

Accidents & Malfunctions

Preparedness & Emergency Response



Panel Members

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Commitment to Safety

- Prevention
- Preparedness
- Training
- Exercises and Testing
- Incident Reporting and Learning
- Continual Improvement



Safety Across All Operations

- All locations – mine site, port, rail
- Consideration of risks from accidents and malfunctions addressed in Final Environmental Impact Statement (FEIS)
- Significant emphasis on shipping related accidents particularly related to the potential for oil spills
- Additional analysis related to overwintering fuel
- Railway operation emergencies

Focus For This Panel:

Shipping

- Marine risks associated with accidents and malfunctions as it relates to the transport and storage of fuel:
 - Ship-to-shore transfer of fuel
 - Overwintering of fuel vessel at Steensby Inlet
 - Shipping route
- Preparedness and emergency response for marine incidents and spills
- Risk for transboundary impact of a fuel spill along the shipping route

Railway

- Preparedness and emergency response for railway accidents and malfunctions

Key NIRB Issues:

- Issue (e) – Potential for accidents and malfunctions associated with proposed marine transport and storage of bulk fuel, including overwintering of fuel vessel and emergency preparedness
- Issue (i) – potential for transboundary impacts associated with proposed shipping activities

Shipping – Regulatory Framework

The regulatory framework to ensure marine safety and to protect the marine environment for shipping in Canada includes:

- Canada Shipping Act (2001)
- Arctic Waters Pollution Prevention Act (AWPPA, 2001)
- Marine Liability Act

Shipping – Regulatory Framework

The Canada Shipping Act and Regulations govern:

- Ship design and construction (including double-hull requirement for fuel tankers)
- Ballast water management
- Pollution control
- Emergency response and preparedness
- Crew qualifications
- Navigation safety

Part 8 of the Canada Shipping Act and its regulations address marine oil spill preparedness and response regime

Shipping – Regulatory Framework

The Arctic Waters Pollution Prevention Act and Regulations include additional protection for the Arctic environment:

- Construction standards for ships including ice breaking capability
- Shipping safety control zones
- Bans on discharge of oil, hazardous material and garbage
- Requirements for vessels to carry insurance addressing civil liability
- Vessel control systems for safe operation in ice conditions, including vessel design and having an experience ice navigator on board

Shipping – Regulatory Framework

The Marine Liability Act contains provisions respecting liability for spills including:

- Requirement for vessels to carry insurance to pay damage for oil spills, and,
- Provision for liability

Shipping – Regulatory Framework

The written submission of Transport Canada and the submission of the Canadian Coast Guards provide more details of these regulatory requirements and the oversight and enforcement role of Transport Canada and other federal agencies.

Transport Canada is the lead federal agency responsible for the National Marine Oil Spill Preparedness and Response Regime.

Approach

- Compliance with regulatory requirements
- Focus on prevention
 - Ensure reliability and safety of installations and equipment
 - Bulk fuel storage and fuel handling facilities
 - Ore carriers (Polar class 4)
 - Navigational safety
 - Fuel tankers – double-hull
 - Suppliers and operators with Arctic experience and expertise
- Effective management plans in place
- Emergency response team

Effective Management Plans

- EH&S Framework and Risk Assessment (FEIS Volume 10)
- Management plans evolve over time
- Emergency Response and Spills Contingency Plan
 - FEIS Appendix 10C-1
 - Guidance from Emergency Response Work Group
- Oil Pollution Emergency Plan (OPEP) for oil handling facilities
 - FEIS Appendix 10C-2 & 10C-3
 - Transport Canada review and approval on annual basis
- Ship Oil Pollution Emergency Plan (SOPEP)
 - Transport Canada approved
 - Specific to each vessel navigating in Canadian waters

Emergency Response Team (ERT)

- All employees undergo formal safety and emergency response training
- Emergency Response Team on site at all times
 - trained in emergency identification and accepted response action techniques
- Emergency Response Team (ERT) training
 - Practical
 - Comprehensive annual exercises
 - External expert organizations to assist in delivery of training
 - External organizations and community representatives will be invited to participate in the training and field exercises.

