



NIRB Application for Screening #125475

A survey of mercury levels within edible plants, fungi and soil in Iqaluit and surrounding areas

Application Type: New

Project Type: Scientific Research

Application Date: 7/3/2019 8:55:57 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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DETAILS

Non-technical project proposal description

English: On a trip in 2017, researchers from Queen's University found elevated mercury levels within an edible mushroom species. In the summer of 2018, researchers assessed multiple plant species and fungal species for elevated mercury concentrations. The literature has shown that mushrooms, especially puffballs bioaccumulate mercury within their fruiting bodies and may transfer it to high trophic levels through consumption. The main objectives for my Masters of Environmental Studies research from Queen's University in 2019 are to sample different locations within Iqaluit over a 14 day period from July 31 to August 14, 2019 in order to: 1) sample additional plant species that were not collected in 2018 and identify their potential to accumulate mercury, 2) sample in depth fungi species with a focus on puffball species that were found to accumulate high levels of mercury from the 2018 sample collection, 3) collect corresponding fungal mycorrhiza and soil samples to determine if the mercury is being accumulated from the soil or the atmosphere. With help from the Nunavut Research Institute (NRI) and local community members taking the Environmental Sampling and Analysis Training Program offered by the Iqaluit Analytical Services Unit (IASU), direct mercury analyzers will be used to test the selected plant, fungi and soil samples for total mercury concentrations. Data will be compiled and statistically analyzed at Queen's University. Additionally, further insight into additional plant species, with a focus on edible fungi and corresponding soil samples will give insight into the impact this contamination may pose on the health of local human and wildlife population and the main source of this mercury contamination. Although this project is a continuation of the project from 2018, this is the first NPC application being completed because we require soil samples in this year's study. Previous years only required sampling plant species and therefore no NPC applications were required.

French: Au cours d'un voyage en 2017, des chercheurs de l'université de Queen's ont trouvé que des champignons comestibles avait des niveaux de mercure élevée. Durant l'été de 2018, les enquêteurs ont étudié plusieurs espèces de plantes et fungus pour déterminer si elles avaient des niveaux de mercure élevées. Plusieurs études dans la littérature démontrent que les champignons, surtout les vesse-de-loup, bio-accumulent le mercure dans leurs fructifications. La consommation de ces fungus peut transférer le mercure à des niveaux trophiques plus élevées. L'objectif de ma maîtrise en études environnementales à l'Université de Queens en 2019 est de procurer des échantillons environnementaux à Iqaluit au cours d'une période de 14 jours du 31 juillet au 14 août, 2019 afin de : 1) Prendre plus d'échantillons d'espèces de plantes qui n'ont pas été étudiées en 2018 et déterminer leur potentielle pour l'accumulation du mercure. 2) Procurer des échantillons de fungus davantage avec une emphase sur les espèces de vesse-de-loup qui avaient accumulé les taux les plus élevés de mercure durant la saison de 2018. 3) Collecter les mycorhizes fongiques et les échantillons de sol correspondant afin de déterminer si le mercure est dérivé de la terre ou de l'atmosphère. Avec l'aide de l'Institut de Recherche du Nunavut (IRN) et les membres de la communauté qui participent au programme d'entraînement en échantillonnage environnemental offert par le groupe de services analytiques de l'Iqaluit, des analyseurs de mercure directes seront utilisés pour tester les échantillons de plantes, fungus et sol afin de déterminer la concentration totale de mercure. Les données seront compilées et les analyses statistiques seront complétées à l'Université de Queens. Avec plus d'information à propos des nouvelles espèces de plantes et une plus grande emphase sur les fungus comestibles et du sol auxquelles ils poussent, il sera possible de déterminer la source de la contamination de mercure et l'impact qu'elle pourrait avoir sur la santé de la population locale humaine et de la faune. Alors que ce projet est une continuation du projet de 2018, cette demande de la Commission d'Aménagement du Nunavut (CAN) est la première à être rempli parce que, pour l'étude de cette année, on a besoin d'échantillons de sol. L'échantillonnage des années précédentes n'a pas requis une application CAN parce que les seuls échantillons collectés étaient les tissus de plantes.

[illegible]

Inuinnaqtun: This language does not apply to my project.

Operations Phase: from 2019-07-31 to 2019-08-14

Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
New project geometry	Researching	Municipal	N/A	N/A	Within several locations of Iqaluit, Nunavut

Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Iqaluit	Jamal Shirley	Nunavut Research Institute	2019-06-01

Authorizations

Indicate the areas in which the project is located:

South Baffin

Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Hunters and Trappers Associations/Organizations	Sampling of plants within Iqaluit and the surrounding area. Approval pending.	Applied, Decision Pending		

Project transportation types

Transportation Type	Proposed Use	Length of Use
Land	Foot	

Project accomodation types

Other,

Material Use

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

Equipment Type	Quantity	Size - Dimensions	Proposed Use
Information is not available			

Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Information is not available						

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
Information is not available				

Environmental Impacts:

Minimal environmental impact. The only impact will be the removal of very minimal plant and fungi samples from several locations of Iqaluit and the removal of the corresponding soil (~10 grams) around the roots of these species. Holes will be filled in after.

