



## **NIRB Application for Screening #125764**

### **Helicopter-based radar survey of Devon Ice Cap**

**Application Type:** New

**Project Type:** Scientific Research

**Application Date:** 1/9/2023 12:44:22 PM

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

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

**Project Proponent:** Mark Skidmore  
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## DETAILS

### Non-technical project proposal description

English: Researchers from Montana State University and the University of Texas at Austin including a graduate student, are proposing a project that would conduct a radar survey of the glaciers of the Devon Ice Cap with a focus on Sverdrup Glacier and the summit region. The aerial survey of part of the Devon Ice Cap would use a radar instrument mounted on a helicopter. The survey would be based out of Grise Fiord with the helicopter and personnel returning to the community at the end of each survey day. We anticipate the aerial survey of the Devon Ice Cap would involve 7 to 10 days of survey flights. All personnel would stay in accommodation in Grise Fiord. There would be no field camps associated with this project. The radar survey would provide information on properties of the Devon Ice Cap glaciers with a focus on Sverdrup Glacier and summit region. The survey would provide information on ice thickness, the shape of the glacier bed and the location of water beneath the ice. This data would improve understanding of the way water flows beneath the ice cap and how this might relate to the speed of ice flow. Results from the research would be shared with the communities of Grise Fiord and Resolute Bay and the Nunavut Research Institute. The project would begin at the Polar Continental Shelf Program facility near Resolute Bay, where the radar instruments would be installed on the helicopter. Test flights would be flown from the Polar Continental Shelf Program facility surveying a glacier on southern Devon Island, west of Maxwell Bay before the team transits to Grise Fiord for the scientific survey of the Devon Ice Cap. We anticipate 1 to 3 days of test survey flights. The survey team would transit back to the Polar Continental Shelf Program facility to disassemble the survey system following the scientific survey. The planned research would take place during the period from mid-April to mid-June 2023.

French: Des chercheurs et un doctorant de l'Université d'État du Montana et de l'Université du Texas à Austin, proposent d'effectuer un relevé radar des glaciers de la calotte glaciaire Devon, en particulier du glacier Sverdrup et de la région sommitale. Le relevé aérien d'une partie de la calotte glaciaire Devon utiliserait un instrument radar hélicoptère. L'équipe aurait pour camp de base la communauté de Grise Fiord où l'hélicoptère et le personnel retourneraient à la fin de chaque journée de travail. Nous prévoyons que l'étude aérienne de la calotte glaciaire Devon nécessitera de 7 à 10 jours de vols. Tout le personnel sera hébergé à Grise Fiord. Il n'y aura pas de camps de terrain associés à ce projet. Le relevé radar fournira des informations sur les propriétés des glaciers de la calotte glaciaire Devon, en particulier sur le glacier Sverdrup et de la région sommitale. L'étude fournira des informations sur l'épaisseur de la glace, la forme du lit du glacier et l'hydrologie sous-glaciaire. Ces données permettront de mieux comprendre la façon dont l'eau s'écoule sous la calotte glaciaire et le lien avec la vitesse d'écoulement de la glace. Les résultats de la recherche seront partagés avec les communautés de Grise Fiord et de Resolute Bay et avec l'Institut de recherche du Nunavut. Le projet débiterait dans les infrastructures du Polar Continental Shelf Program, près de Resolute Bay, où les instruments radar seront installés sur l'hélicoptère. Des vols d'essai seront effectués à partir du Polar Continental Shelf Program'' pour observer un glacier dans le sud de l'île Devon, à l'ouest de la baie Maxwell, avant que l'équipe ne se rende à Grise Fiord pour effectuer le relevé scientifique de la calotte glaciaire Devon. Nous prévoyons 1 à 3 jours de vols d'essai. L'équipe retournera aux installations du Polar Continental Shelf Program pour désassembler le système radar de l'hélicoptère une fois le relevé terminé. Les recherches prévues se dérouleront de la mi-avril à la mi-juin 2023.

