Supplement to Land Use Application 35780

January 29, 2026

Passive Seismic Array

A passive seismic array will be deployed to map out the structure and distribution of subsurface magmatic bodies and other features of interest for geothermal resource assessment. No active seismic sources will be used, only ambient seismic signals. 3-component seismometers will be deployed during winter conditions to take advantage of frozen ground conditions that enable better transmission of seismic signals to the sensor. Snow will be removed, exposing bare ground, and the Installation of the sensor will be completed by driving the spike into the ground with the body of the instrument will sit above the ground surface.

Weight: 6.2 lb (2.8 kg), including spike

Dimensions: 4.6 in (11.7 cm) diameter by 6.4 in (16.3 cm) high
Detachable Spike: 4.6 in (11.7 cm) long

The instrument body contains a 180-Wh rechargeable 180-Wh lithium-ion battery.

Sensors will be deployed in one or more linear arrays with approximately 1 km spacing between nodes. The initial layout is depicted in the attached map shown with blue diamonds.

Magnetotelluric (MT) Array

Purpose and Method Description

The proposed project includes a passive magnetotelluric (MT) geophysical survey to characterize the subsurface electrical resistivity structure associated with potential geothermal resources. MT is a widely used, industry-standard method in geothermal exploration that measures naturally occurring, low-amplitude variations in the Earth's electric and magnetic fields to infer subsurface resistivity to depths of several kilometers. The method does not require any active energy source, does not generate noise, and does not introduce electrical currents into the ground

Planned MT station locations are shown on the map below and listed in the supplied table of coordinates for intended sampling locations. Final station placement may be adjusted in the field (generally by tens of meters) to accommodate terrain, vegetation, or avoidance of cultural features, while maintaining the overall survey geometry.

Survey Design and Equipment

The MT survey will consist of discrete temporary stations distributed across the project area at approximately 1 mile spacings appropriate to geothermal exploration objectives. Consistent with geothermal industry best practices, stations are designed to resolve both shallow and deep resistivity features, including potential clay alteration zones, structural controls, and geothermal upflow or outflow features

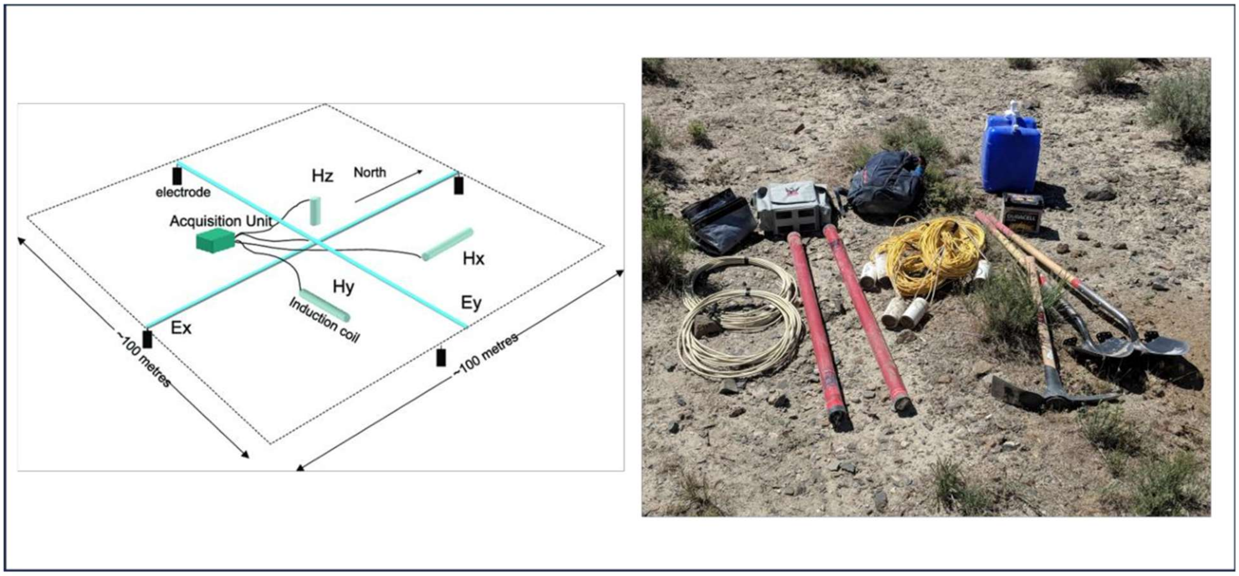
Each MT station records four primary components:

- Two orthogonal horizontal electric field components (Ex and Ey), and
- Two orthogonal horizontal magnetic field components (Hx and Hy).

