



NIRB Application for Screening #126466

Developing local capacity and tools for on-board ship monitoring to better understand ecological risks and identify actions to improve mitigations for ship traffic in Arctic Canada's largest port

Application Type: New

Project Type: Scientific Research

Application Date: Thursday, July 9, 2026

Period of operation: from 2026-08-26 to 2027-12-25

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DETAILS

Non-technical project proposal description

English: The introduction of non-indigenous species (NIS) is one of the top drivers of global biodiversity loss, with ballast water discharge from ships being the primary source of aquatic NIS introductions around the world [1]. Shipping activity has dramatically increased in the Canadian Arctic due to climate change and increased resource extraction [2] with Milne Inlet having the largest increase in shipping traffic due to raw iron exports [3,4]. Ballast water discharge in this previously undeveloped inlet brings NIS introduction risks with potential impacts to sensitive Arctic marine species/habitats (e.g. areas important for feeding/breeding of narwhal/bowhead, bird colonies and Arctic char), consequences for food security/ local community well-being, and more widespread effects if NIS become established and spread to other Arctic regions. Recent updates in regulations have led to the requirement for ballast water management systems (e.g. chlorination or UV) onboard vessels, to treat ballast water before discharge, although there is uncertainty about their efficacy in Arctic environments. Southern ballast water studies found approximately half of sampled vessels exceeded international treatment standards (Regulation D2 [5]) with 10 to 1000s of organisms/m³ of ballast water [6,7,8], including NIS to Canada [7,8]. Colder temperatures often lead to slower chemical reactions, suggesting treatment efficacy to ballast water treatment systems may be lower on Arctic voyages [8] than voyages to southern Canadian ports. In addition, organisms that survive treatment may be hardy, and may be more likely to establish in Arctic environments [9]. This project will assess the number and types of organisms in ballast water discharged, as well as efficacy of ballast water treatment systems on-board ships travelling to the arctic to better understand the potential risk of NIS under Arctic conditions. Further, it will assess the feasibility of ballast water sampling and analysis methods for future use by community members/organizations for future ballast water monitoring. In 2026 and 2027, we propose to sample for up to 8 weeks (length of sampling will be dependant on resources and capacity at Milne Inlet) during the shipping season to sample a total of up to ~64-80 vessels over the duration of the trial monitoring program. Sampling will require a team of 4-5 people who will work with ship's staff to connect sampling equipment to the appropriate sample port on-board. Sampling would include the use of the Ballast Catch tool to filter at least 1000-L of ballast water and collect large size class ($\geq 50 \mu\text{m}$) organisms samples as well as the collection of raw (unfiltered) water samples for the small size class ($\geq 10 \mu\text{m}$ and $\leq 10 \mu\text{m}$) organisms. In addition to large and small size class samples, water quality parameters (water temperature, pH, and salinity) will be measured, residual chlorine levels will be assessed (i.e. to assess if the chlorine used to kill living organisms in ballast water neutralized properly) and environment DNA/RNA (eDNA/eRNA) will be collected for later individual- and meta-barcoding to determine the types of organisms present in ballast water samples. Sample processing will happen on-site at Milne Inlet port where an indicative tool (Ballast eye) will be used to count the number of live organisms in ballast water samples, and assess levels of compliance with the D-2 ballast management standards. A portion of all ballast water samples collected will be preserved for later taxonomic assignment using morphological and genomic methods. Each year, we will host a training workshop where Inuit youth from Pond Inlet, Igloolik and Sanirajak (Hall Beach) involved in the project will learn how to use sampling equipment, and essential safety measures for sampling ships at industrial port sites. A second workshop will take place in the fall where involved Inuit youth will provide feedback on the sampling season and do outreach in each of their communities with support from DFO to share knowledge of the project and discuss questions and concerns with community members. A third workshop will be hosted in the winter where Inuit youth with support from DFO, will analyze data from each field season using mapping and data analysis platforms.

French: L'introduction d'espèces non indigènes (ENI) est l'une des principales causes de la perte de biodiversité à l'échelle mondiale. Le rejet d'eau de ballast par les navires est la principale voie d'introduction de ces espèces dans les milieux aquatiques partout dans le monde [1]. Les activités maritimes ont fortement augmenté dans l'Arctique canadien en raison des changements climatiques et de l'intensification de l'exploitation des ressources naturelles [2]. Le détroit de Milne Inlet a connu la plus forte hausse du trafic maritime en raison de l'exportation de minerai de fer brut [3,4]. Le rejet d'eau de ballast dans cette région auparavant peu développée entraîne un risque d'introduction d'espèces non indigènes, ce qui pourrait avoir des répercussions sur les espèces et habitats marins sensibles de l'Arctique (par exemple, les zones importantes pour l'alimentation et la reproduction du narval et de la baleine boréale, les colonies d'oiseaux et l'omble chevalier). Cela pourrait également avoir des conséquences sur la sécurité alimentaire et le bien-être des communautés locales, ainsi que des effets plus étendus si ces

