



## **Demande de la CNER faisant l'objet d'un examen préalable #125835**

### **Cambridge Bay Water Safety Research**

**Type de demande :** New

**Type de projet:** Scientific Research

**Date de la demande :** 7/4/2023 2:13:06 PM

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

**Autorisations proposées:** from 0001-01-01 to 0001-01-01

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# DÉTAILS

## Description non technique de la proposition de projet

Anglais: Who: York University, Caroline Duncan What: This project will consist of water sampling and workshop activities as part of Caroline's PhD research looking at optimizing water safety in Cambridge Bay through participatory modelling. The central research question explored in this project is: Can access to safe drinking water in Cambridge Bay be improved using participatory system dynamics modelling? The two main goals of the project are to collect quantitative and qualitative data that will be used to build the model and to use the model to identify water management, treatment, and policy leverage points that can be used to improve access to clean and safe drinking water for Cambridge Bay residents. Key objectives: 1. Conduct an in-depth desktop review of water safety policy regulations and frameworks in Nunavut and water quality and operational records in Cambridge Bay 2. Identify technical water safety problems throughout the water system in Cambridge Bay from source to tap by assessing existing infrastructure and in-situ operational procedures and by collecting water quality samples from multiple points within the system 3. Gather qualitative data related to water access, policy, governance, and cultural considerations via participatory stakeholder engagement activities like public forums and focus groups 4. Use participatory system dynamics modelling to identify key technical, policy, and cultural leverage points, weigh the risk of different safety water hazards, and ultimately improve water treatment and water policy in Cambridge Bay. Once the stakeholders have validated the baseline model, the model will be manipulated by the researchers and the stakeholders to explore how technical and policy changes could lead to improved access to clean and safe drinking water for the residents of Cambridge Bay. Water Sampling: Caroline Duncan employed youth will take water samples from the water source, multiple points within the water treatment plant (before and after filtration; after UV disinfection; after initial chlorination; within the storage tank; and during water truck filling); distribution, and from the cisterns and taps in 10 to 12 buildings in the community. Community members will be asked if they would like to volunteer for sampling in advance. Individuals that would like to volunteer will be required to allow researchers to access their cisterns and taps for a short period that is convenient for them. Water samples will be analyzed for standard water chemistry parameters, metals, and bacterial content. Samples will be analyzed in-house at the Canadian High Arctic Research Center by the students for basic water quality analysis and sent to an accredited lab for more extensive analysis. Each month approximately 70 samples will be taken. Approximately 840 L of water will be collected within the year for sampling. A CGS employee will be available to support the students with monthly sampling and analysis. Workshops: Caroline will organize workshops in Cambridge Bay to assess water system risks and factors impacting water safety. Subsequently, she will develop a dynamic model of the water system. The workshops will also share the water quality data collected by the employed students. These students will help Caroline run the workshops. Why: water safety research in Nunavut is crucial for ensuring access to safe drinking water in the communities, the holistic approach of this project goes beyond regulations, actively involving communities in understanding their water systems and recommending improvements. This participatory approach fosters ownership and long-term sustainability. Capacity building is a key focus, employing students to receive water operator training and certification and establishing a potential succession plan for water plants. This investment in youth not only promotes personal development but also local employment and expertise. The research's impact is far-reaching. It will identify weaknesses and areas for improvement by integrating socioeconomic, cultural and political factors. Enabling Cambridge Bay to apply for funding more effectively in water infrastructure. The project aligns with the evolving field of drinking water engineering, addressing disparities between remote and urban areas. The goal is to optimize water safety, bridging health and environmental gaps in Cambridge Bay. Co-creating interventions through quantitative analysis and participatory methods is hypothesized to improve overall water safety in Cambridge Bay. This project sets a precedent for inclusive and sustainable water management in the North. Where: The water sampling activities will be held within the municipal boundaries of Cambridge Bay. Workshop activities will be held in Cambridge Bay and Iqaluit to include Government Stakeholders. When: Water sampling will occur monthly from Nov 2023-2024, while workshop activities are scheduled from Nov 2023-March 2025.

Français: N/A

Inuktitut: N/A

Inuinnaqtun: Kina: York Ilihaqpaalliqviat, Caroline Duncan Huna: Hapkunani havaagharnit imarmik qauyihainiaqtut ayuiqhaqtitaulutiklu hulilukaaqhutik ilauplutik taaffuma Caroline-ngum PhD-nut qauyihagtainut imaqmiittaamik qayangnaiqhimayaamik Iqaluktuuttiaqmi ilaupkaiplutik. Qitqaninngaalluaqtuq apiqhuutauyuq ihivriuqtauniaqtuq hapkunani havaagharnit: Amirnaittumik imaqaqtitauyaamik Iqaluktuuttiaqmi ihuaqhivaallirniaqqa ilaupkaiplutik havauhiqaqhutik? Malruk inirimalluaqtait havaagharnit hapkunani taimaa katitirilutik amigaittunik nakuuyuniklu naunaitkutighanik atuqtauyughat hanayunit

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mut, katimapkainiaqhimaplutik Hikutirvia 2023-mit Qiqailruq 2025-mut.

**Personnel**

Personnel on site: 3

Days on site: 30

Total Person days: 90

Operations Phase: from 2023-11-01 to 2025-08-31

## Activités

Emplacement	Type d'activité	Statut des terres	Historique du site	Site à valeur archéologique ou paléontologique	Proximité des collectivités les plus proches et de toute zone protégée
Location for various water sampling points	Sampling sites	Municipal	N/A	N/A	Cambridge Bay

### Engagement de la collectivité et avantages pour la région

Collectivité	Nom	Organisme	Date de la prise de contact
Cambridge Bay	Jim McEachern	Municipality of Cambridge Bay	2023-04-05

# Autorisations

Indiquez les zones dans lesquelles le projet est situé:

Kitikmeot

## Autorisations

Organisme de régulation	Description des autorisations	État actuel	Date de l'émission/de la demande	Date d'échéance
Institut de recherche du Nunavut	License to perform research activities in Nunavut	Not Yet Applied		
Autre	Ethics Board for ethical approval from York University	Not Yet Applied		
Office des eaux du Nunavut	Water license for research purposes	Applied, Decision Pending		

## Project transportation types

Transportation Type	Utilisation proposée	Length of Use
Land		

## Project accomodation types

Collectivité

## Utilisation de matériel

Équipement à utiliser (y compris les perceuses, les pompes, les aéronefs, les véhicules, etc.)

Type d'équipement	Quantité	Taille – Dimensions	Utilisation proposée
Sample Bottles	3000	1L	Samples bottles for water collection will be of various size, between 250 ml and 1 L. It is not anticipated that this research will exceed 5 m3 water use.

Décrivez l'utilisation du carburant et des marchandises dangereuses

Décrivez l'utilisation de carburant :	Type de carburant	Nombre de conteneurs	Capacité du conteneur	Quantité totale	Unités	Utilisation proposée
Information is not available						

Consommation d'eau

Quantité quotidienne (m3)	Méthodes de récupération de l'eau proposées	Emplacement de récupération de l'eau proposé
0		

# Déchets

## Gestion des déchets

Activités du projet	Type des déchets	Quantité prévue	Méthode d'élimination	Procédures de traitement supplémentaires
Information is not available				

## Répercussions environnementales :

Water sampling events will provide a big picture of the water quality from source to tap in Cambridge Bay. Youth will be hired to take water samples, which will positively impact employment. Additionally, by taking water samples from various locations within the drinking water system, we will be able to identify areas to recommend improvements to drinking water infrastructure and indirectly have a positive impact on human health.



