



APPENDIX 8-D

Addendums for Materials Management and Emergency Response Management Plans



8-D.5: Shipping Management Plan



AGNICO EAGLE

MEADOWBANK DIVISION

WHALE TAIL PIT

Shipping Management Plan

JUNE 2016

VERSION 1

EXECUTIVE SUMMARY

The Shipping Management Plan for the Whale Tail Pit and Haul Road Project (the Project) was developed in accordance with federal legislation, notably the *Canada Shipping Act* and 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 established, well defined shipping lanes presently in use for the annual sea lift 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 kilometre (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 Project site to avoid having such cargo remain in storage in Baker Lake. Other contingency measures associated with shipping-related activities include the Project's Spill Contingency Plan, Emergency Response Plan, and Oil Pollution Emergency Plan (OPEP). Risk and hazard assessments of shore-based marine response activities will be undertaken as part of training 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 exception of two locations; at Deer Island and Target Rock where passages are narrow and have strong current. No major hazards are identified along the shipping and tug-barge routes under normal conditions. Shipping can be carried out without pilotage as the shipping lanes entail minor hazards not significantly reducing ship safety.

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 established sea lanes and follow their internal navigation charts and guides (e.g., Navigation Arctic Guide) based on their experience. In addition, there are some Project-specific measures concerning navigation in Chesterfield Inlet, including careful assessment of the conditions before entering the inlet, travelling during daytime 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 the ship and the small boats to see one another, and, through the Community Liaison Committee, will recommend that all those in small boats wear personal floatation devices.

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 Management Control and Management Regulations*, which should reduce the risk of invasive species being introduced as a result of shipping activities. Agnico Eagle expects to contract vessels that meet applicable environmental requirements in addition to being reliable and having a superior safety record.

Care will be taken to avoid disturbing marine mammals within the shipping lanes as much as possible. As part of shipping companies' standard operating procedures, ship crew 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 Monitoring aboard the vessels between Helicopter Island and Baker Lake, in accordance with NIRB Project Certificate Condition 36 (NIRB 2006). 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 be sought from nearby ships and the Canadian Coast Guard.

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ACRONYMS

AWPPA	<i>Arctic Waters Pollution Prevention Act</i>
BWMP	Ballast Water Management Plan
CCG	Canadian Coast Guard
ERP	Emergency Response Plan
ERT	Emergency Response Team
IMO	International Marine Organization
MARPOL	International Convention for the Prevention of Pollution from Ships
MMSO	Marine Mammal and Seabird Observer
OPEP	Oil Pollution Emergency 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 Division (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 Pit and Haul Road Project (the Project) will utilize shipping arrangements already in use for the Meadowbank Mine and will not incur a net increase in shipping volume within Hudson Bay and Hudson Strait, or a change in shipping procedures (Figure 1-1).

1.1 Shipping Needs

A total of approximately 60,000 tonnes of dry cargo (equipment and supplies) and 66.8 million litres of diesel fuel will be required annually for the operations of the Project. To meet these needs, a total of three to six vessels will annually deliver dry goods, and a total of 18 tankers will annually deliver diesel fuel for the Project, with approximately 4 million litres of fuel delivered each trip.

All shipping will be carried out during the open water season (typically from July to late October) and will follow established shipping lanes that are presently in use for the annual sea lift to Chesterfield Inlet, Baker Lake and other communities.

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.

1.2 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 (see Appendix A for marine hydrographic charts showing the shipping lanes);
- 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 Island¹ by Nunavut Sealink and Supply Inc. (NSSI). Currently, the contracted vessels supply cargo to both Agnico Eagle operations and the nearby communities. The first vessels of the year will normally arrive in the latter part of 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 six 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 (USLD) and Jet A) will be loaded on marine fuel tankers (LOA 130 m, draft 8 m, freight capacity ~ 10 million litres) and delivered to the lightering point near Helicopter Island in July (13 trips delivering 50 million litres total) and October (5 trips delivering 16.8 million litres total) by Woodward Coastal Shipping Ltd. On average, up to four million litres of fuel is delivered per tanker shipment. The port of departure for transporting fuel will be different from that for dry cargo. The fuel is transported by ocean-going tankers between Lewisporte, NL and the lightering location (anchorage) near Helicopter Island, Nunavut. Once the fuel tankers are securely anchored, fuel is transferred to smaller shuttle tankers (LOA ~110 m, draft 4.6 m, fuel capacity ~2,900 m³ diesel). The shuttle tankers then transport the fuel shipment through Chesterfield Narrows to the Meliadine 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 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 manoeuvrable and capable of transiting the access passage with its changing current patterns. Navigation will be during daylight hours and 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.