[illegible]

Closure Phase: from 2027-12-25 to 2028-03-25

Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
Milne Inlet Port - ship sampling on-board bulk carrier vessels.	Scientific/International Polar Year Research	Marine	Milne Inlet Port has been used for a number of years to ship out iron ore mined by Baffinland Iron mines between July and Oct. We will be boarding vessels to collect ballast water samples in September. No environmental samples will be collected as part of this project.	Baffinland is committed to identifying and surveying archeological sites if/when discovered on project lands. We will comply with all guidelines outlined in required training and project certificate as outlined by Baffinland contacts during project activities.	Closest communities are Pond Inlet and Arctic Bay and is within the tallurutiup imanga national marine conservation area.

Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Hall Beach	Office Manager	Hall Beach (Sanirajak) Hunters and Trappers Association	2026-03-31
Pond Inlet	Office Manager	Mittimatalik Hunters and Trappers Organization	2026-03-12
Igloolik	Office Manager	Igloolik Hunters and Trappers Association	2026-03-17

Authorizations

Indicate the areas in which the project is located:

North Baffin

Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Fisheries and Oceans Canada	License to Fish for Scientific Purposes (LFSP; includes zooplankton collection in water samples). Authorizations through NPC and NIRB are required prior to submission for an LFSP.	Not Yet Applied		

Project transportation types

Transportation Type	Proposed Use	Length of Use
Air	The sampling team will get to/from site using charter flights alongside Baffinland iron mine employees.	
Land	The sampling team will use a truck to get to/from accommodations to the dock/lab for sampling each day.	

Project accommodation types

Permanent Camp

Other,

Material Use

Equipment to be used (including drills, pumps, aircraft, vehicles, etc)

Equipment Type	Quantity	Size - Dimensions	Proposed Use
Truck	1	NA	Travel from accommodations to dock/lab

Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Gasoline	fuel	1	50	50	Liters	fuel for truck
Ethanol	hazardous	1	4	4	Liters	Sample Preservation (20 ml samples - up to 32 samples per year)

Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
0		

Waste

Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Scientific/International Polar Year Research	Other, Chemical waste (ethanol)	1L	All waste will be provided to the Baffinland water treatment facility for disposal if they have the abilities to safely dispose of waste. If this is not possible, waste will be shipped back down south for disposal by DFO.	NA

Environmental Impacts:

There are no anticipated impacts to the environment resulting from this project. We are using only existing methods of transportation as permitted by Baffinland based on their project authorizations/certificates and are only collecting sample while on bulk carrier vessels. No samples will be taken from the environment.

Additional Information

SECTION A1: Project Info

SECTION A2: Allweather Road

SECTION A3: Winter Road

SECTION B1: Project Info

SECTION B2: Exploration Activity

SECTION B3: Geosciences

SECTION B4: Drilling

SECTION B5: Stripping

SECTION B6: Underground Activity

SECTION B7: Waste Rock

SECTION B8: Stockpiles

SECTION B9: Mine Development

SECTION B10: Geology

SECTION B11: Mine

SECTION B12: Mill

SECTION C1: Pits

SECTION D1: Facility

SECTION D2: Facility Construction

SECTION D3: Facility Operation

SECTION D4: Vessel Use

SECTION E1: Offshore Survey

SECTION E2: Nearshore Survey

SECTION E3: Vessel Use

SECTION F1: Site Cleanup

SECTION G1: Well Authorization

SECTION G2: Onland Exploration

SECTION G3: Offshore Exploration

SECTION G4: Rig

SECTION H1: Vessel Use

SECTION H2: Disposal At Sea

SECTION I1: Municipal Development

Description of Existing Environment: Physical Environment

Description of Existing Environment: Biological Environment

Description of Existing Environment: Socio-economic Environment

Miscellaneous Project Information

Identification of Impacts and Proposed Mitigation Measures

When using chemicals, only small containers (500 ml or less) will be handled to prevent large spills in the lab, a spill kit will be available at all times to contain and clean up chemical spills. Containers of ethanol will be stored in flammables cabinet to prevent accidental fires. A fire extinguisher will be available at all times in case of fire at the lab.