Ship-to-Shore Transfer of Fuel

Preparedness and Emergency Response

- Addressed in FEIS Volume 9, Section 3.5
 - Fuel spill modelling presented in Appendix 9A and 9B
- During construction – ship-to-shore fuel transfer by floating hose method (method used for all Arctic communities)
 - Fuel tankers have a Ship Onboard pollution Emergency Plan
 - Effective spill prevention measures have been identified and will be implemented for ship-to-shore transfers
 - Oil Pollution Emergency Plan for Oil Handling Facilities is reviewed and approved by Transport Canada on an annual basis
 - Fuel transfer only when weather conditions permit
- Once freight dock is constructed – fuel unloaded at dock

Ship-to-Shore Transfer of Fuel

Preparedness and Emergency Response

- Three types of fuels delivered to ports
 - Arctic diesel, jet fuel and marine diesel
- Fuel spill modelling carried out for both Milne Port and Steensby Port
 - Modelling based on spill of arctic diesel
 - Assumes worse case scenario (5 ML spill) without intervention
 - Modelling based on currents information and wind data
 - Considers fate and persistence of fuel spill on water
 - Purpose of modelling is to identify trajectory of fuel slick on water and environmentally sensitive areas of coast line
 - Useful tool for the planning of emergency response strategies for spill event
 - Up to 90% of trajectories expected to reach shore line in less than 4 hours

Ship-to-Shore Transfer of Fuel

Preparedness and Emergency Response

- Response for spill
 - Emergency response team on site and prepared to respond when fuel transfers occur
 - Response equipment located at each port
 - Boats (work boat and tugs) available and ready for rapid deployment of containment booms
 - Skimmer, barge and other recovery equipment located at each port
 - Effective response and deployment of spill containment within an hour of spill occurrence
 - Small fuel spill during ship-to-shore transfer will quickly be contained and the environmental effects resulting from such an incident will not be significant.
- The risk associated with ship-to-shore transfer of fuel is considered low.

Steensby Port Area

Overwintering of Fuel Vessel

- Rationale – to support early construction activities
- Strategy to support early construction activities
 - It will require up to two years to construct the onshore fuel storage required by the project
- Risk assessment has identified risks and mitigations measures to ensure safe operation
 - Submitted for review on May 15th 2012

Steensby Port Area

Overwintering of Fuel Vessel

- The vessel will comply with all regulatory requirements
 - Double hulled, Polar class 1a vessel
- Operational plans for this practice have been submitted for review
- No fuel off-loading during the shoulder season

Overwintering Vessel Description

Essential characteristics:

- *Ice class 1A or higher*
- *Double hulled, Segmented compartments*
- *Vessel must carry full complement of spill control gear and the crew must be trained in its use*
- *Vessels will meet all requirements of the Arctic Waters Oil Transfer Guidelines - TP 10783 E and also have a Shipboard Oil Pollution Emergency Plan (SOPEP)*

Primula – Used at Hope Bay



Steensby Port Area

Overwintering of Fuel Vessel

- Concerns:
 - Integrity of the vessel – Polar class 1a vessel
 - Spill of fuel under ice – no transfer during shoulder seasons; one transfer per month over ice during winter months
 - Emergency response for vessel on board incidents (SOPEP and OPEP)
- Transport Canada’s review has determined that the Proponent’s plan meets regulatory requirement
- Risk analysis identifies low to medium risk – no high risk components have been identified
- Practice of overwintering has been used successfully in Nunavut as well as NWT
 - Hope Bay Project

Risk Assessment of Fuel Spill at Port and along Shipping Route

Accidents & malfunctions addressed in FEIS Volume 9, Sections 3.6

- Ship engine failure at sea (possible; moderate risk)
- Ship grounding (unlikely; low risk)
- Ice /ship interaction (likely; low risk)
- Collision with other vessels (rare; low risk)

Also discussed in Volume 9, Section 3.8

- Large diesel spill at sea (possible; low risk)

Risk Assessment of Fuel Spill along Shipping Route

Final Environmental Impact Statement concludes that risk of a spill event is low.

Risk assessment work shop held on June 18th, 2012

- Attended by representatives of shipping companies, Transport Canada, Coast Guards, DFO and Environment Canada
- Concluded that risk of a spill along shipping route is unlikely with prevention measures in place and strict adherence the “rules of the road” for shipping

Prevention Measures

- Ship Master's responsibility to navigate with caution
- Transport Canada requires any tanker built after 1993 to be double-hulled to operate in Canadian waters
 - Vessels have anti-collision devices with alarms and radar to ensure that collisions are avoided.
 - Marine heavy oil (IHO) used for powering the ship is stored within a double tank containment inside the ship, away from the hull. IHO storages are unlikely to be damaged by collision or grounding.
- Ore carriers – Polar class 4 vessels
 - Fuel tanks are located within double skin within the vessel
 - Marine diesel tank capacity contained in at least six storage tanks.

