (BWMS) to meet the performance standard);
 - Record ballast water operations and maintain a Ballast Water Record Book on board; and
 - Be subject to inspections in ports or offshore terminals to ensure compliance.

These vessels will also be subject to some former provisions that remain relevant and are not part of the Convention regime:

- To flush otherwise-empty ballast tanks with open ocean water in order to reduce the risk posed by any residual ballast water and sediments;
- To exchange and flush ballast tanks in addition to meeting the performance standard when traveling to Canadian fresh waters (from outside of waters under Canadian jurisdiction, the Great Lakes and the high seas);

- To conduct any exchange or flushing operation in waters at least 2,000 metres deep, whenever possible; and
- To report on the provenance and management of ballast water released in Canada.

The Regulations will require all vessels on international voyage to comply with the Convention's requirements. The Convention requires vessels traveling internationally and built on or after September 8, 2017, to meet the performance standard when the vessel is launched. Conversely, as per the Convention, vessels built before September 8, 2017, will be required to meet the performance standard using a phased-in approach from 2019 to 2024.

2. **Domestic and Great Lakes vessels:** These vessels include those that operate exclusively in waters under Canadian jurisdiction, as well as those that operate there and at United States Great Lakes ports and/or on the high seas. To address the spread of species within Canada, domestic and Great Lakes vessels will be required to comply with the same applicable requirements as vessels in Group 1 above. However, those vessels constructed in or after 2009 will have until September 8, 2024, to come into compliance with the performance standard, while those vessels constructed before 2009 will have until September 8, 2030, to come into compliance.

Non-party vessels (e.g., United States vessels) that transit through Canadian waters of the Great Lakes Basin without loading or unloading ballast water (other than ballast water necessary for the purpose of ensuring the safety of the vessel on a voyage between non-Canadian ports) will be exempt from the Regulations.

3. **Vessels of Non-parties:** The Convention requires Canada to apply the requirements of the Convention to vessels of non-parties to ensure that no favourable treatment is given to such vessels. The Convention's requirements include the development of approved ballast water management plans for meeting the Convention's performance standard wherever ballast water is discharged - even if the ballast is ultimately discharged into waters of non-parties. The Regulations therefore require that vessels that load or discharge ballast water in Canada hold and keep on board a document of compliance issued by, or on behalf of, their flag state that certifies that the vessel meets the requirements of the Convention.
4. **Vessels subject to the equivalent compliance regime:** The Convention allows Canada to establish equivalent compliance requirements for certain international pleasure craft, and search and rescue craft that carry less than eight cubic metres of ballast water and are less than 50 metres in length. The Regulations will do so for these vessels by giving effect to the IMO guidelines for equivalent compliance. For reasons of practicality and feasibility, the Regulations will also allow vessels less than 50 metres in length, as well as non-self-propelled vessels with a gross tonnage of less than 3,000 tons, to follow the equivalent compliance

regime if they operate exclusively in waters under Canadian jurisdiction, or in those waters and on the high seas. Equivalent compliance refers to a set of methods and best practices approved by the IMO that allows vessel owners to determine how best to manage ballast water on board their vessel, as installing and operating BWMS and meeting all of the requirements under the Regulations is not always feasible.

Agnico Eagle expects to hire shipping companies that use domestic vessels active in the coastal trade and operate almost exclusively in waters under Canadian jurisdiction. However, it is the shipping company's responsibility to ensure that all relevant requirements within the *Ballast Water Regulations* are adhered to. Agnico Eagle will require contracted vessels to provide an approved copy of their BWMP.

7.1 Ballast Water Exchange

The exchange of ballast water in deep ocean areas or open seas offers a means of limiting the probability of harmful aquatic organisms and pathogens being transferred to the marine environment via vessel ballast water. If it is necessary to take on and discharge ballast water in the same port to facilitate safe cargo operations, care will be taken to avoid unnecessary discharge of ballast water that has been taken up in another port as this could introduce harmful aquatic organisms.

The *Ballast Water Regulations* implement the Ballast Water Management Convention (BWMC) in Canada, an international treaty adopted by the IMO, which entered into force on September 8, 2017.

The D-1 and D-2 standards are part of the BWMC and aim to address the control and management of ballast water:

- **D-1 Standard:** The D-1 standard of the BWMC relates to ballast water exchange. It specifies the requirements for conducting ballast water exchange, also known as "open-ocean exchange." Ballast water exchange involves replacing ballast water taken on in one location with water from the open ocean, typically beyond 200 nautical miles from the nearest land and in waters of sufficient depth. The purpose of D-1 is to minimize the number of living organisms carried in ballast water.
- **D-2 Standard:** The D-2 standard of the BWMC sets the requirements for ballast water treatment systems. It specifies the performance criteria for such systems to ensure that they effectively treat ballast water to remove or kill organisms and pathogens. Ballast water treatment systems must meet the criteria outlined in the D-2 standard to be considered compliant with the Convention.

All vessels must conform to at least the D-1 (exchange) standard. The requirements for compliance with the D2 standard of ballast water treatment systems were phased in over a period of time based

on the ship's [International Oil Pollution Prevention](#) (IOPP) renewal survey schedule. The specific deadlines for compliance with the D-2 standard depend on the ship's construction date:

- **For new ships:** New ships constructed on or after September 8, 2017, are required to comply with the D-2 standard at the time of delivery.
- **For existing ships:** Existing ships (those constructed before September 8, 2017) are required to comply with the D-2 standard at the time of their first IOPP renewal survey that occurs after September 8, 2019. This means that existing ships needed to install and operate ballast water treatment systems by the time of their first IOPP renewal survey after the specified date.

The specific compliance deadlines may vary depending on the ship's individual circumstances and survey schedule, but the goal of the BWMC is to ensure that all ships eventually meet the D-2 standard to minimize the environmental impact of ballast water discharge. Shipowners and operators are encouraged to consult with relevant authorities and organizations to understand and meet the compliance requirements of the BWMC.

Vessels take on ballast water in segregated chambers for the main purpose of stabilizing the vessels by adding the weight of the water and maintaining a specified draught. Vessels laden with dry cargo or fuel will take on less ballast water than empty vessels. As all ships on the inward voyage to Chesterfield Inlet will be laden, they will have a minimum of ballast water. However, on the outward journey, these vessels will take on ballast water.

The vessels servicing Agnico Eagle will in all likelihood not voyage more than 200 nautical miles from shore and will not exchange ballast water outside waters of Canadian jurisdiction. It remains the responsibility of the shipping companies to ensure that ballast water exchange standards for all vessels meet the provisions of the Convention standards and the Ballast Water Regulations no later than September 2024 or September 2030, depending on when they were built.

SECTION 8 • SAFETY

Safety is a top priority for Agnico Eagle. It begins with all personnel (e.g. Agnico Eagle, contract employees and contractors) wearing the appropriate personal protection equipment suitable for the task at hand and for the weather conditions at the time. Secondly, personnel must understand the hazards associated with the task, the safe procedures in carrying it out, and how not to place oneself in harm's way. Accident prevention will be supported by a proactive program to identify and correct potential hazards before an accident occurs.

Agnico Eagle or contract supervisors will ensure that the interactions between ship and shore are carried out with the safety and the health of the employees first in mind.

SECTION 9 • HAZARD IDENTIFICATION ANALYSIS OF MARINE ROUTES

Hazard, likelihood, severity and risk are defined as follows:

- **Hazard:** Anything that has the potential to cause harm.
- **Likelihood:** The probability/chance of harm occurring as a result of exposure to a hazard.
- **Severity:** The level of harm that may occur as a result of exposure to or contact with a hazard.
- **Risk:** The likelihood of harm occurring combined with the potential severity to produce a level of risk or risk rating.

Navigation through the Labrador Sea, Hudson Strait and Hudson Bay is not challenging during the open water season. Navigation through Chesterfield Inlet also does not represent a major risk with the exception of two locations; at Deer Island and Target Rock where passages are narrow and have strong current. No major hazards were identified along the shipping and tug-barge routes under normal conditions. Electronic charts combined with electronic navigation aids for the recommended shipping routes ensure the vessel remains on course where bathymetry and physical hazards are known.

