



NIRB Application for Screening #125845

Long Term Water Project - Geotechnical Investigations

Application Type: New

Project Type: Scientific Research

Application Date: 8/3/2023 7:15:22 PM

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

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

Project Proponent: Tamilore Adeleke
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DETAILS

Non-technical project proposal description

English: The City of Iqaluit is facing critical challenges with its drinking water supply due to its growing population and the impact of adverse climate changes. To address this pressing issue, the City and their consultants will progress designs for upgrades to its water supply and distribution infrastructure systems. The upgrades are anticipated to include pumping and conveying water from Qikiqtalik Lake (also known as Unnamed Lake) through conveyance pipes to a newly constructed earth berm storage reservoir located adjacent to Lake Geraldine. The source water upgrades will primarily comprise three key aspects: raw water extraction, raw water conveyance, and raw water storage. To advance the engineering design of these upgrades, and ahead of future permitting phases, it is imperative that thorough geotechnical field investigations are completed. These investigations aim to assess existing site features and underground conditions. For timeframe of these investigations, the City anticipate to commence geotechnical field investigations in 2023, with completion anticipated during the summer of 2024. The purpose of this project is to advance the project geotechnical investigations. The geotechnical investigation will study the surface and subsurface conditions of the future pump station, the conveyance pipe, and the reservoir to determine if the sites are adequate to proceed with design, permitting and construction activities. A research geotechnical drilling program will be implemented to coordinate the field investigation and will consist of an estimated total of 24 boreholes (12 boreholes at ~5m depth and 12 boreholes at ~10m depth). For the raw water conveyance pipe, there are two potential alignment options identified in prior studies. Both alignments are roughly the same distance and therefore will require approximately 12 boreholes in total for a geotechnical study. Six (6) of those boreholes at 5-meter depth and six (6) of those at 10-meter depth along the line. Some of those mentioned 12 boreholes will also include the pump station structure for the geotechnical study. The new reservoir will require the other 12 boreholes, six (6) at 5m depths and six (6) at 10m depths. The exact locations will be based on project consultants' recommendations and on-site conditions/surveys. However, the tentative Geotechnical investigation boreholes would be located in three approximate areas: 1. At the proposed pump station site adjacent to Unnamed Lake on the south side in an investigation area approximately 10 m x 10 m and centered at Latitude 63.779769, Longitude -68.4504122. At the proposed reservoir site adjacent to Lake Geraldine on the East side in an investigation area approximately 750m x 350m and centered at Latitude 63.761552& Longitude -68.492085 3. Along the proposed conveyance pipe routes (2) which extend approximately 5 km between the pump station and reservoir with each route comprising an investigation width of 10m. The project proponent will prepare essential management plans, including a spill contingency plan, health and safety plan, refueling procedures, and erosion and sediment control plan for reinstating any impacts resulting from localized boreholes upon the completion of the research activity. Particular attention will be given to avoiding disruption to areas housing fragile vegetation or wildlife. The use of non-toxic drilling fluids will be used to prevent any contamination of water bodies in the vicinity.

French: La ville d'Iqaluit est confrontée à des défis importants en matière d'approvisionnement en eau potable en raison de la croissance de sa population et des répercussions liées à un changement climatique défavorable. Pour répondre à cette situation pressante, la ville et ses consultants feront avancer les projets de modernisation de ses systèmes d'approvisionnement en eau et de son infrastructure de distribution. Les améliorations devraient comprendre le pompage et l'acheminement de l'eau du lac Qikiqtalik (également connu sous le nom de lac Sans Nom) par le biais de conduites d'adduction jusqu'à un réservoir de stockage à berme de terre nouvellement construit à proximité du lac Géraldine. L'amélioration de la source d'eau porte principalement sur trois aspects essentiels : l'extraction de l'eau non traitée, l'acheminement de l'eau non traitée et le stockage de l'eau non traitée. Afin de faire avancer la conception technique de ces améliorations, et en vue des futures phases de délivrance de permis, des études géotechniques approfondies doivent impérativement être réalisées sur le terrain. Ces études visent à évaluer les caractéristiques existantes du site et les conditions souterraines. Pour ce qui est du calendrier de ces études, la ville prévoit d'entamer les études géotechniques sur le terrain en 2023 et de les achever à l'été 2024. La présente proposition de projet a pour objectif de faire avancer les études géotechniques du projet. Les études géotechniques porteront sur les conditions de surface et de subsurface des sites prévus pour la future station de pompage, pour la conduite d'adduction d'eau et pour le réservoir afin d'établir si ces sites sont adéquats pour procéder aux activités de conception, d'obtention des permis et de construction. Un programme de forage géotechnique de recherche sera mis en œuvre afin de coordonner les études sur le terrain. Ce programme consistera en un total estimé de 24 trous de forage (12 trous de forage à environ 5 m de profondeur et 12 trous de forage à environ 10 m de profondeur). En ce qui concerne la conduite d'adduction d'eau non traitée, deux options de tracés ont été identifiées lors d'études antérieures. Les deux tracés couvrent sensiblement la même distance et environ 12 trous de forage au total sont nécessaires pour l'étude géotechnique. Six (6) de ces trous de forage seront à une profondeur de 5 mètres et six (6) autres à une profondeur de 10 mètres le long du tracé. Certains des 12 trous de forage susmentionnés tiendront également compte de la structure de la station de pompage pour l'étude géotechnique. Le nouveau réservoir nécessitera 12 autres trous de forage, six (6) à 5 mètres de profondeur et six (6) à 10 mètres de profondeur. Les emplacements précis seront en fonction des recommandations des