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



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 construction equipment being demobilized following the completion of construction and/or hazardous or other waste being sent to a certified waste management facility for treatment, recycling and/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 Mine barge unloading facilities and the fuel will be transported to the Meadowbank Mine tank farm. Contingency measures related to the transfer of fuel are described in the Oil Pollution Emergency Plan (OPEP).

1.3.3 Explosives and Hazardous Materials

A minimum amount of explosives will be stored at the Whale Tail Pit site. The existing emulsion plant at the Meadowbank Mine will be maintained with deliveries on an as need basis during operations. The Project 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 Project 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 Project site. However, in the eventuality of a delay in their transit to the mine site, these products will be temporarily stored at the Meadowbank Mine 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 Project. Due to transportation restrictions, normally a full year's supply of sodium cyanide will 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; consequently there will be little to no accumulation of such wastes at the Project 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 IMDG code (International Maritime Dangerous Goods).

SECTION 2 • RELATED DOCUMENTS

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

Management and monitoring plans for the Project that provided input to the Shipping Management Plan include the following:

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

2.1 Spill Contingency Plan

The cornerstone of spill contingency 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 all 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 Plan

The Oil Pollution Emergency Plan complements the Spill Contingency Plan and should not be construed as superseding it. The OPEP only provides contingency planning for storage of hydrocarbon products at the Meadowbank Mine laydown area in Baker Lake.

The OPEP 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 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 seeks to minimize potential health and safety hazards, environmental damage, and cleanup costs.

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 *"Guidelines for the Development of the Shipboard Marine Pollution Emergency Plan"*. Vessels contracted by Agnico Eagle will be 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 in providing 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 responding to any spill of fuel or any other hazardous product. Shipboard Oil Pollution Emergency Plans 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 help could be requested for major accidents such as accidental grounding/stranding of a vessel. Under these circumstances, the safety of the crew and maintaining the integrity of the vessel would be the first 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 3-2 lists international conventions and protocols signed by Canada. Canada is a signatory to International Marine Organization (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.

At this time, Agnico Eagle has contracted NSSI and Woodward Coastal Shipping Ltd. to be used in Project shipping to Baker Lake. However, the shipping companies could change over the construction, operations and closure phases of the Project. It is required that the shipping contractors to be used by Agnico Eagle will abide by Canadian laws and regulations, applicable MARPOL 73/70 annexes, and international conventions. Inspections carried 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. As soon as reasonably possible, and before construction begins on the Project, Agnico Eagle will provide Transport Canada with a list of shipping contractors.

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 wastes generated onboard vessels. It does allow for the discharge of untreated sewage². The *Marine Liability Act* 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.

² Ships are to only discharge gray water and treated sewage when the ship is at least 50 km from Rankin Inlet.

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

Vessels servicing the Project will be required to comply with the AWPPA and regulations while in a Shipping Safety Control Zone⁴.

The various shipping companies contracted by Agnico Eagle must have an approved SOPEP, and 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. It is the responsibility of the Master of the ship to ensure safe passage through Canadian waters and to maintain up-to-date charts and publications⁵.

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. Shipping contractors will be encouraged to do the same.

