

NWB Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, Nunavut, X0B 1J0

April 30 2022

NWB Manager of Licensing,

Please find herein my application for Approval for the Use of Water or Deposit of Waste Without a Licence for the project entitled "Periglacial Geomorphology investigation study in permafrost at the Houghton impact structure and surrounding terrains, Devon Island, Nunavut". This is a continuation of a project initiated several years ago. The last time my group carried out research at this location was in summer 2018 when my postdoctoral fellow, Dr. Etienne Godin, led the application (#8WLC-DIS1920).

Below you will find a brief description of the undertaking in both English and Inuktitut.

Please don't hesitate to contact me should you have any questions or required further information.

Best Regards,



Dr. Gordon Osinski
Professor, Department of Earth Sciences
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Project Description:

The Houghton Impact Structure (HIS) located on Devon Island, NU, is a 23 km diameter, 39 Ma meteoritic impact crater. This area and its surroundings is what can be qualified as a cold and dry polar desert, which is ideal conditions to study the crater geology and the geomorphology of the active periglacial processes. Well developed periglacial landforms are present on the site: gullies, patterned ground and polygons. Such landforms found inside the crater were noted as quite different in their geometry and active processes compared to those found outside the crater. We want to deepen our understanding of what the main controls shaping these differences. Also, those landforms are strikingly similar to other found in and around crater rims on Mars; thus their study on Devon provides answers as those are similar to their Martian analogues.

Our objective this year is to investigate the underground in relation to the periglacial landforms and ground ice using a geophysical approach such as field sampling, ground surveying and mapping with a focus on in-crater and out of crater differentiation.

Field supplies such as ammunition and fresh food will be bought at Tudjaat Co-op store at Resolute. Water for camp use (approx. 0.1 m³ per day) will be collected from the nearby Houghton River. All combustible waste will be incinerated while all non-combustible waste will be returned to Polar Continental Shelf facilities for disposal. At the conclusion of the field campaign, everything will be cleaned up and restored as it was when we arrived.

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