ULTRA-WIDEBAND MAGNETOTELLURIC (MT) SURVEYS: LOCAL AND REGIONAL MAPPING OF DEPOSITS AND MINERAL SYSTEMS

AXIOM GROUP's Axiom Group's robust ground surveying capabilities now offer end-to-end magnetotelluric (MT) surveying solutions. MT surveys map the electrical resistivity of the subsurface, which is highly sensitive to common ore-forming minerals as well as fluids, and is a highly effective method for deep imaging. Highly adaptable, MT surveys can be used for targeting, defining prospects, or regional reconnaissance. MT is the deepest imaging electromagnetic method in exploration and is ideal for targets below 500 m depth or targets under cover.

WHAT IS MT?

MT is a frequency domain electromagnetic geophysical method that measures natural electric and magnetic variations at the Earth's surface to image subsurface electrical resistivity. The signals measured by MT have far longer wavelengths than other electromagnetic methods, making it capable of imaging far deeper. Measured data are inverted using advanced inversion algorithms and high-performance computing resources to produce resistivity models

MT BENEFITS:

- Deeper depth of investigation than any other electromagnetic method. Ideal for deep targets or targets under cover. Depths of exploration from the surface to more than 5 km, depending on acquisition time.
- MT surveys are highly adaptable. Common survey configurations include, profiles, grids, or opportunistic locations based on harsh terrain or land-access considerations.
- Capable of imaging at a variety of scales (district, camp, and deposit).

MT USE CASES:

Mineral Exploration:

Electrical resistivity is highly capable of distinguishing between the electrically conductive signatures of most ore-forming minerals and resistive host basement rocks. MT is the most effective electromagnetic tool for mapping deep-seated structures, fluid pathways, and zones of alterations associated with mineralization.

Geothermal Exploration:

Electrical resistivity data is sensitive to porosity, elevated temperatures, saline fluids, and clay alteration caps associated with geothermal prospects. MT is the standard geophysical method for geothermal exploration and target generation.

WHO SHOULD CONSIDER MT?

MT is ideal for situations where targets are deep (greater than 500 m) and/or beneath cover, to cover large areas or properties quickly, those interested in seeing the "roots" of their deposit, and where access is difficult and a lighter weight electromagnetic method is needed.

AXIOM'S MT SERVICES

AXIOM offers end-to-end magnetotelluric consulting services that include:

- Survey design, in-field data acquisition, processing, and inverse modelling to produce 2D and 3D resistivity models.
- Third party review, remodeling, model testing, and interpretation of previously collected datasets and models.
- Integration of MT data with geochemical, geologic, and other geophysical data to improve modelling and interpretations.

AXIOM's in-house expertise with MT includes two PhDs specializing in the method. AXIOM maintains a fleet of MT systems produced by Phoenix Geophysics, which include the MTU5C, MTC-155, and MTC-185[1], and is capable of collecting data in the frequency range of 10,000 – 0.00002 Hz (50,000 seconds). Data is provided as EDI files (Electronic Data Interchange), a standard format for a wide variety of industry-standard software.

Scan for Phoenix Geophysics MT system specifications

1. Phoenix MTU-5C, MTC-155 and MTC-185 spec sheet: bit.ly/4qEBILG

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