NPC 151118: Evaluation of the Deep Geothermal Potential of Baker Lake, Nunavut, Canada

Close

Proposal Status: Conformity Determination Issued

Overview Documents Questionnaire

Project Overview

Type of application: Amendment

Proponent name:

Ysaline Bacon

Proponent company:

Institut National de la Recherche Scientifique

Project Description:

In the context of this research project, led by Professor Jasmin Raymond, Dr. Mafalda Miranda, and myself from the Institut National de la Recherche Scientifique in Quebec, Canada, the aim is to assess the deep geothermal potential of Baker Lake, Nunavut, Canada. Acknowledging the socio-economic benefits that renewable energy could bring to diesel-dependent communities like Baker Lake, the study focuses on two key research questions: firstly, whether the deep geothermal resources beneath Baker Lake can meet the community's heating and eventual electricity demands, and secondly, whether these resources can be obtained at a competitive cost. The interdisciplinary approach involves fieldwork, laboratory analyses, numerical modeling, and life-cycle cost analysis. The main objectives include studying local geology, characterizing thermophysical properties of rock samples, assessing theoretical geothermal potential, developing numerical models, and analyzing the life-cycle cost of the geothermal system. These objectives aim to build conceptual models, evaluate reservoir temperature and depth, estimate energy potential, design sustainable geothermal systems, and assess economic viability. Field research is scheduled for the summer of 2024, spanning from June 1 to September 30, with a duration of three weeks. It will be conducted within a limited area surrounding Baker Lake. Field methods include fracture studies on rocky outcrops, geological mapping, and the collection of surface rock samples. It is worth noting that, on the field, the aim is to target outcrops without vegetation cover accessible by roads around the municipality (Cf. accessible road on map). Fracture data will be gathered using linear scanline and rectangular window sampling methods, providing crucial information on fracture orientation, length, aperture, intensity, fill, and spacing. Hand size surface rock samples

will be collected using geological hammers, contributing to the overall understanding of Baker Lake's geology. The anticipated results have the potential to promote geothermal development in remote northern regions, aligning with environmental and social values held by the Baker Lake community.

Project Schedule

Start Date:

2026-07-23

End Date:

2026-08-08

Project Map

List of project geometries:

Id

Geometry

Location Name

22259

polygon

sampling area

NPC Planning regions:

No Approved Plan

Project Land Use and Authorizations

Project Land Use:

Scientific Research

Bulk Sample

Scientific Research

Licensing Agencies:

Nunavut Research Institute

Nunavut Impact Review Board

Material Use

Equipment:

Type

Quantity

Type

Use

Geological Hammers

3

30 cm

For geological research, we will utilize a specialized geological hammer for surface sample collection, ensuring samples are hand-sized. This tool is designed to minimize environmental impact, allowing precise collection while preserving the delicate nature of the terrain.

vehicule

1

4200*1500*1700

Renting a small local vehicle is vital for efficient mapping in our designated area. Its compact size enables easy navigation through tight spaces. Choosing a local agency supports the community and provides insights into the terrain. This flexibility is crucial for adapting to our mapping needs, ensuring effective coverage.

Fuel Use:

Type

Container

Capacity

Use

No data found

Hazardous Material and Chemical Use:

Type

Container

Capacity

Use

No data found

Water Consumption:

Daily Amount (m^2)

Retrieval Method

Retrieval Location

0

Iqaluit

Drinking water available in the hotel (for cooking, drinking, showering)

Waste and Impacts

Environmental Impacts:

Given the absence of camps and our accommodation in a hotel, the waste production associated with our presence in Nunavut is minimal and has little impact on the natural environment. We will implement stringent practices to minimize our ecological footprint, in compliance with the regulations in place in Baker Lake, ensuring that all generated waste is properly disposed of. In the field, we employ non-invasive exploration methods such as the use of hammers and crack counting, thus avoiding the generation of unnecessary waste. Furthermore, all the equipment we utilize is designed to be reusable, and it will be carefully transported back to the laboratory after our fieldwork. This approach ensures sustainable waste management, minimizing our environmental impact and preserving the integrity of local ecosystems within the framework of our geothermal exploration in Nunavut.

Waste Management:

Waste Type

Quantity Generated

Treatement Method

Disposal Method

No data found