At the anchor point, cargo will be lightered from the ships onto barges and be delivered to Meadowbank Mine barge unloading facilities in Baker Lake via the access passage (Chesterfield Narrows). The tug-barges will be highly maneuverable and capable of transiting the access passage with its changing currents and will not require pilotage. Navigation will proceed with extra caution in periods of low visibility. Traffic through the access passage will be coordinated to avoid shipping conflicts and to ensure safety.

However, the following out of the ordinary events have been identified that could increase the level of hazard and necessitate associated mitigation measures:

- mechanical failure occurring on the ship or tug thereby placing it or other vessels and infrastructures in jeopardy in the shipping lane;
- vessel running aground due to a navigational error or mechanical failure;
- loss or damage to sea cans in heavy seas;
- barge tow line breaking in heavy seas;
- collision of a vessel carrying dry cargo and fuel to Baker Lake through the access passage;
- vessel sinking upon hitting ice; and
- vessel colliding with a small boat.

The access passage between Chesterfield Inlet and Baker Lake deserves special attention as it contains a series of narrow passages and, although two-way traffic is theoretically possible, it raises the risk of collisions and groundings.

SECTION 10 • RISK ANALYSIS OF MARINE ROUTES

All ships, tugs, and tankers use electronic charts and other electronic navigational aids to provide safety in transit, reduce the risk of accidents, and remain within recommended sea routes. Also, shipping companies contracted by Agnico Eagle commonly sail in Hudson Bay and to Chesterfield Inlet, are aware of its marine hazards, and have their own navigation manuals and guides (e.g., Navigation Arctic Guide).

Risk is defined as the likelihood of harm posed by a hazard combined with its potential severity. The potential severity of shipping hazards cannot be changed in most circumstances; what can be reduced is their likelihood. This is possible through the application of mitigation measures. The objective is to reduce the risk as low as practically possible through the use of mitigation measures. Residual risk is what remains after mitigation measures have been applied; those having the highest potential residual risk would be aggressively managed.

The following mitigation/safety measures will be implemented:

- Where available, electronic navigation aids will be used in all instances;
- Subject to ship and human safety considerations ship speeds in open water are to remain less than 14 knots in the absence of marine mammals;
- Shipping will only be carried out during the ice free season; should ice be encountered, the vessel will either sail around it at a reduced speed or proceed slowly through the ice;
- Vessels will remain within recommended shipping routes;
- Vessels will be double hulled;
- Weather warnings will be consulted when updates are provided;
- Traffic through the access passage will be coordinated to avoid conflicts and ensure safety;
- Communication between tugs will coordinate movement through the access passage;
- Agnico Eagle will provide emergency response equipment and materials as outlined in the OPEP/OPPP if necessary; tug or ship will also provide their own emergency response equipment;
- Crews will follow standard operating procedures and adherence to these will be monitored;
- Tug-barge or ship crews are to be trained for responses to hazards that can normally be expected in northern waters;
- Before entering Chesterfield Inlet the Master of the ship is to make a careful assessment of the conditions (wind, waves, tides, currents, visibility, ship characteristics, crew experience and etc.);
- After the assessment, the ship is to proceed in the safest way according to the assessment and surrounding conditions;
- The ship's speed will be adjusted according to the current;
- The tug-barges will always proceed in good visibility conditions; and
- The vessel Master will make up-bound travel with tidal flood (starting at low water at the entrance to Chesterfield Inlet) whenever possible. This allows to take advantage of tidal

current and weaker freshwater discharge current at narrow passages at Deer Island and Target Rock.

SECTION 11 • SOCIO-ECONOMIC IMPACT OF SHIPPING

Agnico Eagle does not believe that Mine-related shipping activities will result in an increased demand on local public service providers (i.e., fire, police, ambulance, medical, and maintenance) in Chesterfield Inlet. In most circumstances, any emergency response will be undertaken by Agnico Eagle personnel and/or the ship's crew. Agnico Eagle personnel and the Master of the ship will be responsible for security matters related to the shipping-related activities.

Shipping may impact socio-economic activities in Chesterfield Inlet and Baker Lake. The following mitigation measures will be employed to minimize negative socio-economic effects:

- Communication between tugs will coordinate movement through the access passage to avoid conflicts and ensure safety;
- Agnico Eagle has a separate laydown and storage area from the community in Baker Lake; and
- Agnico Eagle and the shipping contractor will work alongside to ensure security procedures are followed. This includes restricting the transport of prohibitive substances.

Positive socio-economic effects will continue as a result of the extension of the Meadowbank Mine and the associated number of dry cargo and fuel tankers coming to the communities. The crews of these ships could come ashore when the boat is anchored and contribute to the local economy through the:

- Use of restaurants, hotels and stores in the community;
- Purchase of local Inuit art; and
- Guided tours to the barrens for fishing and wildlife experiences.

SECTION 12 • PUBLIC AND MEDIA COMMUNICATIONS

When an environmental emergency occurs, the public will be provided with timely and accurate information as to the nature of the incident, the steps being taken to correct the problem, and, if necessary, what citizens should do to protect themselves. This information is intended to protect the overall community wellbeing, to ensure cooperation from all interested parties, and to reduce the spread of concern or alarm through the dissemination of inaccurate information.

A coordinated media response is preferred in an emergency situation, however each stakeholder involved may provide its own media communications and designated spokespersons. The lead government Agency is expected to act as the official spokesperson for the response, with support provided by Agnico Eagle and other stakeholders, as required.

In the unlikely event of an environmental emergency relating to Mine-related shipping, Transport Canada guidelines will be followed to ensure proper authorities are informed without delay so that appropriate action may be taken when:

- any incident occurs involving the loss, or likely loss, of dangerous goods into the marine environment; or
- any incident occurs giving rise to pollution or threat of pollution to the marine environment; or
- any oil pollution incident occurs involving the loading or unloading of fuel to or from tanker-to-tanker and from tanker to the Oil Handling Facility.

REFERENCES

DFO. 1990. The Beluga. Department of Fisheries and Oceans Quebec Region. Underwater World Factsheets.

Agnico Eagle Mines Ltd. (Agnico Eagle) 2018. FEIS Addendum for the Whale Tail Pit – Expansion Project. December, 2018.

NIRB. 2006. Project Certificate NIRB [NO.: 004] issued December 30, 2006 by the Nunavut Impact Review Board to Meadowbank Mining Corporation (assigned to Agnico Eagle Mines Limited)

NIRB. 2018. Project Certificate NIRB [NO.: 008] issued March 15, 2018 by the Nunavut Impact Review Board to Agnico Eagle Mines Limited for the development of Whale Tail Pit

Transport Canada. 2024. List of Canada’s Designated Alternate Ballast Water Exchange Areas and Fresh Waters.TP 13617E

Transport Canada. 2009. Reporting Incidents Involving Dangerous Goods, Harmful Substances and/or Marine Pollutants. Guideline TP 9834E.

Transport Canada. 2018. Implementation of the Polar Code in Canada: Challenges and Opportunities. Presentation.

APPENDIX A • MARINE MAMMAL AND SEABIRD MANAGEMENT AND MONITORING PLAN



AGNICO EAGLE

Marine Mammal and Seabird Management and Monitoring Plan

Appendix A

**APRIL 2022
VERSION 4**

TABLE OF CONTENTS

Table of Contents.....	i
Document Control.....	ii
Acronyms	iii
Section 1 • Introduction	iv
Section 2 • Marine Mammal and Seabird Observer Program	v
2.1 Routine Shipping Operations.....	v
2.1.1 Program Protocol	v
2.1.3 Marine Mammal Observing Protocol.....	viii
2.1.3.1 Scan Routine	ix
2.1.3.2 Scan Routine	x
2.1.4 Seabird Survey Protocol	xi
2.1.4.1 Survey Protocol – Moving Vessel.....	xi
2.1.4.1 Survey Protocol – Stationary Vessel	xiv
2.1.4.1 Estimating Distance	xv
2.1.5 Recording Observations.....	xv

DOCUMENT CONTROL

Version	Date	Section	Page	Revision	Author
1	April 2018	All	All	First draft of the Marine Mammal Management and Monitoring Plan	Agnico Eagles Mines Ltd.
2_NIRB	December 2018	All	All	Shipping Management Plan as Supporting Document submitted to Nunavut Impact Review Board for review and approval as part of Whale Tail Pit – Expansion Project	Agnico Eagle Mines Ltd.
3	April 2022	Attachment A	xvii	Updated Marine Mammals Sightings Form	Agnico Eagle Mines Ltd.
		Attachment B	xx	Updated Seabird Sightings Form	
		Attachment C	xxii	Added MSSO Incident Report Form Added Incidental Marine Wildlife Sightings Form	

