



NIRB Application for Screening #125711

Developing new technologies to investigate the Devon Island subglacial lake system

Application Type: New

Project Type: Scientific Research

Application Date: 5/30/2022 3:52:26 PM

Period of operation: from 0001-01-01 to 0001-01-01

Proposed Authorization: from 0001-01-01 to 0001-01-01

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Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
Devon Island Subglacial Lakes Region	Sampling sites	Crown	N/A	None. Not aware of any archeological/paleontological value of the ice cap.	N/A

Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Information is not available			

Authorizations

Indicate the areas in which the project is located:

North Baffin

Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Government of Nunavut, Nunavut Research Institute	We have completed the NPC application and once this NIRB application is submitted we will be waiting on confirmation of the NRI license.	Active		

Project transportation types

Transportation Type	Proposed Use	Length of Use
Air	Helicopter or twin otter transportation from Resolute Bay (PCSP) to the top of the Devon Island ice cap	

Project accomodation types

Temporary Camp

Material Use

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

Equipment Type	Quantity	Size - Dimensions	Proposed Use
Kovacs corer	1	0.2m x 0.2m x 1m	A corer which will be used to collect ice core samples 1 -2 meters into the subsurface of the ice cap.
SLUSH Drill system	1	0.57m x 0.57m x 5m	A drill developed by Honeybee Robotics used to drill into ice using a melt probe. In year one, the drill will be used to drill up to 2 meters into the subsurface of the ice cap and up to 100 meters by year 3 of the project.

Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Propane	fuel	3	5	15	Gallons	Propane will be used in years 2 and 3 of the project (2023 & 2024) for heating and cooking while camping at the field site.
Other	fuel	1	2	2	Gallons	Gasoline/oil mix to be used to power a Honda 2 kw generator which will in turn be used to power the SLUSH drill.

Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
0	Snow melt/bring from PCSP Resolute	PCSP Resolute

Waste

Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Camp	Greywater	50 liters	Transport back to and disposal at PCSP Resolute.	N/A
Camp	Sewage (human waste)	50 liters	Transport in sealed containers back to PCSP Resolute for proper disposal.	N/A

Environmental Impacts:

We predict minimal environmental impact to the field site. In 2022 we only plan to spend up to 10 hours on the ice cap over the course of two days. No equipment and/or waste will be left in the field. All waste will be collected in waste containers and transported back to PCSP at Resolute Bay for disposal in the proper manner. For 2023 and 2024, we plan to camp at the field site for 4 - 5 days. During this time, human waste will be collected in sealed buckets and transported back to PCSP Resolute for proper disposal. All other waste material will be stored in trash bags and brought back to PCSP Resolute for proper disposal. We foresee causing very little impact on the field site. We perceive NO impact to Eskers and other unique or fragile landscapes, unlike what is stated in the form below, which will not save as such.

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

The Devon Island ice cap is a large ice cap situated on the eastern side of the island. The ice cap has a maximum depth of ~900 meters. The top layer of the ice cap where the study will take place is mainly composed of firn and snow. Crevasses in the ice cap are also known.

Description of Existing Environment: Biological Environment

There is no vegetation on the ice cap and to the best of our knowledge, there are no animal populations which reside on the ice cap.

Description of Existing Environment: Socio-economic Environment

The site is far from any community. Devon Island is uninhabited. We perceive it highly unlikely to encounter archaeological or culturally significant sites on the ice cap. There is no land or resource use on the ice cap.

Miscellaneous Project Information

Please see attached PCSP application form for details on training and measures used to mitigate emergencies while in the field. Please see attached document for our comprehensive spill prevention/plan. Our confirmation of application to the NPC is also attached.

Identification of Impacts and Proposed Mitigation Measures

We perceive very little impact to the site. The only lasting impact to the site will be shallow bore holes in the top of the ice cap and one up to 100 meters deep by year 3 of the project. These boreholes are small in diameter (approximately 15 cm wide) and we expect them to fill in naturally after one Arctic winter/spring thaw. These boreholes will also be localized to an area of only 20 to 30 meters, minimizing their impact on the surrounding environment. All impacts on the site from human activity will be minimized by containing all waste materials and fluids in sealed containers which will be transport back to and disposed of properly at PCSP Resolute. No materials will be left at the site once work is completed.

