Australian Government
Geoscience Australia

Activity Information

Curnamona Cube Extension Magnetotelluric Survey

Geoscience Australia, in collaboration with state government agencies and universities, is collecting audio and broadband magnetotelluric data as part of the Australian Government's Exploring for the Future program. At its heart, the program is about contributing to a sustainable, long-term future for Australia through an improved understanding of the nation's groundwater, mineral and energy resource potential.

Why do we want to collect this data?

Audio and broadband magnetotelluric (MT) surveys map the electrical structure of the Earth's crust to depths of a few tens of kilometres by recording the Earth's naturally occurring magnetic and electric signals. The data can be used to interpret the geology of a region and may also help to locate places that are prospective for minerals.

Curnamona Cube Extension MT survey

Geoscience Australia proposes to acquire audio and broadband MT data at up to 102 sites in western NSW and eastern SA in February 2023. The Curnamona Cube Extension MT survey will help to improve our understanding of the geological relationship between the key geological provinces in SA and NSW.

How do we collect the data?

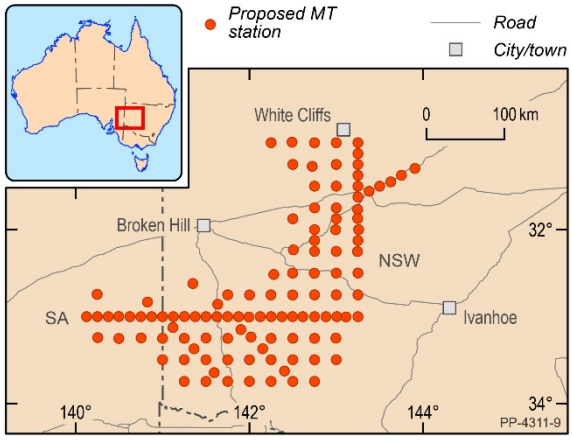
Magnetotelluric surveys usually acquire data at a number of sites in a region. Sites may be 1 to 20 kilometres apart, in a line or on a grid pattern, depending on the survey goals. Locations are chosen in consultation with landholders, Traditional Owners and other stakeholders to minimise impacts and disturbance. The equipment is deployed for one to two days and then retrieved. The equipment does not produce or transmit any signals.

What you might see

An ideal deployment site is an open area about 100 x 100 metres in size, away from sources of interference such as stock, houses, fences, roads, power lines and railway lines. The equipment includes:

- an esky-sized acquisition box containing a data recorder, a GPS receiver and a 12 V battery
- three buried coils oriented north-south, east-west and vertically to measure magnetic-field changes; these are connected to the data recorder by 20 metre cables
- five electrodes buried to the north, south, east and west, and one near the acquisition box, to measure electric-field changes; these are connected to the data recorder by 50 metre cables
- the cables may be buried in shallow trenches to avoid animal interference.

Video showing how MT surveys work:
https://youtu.be/vdwQ6vm3tGM



Proposed Curnamona Cube Extension MT survey sites.

Accessing the land

Geoscience Australia staff and contractors will contact relevant landholders individually before each fieldtrip to discuss land access, biosecurity measures, cultural heritage, and any environmental concerns. Staff will travel to the site using existing tracks as a priority or, if necessary, by helicopter with prior notification

Geoscience Australia staff and contractors comply with all Commonwealth and state government COVID-19 legislation, including public health orders and directions, to protect the health and wellbeing of the community.

A geophysicist at an MT site. A vertical magnetic field sensor in the background and a horizontal sensor (~1.5 m long) in the foreground.

Pre-competitive data acquired by Geoscience Australia will be publicly available after quality control and assurance checks have been performed. Public release of this information may contain explicit spatial location information, such as specific deployment locations and/or areas which may be interpreted as containing groundwater and resource potential.

For further information contact Geoscience Australia: ClientServices@ga.gov.au 1800 800 173 www.ga.gov.au/eftf

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