ACRONYMS

Agnico Eagle	Agnico Eagle Mines Limited
CWS	Canadian Wildlife Service
DFO	Fisheries and Oceans Canada
ECSAS	Eastern Canada Seabird at Sea
ECCC	Environment and Climate Change Canada
MMMP	Marine Mammal Management and Monitoring Plan
MMSO	Marine Mammal and Seabird Observer
NIRB	Nunavut Impact Review Board

SECTION 1 • INTRODUCTION

The Marine Mammal Management and Monitoring Plan (MMMMP) has been developed for the Project to meet commitments made during the Nunavut Impact Review Board (NIRB) hearings related to Marine Shipping, and will continue to be implemented under the Whale Tail Pit and Haul Road Project (the Approved Project) and the Whale Tail Pit - Expansion Project. It should be considered a living document that can be updated throughout the Project lifecycle in order to implement adaptive management techniques.

The MMMMP has been designed to provide protocols for conducting a vessel-based Marine Mammal and Seabird Observer (MMSO) program during all routine shipping activities along the shipping route. During routine shipping operations, Project-specific mitigation measures designed to minimize Project impacts on marine mammals and seabirds will be initiated by vessel-based MMSOs and implemented by the ship's crew.

Data collected by the MMSOs will provide information annually to the Government of Nunavut and other applicable regulators (e.g., Environment and Climate Change Canada (ECCC) - Canadian Wildlife Service (CWS)) regarding the location, behaviour, abundance, and species observed as well as any interactions with Project vessels during shipping activities along the shipping route.

SECTION 2 • MARINE MAMMAL AND SEABIRD OBSERVER PROGRAM

2.1 Routine Shipping Operations

This section outlines the protocol for undertaking a vessel-based Marine Mammal and Seabird Observer (MMSO) program involving marine wildlife monitoring during all routine shipping activities in the shipping route in accordance with Project Certificate Condition 40, which states the following:

"The Proponent shall develop and implement a ship-based marine mammal monitoring program, as part of a Marine Mammal Management and Monitoring Plan, in consultation with Fisheries and Oceans Canada, communities, and other interested parties. The Proponent shall report any accidental contact by project vessels with marine mammals or seabird colonies to applicable responsible authorities including Fisheries and Oceans Canada and Environment and Climate Change Canada. "

The MMSOs will record marine mammal and seabird observations based on the protocols along the shipping routes presented in Figure 1. Datasheets outlined in Attachment A and Attachment B and daily reports outlined in Attachment C will be completed throughout the transit and provided to Agnico Eagle.

2.1.1 Program Protocol

Mitigation measures outlined in Section 4.2 of the Shipping Management Plan will be implemented during all Project shipping activities by the shipping contractor(s). MMSOs will not be directly responsible for implementing mitigation measures. The role of the MMSO is to record and report on marine mammals and seabird sightings during shipping activities, and to advise the ship's crew on the location of observed marine mammals and if any action is recommended based on mitigation measures outlined in the Shipping Management Plan.

The following protocol will be implemented during the MMSO program:

- A minimum of one assigned MMSO will be present on-board the Project shipping vessels¹ during all transits;
- The MMSO will conduct marine mammal and seabirds observations along the shipping route from the bridge during daylight hours;
- The MMSO will observe and record sightings of marine mammals and birds during vessel movements in the shipping routes (including sea birds, coastal waterfowls, and sea ducks²) as well as environmental conditions;

¹ Contractor is responsible to assign a crew member or contractor the task of marine mammal observations (MMSO).

² In accordance with Project Certificate No 008 Condition 39 and 40.

- The shipping contractor will initiate mitigation measures designed to minimize Project impacts on marine mammals and seabirds, as identified in the Shipping Management Plan.

The MMSO program will allow for the opportunity of adaptive management techniques to be implemented if monitoring identifies potential for adverse effects on marine wildlife along the shipping route. This may include modification of mitigation measures in response to new information arising from the monitoring carried out by the MMSO. Adaptive management will be conducted in consultation with the Kivalliq Inuit Association, the Hunters and Trappers Organizations of the Kivalliq communities, and the relevant regulators.

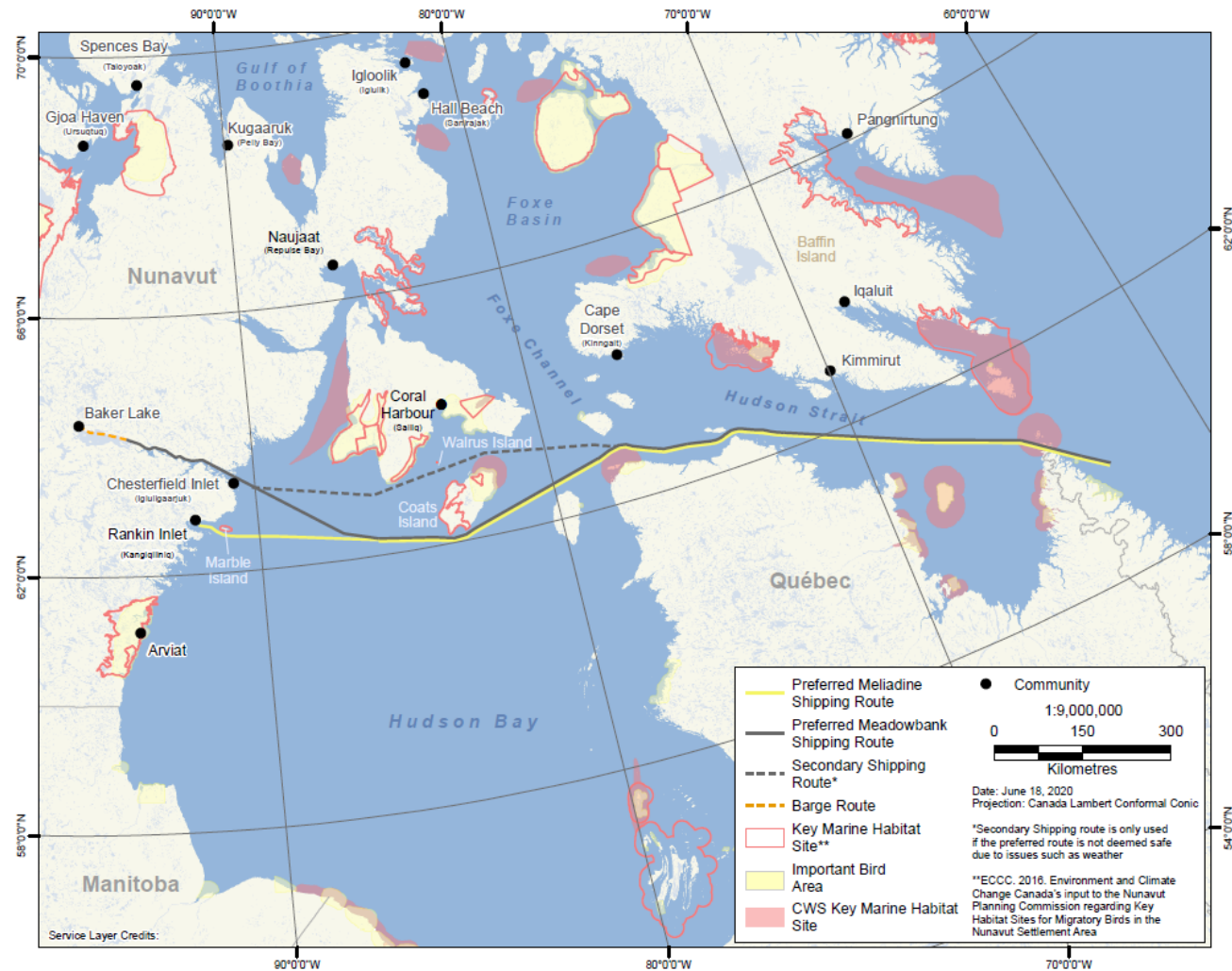


Figure 1: Meadowbank Mine and Whale Tail Pit Expansion Project Shipping Routes

2.1.3 Marine Mammal Observing Protocol

General environmental and marine mammal sightings information is to be collected and recorded by filling out form in Attachment A.

