



Nunavut Research Institute

License Holder Reporting requirements

For research undertaken in the 2024 calendar year (commencing January 01, 2024 and ending December 31, 2024)

Project Title:

Marine Environmental Effects Monitoring Program (MEEMP) and Non-Indigenous Species/Aquatic Invasive Species (NIS/AIS) Monitoring Program

Project Leader(s): Full name, affiliation, and contact information (address, phone number, email) of each project leader (principle investigator and co-PIs)

WSP Canada Inc, 2640 Douglas St, Victoria, British Columbia contracted by Baffinland Iron Mines.

Project Team: Full name, affiliation, and address (name of city/community and province/territory/state) of each member of the project team

Niallan O'Brien, Victoria, BC
Trish Tomliens, Sooke, BC
Karac Lindsey, Victoria, BC
Paul Hinton, cambell River, BC
Olivia Reeves, Fredericton, NB,
Dan Vincente, Saskatoon, SK
Marie-Claire Robitaille, Montreal, QC
Bryce Gunning, Sidney, BC
Ronnie Komangapik, Pond Inlet, NU
Marie Pierrejean, Quebec, QC
Anna Beckett, Vancouver, BC
Isiah Peterlooise, Pond inlet, NU

Abstract: A concise summary of what was done, found, and concluded to date, and how the results/information will be used. This summary must be translated into the appropriate dialect of Inuktitut. Suggested length: 250-300 words. ***This section will be published in the NRI's annual compendium of licensed research**

Baffinland has developed and implemented a multi-disciplinary Marine Environmental Effects Monitoring Program (MEEMP). The MEEMP is designed to evaluate potential Project related effects on the marine environment as predicted in the Final Environmental Impact Statement (FEIS) and FEIS addenda (Baffinland 2012, 2013). The MEEMP includes monitoring of marine water and sediment quality, marine benthic invertebrates, marine vegetation, and fish and fish habitat. The sampling design is generally based on the Metal Mining Environmental Effects Monitoring (EEM) technical guidelines and includes statistical approaches for detecting potential Project-induced impacts on the marine environment. Non-indigenous Species/Aquatic Invasive Species (NIS/AIS) monitoring is an integral component of the MEEMP and is designed to address the potential risks of species introductions to the marine environment from ship ballast water and hull biofouling.

Key messages: Concise, plain language summary of key take-away messages of work to date, findings and conclusions. Preferably 3-5 points, in bullet form.

Findings and conclusions are still being analyzed. A plain language executive summary of will be available in the 2024 NIRB annual report that will be published in spring 2025.

Objectives: Project objectives, preferably in bullet form.

The objective is to evaluate potential Project related effects on the marine environment as predicted in the Final Environmental Impact Statement (FEIS)

Annual activities: A description of activities and methods carried out during the current reporting period. This section should answer the questions: What? Where? When? Who? How? Include dates team members conducted research at remote field sites or collected data (including interviews) in communities; append a map with locations and/or coordinates of remote field sites, if applicable.

The Marine Environment Effects Monitoring Program (MEEMP) was conducted from July 25th to August 21st at Milne Port by a team of 11 (listed above) who conducted sampling around the ore dock.

Water quality monitoring was conducted in the marine receiving environment proximal to the discharge locations to determine whether there were any potential effluent discharge effects. Water quality indicators included metals, total suspended solids, nutrients, and hydrocarbons. Particle size distribution, as well as concentrations of organic and inorganic carbon, total petroleum hydrocarbons, volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), and trace metals were monitored.

Benthic communities were sampled to assess against the following performance indicators: density, richness, Simpson's diversity, and evenness to assess the accuracy of FEIS impact predictions that Project-related changes in benthic infauna.

Relative abundance (ie. density for motile epifauna and percent cover for sessile epifauna and macroflora), taxa richness, and Simpson's diversity and evenness indices were monitored as performance indicators to assess the accuracy of impact predictions in relation to benthic macroflora and epifauna. Divers were used to undertake biophysical surveys of permanent, heavy-duty steel quadrats to improve the resolution of taxonomic identification.

Fish sampling was conducted using both active and passive capture methods. Total catch, relative abundance, and catch per unit effort were used to characterize the marine fish community in Milne Inlet. Fish health was evaluated through the assessment of established endpoints, length frequency distributions, length-weight relationships, visual assessment of internal and external abnormalities, and tissue chemistry analysis for contaminants of concern. Changes in concentrations of polycyclic aromatic hydrocarbons (PAHs) and metal concentrations in fish tissue, as well as overall changes in body condition

Collected data across multiple trophic levels (marine vegetation, invertebrates, and fish) to continue establishing a comprehensive inventory of existing marine biota in the Project area that serves as a point of reference for any new species/taxa identified. This program is designed to ensure that no AIS/NIS are being introduced through ballast water discharges. All specimens caught during the benthic infauna; substrate, macroflora, and benthic epifauna; and fish sampling components of the Marine Environmental Effects Monitoring Program (MEEMP) were screened. Dedicated surveys were also conducted in addition to MEEMP surveys, which included the collection of targeted samples for DNA barcoding; as well as recruitment surveys using settlement substrates.

