



ENVIRONMENTAL & EXPLORATION GEOPHYSICS

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COMPREHENSIVE SUBSURFACE MAPPING SURVEYS FOR ENVIRONMENTAL SITE INVESTIGATIONS

For the past 19 years GeoPotential has been performing SUBSURFACE MAPPING SURVEYS for our Clients involved in environmental investigations. Although our Client's environmental investigations cover a wide range of issues, the contributions that GeoPotential makes to these investigations have evolved into a systematic approach. This document briefly outlines this systematic approach.

In general GeoPotential's SUBSURFACE MAPPING SURVEYS are designed to provide a comprehensive map of shallow subsurface features under a site. These features typically consist of utilities (both conductive and non-conductive), underground storage tanks and ancillary piping, pits which formerly contained USTs, buried waste drums, debris pits, septic tanks and their accompanying drain fields, buried water or monitoring wells, dry wells, septic tanks, building footprints and basements, subsurface voids, trenches, shallow geology and a wide variety of miscellaneous features.

Quite often our Clients requested we map one or more of the above features. However as we acquired more experience along with improved instrumentation and computer hardware and software the requests for COMPREHENSIVE SUBSURFACE MAPPING SURVEYS have increased. The comprehensive surveys consist of mapping all of the subsurface features on a site that we can detect with geophysical methods. In addition our Clients have learned that non-comprehensive surveys can "miss" important subsurface features that were unanticipated on the site.

To conduct comprehensive surveys in a time and cost efficient manner the development of the MOBILE GEOPHYSICAL LABORATORY was initiated in 1995 and continues to the present. In addition the systematic approach described below continues to evolve.

PRE-SURVEY SITE INVESTIGATIONS

Our Clients normally do a pre-survey SITE investigation as part of the Phase I Environmental Site Investigation. However we are occasionally requested to participate in some of the historical research. GeoPotential is often provided with these results to incorporate into our survey. The results may consist of a wide variety of historical information along with a site map or photo. The site map can range from a hand drawn map to a map constructed from air-photos to a land-surveyed map showing details of surface features.

COMPREHENSIVE SUBSURFACE MAPPING SURVEY

In general the SURVEY begins with the construction of a detailed surface map followed by a magnetic and/or electromagnetic survey. While this data is being processed and interpreted conductive utilities are being located and marked with color-coded marking paint or flags on the site using conventional utility locating instrumentation. Next results from the geophysical survey are marked on the SITE. The results are then investigated with a Ground Penetrating Radar (GPR) Survey. In addition GPR data are acquired over the remainder of the SITE to locate non-conductive utilities and other features not detectable with the Magnetic or Electromagnetic surveys. The final results from the survey are marked on the site and posted on the site map.

In addition to the results marked on the site a summary report is provided to our Client. The report includes maps showing geophysical data, surface features and sub-surface features. In addition our clients often request site photos and GPR data.

TIMING AND COST

For a COMPREHENSIVE SUBSURFACE MAPPING SURVEY the timing and cost are largely a function of site conditions and location and can vary widely. However a general cost is about \$700 for a 0.25-acre asphalt covered site in the greater Portland, Oregon area. An acre would cost around \$1,200.00. Results are marked on the site at the end of the fieldwork and the report provided one to three days later. If necessary a report can be provided on site at the time of the survey.