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Personnel

Personnel on site: 5

Days on site: 10

Total Person days: 50

Operations Phase: from 2023-09-11 to 2024-09-30

Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
The line is used to indicate our second option for the borehole locations (option 2 (5-6km))	Drilling	Municipal	An option evaluation for the pipe routing was conducted in both 2021 and 2022 at this specific location. This evaluation aimed to assess and determine the most suitable routing options for the project.	No archaeological sites are found in the specific locations however the study team will abide by any terms and conditions for the protection of archaeological and palaeontological resources provided by the Department of Culture and Heritage.	The planned geotechnical study will be conducted on land adjacent to the communities in Iqaluit. The study area encompasses municipal land.
Area of interest for the proposed reservoir (150,000 sq.m)	Drilling	Municipal	A pre-feasibility study was previously conducted in 2019 and 2020 for evaluation of water storage at this specific location	Stone Caine is found near the proposed reservoir. The archaeological assessment is currently ongoing and the study team will abide by any terms and conditions for the protection of archaeological and palaeontological resources provided by the Department of Culture and Heritage.	The site is situated within municipal boundaries and is in close proximity to Lake Geraldine. The planned geotechnical study will be conducted on land adjacent to the communities in Iqaluit
The line is used to indicate our first option for the proposed borehole locations (option 1 (5-6km))	Drilling	Municipal	An option evaluation for the pipe routing was conducted in both 2021 and 2022 at this specific location. This evaluation aimed to assess and determine the most suitable routing options for the project.	No archaeological sites are found in the specific locations however the study team will abide by any terms and conditions for the protection of archaeological and palaeontological resources provided by the Department of Culture and Heritage.	The planned geotechnical study will be conducted on land adjacent to the communities in Iqaluit. The study area encompasses municipal land.

Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Iqaluit	Jimmy Akavak	Hunters and Trapper association	2023-06-08
Iqaluit	Noah Alookie	Hunters and Trapper association	2023-06-08
Iqaluit	Tim Brown	Nunavut Tunngavik Incorporated (NTI).	2023-04-27
Iqaluit	Matthew Hamp	Qikiqtani Inuit Association (QIA)	2023-03-23
Iqaluit	Navarana Beveridg	Qikiqtani Inuit Association	2023-03-23

		(QIA)	
Iqaluit	Jared Ottenhof	Qikiqtani Inuit Association (QIA)	2023-04-27

Authorizations

Indicate the areas in which the project is located:

South Baffin

Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Other	Department of Culture and Heritage - for archaeological assessment	Active	2023-07-14	2023-12-31

Project transportation types

Transportation Type	Proposed Use	Length of Use
Land	Access to the sites will be overland on existing road trails via truck	

Project accomodation types

Community

Material Use

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

Equipment Type	Quantity	Size - Dimensions	Proposed Use
Geotechnical Drill Rig	2	2.5m x 4.0m	The equipment will be used for drilling geotechnical boreholes.
Flatbed Truck	1	50ft x 8.5ft x 5ft	The equipment will be used to transport other equipment to site.
Pickup Truck	1	20ft x 6.7ft x 6ft	To transport personnel onsite

Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Diesel	fuel	4	20	80	Liters	To power up the drill rig and trucks (flatbed and pickup truck)
Anti-freeze	hazardous	2	5	10	Liters	For vehicle operation

Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
0		

Waste

Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Drilling	Overburden (organic soil, waste material, tailings)	Five cubic meter	Typically, during drilling activities, rock fragments and soil particles are brought to the surface. A portion of these rocks will be collected for sampling purposes, while the remaining material will be carefully distributed across the area in a manner that ensures no adverse impact on local entities.	N/a

Environmental Impacts:

To ensure responsible practices, the project proponent will develop essential management plans. These plans will encompass: a)A spill contingency plan b)A health and safety plan c)An erosion and sediment control plan, aimed at restoring any localized borehole impacts after the research activity concludes. Special emphasis will be placed on safeguarding areas that host delicate vegetation or wildlife to prevent any disruption. This proactive approach underscores our commitment to environmental protection and responsible project execution.

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 geotechnical survey will be an integral part towards future designs, permitting applications and thereafter implementation. These geotechnical investigations will the project proponent to better define the physical environment for future permit applications.

Description of Existing Environment: Biological Environment

This investigation is a critical component of a larger program that will comprehensively assess the biological environment in subsequent phases

Description of Existing Environment: Socio-economic Environment

The planned geotechnical study will be conducted on land adjacent to the communities in Iqaluit. The Project area is mostly Precambrian bedrock with some areas of littoral and nearshore sediments and intertidal sediments that consist of well-sorted gravels deposited as beaches, gravely sand, sand, and silty sand.