The protocol outlined in this section are best conducted along a transect line, therefore, it is best to start a marine mammal observation period when the vessel is and will be moving in a straight line for an extended period of time.

Observer Position

Observations will be done from a high location on the vessel and ideally outdoors if possible and will be conducted at the same location each time. For marine mammal observations with a single observer, depending on the weather conditions and safety requirements for the crew the MMSO will position themselves in the middle of the ship at the front (bow) to observe marine mammal on both the starboard and the port side (Figure 2).

Observation Period

MMSO observation periods (marine mammal and seabird observations) should last approximately 1.5 hours but not last longer than 2 hours to mitigate observer fatigue and eyestrain.

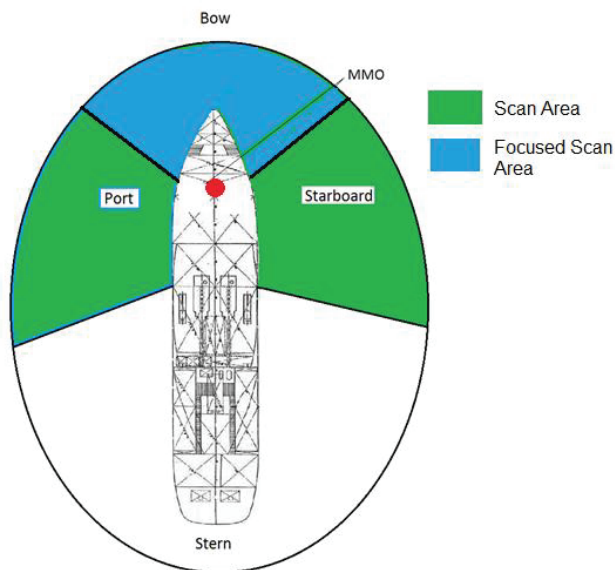


Figure 2. MMSO position and respective observation field on a hypothetical ship

2.1.3.1 Scan Routine

The following scan routine should be conducted throughout the marine mammal observation period. Scan the water with the naked eye and use binoculars only to focus on possible sightings. Perform S and U scans of the observation field about every 20 seconds (Figure 3). The most important aspect of marine mammal observing is to constantly scan the observation field to capture animals that could be located in the peripheral view for brief moments (e.g., surfacing). Scans should be made from the middle of the vessel (for one MMSO) and cover the scan area shown in Figure 2 with a focus on the water ahead and to the side to the moving vessel (e.g., focused scan area in Figure 2). If the vessel is stationary (e.g., anchored) scans should be conducted over the entire scan area (e.g., blue and green in Figure 2) in a uniform fashion. When the vessel is stationary, less priority can be attributed to marine mammal observations.



Figure 3: S & U scanning techniques

All marine mammals observed during the dedicated marine mammal observational periods as well as incidental sightings will be recorded including GPS location, distance to animal, angle to animal, number of individuals, species, behaviour etc. If a species is unknown or if a blow is the only detection of the animal observed, then mark the sighting as unknown. Marine mammals in large groups that are close together should be marked as a single sighting. When possible, photographs of marine mammal sightings will be taken and recorded alongside sightings records. Incidental sightings should be recorded on the *Incidental Marine Wildlife Sightings Form* (Attachment C).

Angle to a marine mammal or group of marine mammal can be calculated using a Pelorus or by estimating the angle with an angle board. Figure 4 shows how an angle to a marine mammal from the vessel should be estimated.

On-effort sightings should be recorded by the MMSO only, with no assistance permitted by other crew members. Sightings of pinnipeds hauled-out on land will be recorded as off-effort sightings. Bow-riding dolphins or porpoises are also not recorded as on-effort sightings unless they are observed prior to their initial approach to the vessel (as it was assumed that the sighting of a bow-riding cetacean was not random but rather influenced by the presence of the vessel). Bow-riding dolphins or porpoises are recorded as incidental (off-effort) sightings.

All efforts will be made to avoid double counting individuals or groups of individuals. If a marine mammal is counted twice in the sightings record, then a note of a re-sighting should be marked.

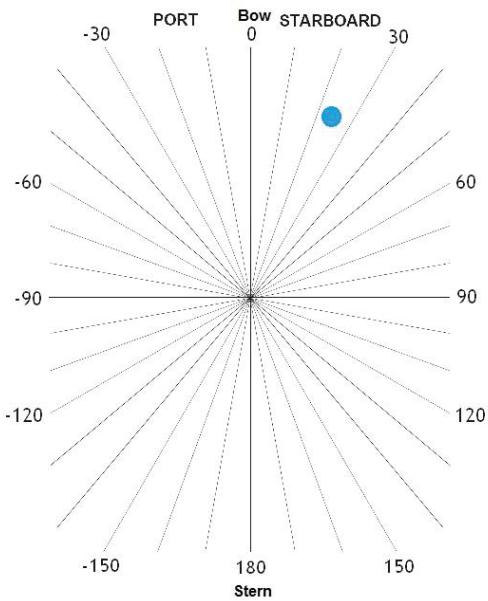


Figure 4. Angle to Marine Mammal (blue dot) is approximately 22°

2.1.3.2 Scan Routine

Record the distance to each marine mammal or group of marine mammal (to the center of the group). For all marine mammals, estimate the angular distance between the marine mammal(s) and the observer.

Using Reticle binoculars

Reticle binoculars have a built in scale called a reticle. Estimating distances to marine mammals using reticles is based upon the distance to the horizon which is dependent on:

- the height of the observer eye above sea level in meters; and
- radians per reticle mark for the type of binoculars.

The height of the eye includes the height of the platform above the surface of the water. The number of radians (usually milliradians³) will depend on the type of reticles binoculars that are used. The number of radians per reticle mark can be used to produce a distance table based on an equation provided by the binocular manufacture. An example of an equation provided by Fujinon 2006 is:

$$\text{Distance} = (\text{eye height} + \text{height above sea level in meters}) \times 1000 / \# \text{ of milliradians}$$

Reticle binoculars cannot be used to estimate distance if the horizon is obscured (by fog or land), or if they are used from a different height above sea level. Their use becomes minimal in nearshore waters.

³ unit of angular measurement

2.1.4 Seabird Survey Protocol

Seabird survey will be conducted on the shipping route. The protocols laid out below were extracted and adapted from the CWS standardized protocol for pelagic seabird surveys from moving and stationary platforms (Gjerdrum et al. 2012).

Observer Position

Observations should be done from a high location on the vessel, when possible, at a location as close to the edge of the platform as possible to increase the detection of seabirds, especially for individuals that use the waters at the base of the vessel. All surveys should be conducted at the same location each time.

2.1.4.1 Survey Protocol – Moving Vessel

General environmental and bird sightings information is to be collected and recorded by filling out the form in Attachment B.

Transect Methods

During transect surveys, the observer is to look forward from the vessel, scanning at a 90° angle from either the port (left) or starboard (right) side depending where he or she is located. The transect width within seabirds are recorded is 300 m from the side of the vessel (see Figure 5). Scan ahead regularly (e.g., every minute) to spot birds that may dive as the vessel approaches.

All birds observed within this 300 m transect, whether flying or on the water, are recorded and are considered in-transect sightings. The methods for recording birds on the water verses birds in flight are outlined below. All five-minute surveys should begin with a snapshot survey to capture flying birds. The perpendicular distance from the line to the seabirds detected on the water or in flight is estimated for each sighting. Birds observed outside the 300 m transect are also recorded if this does not affect observations within the 300 m transect. Distance categories “E” and “T” in Figure 5 are both considered not in transect. Binoculars and spotting scopes can be used to confirm species identification and other details as necessary.

Observation Period

Each seabird survey period will be conducted during six consecutive five-minute periods which is repeated three times a day to capture morning, afternoon and evening periods when possible. These five-minute surveys should be dedicated to surveying for seabirds only. These surveys should be completed regardless if birds are present or not. If the vessel is not moving (stationary), use the method for stationary vessel described in Section 2.1.4.2 below.