Cumulative Effects

Aside from seasonal melt on top of the ice cap, the Devon Island ice cap is relatively unchanging year over year. We plan not to leave any evidence of our presence or work beyond a few localized shallow boreholes. These boreholes are predicted to fill naturally within one year, therefore we do not foresee any cumulative effects from our work on the environment.

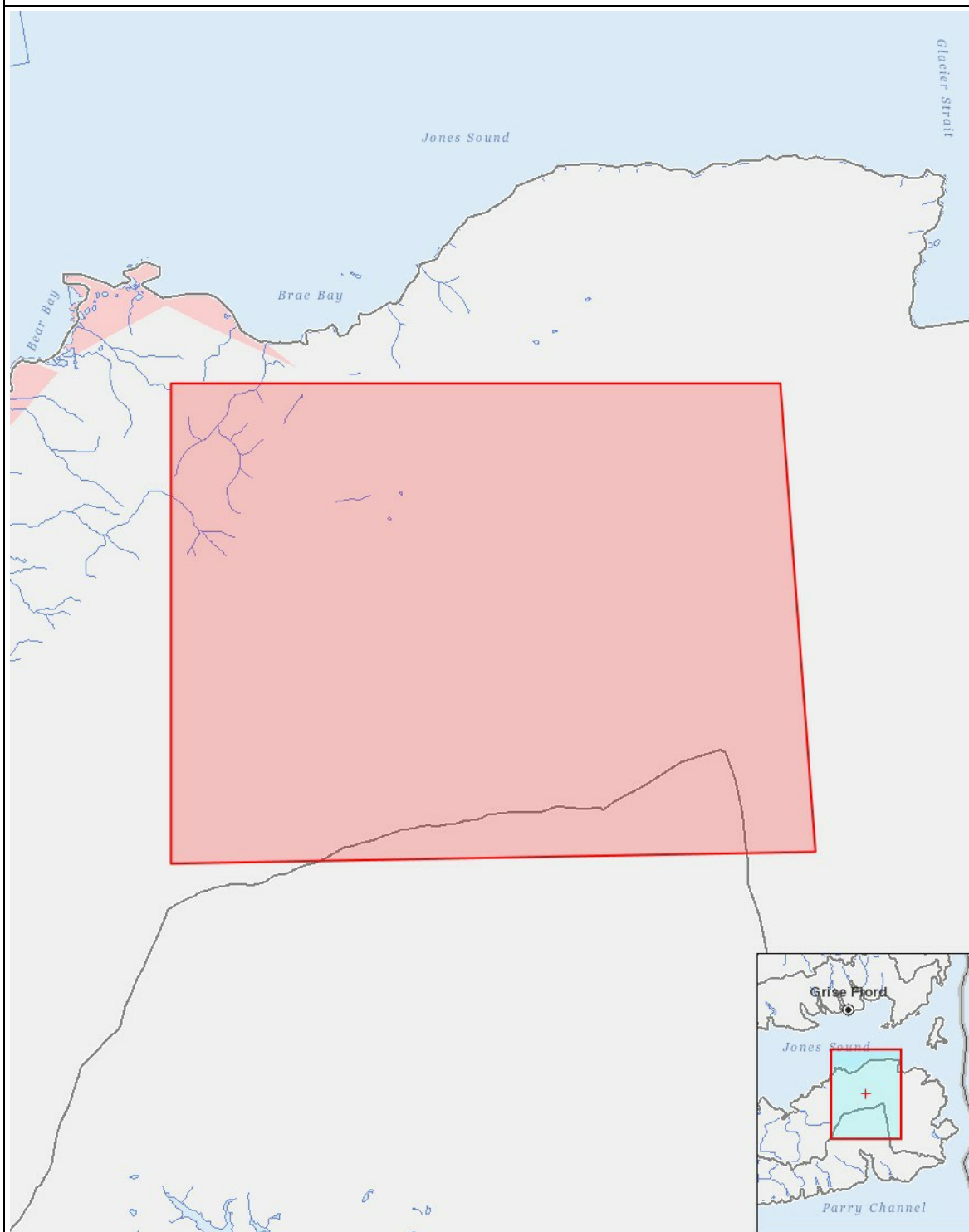
Impacts

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																											
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Operation																											
Sampling sites		-	-	-	-	-	-	P	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-	
Decommissioning																											
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(P = Positive, N = Negative and non-mitigatable, M = Negative and mitigatable, U = Unknown)

Project Location



List of Project Geometries

1	polygon	Devon Island Subglacial Lakes Region
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