NIRB Application for Screening #126163
Resolute Bay Geothermal Potential

Application Type: New

Project Type: Scientific Research

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DETAILS

Non-technical project proposal description

English: Project title: Geothermal Resource Potential of Resolute BayApplicant: Stephen Grasby, Research Scientist, Geological Survey of CanadaBackground, research questions and objectivesGeothermal resources could provide significant benefit to northern communities. For instance, some have estimated that geothermal heating in greenhouses at Resolute Bay can yield fresh produce with an average cost that is 50% lower than having to ship them to the community, supporting food security and nutrition. In 2018 Qulliq Energy conducted a prefeasibility study of geothermal energy in Nunavut, results of which highlighted the community of Resolute Bay, on Cornwallis Island, as one of three areas of interest worthy of further investigation. Following the initial study, Qulliq Energy contracted geophysical surveys by University of Alberta (magnetotelluric/ gravity) around the town of Resolute Bay in 2022/23 to identify potential subsurface reservoirs. Interpretation of these geophysical results requires geoscience knowledge on physical/geochemical properties of rock units in the subsurface. The community of Resolute Bay is underlain by over 4 km of sedimentary rocks. Previous work suggests that a rock units known as the Eleanor Bay Formation, > 3 km deep, could potentially form a geothermal reservoir. Knowledge of the rock properties is limited, however, and there are only two old petroleum wells drilled on the island with subsurface data. To understand the reservoir rocks that currently lie >3 km depth below Resolute Bay, we can examine them where they are exposed, in a geological feature known as the Central Dome, in the centre of Cornwallis Island. Rocks of the Eleanor Bay Formation are well exposed along river channels in the Central Dome but remain poorly described. A second location is a site at Lyall River on Devon Island. To assess the total potential energy production from a rock unit, several physical properties are required to develop models for both heat conduction (heat transfer to the fluid) as well as hydrogeologic (water movement through the rock mass). Basic examination of the rock outcrops are required to understand lateral and vertical heterogeneities of these properties. Equally important is characterisation of rocks that form seals above the reservoir, which limit upward movement of reinjected fluids (i.e. leakage to surface). All of these properties are currently unknown for the units of interest. Study of the two research sites would allow characterisation of both the rock units that could form productive reservoirs of geothermal fluids in the subsurface, as well as cap rocks that would form seals.Where, when, and how long is the field researchWe wish to conduct focused field work by establishing small 6 person tent camps for the first 2 weeks in July, 2025, including a wildlife monitor hired from Resolute Bay. Small individual tents will be used, one per person, plus an additional cooking/eating tent. All materials and food will be brought in and removed at the end. No fuel caches are required. The field team will have appropriate safety training including wildlife awareness. All efforts will be made to minimize wildlife encounters.Methods Access to the field site will be by helicopter from Resolute Bay and then by foot while on site. Measurements will be made by handheld devices and small hand size rock samples will also be collected for detailed study in laboratories. These will be curated and stored at the Geological Survey of Canada in Calgary. No more than 100 kg of rocks in total will be collected. There will be no collection of fossils. Sharing of Results All results and data will be made publicly available through online publication of Geological Survey of Canada Open File reports. Results will also be used in scientific publications. After completion of study, the lead researcher will travel to Resolute Bay and Iqaluit to make in person presentations of results. The timing will be determined through consultation as to when is best (e.g. to link to any planned science events).

French: Titre du projet : Potentiel des ressources géothermiques de Resolute BayDemandeur : Stephen Grasby, chercheur scientifique, Commission géologique du CanadaContexte, questions de recherche et objectifsLes ressources géothermiques pourraient apporter des avantages importants aux collectivités du Nord. Par exemple, certains ont estimé que le chauffage géothermique dans les serres de Resolute Bay peut produire des produits frais à un coût moyen inférieur de 50 % à celui de leur expédition à la communauté, ce qui favorise la sécurité alimentaire et la nutrition. En 2018, Qulliq Energy a mené une étude de préfaisabilité de l'énergie géothermique au Nunavut, dont les résultats ont mis en évidence la communauté de Resolute Bay, sur l'île Cornwallis, comme l'un des trois secteurs d'intérêt méritant une étude plus approfondie. À la suite de l'étude initiale, Qulliq Energy a commandé des levés géophysiques à l'Université de l'Alberta (magnétotellurique/gravité) autour de la ville de Resolute Bay en 2022-23 afin d'identifier des réservoirs souterrains potentiels. L'interprétation de ces résultats géophysiques nécessite des connaissances géoscientifiques sur les propriétés physiques/géochimiques des unités rocheuses dans le sous-sol. La communauté de Resolute Bay repose sur plus de 4 km de roches sédimentaires. Des travaux antérieurs suggèrent qu'une unité

