

כֵּל דִּלְגָּבִי

ᐅᓂᓄᓇᓂᓗ: The geoscience character of the proposed Churchill-Kivalliq Hydro-Fibre (CKHF) link corridor, portions of which are poorly known and under explored, should be assessed, updated and integrated by Kivallirmiut to deliver a seamless, modern, time-calibrated, geological map. This will support activities across a region for which access will increase, and on which future land-use decisions can be soundly based. This project targets the southern half of the CKHF corridor, a hard to access, heavily drift-covered region with outdated geological mapping (1969-1978), rare obsolete (K/Ar biotite) age constraints, and no litho-geochemical knowledge with which to correlate units within, and beyond, the region. This NRCan Geological Survey of Canada-led project aims to:

- refine, update, and produce new geological knowledge of bedrock underlying thick glacial cover of lower Nunavut.
- provide a meaningful way to engage Northerners, especially youth, to experience and participate in science, and enable knowledge sharing and knowledge co-production
- strengthen the capacity of communities within the Churchill-Kivalliq corridor to address geoscience opportunities and challenges related to proposed infrastructure developments.

Field methodology in 2023 will involve planning and execution of community-based, helicopter-assisted mapping based from Whale Cove (2-weeks) and Arviat (3-weeks). Compilation maps and Landsat imagery combined with aeromagnetic data will be analyzed with community members to devise a strategy for ground-truthing geophysical anomalies and new data collection. Bedrock mapping will be assisted by interested Northerners, with a focus on youth 20-30 years, carvers and prospectors who will be provided rotational opportunities as paid field assistants. Mapping will involve 10 days (30 hours) of helicopter support from Whale Cove (~July 2-12, 2023) and 10 days (30 hours) from Arviat (~July 18-30, 2023). All equipment needed will fit into a small backpack provided to all field assistants along with a bagged lunch, and will include a hand lens, compass, pen magnet, hammer (to break off a fresh sample) and digital camera. Observations will be recorded on small, hand-held computers with blue-tooth GPS, downloaded daily, and plotted on maps for interpretation on a new bedrock map, on which local assistants will be contributing authors. This community-based mapping approach is being designed in consultation with the priorities of Kivallirmiut. Consultation and engagement began in June 2022 with letters to introduce the activity and initiate Indigenous co-development. A positive response led to constructive in-person meetings (November 19 – December 2, 2022) in Arviat and Whale Cove where fieldwork is planned for July 2023. Activities related to this project are designed to provide a meaningful way to engage Northerners, especially youth, to experience and participate in science, and to enable knowledge sharing and co-production. They are intended to strengthen the capacity of communities within the Churchill-Kivalliq corridor to address geoscience opportunities and challenges related to this region's proposed infrastructure developments.

[illegible]

Inuinnaqtun: Please see Inuktitut description (above) and attached as a separate file

Personnel on site: 3

Days on site: 35

Total Person days: 105

Operations Phase: from 2023-06-26 to 2023-08-02

Λ ϵ η ϰ η ϱ σ ϰ^{9b} Ϸ^c

ᐱ ᑦ	ᖃᓄᐃᑦᑐᑦᑦ ᐱᑕᓚᐊᖃᖅᑎᑦᐊᖃᑦ<	ᑭᖅᑏᑦ ᓄᐱᖅᑏᑦ	ᑐᔨᐃᒫᔪᖅᔨᑦᑦ ᓄᐱᐃᑦ ᖃᓄᖃᖅ ᐊᑐᒪᐃᑕᐃᖃᖅᑭᒪᔪᓚᐊᖅᒪᓂᖅ	ᐃᑦᔨᖅᑕᖃᖅᐸᐃᐃᑕᑕᐃᖃᑦ< ᐃᓄᖅᓄᑦ ᐱᔪᖃᑕᐃᖃᑦᑕᖅᑏᑦᑕᑦ ᑕᐃᑦᑭᒪᓂᑐᖃᐃᑕᖃᑐᖃᖅ	ᖃᓂᓂᖅᑦᑦᑦ ᓄᐱᑕᑦᑭᐃᐃᔪᖅ ᐊᒪᒪᐃ ᔨᑐᒪᑦᑭᖅᐸᐃᐃᑕᑦ ᑭᓄᓄᑦ
region of proposed bedrock mapping	Researching	Inuit Owned Sub-Surface Lands	includes Crown and IOL. Includes mixed use and limited use (caribou calving grounds)	region likely contains historical markers, inuksuit, hunting and trapping sites that will be left undisturbed	area includes the municipalities of Whale Cove and Arviat
proposed northern fuel cache (8 sealed drums)	Fuel and chemical storage	Inuit Owned Sub-Surface Lands	mixed use	none	152 km WSW of Whale Cove
proposed southern fuel cache (8 sealed drums)	Fuel and chemical storage	Crown	mixed use	none	107 km west of Arviat