Prevention Measures

- Vessels are equipped with several dual/redundant back up systems
 - Engines
 - Radar
 - Navigational systems
 - Communication systems
- Shipping lane bathymetry is known
 - Bathymetric surveys done for a 6 nautical mile width along shipping corridor
- Hazards and environmentally sensitive areas along shipping route have been identified
- Shipment of bulk fuel during the open water season
 - Suppliers with Arctic experienced and expertise with Arctic navigation

“Rules of the Road” for Shipping

- Shipping operators must abide by the established regulatory framework
- Ships must sail within the established shipping corridor (1.5 km within the 6 nautical mile width where bathymetry is known)
- Ships must have a Ship Oil Emergency Response Plan (SOPEP)

Preparedness and Emergency Response

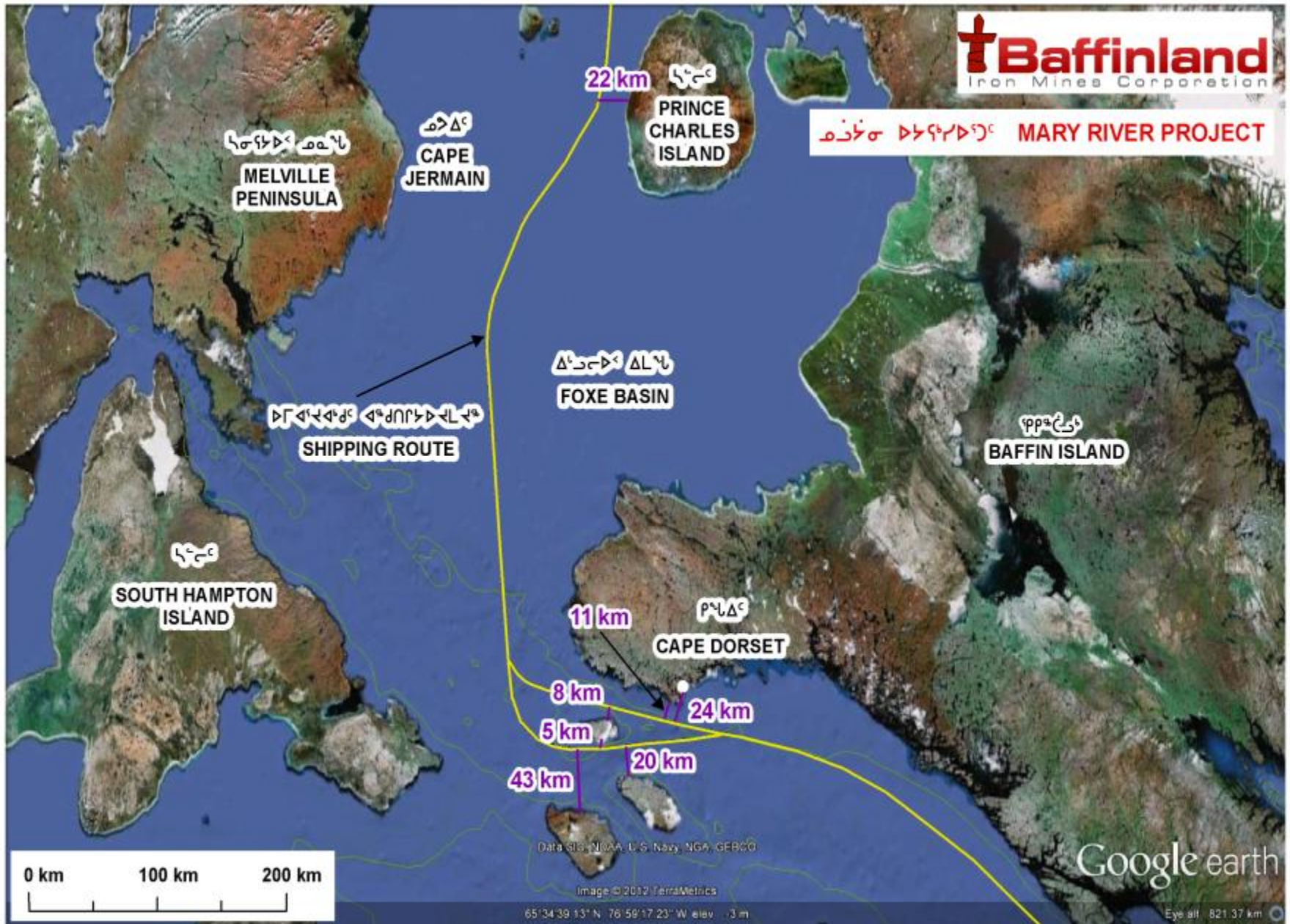
- Capabilities at Port Site
 - Emergency Response Team at Steensby site
 - Two ice management vessels equipped with necessary spill response/containment equipment
 - Additional response equipment at Steensby
- Response along shipping lane
 - Ship is the first responder (SOPEP)
 - Discussions are underway with a “certified” response organization (R.O.) to develop strategies for response