rocheuse connue sous le nom de formation d'Eleanor Bay, d'> 3 km de profondeur, pourrait potentiellement former un réservoir géothermique. Cependant, les connaissances sur les propriétés de la roche sont limitées et il n'y a que deux anciens puits de pétrole forés sur l'île avec des données souterraines. Pour comprendre les roches réservoirs qui se trouvent actuellement à >3 km de profondeur sous Resolute Bay, nous pouvons les examiner là où elles sont exposées, dans une caractéristique géologique connue sous le nom de dôme central, au centre de l'île Cornwallis. Les roches de la formation d'Eleanor Bay sont bien exposées le long des chenaux fluviaux du dôme central, mais elles demeurent mal décrites. Un deuxième emplacement est un site à Lyall River sur l'île Devon. Pour évaluer la production totale d'énergie potentielle à partir d'une unité rocheuse, plusieurs propriétés physiques sont nécessaires pour développer des modèles de conduction thermique (transfert de chaleur vers le fluide) et hydrogéologique (mouvement de l'eau à travers la masse rocheuse). Un examen de base des affleurements rocheux est nécessaire pour comprendre les hétérogénéités latérales et verticales de ces propriétés. La caractérisation des roches qui forment des joints au-dessus du réservoir, ce qui limite le mouvement ascendant des fluides réinjectés (c'est-à-dire les fuites vers la surface), est tout aussi importante. Toutes ces propriétés sont actuellement inconnues pour les unités d'intérêt. L'étude des deux sites de recherche permettrait de caractériser à la fois les unités rocheuses qui pourraient former des réservoirs productifs de fluides géothermiques dans le sous-sol, ainsi que les roches de couverture qui formeraient des étanchéités.Où, quand et combien de temps dure la recherche sur le terrainNous souhaitons mener un travail de terrain ciblé en établissant de petits camps de tentes de 6 personnes pour les 2 premières semaines de juillet 2025, y compris un moniteur de la faune embauché à Resolute Bay. De petites tentes individuelles seront utilisées, une par personne, ainsi qu'une tente supplémentaire pour cuisiner/manger. Tous les matériaux et la nourriture seront broug

