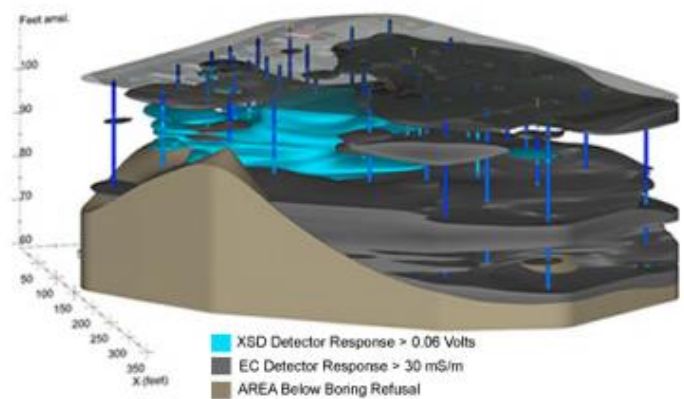


MEMBRANE INTERFACE PROBE

RAPID SCREENING OF VOC DISTRIBUTIONS FOR A MORE FOCUSED INVESTIGATION

Cascade Technical Services specializes in field services that support these expedited approaches. Our Membrane Interface Probe (MIP), combined with our other site characterization tools, onsite laboratories, 3-D data interpolation and visualization services, helps consultants solve their clients' problems and save thousands of dollars, compared to using conventional investigation techniques and fixed labs.



EVS Data Visualization Model

RAPID MAPPING OF VOLATILE ORGANIC COMPOUNDS

Contaminant concentrations, along with other hydrogeologic conditions, can vary significantly over very short distances. Investigation techniques that do not account for this large degree of spatial variability are likely to fail in developing an adequate understanding of the problem at hand.

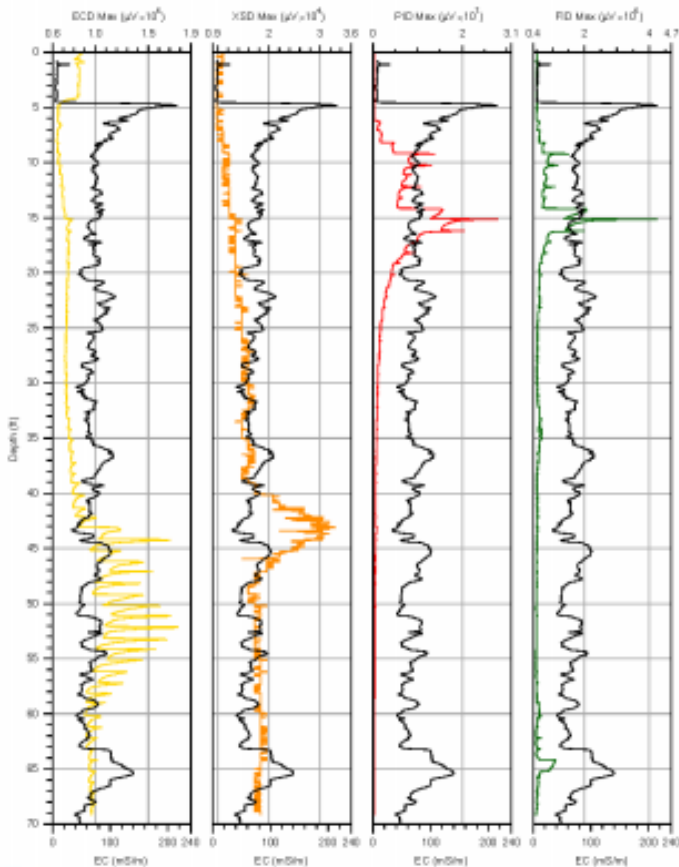
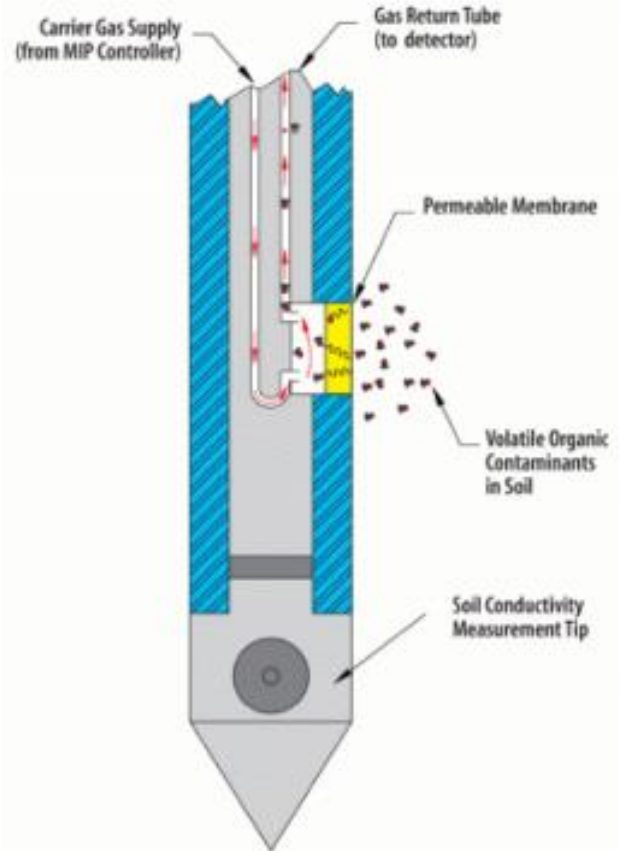
The MIP is designed to address these challenges via the collection of a nearly continuous record of contaminant distribution and an electrical conductivity log which can be used to infer gross stratigraphy. As with other screening technologies, it is imperative that these MIP efforts are followed by quantitative sampling and analytical methods to more accurately assess the contaminant distribution and levels. Knowing where the contaminants are can significantly improve the efficiency and resulting value of subsequent sampling efforts.

An excellent screening tool for use in Triad-approach investigations, the MIP can very quickly generate a large body of data, locating source areas and plume cores in three dimensions. It is capable of completing 150 to 250 linear feet of exploration per day, and the data are immediately available to the site investigator for decision making regarding where to go next with the investigation.



HOW DOES THE MIP WORK?

The MIP system operates by heating the soil and groundwater adjacent to the probe to 120 degrees Celsius to volatilize VOCs in the immediate vicinity of the MIP membrane. The volatilized VOCs diffuse across the membrane into a closed, inert gas loop that carries the vapors to a series of detectors housed at the surface. Each detector produces a continuous profile (plotted with respect to depth) to indicate the presence of various VOC compounds. Each detector operates differently and therefore can detect different classes of compounds.



 CASCADe <small>DRILLING TECHNICAL SERVICES</small>	Company: CASCADe	Operator: D. Casade	Job: 511.DAT
	Point: Owl Flare Example	Client: TRC	Date: 9/20/2013

MIP Log Example

Cascade Technical Services operates the MIP system with an Electron Capture Detector (ECD), Halogen Specific Detector (XSD), Photolionization Detector (PID), and Flamelionization Detector (FID). Soil electrical conductivity is also measured during each boring and can be compared to the MIP logs to better understand the contaminant distribution within the various geologic units that may be encountered.

Ultimately, the use of the MIP and other high resolution site characterization techniques can provide the project team with a more efficient and cost effective set of solutions for deriving accurate conceptual site models from which sound decisions regarding site management and remediation can be made.