Table 3-1 Applicable Acts, Regulation, and Guidelines

Acts	Regulations	Guidelines
Federal Legislation		
<i>Canada Shipping Act, 2001 (S.C. 2001, c. 26)</i>	<i>Response Organizations and Oil Handling Facilities Regulations (SOR/95-405)</i>	Oil Handling Facilities Standards – TP12402
[An Oil Pollution Emergency Plan is required under the Act (168(1)d)]	<i>Pollutant Discharge Reporting Regulations, 1995 (SOR/95-351)</i>	Environmental Prevention and Response National Preparedness Plan 2008 – TP13585
	<i>Environmental Response Arrangements Regulations (SOR/2008-275)</i>	Guidelines for Reporting Incidents Involving Dangerous Goods, Harmful Substances and/or Marine Pollutants – TP9834E 2009
	<i>Ballast Water Control and Management Regulations (SOR/2006-129)</i>	Arctic Waters Oil Transfer Guidelines, 1997 - TP10783E
	<i>Vessel Pollution and Dangerous Chemicals Regulations</i>	Response Organizations Standards – TP 12401E 1995
		Guidelines for the Control of Ballast Water Discharge from Ships in Waters under Canadian Jurisdiction (TP 13617)
<i>Canadian Transportation Accident Investigation and Safety Board Act (S.C. 1989, c. 3)</i>	<i>Transportation Safety Board Regulations (SOR/92-446)</i>	
<i>Marine Liability Act (S.C. 2001, c. 6)</i>	<i>Marine Liability Regulations (SOR/2002-307)</i>	
<i>Arctic Waters Pollution Prevention Act (R.S.C., 1985, c. A-12)</i>	<i>Arctic Waters Pollution Prevention Regulations (C.R.C., c. 354)</i>	

⁴ Rankin Inlet is in Zone 16.

⁵ Transport Canada is not the source to provide up-to-date information on changing sea levels or on emergence of new reefs or shoals.

Acts	Regulations	Guidelines
	<i>Arctic Shipping Pollution Prevention Regulations (C.R.C., c. 353)</i>	
<i>Transportation of Dangerous Goods Act (1992, c.34)</i>	<i>Transportation of Dangerous Goods Regulations (SOR/2001-286)</i>	
<i>Safe Containers Convention Act (R.C.C. 1985, c. S-1)</i>		
<i>Oceans Act (S.C. 1996, c. 31)</i>		
<i>Navigable Waters Protection Act (R.S. 1985 c. N-22)</i>		
<i>Canada Water Act (1985 c.11)</i>		
<i>Fisheries Act (R.S.C. c. F-14)</i>	<i>Marine Mammal Regulations (SOR/93-56)</i> <i>Marine Mammal Regulations (SOR/93-56)</i>	
<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 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	

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. (*Fisheries and Oceans Canada* <http://www.dfo-mpo.gc.ca/Science/publications/uww-msm/articles/beluga-eng.htm>)

The reaction of marine wildlife to vessel traffic is predicted to not be significant and, providing mitigation measures are employed, marine vessel traffic associated with the Project should not lead to any residual effects to marine wildlife (see Volume 3, Appendix 3-A). Agnico Eagle will include in its contracts that ships must remain mindful of marine areas having a high density of marine mammals and birds and stay within shipping lanes, wherever possible. Agnico Eagle request ships provide their ship track data for inclusion in annual reporting.

4.1 Interactions and Potential Effects

Vessel discharges (sewage, solid wastes, 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 and contaminate the food supply;
- 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 the shipping lane for marine mammals from Hudson Strait to the lightering point near Helicopter Island. Since 2010, the Meadowbank division has implemented a vessel-based Marine Mammal and Seabird Observer (MMSO) program which will continue to be implemented during all routine project shipping activities in the Regional Study Area (RSA) for the Project (Volume 3, Appendix 3-A), in accordance with NIRB Project Certificate 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. As safe navigation allows, 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;
- ships will, when possible, maintain a straight course and constant speed, and avoid erratic behaviour;
- 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 ice⁶;
- ships will maintain a minimum distance of 300 m from marine mammals engaged in feeding activities;
- for all other marine mammal encounters, ships will not approach within 100 m of a marine mammal;
- if marine mammals approach within 100 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 100 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 Canada (Canadian Wildlife Services);
- ballast water will only be released in designated areas and if there is no marine wildlife in the area; and
- bilge water, grey water and sewage will be properly treated and only released in areas where no marine wildlife is present.

⁶ As all shipping will occur during the open water season, collision with young seals in liars will not happen.