Inuktitut: ᐱᓕᕆᐊᖑᔪᖅ ᐊᑎᖓ: ᒪᓂᕋᐅᑉ ᐅᖅᑰᓂᖓᓂᒃ ᖃᐅᔨᓴᕐᓂᖅ ᐃᑲᔫᑎᒃᓴᓄᑦ ᐱᑕᖃᕈᓐᓇᖅᑐᖅ ᖃᐅᓯᐃᑦᑐᕐᒥᐱᓇᔪᒃᑐᖅ: ᓯᑰᕚᓐ ᒐᔅᐱ, ᖃᐅᔨᓴᖅᑕᐅᔪᓄᑦ ᖃᐅᔨᓴᖅᑎᒻᒪᓇᒃ, ᓄᓇᓐᖑᐊᓕᕆᔾᑯᑦ ᑲᓇᑕᖅᓄᐃᓐᓂᕆᓯᒪᔭᖓ, ᖃᐅᔨᓴᕈᑎᓄᑦ ᐊᐱᖁᑎᑦ ᐊᒻᒪᓗ ᑐᑭᑖᕆᕚᓪᓕᐊᔭᖏᑦᒪᓂᕋᐅᑉ ᐆᓇᕐᓂᖓᖅᑐᑦ ᐊᖏᔪᒥᒃ ᐃᑲᔫᑎᔪᓐᓇᖅᑐᖅ ᐅᑭᐅᖅᑕᖅᑐᒥ ᓄᓇᓕᖕᓄᑦ. ᐆᒃᑑᑎᕆᓪᓗᒍ, ᐃᓚᒋᑦ ᓇᓚᐅᑖᖅᓯᒪᔪᑦ ᒪᓂᕋᐅᑉ ᐆᓇᕐᓂᖓ ᐅᖅᑰᑎᑦᑎᔪᓐᓇᖅᑐᖅ ᐱᕈᖅᓯᐊᖃᕐᕕᖓᒥ ᖃᐅᓯᐃᑦᑐᕐᒥ ᐅᑯᐊᓗ ᐱᕈᖅᑎᑦᑎᔪᓐᓇᖅᑐᑦ ᐊᑭᓪᓕᕆᐊᖅᑎᑦᑎᓯᒪᔪᓐᓇᖅᑯᑎᒃ 50% ᑎᑭᑎᑕᐅᕙᒃᑐᓂᒃ ᓄᓇᓕᖕᓄᑦ, ᐃᑲᔪᖅᑐᑦ ᓂᕿᒃᓴᖃᕐᑎᑦᑎᓪᓗᑎᒃ ᐊᒻᒪᓗ ᑎᒥᒧᑦ ᓂᕿᑦᑎᐊᕙᐅᓪᓗᑎᒃ. ᑕᐃᑲᓂ 2018 ᖁᓪᓕᖅ ᐆᒻᒪᕐᑯᑎᓕᕆᔾᑯᑦ ᑎᒥᖁᑖ ᖃᐅᔨᓴᖅᓯᓚᐅᖅᑐᑦ ᐋᑐᑎᖃᕈᓐᓇᕐᒪᖔᑕ ᐃᓕᑦᑎᓇᓱᒃᑐᑦ ᓄᓇᖓᑕ ᐆᓇᕐᓂᖓᓂ ᐆᒻᒪᕐᑯᑎᖃᐅᑎᒃᓴᓄᑦ ᓄᓇᕗᓪᒥ, ᑐᑭᓯᓇᖅᓯᔪᑦ ᑐᓂᔭᐅᓚᐅᖅᑐᖅ ᓄᓇᓕᖕᓄᑦ ᖃᐅᓯᐃᑦᑐᖅ, ᑐᔅᔮᓂᑦ ᒪᕈᓕᕿ ᕿᑭᖅᑕᖅ, ᑕᐃᒪᓗ ᐱᖓᔪᕆᔭᐅᔪᖅ ᓄᓇᓂ ᖃᐅᔨᓴᕆᐊᒃᑳᓂᕈᓂ ᐋᑐᑎᖃᒻᒪᕆᒃᑲᔅᓂᖓᓂᒃ. ᐱᔭᕇᕐᒪᑕ ᐱᕆᐊᓖᖅᓱᑎᒃ ᐃᓕᑦᑎᓇᓱᒍᑎᖓᑦ, ᖁᓪᓕᖅ ᐆᒻᒪᕐᑯᑎᓕᕆᔾᑯᑦ ᑎᒥᖁᑖ ᑳᑐᑫᒃᓯᓚᐅᖅᑐᑦ ᓄᓇᖓᑕ ᑭᓯᖃᒻᒪᖔᑦ ᖃᐅᔨᓴᖅᑕᐅᓪᓗᓂ ᐃᓕᓐᓂᐊᕐᕕᒃᔪᐊᖅ ᐊᐃᐳᑕ (ᓂᐱᑦᑕᖅᑐᖃᕐᓂᖓ) ᐊᕙᓗᓕᒫᖓᓂ ᖃᐅᓯᐃᑦᑐᖅ 2022/23 ᓇᓗᓇᐃᖅᓯᓗᑎᒃ ᐱᑕᖃᕐᒪᖔᑦ ᖄᖓᓂ ᐃᒪᖅᐅᑎᖃᕐᕕᖃᕐᓗᑎᒃ. ᑐᑭᓂᐅᕈᑎᑦ ᑖᒃᑯᓄᖓ ᓄᓇᒥ ᑭᓯᖏᑦ ᓴᕿᔮᖅᑐᑦ ᐋᕿᒃᓯᒪᕆᐊᖃᓚᐅᖅᑐᖅ ᓄᓇᒥ ᖃᐅᔨᓴᐃᓂᓪᒪᓇᒃᑎᒍᑦ ᖃᐅᔨᒪᓂᕐᒥᒃ ᑭᓯᖏᓐᓂᒃ/ ᓄᓇᐅᑉ ᐃᓚᐅᕈᑎᖏᓐᓂᒃ ᐅᔭᖃᓂᓪᓗ ᐃᑭᐊᖓᓂᑦ. ᖃᐅᓯᐃᑦᑐᖅ ᖁᖓᓃᑦᑐᖅ ᐅᖓᑖᓂ 4 ᑭᓛᒥᑕᔅ ᐅᔭᖃᑦ ᐃᒪᐅᑉ ᐃᖃᖓᓂᕐᒥᐅᑕᓂᒃ. ᑭᖑᓂᑦᑎᓐᓂ ᐱᓕᕆᓚᐅᖅᑐᑦ ᐃᓯᒪᓕᖅᓯᓯᒪᔪᑦ ᑕᒪᒃᑯᐊ ᐅᔭᖃᑦ ᑕᐃᔭᐅᓲᑦ Eleanor Bay Formation, > 3 ᑭᓛᒥᑕᔅ ᐃᑎᑎᕆᔪᖅ ᐃᑭᐊᖓᓄᑦ, ᐃᒻᒪᖄ ᑕᐃᒪᐃᓕᔪᖅ ᓄᓇᖓᑕ ᐆᓇᕐᓂᖓᓂᑦ ᐃᒪᖅᐅᑎᖃᕐᕕᖓᓂᑦ. ᖃᐅᔨᒪᓂᖅ ᐅᔭᖃᑦ ᑭᓯᖃᕐᒪᖔᑕ ᐱᑕᖃᓗᐊᕐᓂᖏᑦᑐᖅ, ᑕᐃᒪᓐᓇᐅᓚᓗᐊᖅᑎᓪᓗᒍ, ᐊᒻᒪᓗ ᒪᕈᐃᓐᓇᐅᖕᒪᑎᒃ ᐅᖅᓱᐊᓗᒃᓯᐅᕕᑦ ᓂᐅᖅᑐᖅᑕᐅᓂᒃᑯᑦ ᕿᑭᖅᑕᖓᓂ ᐃᑭᐊᖓᓂᒃ ᖃᐅᔨᓴᕈᑎᑖᕝᕕᐅᔪᓇᖅᑐᑦ. ᑐᑭᓯᐊᕐᓗᒍ ᐃᒪᖅᐅᑎᖃᕐᕕᖓ ᐅᔭᖃᑦ ᐅᓇ ᒫᓇᐅᔪᖅ ᖁᖓᓃᑦᑐᖅ 3 ᑭᓛᒥᑕᔅ ᐃᑭᐊᖓᓂ ᐊᑖᓂ ᖃᐅᓯᐃᑦᑐᖅ, ᖃᐅᔨᓇᓱᒍᓐᓇᖅᑕᕗᑦ ᑕᐃᑲᓂ ᓴᕿᔮᕐᓂᖓᓂᑦ, ᐊᒻᒪᓗ ᓄᓇᖓᑕ ᑭᓯᖃᕐᓂᖓ ᖃᐅᔨᒪᔭᐅᔪᖅ ᑕᒪᐃᓐᓄᑦ ᕿᑎᓇᔭᐅᔪᖅ ᒥᖅᓵᑎᖑᐊᖅᑎᑐᑦ, ᕿᑎᐊᓂ ᒪᕈᓕᕿ ᕿᑭᖅᑕᖅ. ᐅᔭᖃᑦ ᑕᒪᓐᓇ Eleanor Bay Formation ᓂᕆᐅᓚᖅᑐᖅ ᑕᒪᐅᓈᖓᓂᓕᒫᖓ ᑰᑉ ᐃᓯᖅᐸᓪᓕᐊᓂᖓᑕ ᓰᓗᐊᒍᑦ ᑕᒪᐅᖓ ᒥᖅᓵᑎᖑᐊᖓᓄᑦ ᑭᓯᐊᓂ ᓇᓗᓇᐃᔭᑦᑎᐊᖅᓯᒪᖕᒋᓗᐊᖅᑐᖅ. ᐱᖃᑖᑦ ᐃᓂᖓ Lyall ᑰᒃ ᑕᓪᓗᕈᑎᓂ. ᖃᐅᔨᓇᑦᑎᐊᖅᓱᒍ ᑲᑎᓪᓗᕆᑦ ᐆᒻᒪᕐᑯᑎᖃᐅᑎᖃᕈᓐᓇᕐᑎᑦᑎᔪᓐᓇᖅᑐᖅ ᐅᔭᖃᓂᑦ, ᐊᒥᓯᑦ ᐱᑕᖃᖅᑐᖅ ᐋᕿᒃᓯᓇᐊᖃᖅᓱᑎᒃ ᖃᓄᐃᓕᖓᔪᓇᕋᔭᖅᑕᖏᓐᓂᒃ ᑕᒪᕐᒥᒃ ᐆᓇᖅᑐᖃᐅᑕᐅᔪᓇᖅᑐᑦ (ᐆᓇᕐᓂᖓ ᐃᒪᖑᕐᓗᓂ) ᐊᒻᒪᓗ ᐃᒪᖓᑕ ᓅᑕᕐᓂᖓ (ᐃᒪᐃᑦ ᐃᖏᕐᕋᔪᑦ ᐊᑖᒍᑦ ᐅᔭᖃᑦ ᐊᖏᔪᕐᔪᐊᑦ). ᖃᐅᔨᓇᓱᑦᑎᐊᖅᓱᒍ ᐅᔭᖃᑦ ᓴᕿᔮᕐᓂᖏᑦᑎᒍᑦ ᑐᑭᓯᓂᐊᕋᑦᑕ ᓴᓂᒧᑦ ᐊᒻᒪᓗ ᑐᑭᒧᑦ ᒪᓂᕋᖓᑕ ᐅᔭᐊᑦᑎᐊᕙᐅᖕᒪᖔᑕ ᑖᒃᑯᐊ ᑭᓯᖃᕐᓂᖏᑦ. ᑕᐃᒫᒃᑕᐅᖅ ᐱᓪᒪᕆᐅᑎᕆᔪᑦ ᑭᓯᖃᕐᓂᖏᑦ ᐅᔭᖃᑦ ᓯᒥᒃᓯᔪᓇᕐᒪᑕ ᐃᒪᖅᐅᑎᖃᕐᕕᖓᓂᒃ, ᑕᐃᒪᓗ ᓄᒃᑕᕈᓇᕐᓕᑎᑦᑎᓗᑎᒃ ᖁᓪᓗᑦ ᓯᐱᓂᐊᕐᒪᑦ ᐃᒪᖓ (ᓰᕐᓗ ᑎᖕᒦᖅᓗᓂ ᖃᖓᓄᑦ). ᑖᒃᑯᓇᖓᓕᒫᑦᑎᐊᖅ ᑭᓯᖁᑎᓕᒫᖏᑦ ᒫᓇᐅᔪᖅ ᖃᐅᔨᒪᓇᖏᑦᑐᑦ ᐱᓕᕆᕝᕕᐅᔪᓕᔪᑦ. ᐃᓕᑕᐅᓇᓱᒃᑐᑦ ᒪᕐᕈᖕᓂᒃ ᖃᐅᔨᓴᕝᕕᖅᓱᒍᑎᒃ ᐃᓂᖅᓱᒍᑎᒃ ᐊᔪᖏᓐᓂᐊᕐᒪᑕ ᖃᐅᔨᓇᖅᓯᓗᑎᒃ ᑭᓯᖃᐅᕐᒪᖔᑕ ᑕᒪᕐᒥᒃ ᐅᔭᖃᑦ ᐃᒪᖅᐅᑎᖃᕐᕕᖑᕈᓐᓇᖅᑐᑦ ᓄᓇᐅᑉ ᐆᓇᕐᓂᖓᓂᑦ ᐃᒪᖓᓂᑦ ᐃᑭᐊᖓᓂ, ᐊᒻᒪᓗ ᒪᑐᓗᕆᑦ ᐅᔭᖃᑦ ᐊᕙᓗᐊ ᓂᐱᑦᑎᐊᕈᓇᕐᓂᐊᕐᒪᑦ. ᓇᓂ, ᖃᖓ, ᐊᒻᒪᓗ ᖃᓄᖅ ᐊᑯᓂᐅᑎᒋᔪᖅ ᓄᓇᒥ ᖃᐅᔨᓴᕐᓂᐊᖅᐸᑦᐱᓕᕆᔪᒪᔪᒍᑦ ᐊᐅᓪᓗᑎᓗᒍ ᓄᓇᒥ ᓴᓇᔪᑦ ᓴᕿᑦᑎᓯᒪᓗᑕ ᒥᑭᔪᓂᒃ 6 ᐃᓄᖅᑲᕈᓐᓇᖅᑐᑦ ᑐᐱᑦ ᑕᖕᒫᖅᓯᒪᕕᖕᒥᒃ ᓯᕗᓪᓕᐊᓂ 2 ᐱᓇᓱᐊᕈᓯᑦ ᔪᓚᐃ, 2025, ᐃᓚᖃᕐᓗᑕ ᓂᕐᔪᑎᓂᒃ ᐅᐊᑦᓯᔨᐅᓂᐊᖅᑐᒥᒃ ᐃᖅᑲᓇᐃᔭᓕᖅᑎᑕᐅᓗᓂ ᖃᐅᓯᐃᑦᑐᕐᒥᑦ. ᒥᑭᔪᓂᒃ ᑐᐱᕐᓂᒃ ᐊᑐᕐᓂᐊᖅᑐᑦ, ᐊᑕᐅᓯᖅᓯᐅᑎᑦ ᐃᓄᖕᒧᑦ, ᐊᒻᒪᓗ ᓇᑉᐸᖅᓯᓯᒪᓗᑕ ᓴᓂᐊᓂ ᓂᕿᓕᐅᕐᕕᒃᓴᒥᒃ/ᓂᕆᕝᕕᒃᓴᒥᒃ ᑐᐱᕐᒥᒃ. ᑕᒪᕐᒥᒃ ᐱᕐᑯᑎᑦ ᐊᒻᒪᓗ ᓂᕿᑦ ᑕᒪᐅᖓᖅᑕᐅᓂᐊᖅᑐᑦ ᐊᒻᒪᓗ ᐋᖅᑕᐅᓂᐊᓇᓪᓗᑎᒃ ᐱᔭᕇᖅᐸᑕ ᐃᓯᐊᓂ. ᐅᖅᓱᒃᓴᓂᒃ ᐃᓕᓯᒪᕙᕆᓇᐊᑐᔫᖕᒋᑦᑐᒍᑦ. ᓄᓇᒥ ᐱᓕᕆᖅᑎᕗᑦ ᐱᔭᕇᖅᓯᓯᒪᑦᑎᐊᖅᑐᑦ ᐊᑦᑕᕐᓇᖅᑕᐃᓕᑎᑦᑎᓂᕐᒧᑦ ᐱᔭᕇᖅᓴᐅᑎᓂᒃ ᐊᒻᒪᓗ ᓂᕐᔪᑎᓂᒃ ᖃᐅᔨᒪᓇᓯᑦᑎᐊᓇᐊᖅᑕᒥᖕᓂᒃ. ᑕᒪᐃᓐᓄᑦ ᐱᑦᑎᐊᓕᓇᓯᖕᓂᐊᖅᑐᒍᑦ ᓂᕐᔪᑎᓂᒃ ᖃᐃᔪᖃᕐᓂᐊᖕᒋᓪᓚᑦ.ᖃᐅᔨᓴᕈᓯᑦ