Short breaks should be taken at the end of each five-minute period to record the vessel’s position and any conditions that may have changed since the last five-minute survey period. If ship speed or direction changes significantly during the survey period, record the time and location (GPS), cease the current survey and begin a new five minute survey period.

The frequency of the seabird surveys has been selected to provide time for the MMSO to:

- have dedicated seabird and marine mammal observation periods (as described above);
- conduct daily shipping-related activities if the MMSO is part of the ship's crew;
- take necessary breaks to avoid observer fatigue; and
- conduct daily reporting.

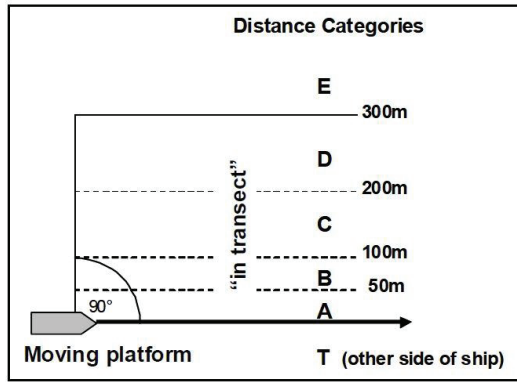


Figure 5. Illustration of a survey using a 90° scan, covering a 300 m transect from a moving platform (extracted from Gjerdrum et al. 2012)

Birds on the Water

All birds observed on the water are continuously recorded throughout the five-minute survey period. If birds in the transect fly off the surface of the water as the vessel approaches, use binoculars to help count them, and record these birds as being on the water as outlined in the seabird survey sighting form (Attachment B). These birds are not subsequently counted as a flying bird during a snapshot survey (described below for flying bird).

Birds on the water may be observed up ahead of the platform, perhaps as far as 400 m or 500 m, but still within the 300 m transect (Figure 5). Because these individuals may dive or fly away as a result of the approaching ship, they should be counted as in transect and their perpendicular distance recorded when they are first observed. If the five-minute survey will end before the ship reaches them, they should be recorded in the next five-minute survey period.

Birds in Flight – Snapshot method

All five minute surveys should begin with a snapshot of flying birds. Flying birds are not recorded continuously throughout the five-minute survey period as with birds on the water, as this would overestimate bird density. Create a routine of snapshot counts to record flying birds during the survey period. Only use the snapshot method when there are many birds observed flying in the area. The number of snapshots done will depend on the speed of the vessel (Table 1).

During each snapshot, record flying birds as in transect if they are flying above the 300 m transect. Record all other flying birds that are seen outside of the 300 m transect or between snapshot intervals as not in transect.

Some species may fly in long lines across the 300 m survey transect. At the time of the snapshot, the number of birds in the flock is recorded and the distance class is assigned according to the location of the center of the flock. All the birds in the flock are recorded as in transect if the center is within the 300 m transect. If the center of the flock is outside the 300 m transect, all birds are recorded as not in transect.

Large Groups of Birds

When very large numbers of birds are encountered that overwhelm the observer's ability to count the number of birds and measure the distance to flocks the snapshot method can be used to count all birds in flight and on the water. If this protocol is used, note the change in protocol on the seabird survey sighting form (Attachment B). If it is not practical to estimate distance to each bird or flock of birds, the observer should at least indicate whether the birds were observed in or out of transect. If it is not practical to note which birds are on the water and which are in flight use the following guidelines:

- If the majority of the birds are in the air, they can be recorded as flying.
- If birds appear first on the water and then fly away as the vessel approached, or they continuously move between the water and air, recorded them being as on the water.

Birds that follow the Vessel

To avoid double counting birds, once a bird is recorded in-flight it is not subsequently recorded again if it follows the ship and it is not recorded on subsequent snapshots. If many birds are following the vessel and it becomes difficult to determine which individuals have already been recorded, the number of birds following the ship can be estimated and recorded at regular intervals (i.e., in between each five minute survey or as possible).

Table 1: Intervals at Which Instantaneous or "Snapshot" Counts of Flying Birds Should be conducted during a Moving Vessel Survey

Platform Speed (knots)	Interval Between Counts (minutes)
<4.5	2.5
4.5 – 5.5	2.0
5.5 – 8.5	1.5
8.5 – 12.5	1.0
12.5 - 19	0.5

Poor Visibility

When a survey period cannot be done because of poor visibility (i.e., when the entire width of the 300 m transect is not visible), the extent of visibility should be noted on the seabird survey information form.

Observation Periods with No Birds

If no birds are observed during a five-minute survey period, "no seabirds observed" must be noted on the seabird survey information form.

2.1.4.1 Survey Protocol – Stationary Vessel

Scan Method

Surveys while the vessel is stationary (e.g., on standby or anchored) are done using instantaneous counts, or “snapshots” of birds within a 300 m “semi-circle” area from the vessel. These surveys are conducted by scanning through a 180° arc, limiting observations to a semi-circle around the observer (Figure 6).

The area should be scanned from one side to the other, and all seabirds on water and in flight that are observed within 300 m are systematically recorded. Birds visible beyond 300 m are also, if possible. The distance to seabirds (inside and outside the 300 m area) from the observer is estimated and recorded for all birds. Birds observed outside the 300 m semi-circle are recorded as not in semi-circle on the seabird survey information form. Binoculars and spotting scopes can be used to confirm species identification and other details as necessary.

Observation Period

When the vessel is stationary, less priority can be attributed to marine mammal observations. The length of each scan will depend on the number of birds present at the time of the scan (e.g., it may only last a few seconds if there are no birds present).

Poor Visibility

When an observation period cannot be done because of poor visibility (i.e., when the entire width of the 300 m transect is not visible), the extent of visibility should be noted on the seabird survey information form.

Observation Periods with No Birds

If no birds are observed during a five-minute survey period, “no seabirds observed” must be noted on the seabird survey information form.

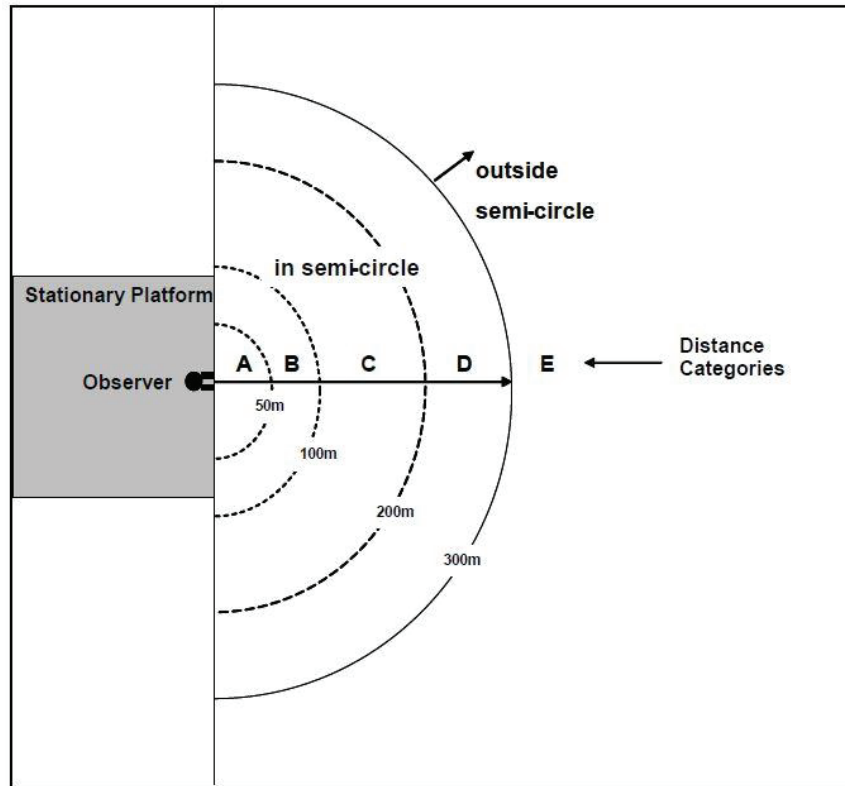


Figure 6. Survey using an 180o scan, surveying an area 300 m from a stationary observer (Extracted from Gjerdrum et al. 2012)

2.1.4.1 Estimating Distance

Record the distance to each bird or flock of birds (to the center of the flock). For all birds, estimate the perpendicular distance between the bird(s) and the observer (Figure 6). If a group of birds is straddling the 300 m boundary with the flock center located in D (some individuals inside and some individuals outside the transect) record the entire flock as being in D. If the flock center is outside the transect, record the entire flock as distance class E. It is very important to record distance to birds within the 300 m strip, but if this is not possible (i.e., too busy), you may use the code 3 = within 300 m but no distance recorded. Distance T is used to indicate that the bird or flock was observed on the opposite side of the vessel.

