FACT SHEET

Division of Environmental Response & Revitalization
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Capabilities of the Site Investigation Field Unit (SIFU) Mobile Laboratory Analytical Services

Overview

The Site Investigation Field Unit's Mobile Laboratory provides customized, real-time, on-site analysis of environmental samples. Analytical testing takes place in a controlled environment with adherence to instrument-specific methodologies, sample control and associated quality assurance/quality control (QA/QC) requirements. On-site analysis provides tailored, project-specific data; the screening data allows for increased efficiency, and aids in a more complete site characterization/investigation during a single mobilization. Use of the Mobile Lab provides for rapid, thorough site investigations, delineation and identification of contaminant patterns.

By screening samples when they are collected, the investigator can select a subset of the total samples collected (those most likely to contain contaminants of concern) to send to a fixed based laboratory for confirmatory analysis. Use of the mobile lab and its capabilities decreases the overall cost of the investigation and allows for a more focused and productive sample collection and an efficient project mobilization.

Figure 1: DERR/SIFU Mobile Lab

SIFU's capabilities - Mobile Laboratory Analytical Services

Equipment

SRI Model 8610C Gas Chromatograph (GC) is ideal for on-site analysis where volatile organic compounds are of concern. Capable of analyzing soils, water, groundwater and vapors, the SRI GC provides real-time sample data with low level (ppb) detections. Sample detections may be as low as 1 ppb for certain compounds.

Whether the contamination is of known or unknown analytes, the SRI GC identifies compound-specific (TCE/PCE), or multi-compound analytes (TO-15). Contaminant identification is achieved through customizable calibrations (BTEX or chlorinated solvents for example) and/or identified project-specific contaminants.

This quantitative analysis provides a sample turn-around time of 10 to 20 minutes. Calibration procedures and adherence to QA protocols provide additional confidence in sample results.

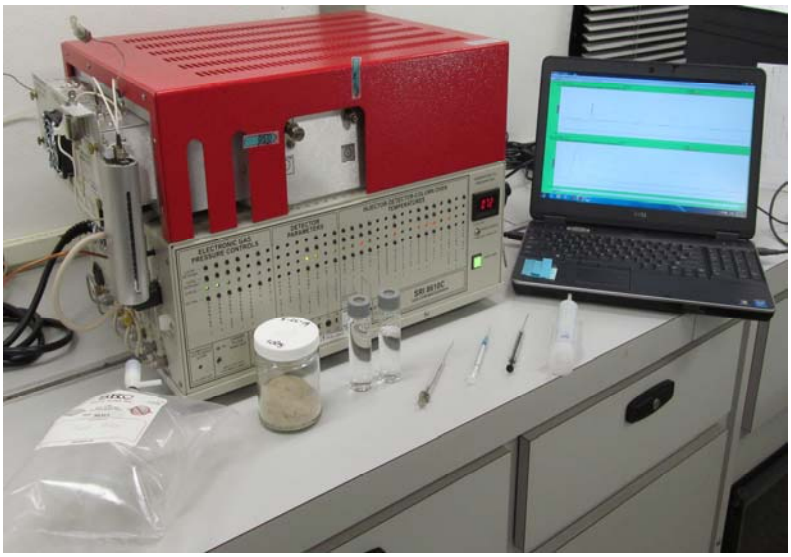

Figure 2: SRI GC with vapor, soil and groundwater samples in mobile lab.

A **Photovac Gas Chromatograph (GC)** is used to semi-quantitatively identify specific volatile organic compounds in soil, water, ground water and vapor/gas samples. Field portability of this testing instrument provides on-site, real-time data to reduce project costs while effectively and efficiently assisting project assessments. Detection limits with this instrument are compound-specific and range from low ppb to ppm. Sample turn-around time averages 10 to 20 minutes per sample.

Figure 3: Photovac GC analyzing soil gas sample in the mobile lab and connected directly to tubing for analysis of soil gas sample in the field.