Results and Achievements: Findings and results to date of the above activities, highlighting any key research achievements (see guide below for formatting tips regarding tables and figures).

The results of the 2024 monitoring programs is currently being analyzed. Preliminary results will be available in the spring of 2025 and will be published in Baffinland's Annual Report to the NIRB.

Challenges/Obstacles: In this section, please comment on any challenges/obstacles (if any) that you experienced during this project year. If there were any actions to mitigate or resolve these challenges, please list them here. Were any concerns raised regarding the conduct of research team members or the impacts of the project?

No challenges or obstacles.

Expected Project Completion Date: Provide month and year of expected completion date of the project.

The field component of the program was completed in August 2024.

Project website (if applicable): If your project has a presence on the internet, including a website and/or social media page, please provide the link and/or account handle.

URL: <https://www.baffinland.com/media-centre/document-portal/>

Citations: Please append a complete reference list if citations are used anywhere in the document.

POLICY RELEVANCE

Does this research support policy development or decision-making in Nunavut? If yes, please describe.

In accordance with existing Terms and conditions of the Nunavut Impact Review Board (NIRB) project Certificate (PC) 005 Baffinland is responsible for the establishment and implementation of a Marine Monitoring Plan (MMP), which includes detailed information on Baffinland's project effects monitoring programs that are conducted over a sufficient time to meet the following objectives:

- a. Measure the relevant effects of the Project on the marine environment.
- b. Confirm that the project is being carried out within the terms and conditions relating to the protection of the marine environment.
- c. Assess the accuracy of the predictions contained in the Final Environmental Impact Statement (FEIS) for the project.

RESEARCH OUTCOMES: BENEFITS

Community engagement: Briefly list and describe any community consultation, engagement, collaboration and outreach activities that you have undertaken for the project; describe the role(s) that community members and/or specific organizations have played in research co-design and activities.

Before the commencement of the Marine monitoring programs, WSP on behalf of Baffinland obtains a letter of support from Mittimatalik Hunters and Trappers Organization (MHTO).

Youth engagement: Briefly list and describe any outreach, school or classroom activities that you have undertaken for the project; describe the role(s) that youth have played in your research activities.

N/A

Training and Employment:

How many Nunavummiut received training from team members? Please describe training and/or compensation provided.

Nunavummiut participants received training from team members on health and safety and the expected Field Level Risk Assessment (FLRA) before the start of each activity.

How many team members received training from Nunavummiut? Please describe training received and/or what knowledge sharing and/or skills exchange took place.

Nunavummiut participants shared information and knowledge with team members in an informal capacity over the duration of the field program.

How many Nunavummiut received employment? Please describe employment type and length, role(s) and responsibilities, and compensation provided.

The two Nunavummiut participants were Baffinland and QIA employees.

How many Nunavummiut received honoraria as research participants? Please describe method of participation (interview, observation, sample, survey, etc.), including compensation provided.

Same as above

Please explain how the project directly benefited Nunavut organizations and/or businesses (e.g., through contract services, local purchases, equipment donations, etc.)

Any Inuit firm registered with Nunavut Tunngavik incorporated (NTI) with 100% Inuit ownership operating in Qikiqtani region is designated as a preferred Inuit Firm (PIF) with Baffinland and gains advance notice on contracting opportunities at the Mary River Project.

OPTIONAL: Nunavut Team Members, hires, and/or trainees (excluding research participants e.g., interviewees)

The NRI is creating an inventory of Nunavummiut who are skilled and/or interested in research. The information provided below will not be shared publicly but will support long-term capacity sharing by connecting local and visiting researchers with research talent in each community.

Name	Expertise/skills	Training/interest areas	Contact Info	Community

Academic Mobility

If you are affiliated with an academic institution, please answer the following question: For which Level of Project(s) will the data be used? (Check all that may apply)

- Research
- Post-Doctoral Research
- PhD Thesis
- Masters (Major Research Paper)
- Masters (Thesis)
- Graduate Course Project
- Staff/Administration Research
- Undergraduate Honours Thesis

Other

BUDGET

Please complete the table below to detail your projected and actual research expenditures during the reporting period.