Cumulative Effects

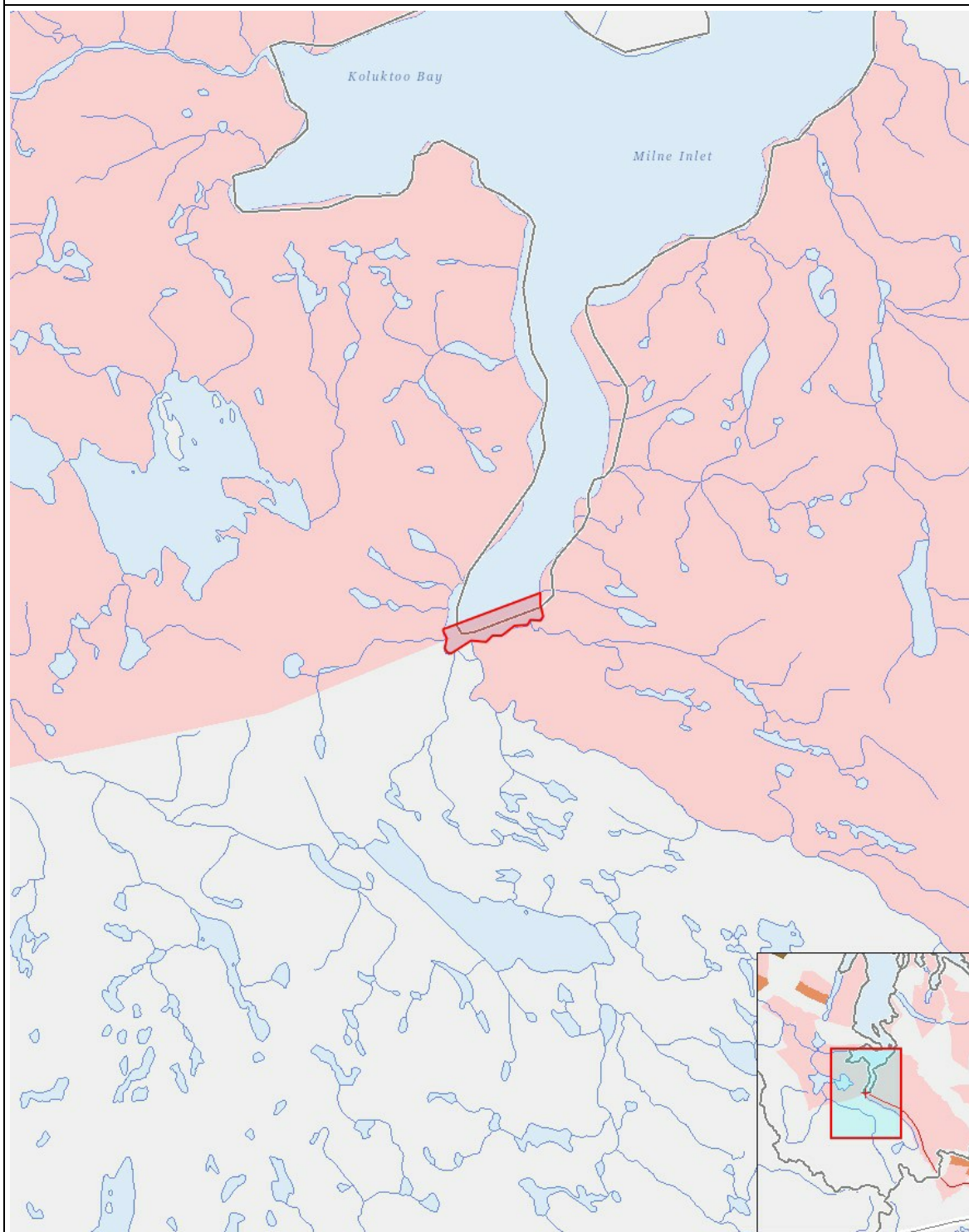
Impacts

Identification of Environmental Impacts

	PHYSICAL	Designated environmental areas	Ground stability	Permafrost	Hydrology / Limnology	Water quality	Climate conditions	Eskers and other unique or fragile landscapes	Surface and bedrock geology	Sediment and soil quality	Tidal processes and bathymetry	Air quality	Noise levels	BIOLOGICAL	Vegetation	Wildlife, including habitat and migration patterns	Birds, including habitat and migration patterns	Aquatic species, incl. habitat and migration/spawning	Wildlife protected areas	SOCIO-ECONOMIC	Archaeological and cultural historic sites	Employment	Community wellness	Community infrastructure	Human health
Construction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Decommissioning	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(P = Positive, N = Negative and non-mitigatable, M = Negative and mitigatable, U = Unknown)

Project Location



List of Project Geometries

- | | | |
|---|---------|---|
| 1 | polygon | Milne Inlet Port - ship sampling on-board bulk carrier vessels. |
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