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 Project related shipping would be diesel fuel, which floats on the water surface and has a high rate of evaporation. However, these occurrences are expected to be rare and the activation of the SOPEP 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

Agnico Eagle will continue to ensure contracted vessel operators the monitoring of marine wildlife. Contracted vessels by Agnico Eagle will be requested to collect incidental monitoring data during their voyage and to report it to Agnico Eagle. In addition, a vessel-based MMSO program will be implemented during all Project routine shipping activities in the RSA. This program will be executed by trained local observers stationed on-board Project 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 small boats and barges-tugs and/or ships or 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 on the shipping activities that can be expected over the ice-free shipping season; 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 shipping lanes 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.

SECTION 6 • ON BOARD WASTE MANAGEMENT

The six 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.

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 meeting Canadian standards⁷. Holding tanks with the capacity for all grey and treated sewage while in port are expected to be part of the ship's infrastructure. Agnico Eagle will advise ships that disposal of waste water 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 in the marine environment.

The design and operation of shipboard incinerators in Canada are specified under the International Marine Organization, 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 Project, 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 with the ash stored in containers, which will be shipped south at the end of the shipping season for treatment, recycling and/or disposal in a certified waste management facility.

Hazardous waste will not be incinerated but returned south for treatment, recycling and/or disposal in a certified waste management facility.

⁷ If all sewage is to be incinerated, there will not be any need for sewage treatment.

SECTION 7 • BALLAST WATER MANAGEMENT

Ballast water is essential to control trim, list, draught, stability, and/or stresses on a vessel. Ballast water control and management regulations protect waters under Canadian jurisdiction from non-indigenous aquatic organisms and pathogens that can be harmful to ecosystems. The *Ballast Management Control and Management Regulations* are intended to minimize the probability of introduction of harmful aquatic organisms and pathogens from vessels' ballast water while also protecting the safety of vessels (Transport Canada 2007).

While an exemption exists in the regulations for vessels operating exclusively in waters under Canadian jurisdiction or certain adjacent waters, any Canadian vessel that has operated outside these waters may carry harmful aquatic organisms or pathogens in their residual ballast and, as such, is not eligible to exemption.

Agnico Eagle expects to use vessels largely active in the coasting trade that operate almost exclusively in waters under Canadian jurisdiction. However, these vessels do on occasion venture into waters outside Canadian jurisdiction and, as such, will require a Ballast Water Management Plan (BWMP). The regulations require the preparation and carriage of a BWMP for each vessel, and for copies to be submitted to Transport Canada. The BWMP will be specific to the vessel and will be a requirement of the carrier.

If Agnico Eagle were to contract vessels originating from waters outside the jurisdiction of Canada, a BWMP would be required. All BWMP (reviewed by the National Administration) carried on ships of foreign origin would be based on the following international guidelines and guiding principles:

- IMO Resolution A.868(20): *Guidelines for the Control and Management of Ships Ballast Water to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens*, in particular Section 7.1;
- The *Model Ballast Water Management Plan* developed by the International Chamber of Shipping and the International Association of Independent Tanker Owners;
- Regulation B-1 of the IMO's *Regulations for the Control and Management of Ships' Ballast Water and Sediments*; and
- Part B of the Annex to Resolution MEPC.127 (53): *Guidelines for Ballast Water Management and Development of Ballast Water Management Plans*.

Agnico Eagle will require contracted vessels not eligible for exemption to provide Agnico Eagle with a copy of their BWMP.

7.1 Ballast Water Exchange

It is recognised by the IMO that 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. In particular, sediment found in the vessel's ballast tanks should be disposed of at sea in areas outside 200 nautical miles (370 km) from land and in water depths exceeding 2,000 m.

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. This will occur while on anchor outside the access passage after the lightering of dry cargo or fuel.

In the event that a ship is contracted from waters outside jurisdiction of Canada, ballast exchange is to occur at least 200 nautical miles from shore where the water is at least 2,000 m deep. If the foreign vessel undertakes this ballast exchange outside Canadian waters, it can undertake further ballast water exchanges within Canadian waters. If safety or other reasons dictates that the ballast exchange cannot occur outside waters under Canadian jurisdiction, an alternate designated area is available in Hudson Strait, east of 70° west longitude, where the water is over 300 m deep.

