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Reykjavík, 25. janúar 2024
UST202309-088/P.V.B.
09.04.00

Subject: Permit to conduct research - Strokkur Geysir area

The Environment Agency of Iceland has received an application from University of Gent, dated September 8th 2023 with additional information on December 19th 2023, for permit to carry out research within Geysir area.

Geysir is protected as natural monument, cf. regulation no. 660/2020. All disturbance of geological monuments is prohibited, incl. any inscriptions and disturbance of the activity and water level of the hot spring area, disturbance of hot springs, hot springs, soils and rocks, without permission. Helicopters and other manned aircraft may not land within the area without the permission of the Environment Agency. Operating an unmanned aircraft/drone within the protected area is subjected to a permit from the Environment Agency of Iceland. Nature studies other than those of the Icelandic Institute of Natural History and studies of cultural monuments in the area that may result in disturbance to geological monuments or disturbance of wildlife are subject to a permit from the Environment Agency of Iceland.

Description of the project:

Aim of the project is to visualize the dynamic processes of volcanic hydrothermal systems (VHS) using electrical resistivity tomography (ERT). The ERT will allow the applicant to visualize these processes at a m-scale up to 50-meter depth. A profile will be installed, which consists of electrodes - metal rods of about 1cm in diameter - mounted in the surface to ensure good electrical contact. The 36 electrodes will be installed with a spacing of 1 or 2 meters giving a profile of maximum 70 meters. The larger electrode spacing allows for a deeper penetration but with a lower resolution and vice versa. Additionally Fiber Bragg Grating technology, FBG in short, would also be used. This is a fiber optic cable equipped with strain (or temperature) sensors every 5 meters. The fiber optic method requires the cable to be coupled to the ground every 5 meters. Lastly the aim is to deploy 30 geophones in the area and one hydrophone in the geyser to monitor the activity. The hydrophone

would not react with water. Since the methods are minimally invasive, they will have no impact on the geyser structure and will cause no damage to the system. We opt to try out different techniques to see which is best suitable and therefore would like to measure for 4 to 5 days. All experiments can be done at night so that no tourists are affected by it. The equipment has to be installed in a straight line so staying completely on-track will not be possible. Map showing the research area was included with the application. The research would take place in the last week of March or first week of April 2024. Number of employees would be 4 persons.

Impact assessment:

The Environment Agency of Iceland considers the project not likely to have negative impact on conservation value and visitors in the site. The project might have impact on geological formation and put researchers at risk while placing the equipment in the area outside paths in the area. The Agency considers that the impact can be reduced if rangers will instruct where it would be safe to walk outside paths while placing the equipment.

Conclusions and conditions:

The Environment Agency of Iceland hereby grants University of Gent permission on its behalf to conduct research within Geysir area as described above on March 18th - April 13th 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 applicant shall inform rangers in the area about their arrival and departure. This is to be done 24 hours before entering the area and again before leaving it.
- If the project dates or description changes the Environment Agency shall be notified as soon as possible.
- When it is necessary to go off-path, extra care must be taken not to cause damage to terrain, including vegetation, soil and geological formation. All traces of activity must be removed afterwards. It is only allowed to go off paths where rangers have approved the route you wish to walk.
- Only those who need to go off path are allowed to.
- The crew must follow rules of conduct that apply to the area.
- Time spent off paths should be limited as possible.
- Every measure must be taken not to cause damage to the site.
- All traces of the work must be removed carefully from the site by the end of the work/project.
- If any complications occur during the project, please contact the ranger or 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 doing the measurements and placing the equipment.

- All participants in the project must wear high-visibility clothing during field work, labelled with the identity of the researcher or the research institute.

If the researcher 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).

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 operational, events, research and other activities is **57.000 ISK** according to art. 29. a. in the agency's tariff no. 206/2023.

Supervision:

The Environment Agency will supervise the project. The supervisor will be a ranger from the Environment Agency.

Sincerely

Valdimar Kristjánsson
advisor

Pórdís Vilhelmína Bragadóttir
advisor