[illegible]

ᓄᓇᓕᓯᓴᖅ	ᐃᑏᓕ	ᓇᐅᓪᓰᐃᖅᓇᑏᓯᓴᖅ	ᖅᓴᓴᓴ ^ᖅ ᐅᐱᖅᓇᑏᓴᐅᓇᐅᓴᐃᖅᓯᓴᖅ
ᓇᓴᓯᓴᓇᓇᓇᖅ	Luis Manzo	Kivalliq Inuit Association	2022-11-21
ᐃᖅᐃᐃᓕ	Steve England SAO	Hamlet Office	2022-11-24
ᐃᖅᐃᐃᓕ	Mike Beauregard	Government of Nunavut Economic Development and Transportation	2022-11-24
ᐃᖅᐃᐃᓕ	Nicole Issakiark	Arviat Hunters' & Trappers	2022-11-24
ᐃᖅᐃᐃᓕ	Chi-Chi Arinze, Principal & Lyndsay Hines, Guidance Councillor	John Amaguluk High School	2022-11-25
ᐃᖅᐃᐃᓕ	Steve England, Hamlet Office	Public Community Meeting with Interpreter	2022-11-25
ᑏᓯᓴᖅᐃᐃᓇᖅ	Brian Fleming, SAO	Hamlet Office	2022-11-28
ᑏᓯᓴᖅᐃᐃᓇᖅ	Eva Angoo	Issuark HTO	2022-11-28
ᑏᓯᓴᖅᐃᐃᓇᖅ	Peter, Science teacher	Inuglak School, Whale Cove	2022-11-29

ᓕᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ

ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ:

Kivalliq

ᓕᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ

ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ	ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ	ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ	ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ	ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ
ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ	gateway to scientific research in Nunavut, responsible for licensing research in the natural sciences (e.g., geoscience) as required under Nunavut's Scientists Act. Clearinghouse for information on research in Nunavut, providing mentorship, guidance, and support to scientists working throughout the territory.	Applied, Decision Pending		
Indigenous and Northern Affairs Canada	Crown agency to which a permit to undertake geological mapping (land use) needs to be sought	Not Yet Applied		
ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ ᓂᓐᓂᓐᓂᓐ	The Designated Inuit Organization (DIO) that represents the interests of all Inuit living in the Kivalliq Region. With a mission to represent, in a fair	Not Yet Applied		

<p>and democratic manner, Inuit of the Kivalliq Region in the development, protection, administration and advancement of their rights and benefits as an aboriginal people, as well as to promote their economic, social, political and cultural well-being through succeeding generations. The KIA's goals include:</p> <ol style="list-style-type: none"> 1) to preserve Inuit heritage, culture & language; 2) to manage Inuit-owned-lands in the region and provide information to and consult with land claims beneficiaries on land use; 3) to protect Arctic Wildlife & environment, thereby preserving traditional uses for current and future generations; and 4) to assist Inuit in the Kivalliq region in training opportunities. 			
--	--	--	--

Project transportation types

Transportation Type	Activity	Length of Use
Air	helicopter transport from the airport for 10 days, returning each evening	
Land	foot traverse and ATV travel in the community	