Where ground conditions allow, a vertical magnetic field component (Hz) may also be recorded to enhance data interpretation. Recording is passive and typically occurs overnight for a minimum of approximately 12 hours to capture a broad range of natural electromagnetic frequencies.

Typical MT Station Layout

A typical MT station occupies an area of approximately **100 m × 100 m**, with components distributed across this footprint. A representative layout is shown in **the figure below**. Note that the sensor components are not to scale on the layout diagram.



Typical MT station layout and MT equipment. Diagram showing electrode dipoles extending ~100 m in north–south and east–west directions, with magnetic sensors oriented north–south, east–west, and vertically. Note that the sensor components are not to scale on the layout diagram.

At each station:

- **Five non-polarizable electrodes** are installed to measure electric fields. These are placed at the ends of two perpendicular dipoles (approximately 100 m in length) and at a central reference location.
- **Three magnetic sensors** may be deployed:
  - Two horizontal induction coils oriented precisely in the north–south and east–west directions.
  - One optional vertical induction coil installed upright where digging conditions permit.

Sensor Dimensions and Installation

Installation details are as follows:

- **Electrodes** are installed in hand-dug holes approximately **6–8 inches deep**. A small amount of water may be mixed with native soil to create a slurry that improves electrical contact. Electrodes are placed in the slurry and the hole is backfilled with the original soil.
- **Horizontal magnetic sensors** are approximately 1.5 m (5 ft) in length and are buried 8–12 inches below the ground surface after being carefully aligned and leveled.
- **Vertical magnetic sensors**, when installed, are approximately 1 m (3 ft) in length and require a slightly larger vertical hole to accommodate the sensor orientation.

All installation is performed using hand tools. No heavy equipment, drilling, or ground clearing is required.