Risk of Transboundary Effects

- FEIS Volume 9, Section 3.8.11 and Appendix 9C
 - Coastal Ocean Resources Inc.
- Worse case scenario – 5ML spill without containment or response action
- Diesel persistence is relatively short
 - Weathering – 90% of the fuel likely to be weathered within 96 hours
 - Worse case – persistence is one to two weeks
- Size of fuel slick on water
 - Highly probable that a spill will be largely confined to a 15 km swath on each side of the spill location
 - Shore line within 15 km swath may be impacted
 - Shore line outside 15 km swath unlikely to be impacted

Risk of Transboundary Effects

- The southern shipping route enters eastern Hudson Strait, passes the community of Cape Dorset and turns northward in Foxe Basin:
 - The preferred route is north of Mills Island – closest distance to Cape Dorset is 24 km
 - The alternative route passes south of Mills Island distance of 20 km from the Nunavik Settlement boundary and the islands of Nottingham and Salisbury
- Risk of transboundary effects is low



Summary – Shipping

Preparedness and Emergency Response

- Risk of a spill is low
 - Bulk fuel tankers are double hulled
 - Ore carriers are Polar class 4 vessels with internal double skin fuel storage tanks
 - Ship owner/operator have Arctic experience and expertise
 - State of the art navigational systems on ships
 - Well defined shipping lane and known bathymetry
- Preparedness and Emergency response
 - Ships will have Transport Canada approved SOPEP
 - Baffinland will have Emergency Response Team and response equipment on shore at Steensby and Milne
 - Two ice management vessels equipped with emergency response equipment
 - Contract with certified Response Organization (R.O.) for response and clean up for spills
- Transboundary effects of spill - Very low risk

Railway – Regulatory Framework

- Federally regulated railway
- Requirement for:
 - Certificate of Fitness
 - Authorization to construct and operate a railway under article 98 of the Canadian Transportation Act
- The regulatory framework for railway safety encompasses the legislation, regulations, rules, and, engineering standards that provide the structure in which railway companies can operate safely.
- Relevant rail safety legislation, regulations, rules, engineering standards, policies and guidelines presented in Transport Canada's submission – Appendix B

Prevention Measures

- Compliance with regulatory requirements and guidelines
 - BIM will develop a Railway Safety Management System
 - BIM will give “Notice and Approval of Railway Works” in accordance with regulation
 - In accordance with Railway Safety Act, BIM will file rules and engineering standards with the Minister
- Compliance with Transportation of Dangerous Goods
- Railway Maintenance Management Plan
 - Draft presented in FEIS Appendix 10D-9.1
 - Recommendations made by Transport Canada will be incorporated
- Railway Emergency Response Plan
 - Draft presented in Appendix 10D-9.2
 - Recommendations made by Transport Canada will be incorporated

Prevention Measures

- Dangerous goods transported
 - Bulk arctic diesel and jet fuel in tanker cars
 - All other dangerous goods in appropriate packaging within sea container
- Operating practices
 - Fuel tanker cars – add two to four tanker cars to the return train to Mine site
 - Railway speed limited to 30 to 40 km/hr
- Railway tanker car design
 - Regulations and Canadian Standard

Railway Accidents & Malfunctions

- Risk of a spill is low
 - Prevention measures, mitigations and management plans in place to minimize risks
- Railway Emergency Response Plan
 - Emergency Response Team (ERT) and emergency response equipment located at Mine Site and at Steensby
 - External expertise to assist in training of ERT
 - ERT is trained and knowledgeable
- First response
 - Safety of personnel
 - Secure site / containment
 - Respond as weather conditions safely allow