Project accomodation types

ቃረብኝ፡፡

◁▷↳σ◁⁹⁶▷⁹⁶

Λ⁹D Δ⁶ΓΔ⁵ ΔD⁵C DσD⁴ΥΔ⁵ Δε⁵βP DΠΔ⁴ ΓΔjCΔ⁴, Γ^cΔPΔ⁴, Ξ⁶ΛCΔ⁵, μεPΔ⁴ ΔP⁶Γ^cΔ

ᐃᓴᓴᓴ ᐱᓴᓴ ᐃᐃᐃᐃᐃ ᐃᓴᓴᓴ ᓴᓴᓴᓴᓴᓴᓴ	ᓴᓴᓴᓴᓴᓴ	ᐃᓴᓴᓴᓴᓴ - ᓴᓴᓴᓴᓴᓴᓴ	ᓴᓴᓴᓴ ᐃᐃᐃᐃᐃᐃᓴᓴᓴ
helicopter	1	206L3	to ferry research scientist and 1-3 community assistants from airport to exposed bedrock localities, and return to community each evening
rock hammer	4	3 lb	break off fist-size chunks of rock
chisel	4	0.5 in	assist in taking fist-size rock samples
hand lens	4	16x mag	view minerals in rock
digital camera	4	compact	photograph rock units
tablet	2	20x20 cm	record observations of rock units into digital database
pen magnet	4	6 cm long	check if rock is magnetic
Delorme InReach satellite communicator	4	15x10 cm	Safety device, for emergency use only

በበፍጥረቱ ስራ ላይ ለሚገኙት ሰራተኞች ምርጫ ስራ ላይ ለማስገባት ሲሞክሩ

ᐱᕈᓄᑦ ᐃᖅᓴᖅᓴᓴᒋᐱᖅ ᐳᐭᐤᓂᐱᖅ	ᖁᔨᐸᐸᐸᐸᐸᐸᐸᐸ ᐃᖅᓴᖅᓴᖅᓴᒋᐱᖅ	ᖁᔨᐸᐸᐸᐸᐸᐸᐸᐸ ᐃᖅᓴᖅᓴᖅᓴᔪᐸᐸᐸᐸ	ᘎᖅᓴᐸᐸ ᐸᐭᖅᓴᖅᓴᖅᓴᐸᐸᐸᐸᐸᐸ	ᔨᐸᐸᐸᐸ	ᘎᖅᓴᐸᐸᐸᐸ ᐳᒋᓴᓂᖅᓴᒋᐸᐸᐸᐸ	ᐱᕈᓄᑦ ᐳᐭᐤᓂᐸᐸᐸᐸᐸᐸᐸᐸ
Aviation fuel	fuel	32	205	6560	Liters	fuel 206L4 based from Whale Cove airport
Aviation fuel	fuel	40	205	8200	Liters	fuel 206L4 based from Arviat airport
Aviation fuel	fuel	8	205	1640	Liters	8-sealed drum cache located 83 nautical miles WSW of Whale Cove to enhance flexibility,

$\triangleleft^b C d^c$
$$\Delta^b C d_{\sigma} \Delta^{\sigma} \sigma^b$$

Λ<ηΔη&D>L>J ^c Λ<ηΔη&DσΔ ^b J ^b	ᶜᵇᵐΔ<J ^b Δ ^b Cj ^b	ᶜᵇᵐΠΓ Δ ^b Cj ^c Λ ^b PΔσΔ ^b Jη&D> ^c	ᶜᵇᵐᵐ Δ ^b C ^b CΔσΔ ^b <	Λ>L ^b ΛDΠ ^b Λ ^b ᵇ ^a σΔσΔ ^b J ^c
Information is not available				

$$\triangleleft \triangleleft \cap \Gamma \triangleright C \div^C \supset^C \quad \triangleleft^b \supset^{fb} C \triangleright \rho L \downarrow^C$$