Category	Planned/Approved Expenditure	Actual Expenditure
Travel and Accommodation		
Equipment, Materials and Supplies		
Salaries/Wages for Nunavut residents		
Salaries/Wages for non-Nunavut resident researchers		
Professional Fees and services in Nunavut		
Professional Fees and Services outside of Nunavut		
TOTAL EXPENDITURES		

List the total \$ amount of funding from each funding source for your full research program, including in-kind support

N/A

RESEARCH OUTPUTS / REPORTING TOOLS

What research outputs were generated? Please list below and append copies of each. Specify which outputs (if any) may be made public on the NRI research licensing database.

The 2024 Baffinland Annual Report to the NIRB. This will be available in spring of 2025.
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Have peer-reviewed manuscripts been published as a result of your project? If Yes, complete the following table:

Full citation	Publicly accessible/ free to access (Y/N)	Link (if available) and DOI (if available)
	Y	
	Y	

If No, do you intend to submit a manuscript (or manuscripts) for peer reviewed publication?

WSP has an internal review process, and all monitoring programs are reviewed by the technical Marine Environment Working Group (MEWG) members.

Were non-peer reviewed materials produced to either communicate or synthesize results to the public? Examples of these materials include (but are not limited to): websites, reports, brochures, podcasts, webinars, presentations, non-peer reviewed publications, etc.

If Yes, complete the following table:

Title	Description of Materials	Link (if available)	DOI (if available)
Marine Environment Effects Monitoring Program Report	Details of the Bruce head shore based program, including observ	Yes	https://www.baffinland.com/media-centre/document-portal/
NIRB Annual Report	Detail of all program conducted by Baffinland during the year in r	Yes	https://www.baffinland.com/media-centre/document-portal/
		No	No
		No	No

Did your project develop a communications plan? Please describe communications/reporting tools used, and list the target audience for each and/or who requested which.

Through the NIRB review process, Baffinland responds to all comments received on its Annual report. We send hard copies and digital copies of NIRB annual report and monitoring reports to the five HTAs.

How were Nunavummiut credited and/or acknowledged in all project outputs, such as co-authorship, participant biographies, article acknowledgements, etc.

Nunavummiut participants are always acknowledged in the reports. This will be listed when the 2024 Annual report to the NIRB is published in June 2025.

DATA AND INTELLECTUAL PROPERTY

Did you enter into a research agreement, data-sharing agreement and/or intellectual property rights agreement with a community and/or designated Inuit organization (DIO)? If yes, please explain.

Do intellectual property rights apply to your research? If yes, please explain.

WSP owns all copyright including all text, data, tables, figures, drawings published in the Marine Environment Effects Monitoring program Report.

Who owns the data? Has the raw data been shared with the appropriate community and/or DIO? If yes, how? How is data security and storage handled by community-based co-owners?

The data from Baffinland research is owned by Baffinland. Results of the research is shared to community members through the Marine Environment Working Group. In addition hard copies and soft copies of the Annual and monitoring reports are shared with the communities.

Where is the data stored and will the data be destroyed within a set timeframe?

Baffinland and its consultants store the data, and there is no schedule to destroy the data.

Is the data trackable and/or available in a public data repository? If yes, please provide the appropriate information and/or link to ensure the findability and accessibility of the data.

Results are available at <https://www.baffinland.com/media-centre/document-portal/> but raw data is not available publicly.

Please append a copy of your data management plan.

CLIMATE CHANGE

Is your research about climate change (causes, impacts, mitigation, adaptation, etc.)? If yes, explain.

No, this program is not focused on Climate Change.

PHOTOGRAPHS

If possible, please provide high-resolution photos of licensed research activities that NRI may use in communication materials, organizational reporting, and other promotional purposes. The photographer and all recognizable people in each photo must sign the attached Photo and Video Release form. Please also complete the table below for each photo provided and submit to NRI along with all required NRI photo release forms. The photographer/owner will be credited in all uses of the photograph(s).

File Name	Location	Description	Subjects	Photographer/Owner	Date

Would you like your project to be considered for a research profile and promotion by the NRI? **Yes**

FORMATTING TIPS

Main text:

Please supply report in a standard manuscript format (**Microsoft Word format is required**).

Tables:

Any number of tables can appear in one file (as long as they are clearly marked). Tables prepared using simple table formats as provided in word processing programs such as WordPerfect are preferred. Each table should be numbered according to its appearance in the text (e.g., Table 1, Table 2) and each should have a brief descriptive heading.

Figures:

Each figure or graphic element should be submitted as a separate file. Black & white and colour graphics are both acceptable. We can accommodate most standard graphic file formats, however, please indicate in which format the graphic was prepared.

References:

Please use the APA or MLA Citation Style while referencing throughout the report.

Size:

The size of the electronic document must not exceed 4MB (if larger than 4MB, please send attachments separately and number the emails).