2.1.5 Recording Observations

General environmental and marine mammal sightings information is to be collected and recorded by filling out the Incidental Marine Wildlife Sightings Form in Attachment C.

MMSO's will record any responsive actions undertaken by the vessel crew in response to sightings. This will be recorded on a daily basis as outlined in the MMSO daily reporting template provided in Attachment C. All records of vessel strikes on marine mammals and bird collisions will be provided to Fisheries and Oceans Canada (DFO) and CWS on a weekly basis, as vessel communications allow (i.e., as internet connections allow). Immediate reporting will be required in the event that a ship strike occurs on a marine

mammal, or multiple bird collisions occur (involving more than five individuals) and the incidents appear related (i.e., similar time period, location, and weather conditions). In this instance, the regional Environment and Climate Change Canada (ECCC) Wildlife Enforcement Officer (contact information provided below) will be contacted to provide advice on the implementation of adaptive management techniques to attempt to reduce the likelihood of collisions occurring in the future. If bridge crew determine a ship strike of seabirds has occurred, they will complete the MSSO Incident Report Form (Attachment C).

Attachment A

Marine Mammal Sightings Form

Marine Mammal Sightings Form (circle options that are *italicized* as appropriate)

General Information														
Date (DD/MM/YYYY)				Observer Name				Height of Eye (m)						
Vessel Information														
Company/Agency				Vessel Type				Vessel Heading (compass)						
Vessel Name				Vessel Activity	<i>Moving</i> <i>Stationary</i>			Vessel Speed (kt)						
Environmental Information														
Weather	<i>Clear</i> <i>Partly Cloudy</i> <i>100% Cloud</i> <i>Fog</i> <i>Rain</i> <i>Snow</i>							Sea State (0-9)						
Beaufort Wind Force	<i>Calm</i> <i>Light Wind</i> <i>Strong Wind</i> <i>Gale Force Wind</i> <i>Stormy</i>							Wave Height (m)						
Wind Direction (deg.)				Glare Conditions	<i>None</i> <i>Slight Grey</i> <i>Bright</i>			Visibility (km)						
Survey Information														
Transect Start	Local Time (24 hr)			Latitude (DD)				Longitude (DD)						
Transect End	Local Time (24 hr)			Latitude (DD)				Longitude (DD)						
Observer Location	<i>Outdoors</i> <i>Indoors</i>		Observation Side	<i>Starboard</i> <i>Port</i>		<i>Bow</i>								
Notes														
Marine Mammal Sighting Information														
Time of Sighting	Distance to Sighting (m)	Angle to Sighting (deg.)	Sighting Coordinates			Species	Count	Age (Adult/Young)	Sex (M/F/UNK)	Re-Sighting (Y/N)	Behaviour (Travel, Feeding, Other)	Mitigation Required?	Photo Number	Comments/Notes
			WPT	Latitude (DD)	Longitude (DD)									

Species	How Animal Was Spotted	Certainty of ID	Animal Activity
Narwhal Whale	By Eye	Definite	Slow Swimming
Beluga Whale	Reticle Binoculars	Probable	Medium Swimming
Bowhead Whale	Big-eye Binoculars	Possible	Fast Swimming
Atlantic Walrus			Looking – Seals
Bearded Seal			Feeding
Ringed Seal			Flipper Slapping
Harbour Seal			Surfacing
Hooded Seal			Resting
Harp Seal			Diving
Polar Bear			Diving (Fluke Visible)
Killer Whale			Splashing
			Surfacing
			Fluking
			Lobtailing
			Bow Riding
			Wake Riding
			Porpoising
			Spyhopping
			Breaching
			Acrobatic
			Startle Response
			Milling
			Unknown

Attachment B

Seabird Sightings Form

Appendix I - Estimating Distance Categories Using Ruler Gauge

Appendix II Through VI - Codes for General Weather Conditions and Glare, Sea State and Beaufort Wind Force, Ice Conditions, Species Codes for Eastern Seabirds, and Codes for Associations and Behaviours

Seabird Sightings Form (circle options that are *italicized* as appropriate)

Survey Type (circle one):		<i>Moving Vessel</i>		<i>Stationary Vessel</i>					
General Information									
Date (DD/MMM/YYYY)		Observer Name		Height of Eye (m)					
Vessel Information									
Company/Agency		Vessel Type		Vessel Heading					
Vessel Name		Vessel Activity	<i>Moving</i> <i>Stationary</i>	Vessel Speed (kt)					
Environmental Information									
Weather	<i>Clear</i> <i>Partly Cloudy</i> <i>100% Cloud</i> <i>Fog</i> <i>Rain</i> <i>Snow</i>			Sea State (0-9)					
Beaufort Wind Force	<i>Calm</i> <i>Light Wind</i> <i>Strong Wind</i> <i>Gale Force Wind</i> <i>Stormy</i>			Wave Height (m)					
Wind Direction (Deg)		Glare Conditions	<i>None</i> <i>Slight Grey</i> <i>Bright</i>	Visibility (km)					
Survey Information									
Tansect Start	Local Time (24 hr)		Latitude (DD)		Longitude (DD)				
Tansect End	Local Time (24 hr)		Latitude (DD)		Longitude (DD)				
Survey Number (x of 6)									
Observer Location	<i>Outdoors</i>	<i>Indoors</i>	Observation Side	<i>Starboard</i>	<i>Port</i> <i>Bow</i>				
Notes:									
Seabird Sighting Information									
Species	Count	Observation Type (Fly or Water)	In Transect (Y/N)	Distance (m)	Behaviour (escape flight, rafting, other)	Flight Direction (Deg)	Age (Adult/Young)	Plumage (breeding/non-breeding/molt)	Comments*

*Indicate in Comments if observation of flying birds was during a "snapshot survey".

APPENDIX I. Estimating distance categories

The various distance categories can be estimated using the following equation¹:

$$d_h = 1000 \frac{(ah3838\sqrt{h}) - ahd}{h^2 + 3838d\sqrt{h}} \quad \text{e.g. if } a = 0.730 \text{ m, } h = 12.5 \text{ m, and } d = 300 \text{ m}$$

then $d_h = 30.0 \text{ mm}$

where:

d_h = distance below horizon (mm)

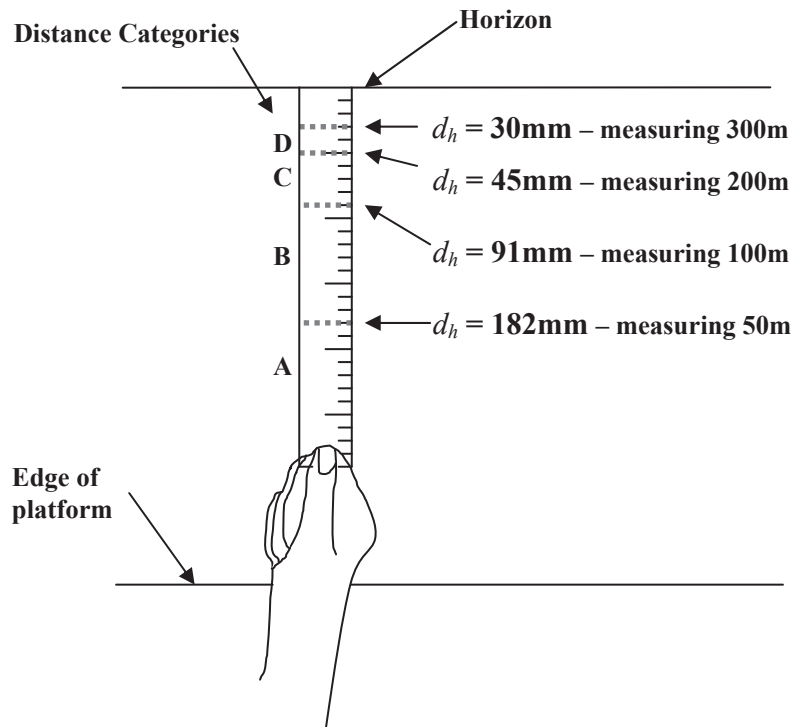
a = distance between the observer's eye and the ruler when observer's arm is fully out-stretched (m)

h = height of the observer's eye above the water at the observation point (m)

d = distance to be estimated (m; a separate calculation is required for each of 50, 100, 200, 300)

Distances are easily estimated using a gauge made from a transparent plastic ruler. A different ruler will be required for each combination of observer arm length (a) and platform height (h). Calculate d_h for the boundary of each distance class (A, B, C, D) and mark them on the ruler (dashed lines in figure). To use the gauge, extend the arm fully and keep the top end of the ruler aligned with the horizon. The dashed lines now demark the distance class boundaries on the ocean surface. Keep the gauge nearby during surveys to quickly verify bird distances.