Mapping will involve examination and documentation of exposed bedrock within the Kivalliq region west of Whale Cove and Arviat. Coverage will be via low-impact foot traverses by a 2-3 person team comprising the project proponent (Mary Sanborn-Barrie) and 1 or 2 community members. Transport to the exposures will be by helicopter which will return to Whale Cove (July 2-14) or Arviat (July 16-26) airport each evening. All equipment to be used will fit into a small backpack to be provided to all field assistants along with a bagged lunch. Examination of rock exposures is done using a hand lens, structural compass for measurements, pen magnet, hammer (to break off a fresh sample), and digital camera. Observations and interpretations will be recorded on small, hand-held computers with bluetooth GPS. ** No camps, buildings, ditches, trenches, dams, roads or other structures will be constructed ** No trace of our mapping will be detectable (very low impact). Positive impacts include employment, training and mentoring, increased knowledge of how the land evolved over time, so that land-use decisions are founded also on understanding of geological history of the region.

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 11: Municipal Development

ᐱᓪᓇ ᐃᑦᑎᐅᑦ ᖃᓄᐃᑦᑐᑦᑕᓚᐅᓂᖅ: ᓄᓇᐅᑦ ᖃᓄᐃᑦᑐᓂᖅ

Please see the attached Detailed Plan

ᐱᓪᑦ ᐸᑦᐅᐅᑦ ᖃᓄᐃᑦᑐᑦ ᓇᐅᓂᖅ: ᐅᐤᔭᖃᑕᖃᑦᓂᖅ

[illegible]

July 1 – August 2, 2023 activities are community-based, and include helicopter-assisted mapping carried out by interested residents from the central Nunavut hamlet of Whale Cove (2-weeks) and the lower Nunavut community of Arviat (3-weeks). Compilation maps and Landsat imagery combined with aeromagnetic data will be analyzed with community members. Interested Northerners, with a focus on youth 20-30 years, carvers and prospectors will be provided rotational opportunities as paid field assistants for training and mentoring in geoscience.

Miscellaneous Project Information

Many details and relevant contact information are provided in the attached Detailed Plan with Waste Management and Spill Plan Contingency, with mitigation measures

[illegible]

Please see the attached Detailed Plan with Waste Management & Spill Contingency Plan with mitigation measures

Cumulative Effects

There will be no cumulative effects from this mapping activity, please refer to the attached Detailed Plan with Waste Management & Spill Contingency Plan with mitigation measures

Impacts

$\omega \rightarrow \omega \Delta^{96} C D \sigma^{-96} r^C$ $\Delta \leftarrow \Pi \Gamma D C \sigma^{-C} D^C$ $\Delta^b D^{96} C D r L \downarrow^C$

[illegible]
$$(P = \langle b \rangle \Delta_P \cap \langle a \rangle \Delta^C, N = \langle b \rangle \Delta_P \cap \langle \langle \Delta \rangle \langle a \rangle \Delta^C \rangle^C \langle \langle \Delta \rangle \langle \Delta \rangle \langle \Delta \rangle \rangle^{\Delta^C} \langle \langle \Delta \rangle \langle a \rangle \Delta^C \rangle^C, M = \langle b \rangle \Delta_P \cap \langle \langle \Delta \rangle \langle a \rangle \Delta^C \rangle^C \langle \langle \Delta \rangle \langle \Delta \rangle \langle \Delta \rangle \rangle^{\Delta^C}, U = \langle \langle \Delta \rangle \langle \Delta \rangle \langle \langle \Delta \rangle \langle a \rangle \Delta^C \rangle^{\Delta^C})$$

1	polygon	region of proposed bedrock mapping
2	point	proposed northern fuel cache (8 sealed drums)
3	point	proposed southern fuel cache (8 sealed drums)

- | | | |
|---|---------|---|
| 1 | polygon | region of proposed bedrock mapping |
| 2 | point | proposed northern fuel cache (8 sealed drums) |
| 3 | point | proposed southern fuel cache (8 sealed drums) |