[illegible]

[illegible]

## Personnel

Personnel on site: 7

Days on site: 60

Total Person days: 420

Operations Phase: from 2023-04-16 to 2023-06-16

## Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
Devon Ice Cap survey region	Scientific/International Polar Year Research	Crown	Remnant Ice from last ice age. Previous aerial radar surveys have been completed over parts of this region.	N/A	Closest community is Grise Fiord, 75 km away.
Gascoyne Inlet - Fuel Cache	Fuel and chemical storage	Crown	Established fuel caching location, previously used as a field camp for Defence Research and Development Canada	N/A	Closest community is Resolute Bay, 100 km away.
Test flight region: glacier ice west of Maxwell Bay	Scientific/International Polar Year Research	Crown	N/A	N/A	Closest community is Resolute Bay, 150 km away.
Truelove Lowlands - Fuel Cache	Fuel and chemical storage	Crown	Established fuel caching location, former site of the Arctic Institute of North America field camp.	N/A	Closest community is Grise Fiord, 95 km away.

## Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Grise Fiord	Daniel	North Inn	2022-12-12
Resolute Bay	Ian Dudla	Municipality of Resolute Bay	2022-05-26
Grise Fiord	Etuk	Siku Services	2023-02-10
Resolute Bay	Chantell	ATCO	2023-02-10
Resolute Bay	Nancy Amarualik	Resolute Bay Hunters and Trappers Association	2022-05-26
Grise Fiord	Iviq Hunters and Trappers Organisation	Iviq Hunters and Trappers Organisation	2023-02-24
Resolute Bay	Nancy Amarualik	Resolute Bay Hunters and Trappers Association	2023-02-24

## Authorizations

Indicate the areas in which the project is located:

North Baffin

### Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Nunavut Research Institute	NRI Application will be submitted shortly	Not Yet Applied		

### Project transportation types

Transportation Type	Proposed Use	Length of Use
Air	Transiting from Resolute to Grise Fiord	

### Project accomodation types

Community

## Material Use

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

Equipment Type	Quantity	Size - Dimensions	Proposed Use
AS350 B2 Helicopter	1	-	Survey Aircraft
Bell 206 LR Helicopter	1	-	Search and Rescue Capacity
Twin Otter	1	-	Transportation of personnel, fuel caching

### Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Aviation fuel	fuel	10	200	2000	Liters	For helicopter refueling at Gascoyne Inlet.
Aviation fuel	fuel	15	200	3000	Liters	For helicopter refueling at Truelove Lowlands. Fuel would be staged in increments. As fuel is used, new barrels would be flown out in replacement, with the empty barrels being removed and returned to PCSP in Resolute Bay. Maximum number of fuel barrels used at Truelove Lowlands would be 25.

### Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
0	No water retrieval, since no camp and no water use	No water retrieval, since no camp and no water use

# Waste

## Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Fuel and chemical storage	Other, Fuel barrels	Thirty five barrels total for the project	Empty barrels would be returned to PCSP in Resolute Bay	N/A

### Environmental Impacts:

The project has no field camp and would have no water use and would not generate solid, liquid or hazardous waste. The project involves caching fuel and helicopter refueling using that fuel. We would employ mitigation measures to prevent and reduce any impact of a spill. Fuel caching would occur in established locations at Gascoyne Inlet and Truelove Lowlands and fuel drums at those locations would be placed within containment berms. The fuel would be staged in increments to limit the amount of fuel at a cache. As fuel is used, new barrels would be flown out in replacement, with the empty barrels being removed and returned to Resolute Bay. We are aware of the requirements to notify CIRNAC within 30 days of establishing a fuel cache and would send the appropriate information on the fuel caches to the general CIRNAC land administration email: [landsmining@rcaanc-cirnac.gc.ca](mailto:landsmining@rcaanc-cirnac.gc.ca). Helicopter refueling at the fuel caches would follow standard industry procedures implemented by Canadian Helicopters, who also carry spill kits on the helicopters, in the case of a fuel spill. We are aware of the requirements regarding fuel spillage reporting, should one occur and would follow the guidance as outlined at <https://www.gov.nu.ca/environment/documents/spill-response>. All fuel barrels would be returned to PCSP in Resolute Bay following fieldwork.

