

Stony Brook University
145 Endeavour Hall
United States

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UST202104-005/Þ.V.B.
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Research permit

The Environment Agency of Iceland has received an application from Roy E Price at Stony Brook University, dated April 1st 2021 with additional data on April 24th 2021, for research permit within Arnarnesstrýtan and Strýtan hydrothermal vent chimneys.

Arnarnesstrýtur hydrothermal vent is protected cf. regulation no. 510/2007. Research and collection of specimens are subject to a permit from the Environment Agency of Iceland. It is prohibited to disrupt the hydrothermal vent chimneys and attach any kind of sign on the vents.

The Strýtur hydrothermal vent is protected cf. regulation no. 249/2001. Research and collection of specimens are subject to a permit from the Environment Agency of Iceland. It is prohibited to disrupt the hydrothermal vent chimneys and attach any kind of sign on the vents.

Description of the project:

The goal of the project is to evaluate how and to what extent, energy generated by ancient, saponite-rich, alkaline hydrothermal settings on Mars could have supported biological processes. Several liters of fluids will be collected from cones in both areas. Small pieces of active cones will be taken and placed into zip lock baggies. It is anticipated to collect 2-4 samples from the cones (<4 cm in height each) by using a small pipe (maybe ~5 cm diameter) to push into an area of fresh precipitation, then pull out the core. The hole left behind can be plugged, e.g., with rubble or other pieces of the cone, and within a few weeks the hole seals up again. This will be done in an area that divers rarely visit. If there are small cones (10 cm height max) lying around that have already broken off, they will be collected as well. There will be no noticeable disturbances to the Strýtan or Arnarnesstrýtan cones. For analysis on environmental characterization of the microbial community ecosystem at Strýtan following samples will be collected: max 30 filtered water samples, 15 vials max of 100 ml fluid samples, 30 vials max of 10 ml hydrothermal fluids, 30 vials max of 20 ml eppendorf tubes containing 1 ml each of hydrothermal fluids and 30 vials max of minerals precipitates (max 30 grams each) that will be collected the same way as above. All samples will be collected under the direction of Erlendur Bogason. There are 5 participants in the sampling group and sampling will take 4 days in the period of May 23rd til May 30th 2021.

Review:

The Environment Agency of Iceland requested review from the committee of protection of Hverastrytur á botni Eyjafjarðar and Hverastrytur á botni Eyjafjarðar, norður af

Arnarnesnöfum on May 5th. The review from the committee was received on May 7th. In their review they evaluate that the research project is not expected to damage the hydrothermal vent chimneys permanently and agrees on that the permit should be granted.

Impact assessment:

The Environment Agency of Iceland considers the project not likely to have negative effect on the area if conditions of the permit are followed.

Conclusions and conditions:

The Environment Agency of Iceland hereby grants Roy E Price at Stony Brook University permission on its behalf to collect fluid samples and cone samples within Arnarnesstrýtan and Strýtan hydrothermal vent chimneys as described above on May 25th til May 29th 2021 on the following conditions:

- Keep this letter with you on site during the project. The permit conditions should be introduced to the staff of the project before work begins.
- The project shall be done in cooperation with Erlendur Bogason and follow his instructions.
- If the project dates or description changes the Environment Agency shall be notified as soon as possible.
- The crew must follow rules of conduct that apply to the area.
- If any complications occur during the project, please contact the Environment Agency of Iceland, tel. +354 591 2000.
- This permit is only valid for research purposes. It does not include permit to utilize the samples for commercial purposes. The samples cannot be signed over to third party for commercial use.
- Every measure should be taken to avoid damage to the sites and unnecessary disturbance while collecting samples.
- Samples should be collected where any resulting disturbance of geological formations is not visible to other visitors.
- This permit is only valid for sample collection according to the application.
- The Environment Agency shall be informed as soon as possible if any accidental damages occur to the hydrothermal vent chimneys.
- All disturbance to animals and wildlife is strictly prohibited.

If the developer causes damage to nature, according to art. 87 in the Nature Conservation Act no. 60/2013, the Environment Agency of Iceland can, according to the Nature Conservation Act, f.e. order the licensee to fix damage to nature and vegetation and/or stop the project.

The Environment Agency of Iceland can according to art. 89 in the Nature Conservation Act no. 60/2013 change conditions of the permit, add new conditions or withdraw the permit in order to prevent damage to nature if environmental conditions change.

According to art 89. in the Nature Conservation Act no. 60/2013 the Environment Agency can withdraw the permit if conditions of the permit are not complied to.

Permit from the National Energy Authority is needed for researches in geothermal areas (www.os.is).

If you wish to export samples from Iceland a special permit is needed from the Icelandic Institute of Natural History (www.ni.is).

The Environment Agency of Iceland wishes to receive, free of charge, a copy of all reports and scientific articles that result from the research project.

Permission fee:

Environment Agency of Iceland charges a fee for processing applications for permits in protected areas based on Article 92 of Act no. 61/2013 on Nature Conservation. The fee for research permits is 39.400 ISK according to art. 24. b. in the agency's tariff no. 535/2015.

Sincerely

Davíð Örvar Hansson
advisor

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advisor