In the case of non-transoceanic navigation, and where ballast water is taken on-board outside waters of Canadian jurisdiction, the water is to be exchanged before entering Canadian waters at a location at least 50 nautical miles offshore, in water at least 500 m deep. If this is not possible due to safety or other reasons, the ballast water exchange can occur in the alternate designated area in Hudson Strait, east of 70° west longitude, where the water is over 300 m deep.

All coastal trade vessels will in all likelihood not venture more than 200 nautical miles from shore and will not exchange ballast water outside waters of Canadian jurisdiction. All the same, ballast water exchanges for all vessels operating in waters under Canadian jurisdiction are expected to meet the provisions of the Regulations, and to follow Part A of the IMO *Guidelines for Ballast Water Management and Development of Ballast Water Management Plans*, and the IMO *Guidelines for Ballast Water Exchange*.

SECTION 8 • SAFETY

Safety is a top priority for Agnico Eagle. It begins with all personnel (Agnico Eagle, contracted 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 contracted 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: 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 season⁸. 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 shipping lanes ensure the vessel remains on course where bathymetry and physical hazards are known.

The average speed of the vessels in open waters is expected to be less than 14 knots (26 km/h). Within the near shore shipping lane, there will be navigations aids on islands which will provide an extra measure of safety for the ships. Shipping can be carried out without pilotage as the shipping lanes entail minor hazards that do not significantly reduce ship safety. Any actions required by the crews of the ships and tugs are expected to be well within their capabilities.

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 tugs-barges will be highly manoeuvrable and capable of transiting the access passage with its changing currents and will not require pilotage. Navigation will be during daylight hours and 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 in jeopardy in the shipping lane;
- vessel running aground due to a navigational error or mechanical failure;

⁸ Agnico Eagle's shipping routes within Nunavut are non-compulsory pilotage areas during the ice free shipping season

- 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 established sea lanes. The shipping lanes used are well defined. For an extra measure of safety, buoys are present along the route within islands leading up to Chesterfield Inlet, and weather warnings are updated regularly. Also, shipping companies likely to be employed 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 hazards⁹ 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, through the use of mitigation measures, to reduce the risk as low as practically possible. 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;
- 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 defined sea lanes;
- vessels will be double hulled;
- 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 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;

⁹ One hazard that can be reduced is shipping when ice is present. Agnico Eagle has opted to only ship during the ice-free season thereby greatly reducing this hazard.

- the tug-barges will always proceed during daylight and in good visibility conditions;
- the vessel Master will conduct a risk assessment before proceeding if wind-speed is higher than 30 knots; 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 Project 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. 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; and
- Agnico Eagle has a separate laydown and storage area from the community in Baker Lake.

The mitigation of negative socio-economic effects of smuggling alcohol and prohibitive substances into the community were described earlier.

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 will 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, including human health; to provide timely information amongst the public;; to ensure cooperation from all interested parties; and to reduce the spread of concern or alarm through the dissemination of inaccurate information.

Each agency involved in a major spill event may provide its own media communications, and may designate spokespersons for such; however, from the Arctic REET's (Regional Environmental Emergencies Team) perspective, a coordinated response is preferable. To that end, the government lead Agency is expected to act as the official spokesperson for the response, with support provided by personnel within the Arctic REET, as required.

In the unlikely event of an environmental emergency relating to Project 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

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)

Transport Canada. 2007. A Guide to Canada's Ballast Water Control and Management Regulations. Guideline TP 13617E