# **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 fuel caching location at Truelove Lowlands is at a well-established site using for caching fuel, the former site of the Arctic Institute of North America field camp. There is an existing airstrip at this location. The fuel caching location at Gascoyne Inlet is at a well-established site for caching fuel, for the field camp for Defence Research and Development Canada. There is an existing airstrip at this location. The survey region of the Devon Ice Cap is between 75 and 140 km away from the closest community, Grise Fiord. The test survey region on the glacier west of Maxwell Bay is 150 km away from the closest community, Resolute Bay.

### **Description of Existing Environment: Biological Environment**

There is no vegetation on the Devon ice cap or glacier to the west of Maxwell Bay that would be surveyed from the helicopter. It is possible that animals may migrate across the Devon ice cap or this glacier but these locations are not known animal migration corridors.

### **Description of Existing Environment: Socio-economic Environment**

The fuel caching location at Truelove Lowlands is 95 km away from the closest community, Grise Fiord. The survey region of the Devon Ice Cap is between 75 and 140 km away from the closest community, Grise Fiord. The fuel caching location at Gascoyne Inlet is 100 km away from the closest community, Resolute Bay. The test survey region on the glacier west of Maxwell Bay is 150 km away from the closest community, Resolute Bay.

### **Miscellaneous Project Information**

Not applicable

### **Identification of Impacts and Proposed Mitigation Measures**

The scientific research project would have a positive economic benefit for the local communities as it would rely upon local services in Grise Fiord; including lodging at the Grise Fiord Lodge - Inns North, some supplies from the Co-op and aviation fuel through Siku Services and in Resolute Bay, aviation fuel through ATCO. The optimal elevation for the radar survey of the Devon Ice Cap and glacier to the west of Maxwell Bay would involve the helicopter flying at an elevation of 1600 feet above the ice surface. The ground level noise from the helicopter flying at this elevation would be limited and thus would have a minimal impact on any wildlife if they were on the ice surface. However, to mitigate the impact of helicopter noise on wildlife, if animals were observed on the ice surface on a given day, then the survey location for that day would be changed to move away from the location of the animal(s). Fuel caching would occur in established locations at Gascoyne Inlet and Truelove Lowlands, where there are existing airstrips. The fuel drums at those locations would be placed within containment berms. The fuel would be staged in increments at Truelove Lowlands and as fuel is used, new barrels would be flown out in replacement, with the empty barrels being removed and

returned to Resolute Bay. Helicopter refueling at the fuel caches would follow standard industry procedures implemented by Canadian Helicopters, who also carry spill kits on the helicopters, in case of a fuel spill. All fuel barrels would be returned to PCSP in Resolute Bay following fieldwork. The footprint of the berm for the fuel cache at each location would be small (10' x 15') but the fuel cache may result in some minor compaction of the soil and vegetation beneath. This impact would be limited due to the relatively short duration for the fuel cache and the likelihood that the ground would be frozen during this time. Caching fuel and refueling the helicopter would produce minor and short-term elevated noise levels at the fuel caching location when aircraft land and take-off. This effect is mitigated by the infrequent and short duration of these noise disturbances.

### **Cumulative Effects**

No cumulative effects are anticipated.