Measurements for an observer with $a = 73 \text{ cm}$ and $h = 12.5 \text{ m}$:



¹ Formula derived by J. Chardine, based on Heinemann 1981. A spreadsheet is available from the corresponding author to perform this calculation.

APPENDIX II. Codes for general weather conditions and glare

Code	Description	Explanation
<i>Weather conditions</i>		
0		< 50% cloud cover (with no fog, rain, or snow)
1		> 50% cloud cover (with no fog, rain, or snow)
2		patchy fog
3		solid fog
4		mist/light rain
5		medium to heavy rain
6		fog and rain
7		snow
<i>Glare conditions</i>		
0		none
1		slight/grey
2		bright on the observer's side of vessel
3		bright and forward of vessel

APPENDIX III. Codes for sea state and Beaufort wind force

Wind Speed (knots)	Sea state code and description	Beaufort wind force and description
0	0 Calm, mirror-like	0 calm
01 – 03	0 Ripples with appearance of scales but crests do not foam	1 light air
04 – 06	1 Small wavelets, short but pronounced; crests do not break	2 light breeze
07 – 10	2 Large wavelets, crests begin to break; foam of glassy appearance; perhaps scattered white caps	3 gentle breeze
11 – 16	3 Small waves, becoming longer; fairly frequent white caps	4 moderate breeze
17 – 21	4 Moderate waves with more pronounced form; many white caps; chance of some spray	5 fresh breeze
22 – 27	5 Large waves formed; white foam crests more extensive; probably some spray	6 strong breeze
28 – 33	6 Sea heaps up; white foam from breaking waves blows in streaks in direction of wind	7 near gale
34 – 40	6 Moderately high long waves; edge crests break into spindrift; foam blown in well-marked streaks in direction of wind	8 gale
41 – 47	6 High waves; dense streaks of foam in direction of wind; crests of waves topple and roll over; spray may affect visibility	9 strong gale
48 – 55	7 Very high waves with long overhanging crests; dense foam streaks blown in direction of wind; surface of sea has a white appearance; tumbling of sea is heavy; visibility affected	10 storm
56 - 63	8 Exceptionally high waves; sea is completely covered with white patches of foam blown in direction of wind; edges blown into froth; visibility affected	11 violent storm
64 +	9 Air filled with foam and spray; sea completely white with driving spray; visibility seriously affected	12 hurricane

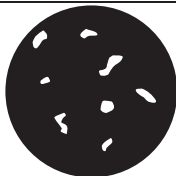





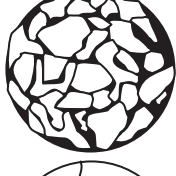
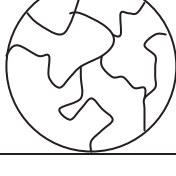
APPENDIX IV. Codes for ice conditions

Adapted from NOAA: Observers Guide to Sea Ice

Sea Ice Forms

Code	Name	Description
0	New	small, thin, newly formed, dinner plate-sized pieces
1	Pancake	rounded floes 30 cm - 3 m across with ridged rims
2	Brash	broken pieces < 2 m across
3	Ice Cake	level piece 2 - 20 m across
4	Small Floe	level piece 20 - 100 m across
5	Medium Floe	level piece 100 - 500 m across
6	Big Floe	level, continuous piece 500 m - 2 km across
7	Vast Floe	level, continuous piece 2 - 10 km across
8	Giant Floe	level, continuous piece > 10 km across
9	Strip	a linear accumulation of sea ice < 1 km wide
10	Belt	a linear accumulation of sea ice from 1 km to over 100 km wide
11	Beach Ice or Stamakhas	irregular, sediment-laden blocks that are grounded on tidelands, repeatedly submerged, and floated free by spring tides
12	Fast Ice	ice formed and remaining attached to shore

Sea Ice Concentration

Code	Concentration	Description	
0	< one tenth	"open water"	
1	two-three tenths	"very open drift"	
2	four tenths	"open drift"	
3	five tenths	"open drift"	
4	six tenths	"open drift"	
5	seven to eight tenths	"close pack"	
6	nine tenths	"very close pack"	
7	ten tenths	"compact"	

APPENDIX V. Species codes for birds seen in Eastern Canada

Common name	Species code	Latin name
COMMON, REGULAR OR FREQUENTLY SEEN SPECIES		
Northern Fulmar	NOFU	<i>Fulmarus glacialis</i>
Great Shearwater	GRSH	<i>Puffinus gravis</i>
Manx Shearwater	MASH	<i>Puffinus puffinus</i>
Sooty Shearwater	SOSH	<i>Puffinus griseus</i>
Wilson's Storm-Petrel	WISP	<i>Oceanites oceanicus</i>
Leach's Storm-Petrel	LESP	<i>Oceanodroma leucorhoa</i>
Northern Gannet	NOGA	<i>Morus bassanus</i>
Red Phalarope	REPH	<i>Phalaropus fulicaria</i>
Red-necked Phalarope	RNPH	<i>Phalaropus lobatus</i>
Long-tailed Jaeger	LTJA	<i>Stercorarius longicaudus</i>
Parasitic Jaeger	PAJA	<i>Stercorarius parasiticus</i>
Pomarine Jaeger	POJA	<i>Stercorarius pomarinus</i>
Great Skua	GRSK	<i>Stercorarius skua</i>
Herring Gull	HERG	<i>Larus argentatus</i>
Iceland Gull	ICGU	<i>Larus glaucoides</i>
Glaucous Gull	GLGU	<i>Larus hyperboreus</i>
Great Black-backed Gull	GBBG	<i>Larus marinus</i>
Black-legged Kittiwake	BLKI	<i>Rissa tridactyla</i>
Common Murre	COMU	<i>Uria aalge</i>
Thick-billed Murre	TBMU	<i>Uria lomvia</i>
Razorbill	RAZO	<i>Alca torda</i>
Dovekie	DOVE	<i>Alle alle</i>
Atlantic Puffin	ATPU	<i>Fratercula arctica</i>
SPECIES MORE COMMONLY SEEN INSHORE		
Common Loon	COLO	<i>Gavia immer</i>
Red-throated Loon	RTLO	<i>Gavia stellata</i>
Red-necked Grebe	RNGR	<i>Podiceps grisegena</i>
Horned Grebe	HOGR	<i>Podiceps auritus</i>
Great Cormorant	GRCO	<i>Phalacrocorax carbo</i>
Double-crested Cormorant	DCCO	<i>Phalacrocorax auritus</i>
Greater Scaup	GRSC	<i>Aythya marila</i>
Common Eider	COEI	<i>Somateria mollissima</i>
Harlequin Duck	HARD	<i>Histrionicus histrionicus</i>
Long-tailed Duck	LTDU	<i>Clangula hyemalis</i>
Surf Scoter	SUSC	<i>Melanitta perspicillata</i>
Black Scoter	BLSC	<i>Melanitta nigra</i>
White-winged Scoter	WWSC	<i>Melanitta fusca</i>
Red-breasted Merganser	RBME	<i>Mergus serrator</i>
Black Guillemot	BLGU	<i>Cephus grylle</i>