ᓄᓇᒧᐊᖃᑦᑕᕐᓂᐊᖅᑐᒍᑦ ᐱᓕᕆᕖᒋᔭᑦᑎᓐᓄᑦ ᖁᓕᒥᒨᓕᒃᑯᑦ ᖃᐅᓯᐃᑦᑐᕐᒥᑦ ᐊᒻᒪᓗ ᐱᓱᖃᑦᑕᕐᓗᑕ ᑕᐃᑲᓃᓕᕈᑦᑕ ᐃᓂᑦᑎᓐᓂ. ᐆᒃᑐᕋᖅᓯᓂᖅ ᐱᓕᕆᐊᖑᓂᐊᖅᑐᑦ ᑎᒍᒥᐊᕆᐊᓕᒃᑎᒍᑦ ᐊᒻᒪᓗ ᒥᑭᔪᑦ ᑎᒍᔭᒃᓴᐅᔪᑦ ᐊᒡᒐᒧᑦ ᐅᔭᖃᑦ ᖃᐅᔨᓴᕈᑎᑖᕐᕆᓗᒋᑦ ᐅᑯᐊᑦᑕᐅᖅ ᓄᐊᑕᐅᓂᐊᖅᑐᑦ ᓇᓗᓇᐃᑦᑎᐊᒃᑲᓐᓂᕐᓂᐊᕐᒪᑕ ᐊᖏᓐᓇᖅᑐᖃᖅᑐᒧᑦ ᖃᐅᔨᓴᕈᑎᑦᑎᒍᑦ ᐃᓕᑕᐅᓇᓱᑦᑎᐊᕐᓗᑎᒃ. ᐅᑯᐊ ᐋᕿᒃᓱᖅᑕᐅᑦᑎᐊᖅᓯᒪᓂᐊᖅᑐᑦ ᐊᒻᒪᓗ ᔫᖅᑕᐅᓯᒪᓗᑎᒃ ᓄᓇᖑᐊᓕᕆᔾᔪᒃᑯᑦ ᑲᓇᑕᒥ ᑳᑯᓕᒥ. ᐊᖏᓂᖅᓴᐅᔾᔪᓐᖏᑦᑐᑦ 100 ᑭᓚᒍᓚᒻᔅ ᑲᑎᖕᓗᒋᑦ ᓄᐊᑕᐅᔪᑦ. ᓄᐊᑦᑎᓂᐊᓐᖏᑦᑐᒍᑦ ᐆᒪᔪᒥᓂᕐᓂᒃ ᐅᔭᕋᖑᖅᓯᒪᔪᓂᒃ.ᑐᓴᕐᑎᑦᑎᓂᖅ ᑐᑭᓯᓇᖅᓯᔪᓂᒃᑕᒪᕐᒥᒃ ᑐᑭᓯᓇᖅᓯᔪᑦ ᐊᒻᒪᓗ ᖃᐅᔨᓴᕈᑎᑖᑦ ᑭᒃᑯᑐᐃᓐᓇᓄᑦ ᐊᑐᐃᓐᓇᕈᖅᑎᑕᐅᓂᐊᖅᑐᑦ ᐃᑭᐊᕿᕖᒃᑯᑦ ᐅᖃᓕᒫᕐᕕᖑᖅᑎᓯᒪᔪᖏᑦ ᓄᓇᖑᐊᓕᕆᔾᔪᒃᑯᑦ ᑲᓇᑕ ᑐᖅᑯᖅᓯᒪᔪᖏᑦ ᐅᓂᒃᑳᑦ. ᑐᑭᓯᓇᖅᓯᔪᑦ ᐊᑐᖅᑕᐅᓂᐊᕐᒥᔪᑦᑕᐅᖅ ᖃᐅᔨᓴᖅᑎᒻᒪᕆᖕᓄᑦ ᐅᖃᓕᒫᒐᒃᓴᖏᓐᓄᑦ. ᐱᔭᕇᖅᐸᑦ ᑕᒪᓐᓇ ᐃᓕᑦᑎᓇᓱᖕᓂᖅᐳᑦ, ᐊᖓᔪᖅᑳᖓ ᖃᐅᔨᓴᖅᑎ ᖃᐅᓯᐃᑦᑐᕐᒧᐊᕐᓂᐊᖅᑐᖅ ᐊᒻᒪᓗ ᐃᖃᓗᖕᓄᑦ ᐅᖃᐅᓯᕆᔭᖅᑐᕐᓗᒋᑦ ᑐᑭᓯᓇᖅᓯᔪᑦ. ᖃᖓᒃᑰᖓᓇᔭᕐᓂᖓ ᓇᓗᓇᐃᕆᐊᓕᒃ ᓯᓕ ᑕᒪᐅᓇ ᑐᑭᓯᓇᓱᖃᑎᖃᓚᐅᖅᑎᖕᓗᒋᑦ ᖃᖓ ᓈᒻᒪᒐᔭᕐᒪᖔᑦ (ᓲᕐᓗ ᐊᑦᑕᑎᑦᑎᕖᖃᕐᓂᐊᕋᑦᑕ ᓇᓕᐊᖕᓂᑐᐃᓐᓇᖅ ᐸᕐᓇᒃᓯᒪᔭᑦᑎᓐᓂᒃ ᖃᐅᔨᓴᐃᓂᒻᒪᕆᖕᒧᑦ ᖃᓄᐃᓕᐅᕈᑕᐅᔪᓄᑦ).