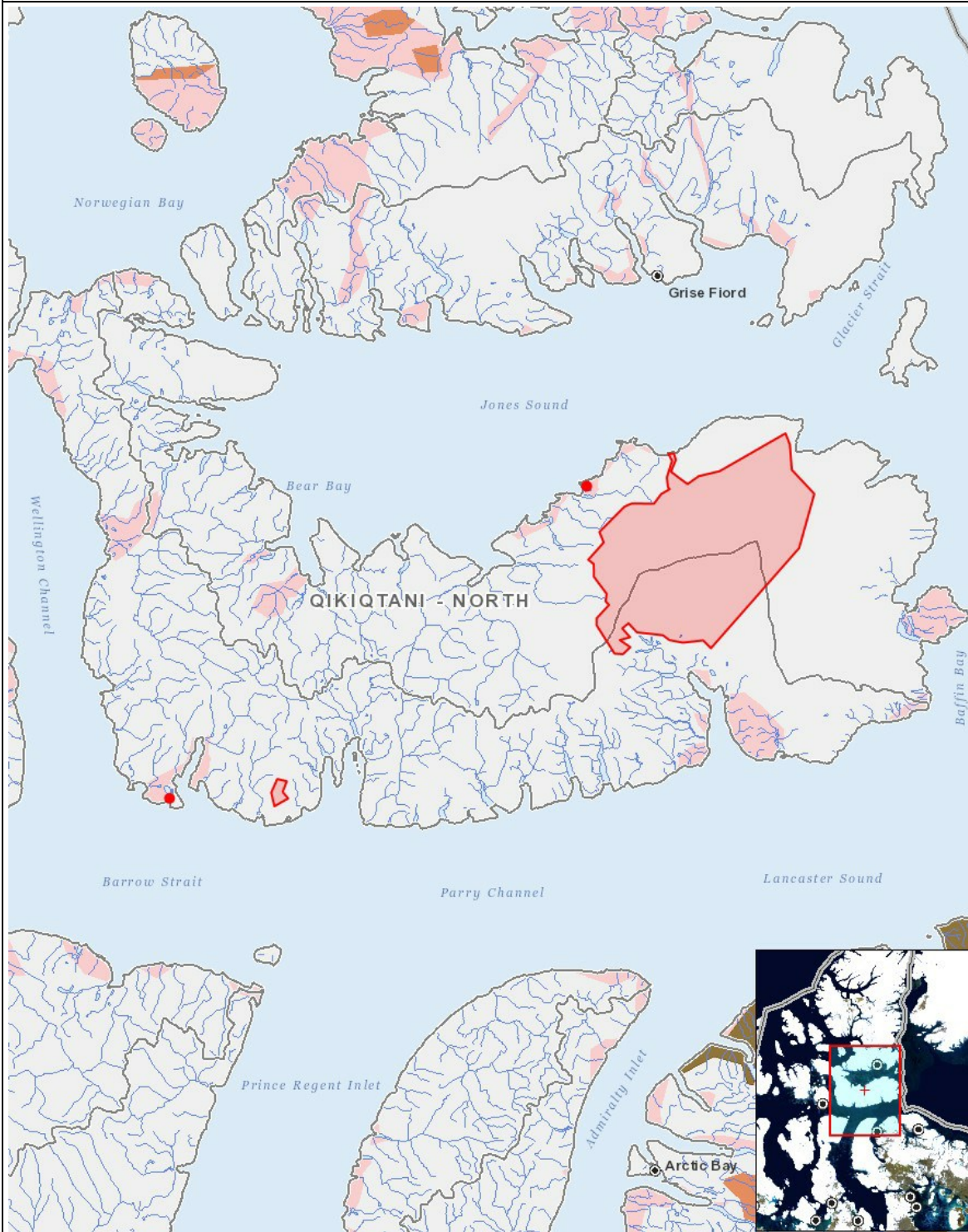
# Impacts

## 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																									
Fuel and chemical storage			-	-	-	-	-	-	-	-	-	-	-	M		M	-	-	-	-	-	P	-	-	-
Scientific/International Polar Year Research			-	-	-	-	-	-	-	-	-	-	-	M		-	M	M	-	-	-	P	-	-	-
Decommissioning																									
-			-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-		-	-	-	-	-

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

## Project Location



## List of Project Geometries

- |   |         |   |
|---|---------|---|
| 1 | polygon | Devon Ice Cap survey region                         |
| 2 | polygon | Test flight region: glacier ice west of Maxwell Bay |
| 3 | point   | Gascoyne Inlet - Fuel Cache                         |
| 4 | point   | Truelove Lowlands - Fuel Cache                      |