SIFU's capabilities - Mobile Laboratory Analytical Services

InnovX X-Ray Fluorescence (XRF) analyzer is capable of "point and shoot metals analysis". The collected sample can be prepared in the mobile lab and analyzed for 22 different metals including lead, arsenic, chromium, and elemental mercury. Soil, sediments, paints, dust wipes and even children's toys and jewelry can all be analyzed by the XRF.

This analysis meets US EPA Method 6200 as well as NIOSH Method 7702 and OSHA Methods OSA1 & OSS1.

This nondestructive testing method makes site delineation for metals simple and efficient with an analysis time of 60 seconds per sample. Included with each metal concentration is a standard deviation which provides an added level of confidence for on-site decision-making.

This instrument is ideal for in-situ site assessment and removal activities. Rapid, thorough site investigations, delineation and contaminant patterns are achievable with use of the XRF.

Figure 4: XRF testing prepared soils for 22 different metals. Ideal for establishing area contamination boundaries and depth profiles.

Immunochemistry kits, such as the Hach DR 2800 Spectrophotometer (pictured) provide both quantitative and qualitative data for specific contaminants of concern in soils, sediments, leachate and aqueous media. These kits have a limited shelf life, so they are acquired and available when needed. Approximately one week advance notice is required to purchase the needed kit(s).

The Hach DR2800 portable spectrophotometer can be used for more than 240 analytical methods and can also store up to 50 user programs and 500 data points.

Project-specific data analysis is achieved with quick turn-around times. Ideal for parameters with short holding times.

Figure 5: Immunochemistry capabilities achieved with use of a DR 2800 Spectrophotometer.

SIFU's capabilities - Mobile Laboratory Analytical Services

Hazmat ID System (Smith's Detection) is used for the chemical identification of unknown substances with results provided in less than 2 minutes. This tool has a library of several thousand compounds or substances that it uses to identify an unknown solid or liquid.

The HazMatID uses Fourier-Transform Infrared Spectroscopy (FT-IR) and an extensive on-board spectral library to rapidly identify solid and liquid chemicals based on their distinct molecular fingerprint. Mixture analysis, combined with chemical hazard classification capabilities enables advanced data handling and comprehensive analysis in the field.

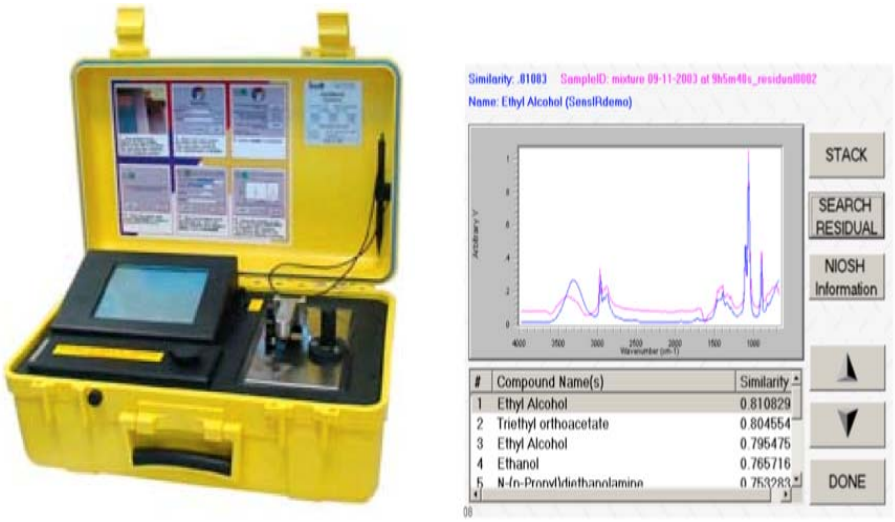

Figure 6: HazMat ID Unit – useful for determining unknown solids and liquids through identification of base chemical components. Internal library consists of several thousand compounds which are compared to the "unknown" sample.

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