# **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 de l'environnement existant : Environnement physique**

**Description de l'environnement existant : Environnement biologique**

**Description de l'environnement existant : Environnement socio-économique**

**Miscellaneous Project Information**

**Identification des répercussions et mesures d'atténuation proposées**

**Répercussions cumulatives**

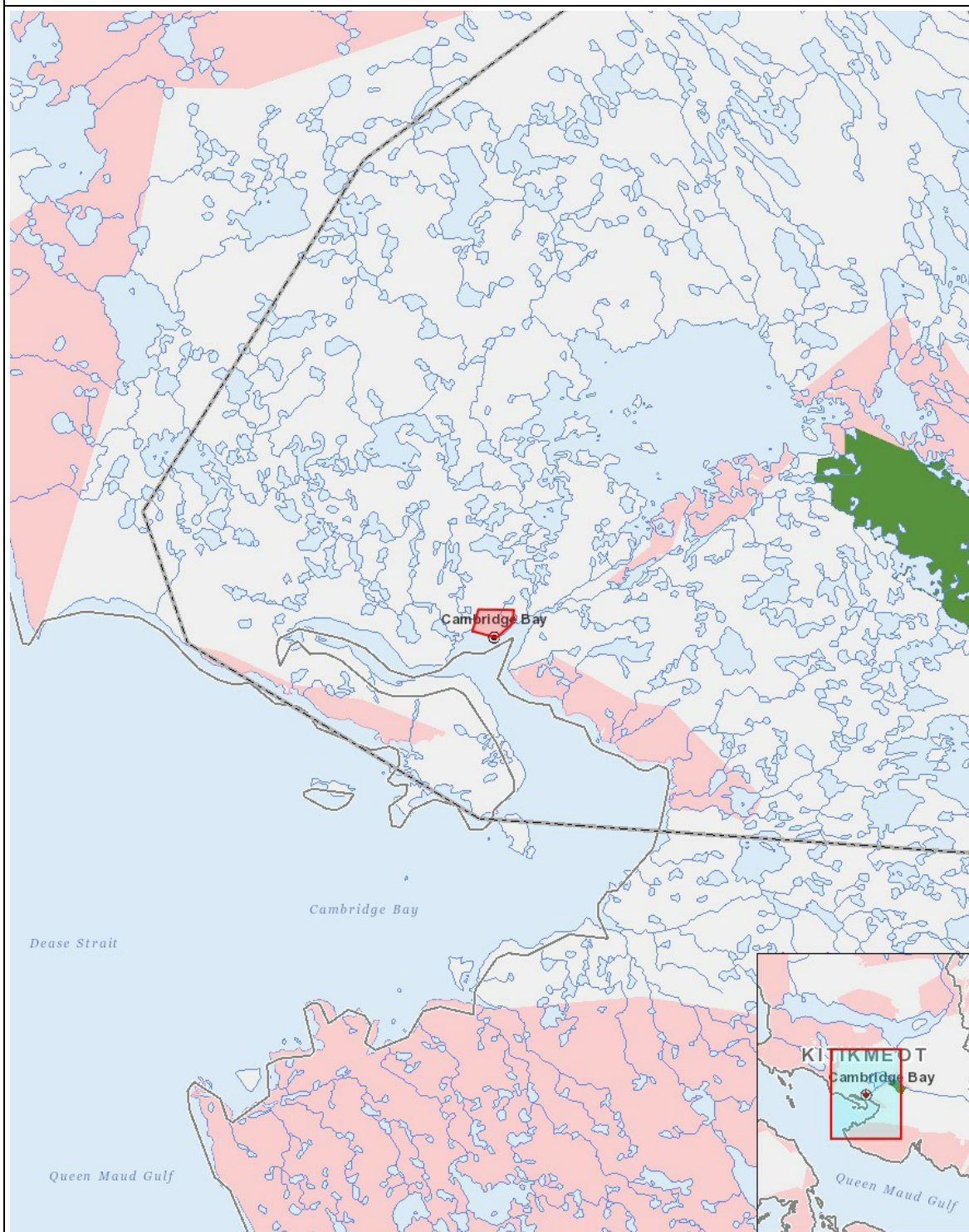
Impacts

Identification des répercussions environnementales

	PHYSICAL	Designated environmental areas	Ground stability	Permafrost	Hydrology / Limnology	Water quality	Climate conditions	Eschers 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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exploitation																									
Sampling sites		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	P	-	P	P
Désaffectation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(P = Positive, N = Négative et non gérable, M = Négative et gérable, U = Inconnue)

# Site du projet



## Liste des géométries de projet

1	polygon	Location for various water sampling points
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