Miscellaneous Project Information

Identification of Impacts and Proposed Mitigation Measures

The project proponent will prepare essential management plans, including a spill contingency plan, health and safety plan, refueling procedures, and erosion and sediment control plan for reinstating any impacts resulting from localized boreholes upon the completion of the research activity. Particular attention will be given to avoiding disruption to areas housing fragile vegetation or wildlife.

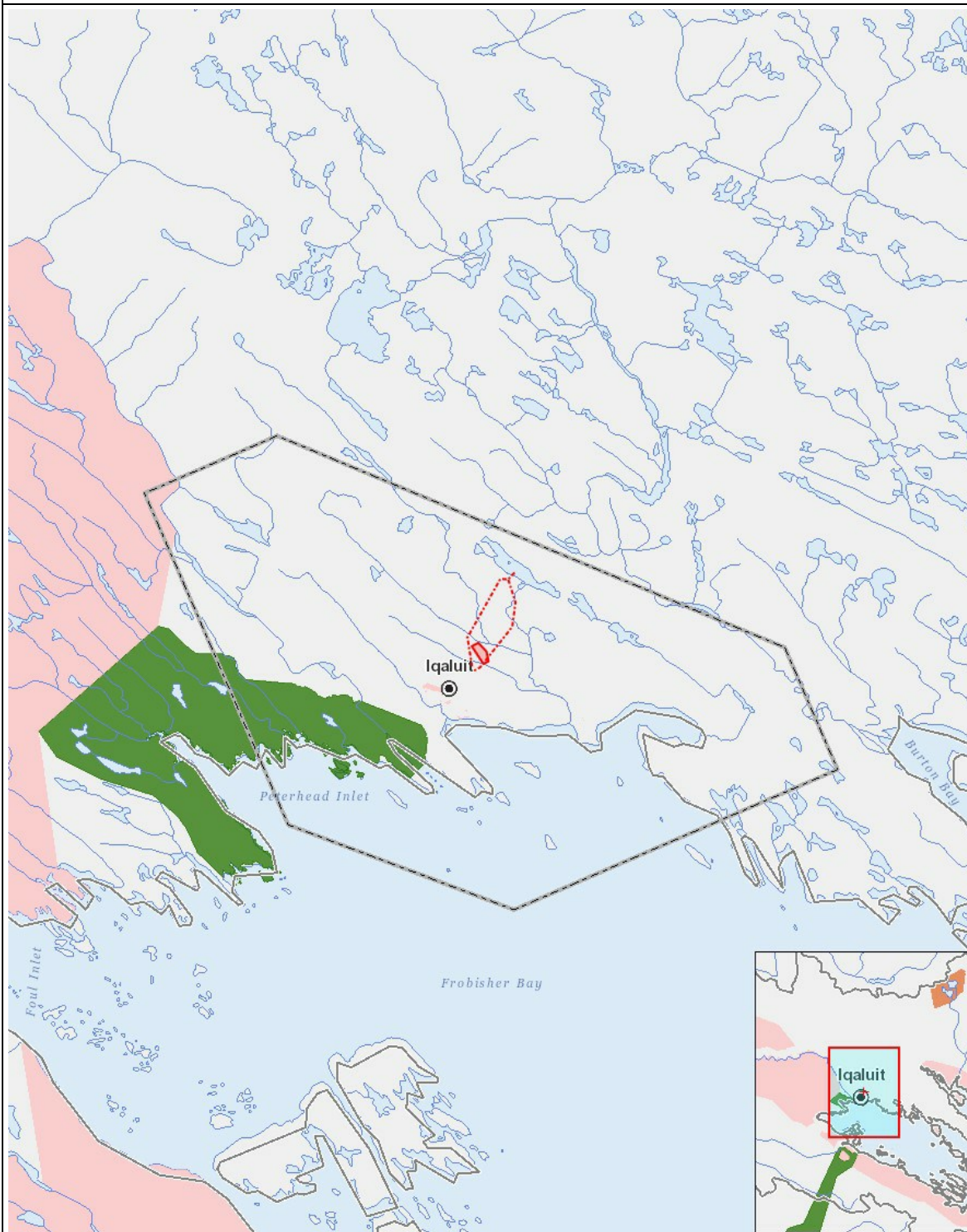
Cumulative Effects

Impacts

Identification of Environmental Impacts

		PHYSICAL																BIOLOGICAL										SOCIO - ECONOMIC				
		Designated environmental areas																Vegetation										Archaeological and cultural historic sites				
		Ground stability																Wildlife, including habitat and migration patterns										Employment				
		Permafrost																Birds, including habitat and migration patterns										Community wellness				
		Hydrology / Limnology																Aquatic species, incl. habitat and migration/spawning										Community infrastructure				
		Water quality																Wildlife protected areas										Human health				
		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																														
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Project Location



List of Project Geometries

- 1 polygon Area of interest for the proposed reservoir (150,000 sq.m)
- 2 polyline The line is used to indicate our first option for the proposed borehole locations (option 1 (5-6km))
- 3 polyline The line is used to indicate our second option for the borehole locations (option 2 (5-6km))