Common name	Species code	Latin name
INFREQUENTLY OR RARELY SEEN SPECIES		
Cory's Shearwater	COSH	<i>Calonectris diomedea</i>
Audubon's Shearwater	AUSH	<i>Puffinus lherminieri</i>
Lesser Scaup	LESC	<i>Aythya affinis</i>
King Eider	KIEI	<i>Somateria spectabilis</i>
South Polar Skua	SPSK	<i>Stercorarius maccormicki</i>
Bonaparte's Gull	BOGU	<i>Larus philadelphia</i>
Ivory Gull	IVGU	<i>Pagophila eburnea</i>
Black-headed Gull	BHGU	<i>Larus ridibundus</i>
Laughing Gull	LAGU	<i>Larus articilla</i>
Ring-billed Gull	RBGU	<i>Larus delawarensis</i>
Lesser Black-backed Gull	LBBG	<i>Larus fuscus</i>
Sabine's Gull	SAGU	<i>Xema sabini</i>
Common Tern	COTE	<i>Sterna hirundo</i>
Arctic Tern	ARTE	<i>Sterna paradisaea</i>
Roseate Tern	ROTE	<i>Sterna dougallii</i>
CODES FOR BIRDS IDENTIFIED TO FAMILY OR GENUS		
Unknown Bird	UNKN	
Unknown Shearwater	UNSH	<i>Puffinus</i> or <i>Calonectris</i>
Unknown Storm-Petrel	UNSP	Hydrobatidae
Unknown Duck	UNDU	Anatidae
Unknown Eider	UNEI	<i>Somateria</i>
Unknown Phalarope	UNPH	<i>Phalaropus</i>
Unknown Jaeger	UNJA	<i>Stercorarius</i>
Unknown Skua	UNSK	<i>Stercorarius</i>
Unknown Gull	UNGU	Laridae
Unknown Tern	UNTE	<i>Sternidae</i>
Unknown Alcid	ALCI	Alcidae
Unknown Murre or Razorbill	MURA	<i>Uria</i> or <i>Alca</i>
Unknown Murre	UNMU	<i>Uria</i>

APPENDIX VI. Codes for associations and behaviours

From Camphuysen and Garthe (2004). Choose one or more as applicable.

Code	Description
<i>Association</i>	
10	Associated with fish shoal
11	Associated with cetaceans
13	Associated with front (often indicated by distinct lines separating two water masses or concentrations of flotsam)
14	Sitting on or near floating wood
15	Associated with floating litter (includes plastic bags, balloons, or any garbage from human source)
16	Associated with oil slick
17	Associated with sea weed
18	Associated with observation platform
19	Sitting on observation platform
20	Approaching observation platform
21	Associated with other vessel (excluding fishing vessel; see code 26)
22	Associated with or on a buoy
23	Associated with offshore platform
24	Sitting on offshore platform
26	Associated with fishing vessel
27	Associated with or on sea ice
28	Associated with land (e.g., colony)
50	Associated with other species feeding in same location

Code	Description	Explanation
<i>Foraging behaviour</i>		
30	Holding or carrying fish	carrying fish towards colony
32	Feeding young at sea	adult presenting prey to attended chicks (e.g., auks) or juveniles (e.g., terns)
33	Feeding	method unspecified (see behaviour codes 39,40,41,45)
36	Aerial pursuit	kleptoparasitizing in the air
39	Pattering	low flight over the water, tapping the surface with feet while still airborne (e.g., storm-petrels)
40	Scavenging	swimming at the surface, handling carrion
41	Scavenging at fishing vessel	foraging at fishing vessel, deploying any method to obtain discarded fish and offal; storm-petrels in the wake of trawlers picking up small morsels should be excluded
44	Surface pecking	swimming birds pecking at small prey (e.g., fulmar, phalaropes, skuas, gulls)
45	Deep plunging	aerial seabirds diving under water (e.g., gannets, terns, shearwaters)
49	Actively searching	persistently circling aerial seabirds (usually peering down), or swimming birds frequently peering (and undisturbed by observation platform) underwater for prey
<i>General behaviour</i>		
60	Resting or apparently sleeping	reserved for sleeping seabirds at sea
64	Carrying nest material	flying with seaweed or other material; not to be confused with entangled birds
65	Guarding chick	reserved for auks attending recently fledged chicks at sea
66	Preening or bathing	birds actively preening feathers or bathing
<i>Distress or mortality</i>		
71	Escape from ship (by flying)	escaping from approaching observation platform
90	Under attack by kleptoparasite	bird under attack by kleptoparasite in an aerial pursuit, or when handling prey at the surface
93	Escape from ship (by diving)	escaping from approaching observation platform
95	Injured	birds with clear injuries such as broken wings or bleeding wounds
96	Entangled in fishing gear or rope	birds entangled with rope, line, netting or other material (even if still able to fly or swim)
97	Oiled	birds contaminated with oil
98	Sick/unwell	weakened individuals not behaving as normal, healthy birds, but without obvious injuries
99	Dead	bird is dead

Attachment C

MMSO Daily Reporting Template

MSSO Incident Report Form

Incidental Marine Wildlife Sightings Form

1.0 MARINE MAMMALS AND SEABIRD OBSERVING (MMSO) DAILY REPORT**Project Information**

Client:

Date:

Project Name:

Location:

Ship Contractor Information

Ship Contractor Name:

Site Supervisor or Captain:

Ship Name/Type:

MMSO name:

General weather conditions (throughout the day)

Cloud cover:

Precipitation:

Wind (knots):

Sea state:

Swell height:

Air temperature:

Ice presence:

Notes:

Time start/Time end MMSO duties (UTC):

2.0 MITIGATION LOG

Mitigation Implemented	Time (UTC)	GPS Location	Rational for Implementation

Under Activity note the following: Description of any vessel mitigation implemented (e.g., reduction in speeds, evasive maneuvers etc.)

3.0 RECORD OF VESSEL-ANIMAL COLLISIONS/INTERACTIONS

Species	Number of Individuals	Time (UTC)	GPS Coordinates	Visibility/Sea State	Comments

Extracted from the Meliadine Shipping Management Plan, 2017

In the comments note the following: Animals observed on the deck (seabirds) or in the water (seabirds or marine mammals), if search lights or vessel lighting sources were active at the time of collision, and any other relevant notes.

4.0 MMSO CHECKLIST

Item or Location to Check	Yes	No	Comments - Discussed (D) with relevant Ship personnel - Observed (O) - Not Applicable (NA) - Action required (as/if applicable)
General			
Copy of SMP and appendices posted on-site			
Orientation to mitigation measures outlined in Section 4.2 of the SMP			
Overview of MMSO duties and protocols (e.g., ship crews should be made aware that the MMSO is the only individual that can mark sightings during the dedicated surveys/observation periods)			
Add additional items as necessary and depending on the role of the MMSO			
General Notes:			

5.0 SUMMARY OF ISSUES AND RECOMMENDATIONS / ACTIONS

Date Noted	Issue	Recommendation/Action	Completed (Date Resolved)	Comments

Extracted from the Meliadine Shipping Management Plan, 2017

Marine Mammals and Seabird Observer (MMSO) Incident Report

Project Information		
Client: Agnico Eagle		Date:
Project Name (circle one): <i>Meadowbank</i> <i>Meliadine</i>		General Location:
Vessel Contractor Information		
Vessel Contractor Name:		Site Supervisor or Captain:
Vessel Name/Type:		
MMSO Name:		
General Weather Conditions (throughout the day):	Wind (knots):	
	Sea State:	
	Swell Height (m):	
	Temperature (°C):	
	Notes:	
Time Start/Time End MMSO Duties (HH:MM):	Start:	End:

Mitigation Log*

Time (UTC; HH:MM)	Was Mitigation Implemented?	Location		Rationale for Implementation
		Latitude (DD)	Longitude (DD)	

*Fill in this section if vessel is required to route north of Coats Island due to safety concerns

Record of Vessel-Animal Collisions/Interactions

Species	Number of Individuals	Time (HH:MM)	Location		Visibility (m)/ Sea State	Comments
			Latitude (DD)	Longitude (DD)		

Summary of Issues and Recommendations/Actions

Date Noted	Issue	Recommendation/Action	Date Resolved	Comments



(1 form per observation: PLEASE PRINT: circle options provided in *italics* as appropriate)

¹ Refer to list of species in the ID Guides

¹ Refer to list of species in the ID Guides