GUIDELINEGEO

ABEM | MALÅ

CASE STORY

Geophysical survey

| TEM - Transient Electro Magnetic |

TEM used to characterize hydrostratigraphy and landfill construction

CLIENT PROFILE

U.S. Geological Survey (USGS) is the science agency within the U.S Department of the Interior. USGS serves the US by providing scientific information about the Earth. The agency collects, monitors and analyze data to protect and preserve life, water, mineral resources, energy including minimizing the effects of natural disasters etc. (www.usgs.com)

CHALLENGE

Although the location of the waste disposal trenches in Beatty, Nevada is generally known, historical construction activities may have displaced the trench boundary monuments. EM methods provide a non-invasive means of delineating trench boundaries to assess locations and geometry.

SOLUTION

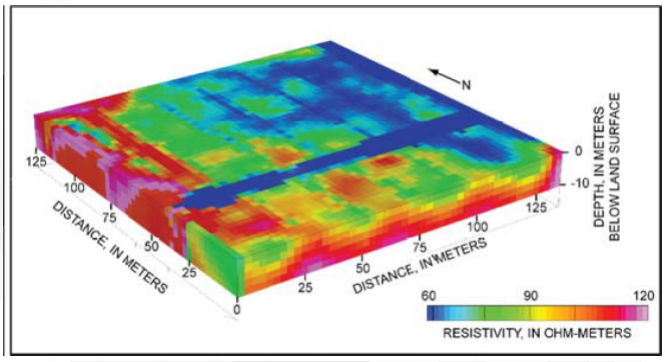
FDEM (frequency-domain electromagnetic) surveys were conducted within and adjacent to a closed low-level radioactive waste disposal site located at the ADRS (Amargosa Desert Research Site).

FDEM surveys were conducted on a grid of north-south and east-west profiles to assess the locations and boundaries of historically recorded waste-disposal trenches. In 2015, the USGS conducted time-domain (TDEM) soundings along a profile adjacent to the disposal site (landfill) to assess the thickness and characteristics of the underlying deep unsaturated zone, and the hydrostratigraphy of the underlying saturated zone.

CONCLUSION

Use of FDEM and TDEM surveys conducted within the site provided useful information about the electrical properties of the subsurface at different scales of investigation.

The FDEM surveys were able to delineate the lateral boundaries and depths of buried waste disposal trenches. The TDEM results provide information on the underlying hydrostratigraphy and characteristics of the unsaturated zone that form the site conceptual model and improve understanding of the hydrogeologic framework.



3D FDEM model from inversion of data collected over the low level radioactive waste disposal trenches

PROJECT

- Site: Amargosa Desert Research Site, Beatty, Nevada
- Citation: White, E., Lane, J., Day-Lewis, F., Johnson, C., Werkema, D. (2016) "Application of frequency-and-time-domain electromagnetic surveys to characterize hydrostratigraphy and landfill construction at the Amargosa Desert Research Site, Beatty, Nevada" - SAGEEP 2016 http://www.eegs.org/
- Method: TEM (FDEM & TDEM)