

HGS Environmental and Engineering Geologists Dinner Meeting, March 12

Geophysical Methods for Site Characterization

by Mustafa Saribudak, Ph.D.

The primary factor affecting the accuracy of any site characterization effort is the limited number of sample borings, resulting in insufficient spatial sampling to adequately characterize the site. This is the primary reason for the application of surface geophysical methods.

A number of geophysical methods are commonly applied to detailed shallow-depth investigations. These methods are electrical, electromagnetic, magnetic, gravity, seismic reflection and refraction, borehole logging, and ground-penetrating radar. Each geophysical method is useful for measuring the vertical and/or lateral distribution of subsurface bodies having differing geophysical properties.

The success of any surface geophysical survey is dependent upon many factors.

One of the most important is the competence of the person(s) responsible for carrying out the survey and interpreting the data. An understanding of the theory, field procedures, and methods for interpretation of data, along with an understanding of the site geology, is necessary to successfully complete a geophysical survey. Properly planned, conducted, interpreted, and reported, a geophysical survey can provide a wealth of subsurface information that could not be obtained otherwise.

This presentation is a review of the capabilities and limitations of basic geophysical methods currently being employed in the environmental industry. In addition, several case studies, including magnetic, gravity, conductivity, time-domain sounding, resistivity, and ground-penetrating radar, will be presented.

Biographical Sketch

Mustafa Saribudak is a principal in Environmental Geophysics (9406 Palm Shores Drive, Spring, TX 77379). He received a master's degree in geology and a doctorate in geophysics from Istanbul Technical University. He came to the University of Houston in 1989 to work on a project funded by the National Science Foundation. He worked for Tierra Environmental between 1990-93, where he pioneered the application of geophysical methods to environmental problems. He founded Environmental Geophysics in 1994 to provide near-surface geophysical services. During the last five years, he has conducted geophysical surveys at more than 100 sites in the U.S. and abroad. ■