Personnel

Personnel on site: 6
Days on site: 0
Total Person days: 0
Operations Phase: from 2025-07-30 to 2025-08-15

Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
Central Dome, field camp location, and examination of rock outcrops within walking distance	Sampling sites	Crown	No known previous use, land in natural state	No known archeological locations	~52 km from Resolute Bay
Eleanor Lake field location, rock outcrops examined during day trips	Sampling sites	Inuit Owned Surface Lands	No known previous use, land in natural state	No known archeological locations	~77 km from Resolute Bay
Central Dome, field camp location, and examination of rock outcrops within walking distance	Camp	Crown	No known previous use, land in natural state	No known archeological locations	~52 km from Resolute Bay
Cape Manning field location, rock outcrops examined during day trips	Sampling sites	Crown	No known previous use, land in natural state	No known archeological locations	~ 81 km from Resolute Bay
Burrow Harbour camp site, at old twin strip on previously disturbed land	Camp	Crown	From satellite images the area was previously used as a camp site with two twin strips, modern tent rings, and potential debris left behind. Uncertain who's camp this was or when.	No known archeological locations	210 km from Resolute Bay
Lyall River field location, rock outcrops examined during day trips	Sampling sites	Crown	No known previous use, land in natural state	No known archeological locations	250 km from Resolute Bay

Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Resolute Bay	Melanie	Resolute Bay HTA	2024-07-26
Resolute Bay	Melanie	Resolute Bay HTA	2024-08-19

Resolute Bay	Nancy Amarualik	Resolute Bay HTA	2024-09-12
Resolute Bay	Joel Fortier	Qikiqtani Inuit Association	2024-09-19
Resolute Bay	Ian Dudla	Hamlet of Resolute Bay	2024-09-12
Resolute Bay	Ian Dudla	Hamlet of Resolute Bay	2024-09-17
Resolute Bay	Nancy Amarualik	Resolute Bay HTA	2024-09-17
Resolute Bay	in person Community Meeting	Resolute Bay Community open house	2024-09-17

Authorizations

Indicate the areas in which the project is located:

Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Nunavut Water Board	application for exemption from a water licence	Applied, Decision Pending		
Qikiqtani Inuit Association	land use permit for Elanor Lake site	Applied, Decision Pending		
Nunavut Research Institute	Application for a research licence	Applied, Decision Pending		

Project transportation types

Transportation Type	Proposed Use	Length of Use
Air	twin otter and helicopter	
Water	collection from streams and/or snow pack for daily drinking/washing/cooking needs	
Land	small temporary tent camp	

Project accomodation types

Temporary Camp

Material Use

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

Equipment Type	Quantity	Size - Dimensions	Proposed Use
Aircraft	1	A star	Helicopter from PCSP at Resolute Bay to access field sites
fixed wing	1	twin otter	Flight from Resolute Bay to Borrow Harbour

Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Aviation fuel	fuel	10	55	550	Gallons	fuel for helicopter, fueled at Resolute Bay airstrip

Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
0	retrieval by hand with a bucket	nearby streams and/or snowpack

Waste

Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Camp	Greywater	~5/L per day	strain out and food particles then pour greywater into a shallow pit dug 50 m from any water body	none
Camp	Sewage (human waste)	6 kg/ day	latrine pit hand dug. Backfilled after camp is closed.	none

Environmental Impacts:

We have discussed with Resolute Bay HTA potential camp locations and no concerns were raised in terms of known migration paths or birthing grounds. We will hire a local wildlife monitor from Resolute Bay to mitigate and encounters with wildlife. This will start with seeking advise onsite where to best establish the camp, and extend to how to respond to any wildlife encounters. Our goal is to avoid any encounters or to minimize the risk. Should there be any sign of bear activity we would use detents such as noise makers and bear spray. Firearms would only be used as an absolute last resort to save human life. Travel to the camp site by aircraft will generate noise that could disturb wildlife, we will follow minimum flight altitude guideline to minimise any such risk. Generation of waste water and sewage could risk water quality. This will be mitigated by proper disposal in greywater and latrine pits dug > 50 m from any water body. Our rock sampling will disturb the bedrock geology. We will mitigate this by selecting small handsize samples, and from areas that are not obvious to the naked eye. We will not sample any unique features we may observe in the outcrop. Our standard goal is to minimize any disruption of the outcrop such that future researchers could reproduce our studies. Results of our work will go directly to assessment of renewable geothermal energy potential for Resolute Bay and to support local decision making on if this could be a viable solution for the community should they wish to explore it further, supporting community wellness and infrastructure.

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

tundra environment, mostly rocky areas with little vegetation, rolling hills.

Description of Existing Environment: Biological Environment

Very little vegetation and not known as areas for any significant wildlife.

Description of Existing Environment: Socio-economic Environment

No human infrastructure in the area although there appears to be an old camp from satellite images at Burrow Harbour (square tent rings, two twin otter strips, etc.)