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

APPENDIX A • MARINE HYDROGRAPHIC CHARTS

Chart 5002 Hudson Bay and Hudson Strait

Chart 5620 Entrance to Chesterfield Inlet

Chart 5621 Rockhouse Island to Centre Island

Chart 5622 Centre Island to Farther Hope Point

Chart 5623 Farther Hope Point to Terror Point

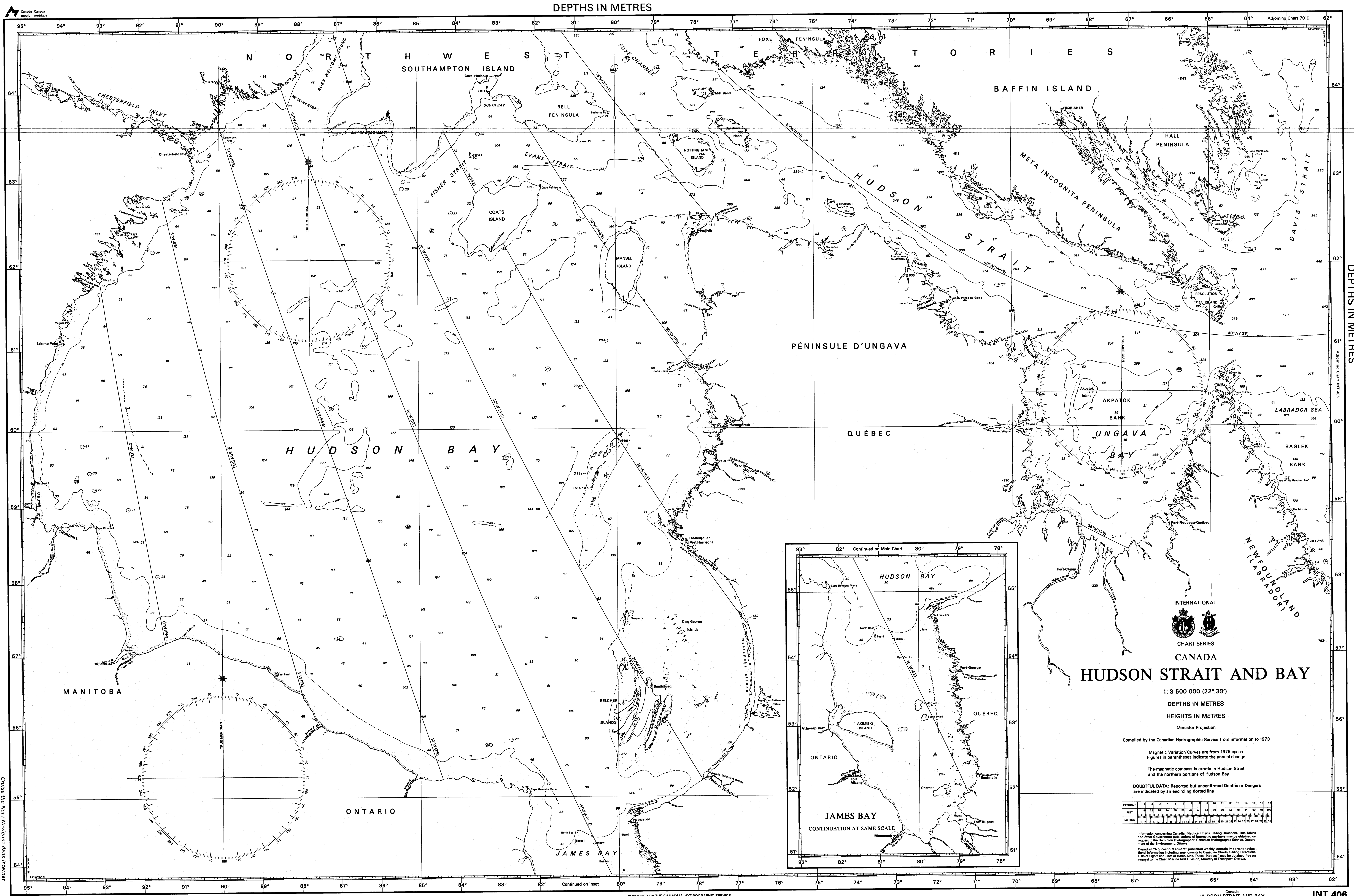
Chart 5624 Terror Point to Schooner Harbour

Chart 5625 Schooner Harbour to Baker Lake

Chart 5626 Baker Lake

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NEW CHART July 23 1975
Corrections to NOTICES TO MARINERS / Corrigés à l'avis aux navigateurs : 2008-02-09
See Notices to Mariners for subsequent corrections / Voir Avis aux navigateurs pour les corrections subséquentes

Geographic Through
Notice to Mariners
2015-08-20
Corrigés aux cartes de
Avis aux navigateurs à
la date d'interférence

WARNING
Mariners may find that some soundings are in black or green and some are in white or red
Les navigateurs peuvent trouver les sondes de blanc ou vert ou rouge et blanc. Ces sondes ont une signification particulière. Voir l'avis aux navigateurs pour les corrections subséquentes.

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