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

Description of Existing Environment: Biological Environment

Description of Existing Environment: Socio-economic Environment

Miscellaneous Project Information

Identification of Impacts and Proposed Mitigation Measures

Cumulative Effects

Impacts

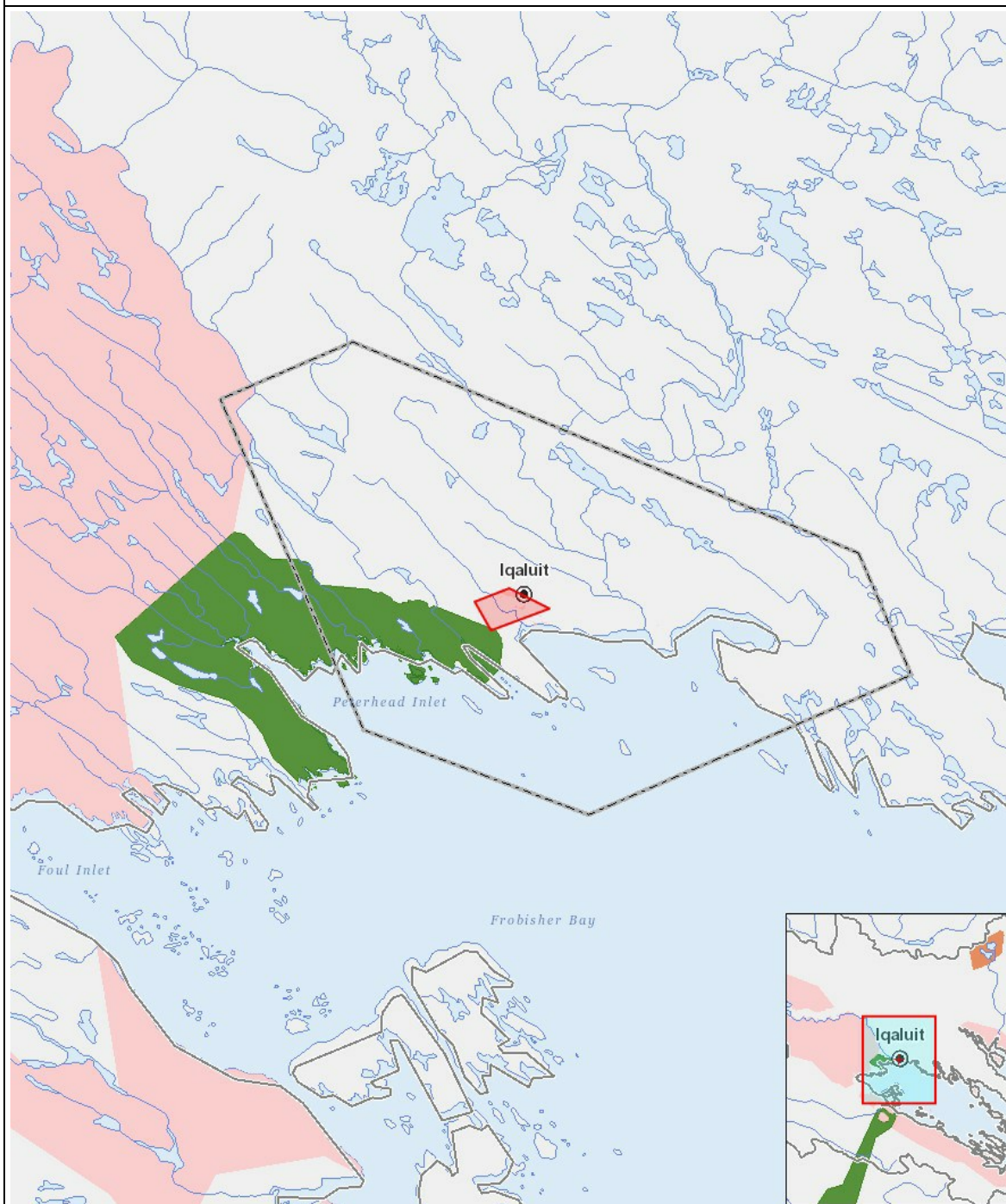
Identification of Environmental Impacts

		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																Vegetation										Employment					
		Eskers and other unique or fragile landscapes																Wildlife, including habitat and migration patterns										Community wellness					
		Surface and bedrock geology																Birds, including habitat and migration patterns										Community infrastructure					
		Sediment and soil quality																Aquatic species, incl. habitat and migration/spawning										Human health					
		Tidal processes and bathymetry																Wildlife protected areas										Employment					
		Air quality																Vegetation										Community wellness					
		Noise levels																Wildlife, including habitat and migration patterns										Community infrastructure					
		BIOLOGICAL																SOCIO - ECONOMIC						Employment									
		Vegetation																Archaeological and cultural historic sites						Community wellness									
		Wildlife, including habitat and migration patterns																Wildlife protected areas						Community infrastructure									
		Aquatic species, incl. habitat and migration/spawning																Wildlife protected areas						Human health									
		Wildlife protected areas																SOCIO - ECONOMIC						Employment									
		Archaeological and cultural historic sites																Wildlife, including habitat and migration patterns						Community wellness									
		Employment																Wildlife, including habitat and migration patterns						Community infrastructure									
		Community wellness																Wildlife, including habitat and migration patterns						Human health									
		Community infrastructure																Wildlife, including habitat and migration patterns						Employment									
		Human health																Wildlife, including habitat and migration patterns						Community wellness									

Construction																								
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Operation																								
Researching		N	N	-	-	-	-	-	-	N	-	-	N		N	-	-	-	-	-	-	-	-	-
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	New project geometry
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