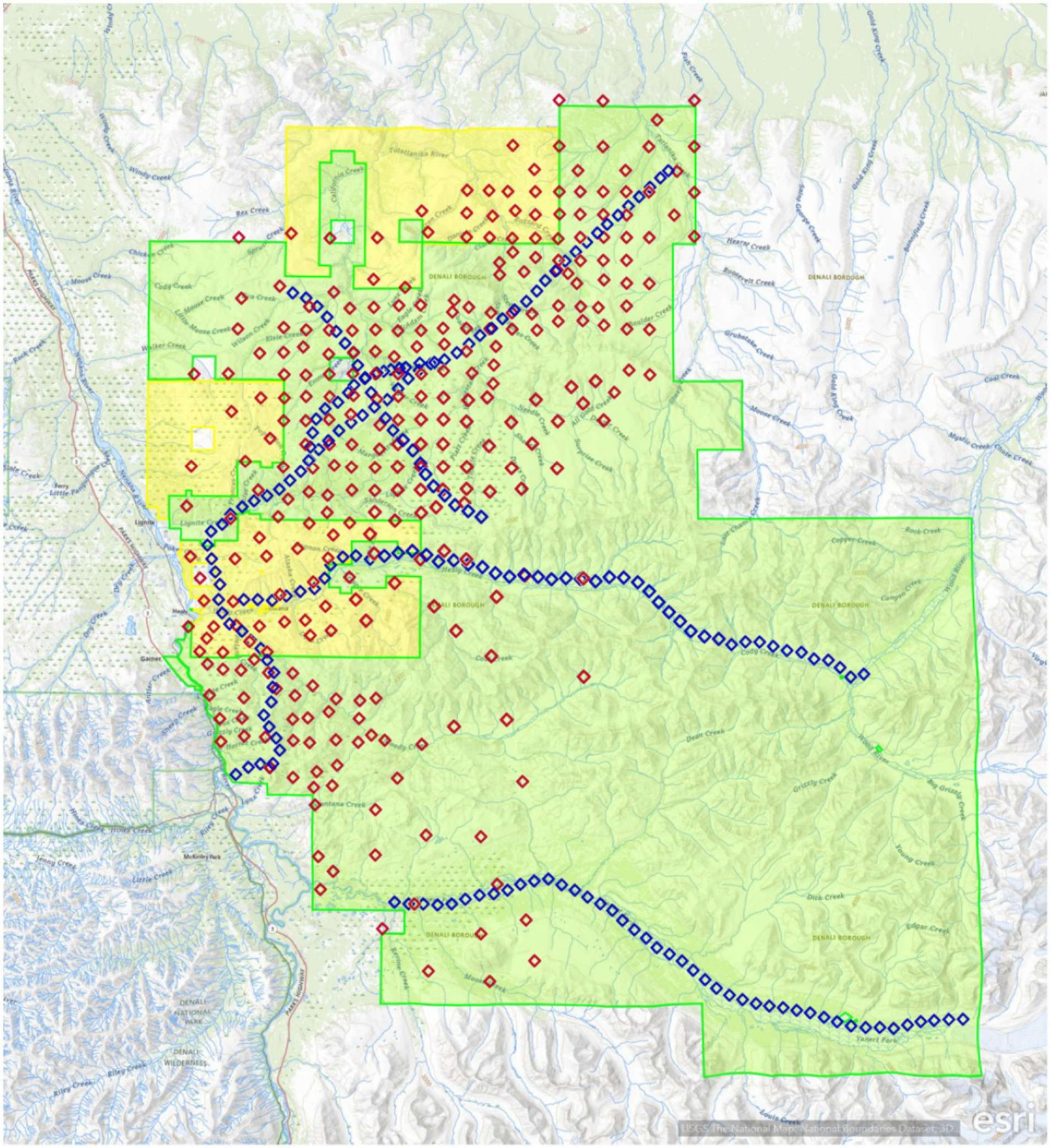
Ground Disturbance and Site Restoration

Ground disturbance associated with MT data collection is minor, shallow, and temporary. Disturbance is limited to a small number of shallow hand-dug holes and light foot traffic within the station footprint. No vegetation clearing is required beyond what is necessary to safely access individual sensor locations.

Following data acquisition, all sensors and electrodes are completely removed. Holes are backfilled with native material, and the ground surface is restored to approximate pre-survey conditions. No permanent markers or equipment remain on site. The level of disturbance is comparable to that associated with temporary backcountry camping activities.

MT surveys require the presence of native soil for electrode coupling and therefore avoid exposed bedrock outcrops or areas where excavation is impractical. Site selection prioritizes previously disturbed ground, natural soil cover, and avoidance of sensitive environmental or cultural features where possible.

GTO-032 Magnetotelluric and Seismic Sampling Plan



0 10 20 Kilometers

Green Polygon = Access requested to DNR-managed lands under LAS 35780
Yellow Polygons = Alaska Mental Health Trust Authority Lands
Blue Diamonds = Potential seismic sensor deployments (winter)
Red Diamonds = Planned MT sensor deployments (summer)

Geological Field Mapping and Petrologic Sampling Methods

Purpose and Method Description

The proposed project includes geological field mapping and limited petrologic sampling to support geothermal resource assessment. Geological mapping is a standard, non-invasive exploration activity used to characterize surface lithology, stratigraphy, structural features (e.g., faults, fractures, folds), alteration minerals, and geomorphic expressions that may be associated with geothermal systems. Petrologic sampling provides physical specimens for laboratory analysis to better understand rock composition, alteration processes, and thermal history relevant to geothermal prospectivity.

These activities are observational in nature and rely primarily on visual inspection, handheld instruments, and limited sample collection. No subsurface excavation, drilling, or mechanized equipment is involved.

Planned mapping areas may include anywhere within the yellow or green polygons on the map above.

Geological Mapping Activities

Geological field mapping will be conducted by trained geologists traveling by vehicle, helicopter, and on foot across the project area. Mapping activities may include:

- Identification and documentation of rock types and stratigraphic relationships;
- Measurement of structural orientations (e.g., bedding, foliation, fractures, and faults) using a handheld compass or digital equivalent;
- Visual assessment of hydrothermal alteration, mineral assemblages, and surface expressions potentially related to geothermal systems (e.g., clay alteration, silica deposition, iron oxides);
- Recording of field observations using notebooks, tablets, handheld GPS units, and photographs.

Mapping does not involve ground disturbance beyond normal foot travel. No vegetation clearing or soil excavation is required to conduct mapping observations.

Petrologic and Rock Sampling

Limited rock sampling may be conducted to support laboratory-based petrologic, mineralogical, and geochemical analyses. Samples are collected selectively and only where necessary to characterize lithology or alteration relevant to geothermal exploration.

Typical sampling characteristics include:

- **Sample size:** Hand specimens generally weighing less than 1–2 kilograms (approximately fist-sized or smaller);
- **Collection method:** Removal of loose material from the ground surface or extraction of small fragments from exposed outcrops using hand tools such as a rock hammer;
- **Sample density:** Sparse and discontinuous, typically limited to a small number of samples per square kilometer.

Sampling is focused on existing rock exposures (e.g., natural outcrops, talus, stream cuts, road cuts) and avoids soil excavation. No trenching or blasting is conducted.

Ground Disturbance and Site Restoration

Ground disturbance associated with geological mapping and petrologic sampling is minimal, localized, and temporary. Disturbance is generally limited to:

- Foot and vehicle traffic along existing trails or natural terrain;
- Removal of small hand samples from rock outcrops or loose surface material.

Where a small fragment is removed from an outcrop, no backfilling is required, and the surrounding area remains stable. No permanent markers, installations, or structures are placed in the field. Sample locations may be documented with temporary GPS waypoints or photographs only.