Miscellaneous Project Information

none

Identification of Impacts and Proposed Mitigation Measures

Impacts will be minor and limited to footsteps left behind. We will remove all camp equipment brought to the site and any garbage produced. We will strive to leave no obvious signs of our presence.

Cumulative Effects

none

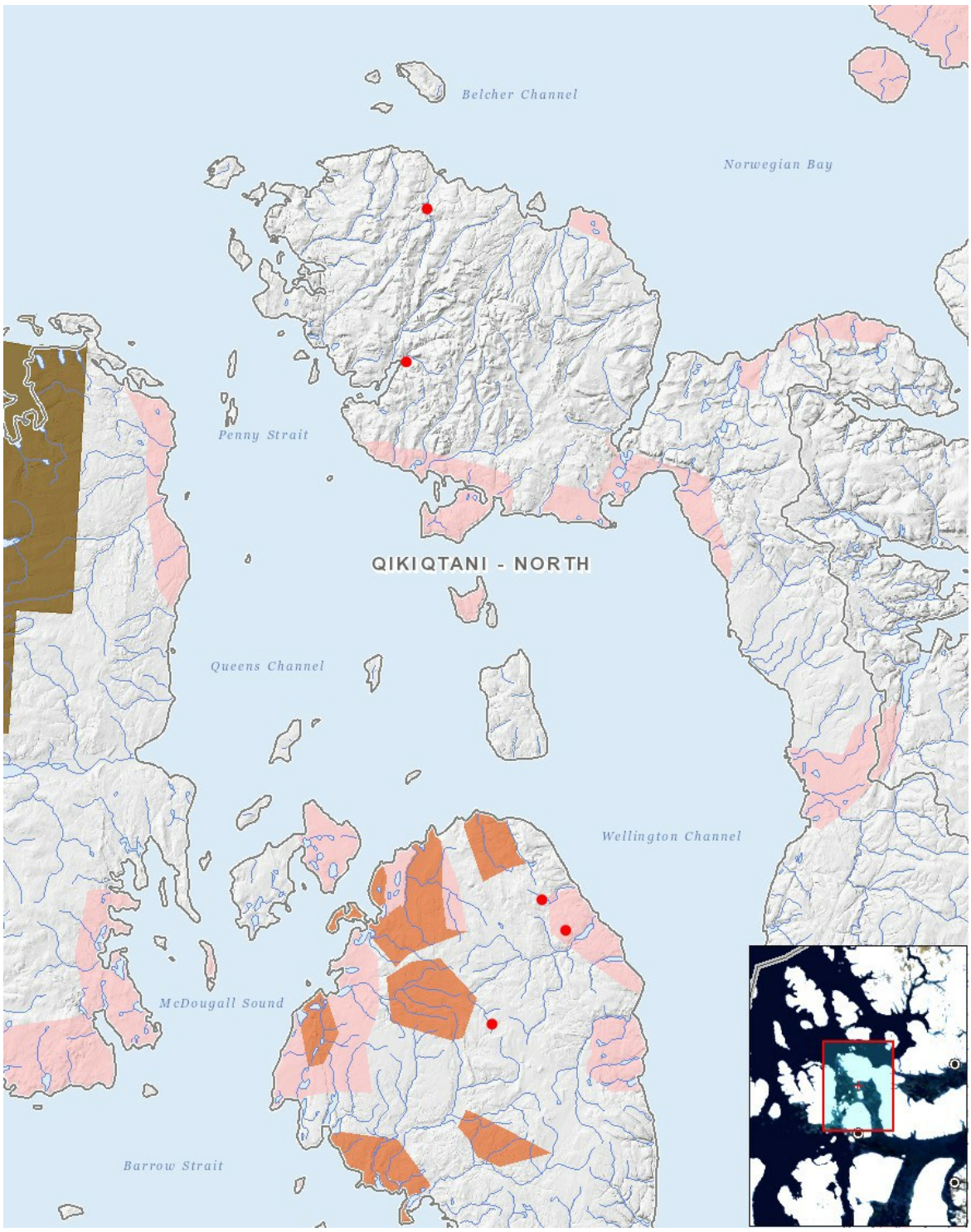
Impacts

Identification of Environmental Impacts

	PHYSICAL	Designated environmental areas	Ground stability	Permafrost	Hydrology / Limnology	Water quality	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	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																									
-		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-
Operation																									
Camp		-	-	-	-	M	-	-	-	-	-	-	M		-	M	-	-	-		-	P	P	P	-
Decommissioning																									
-		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-

(P = Positive, N = Negative and non-mitigatable, M = Negative and mitigatable, U = Unknown)

Project Location



List of Project Geometries

1	point	Burrow Harbour camp site, at old twin strip on previously disturbed land
2	point	Lyall River field location, rock outcrops examined during day trips
3	point	Cape Manning field location, rock outcrops examined during day trips
4	point	Eleanor Lake field location, rock outcrops examined during day trips
5	point	Central Dome, field camp location, and examination of rock outcrops within walking distance