

PROBING TIMES

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TCE Contamination Logged Using MIP with SmartData Solutions®

A warehousing facility for an equipment manufacturer had undergone several rounds of investigation and remediation to determine the extent of TCE contamination. The distribution of TCE on this several acre site in Los Angeles County, CA, was strongly controlled by thin-layer geology. And after more than a decade of investigating, the extent of the contamination was still not fully understood.

Long before the fieldwork began, Columbia Technologies, based in Baltimore, MD, worked closely with GeoTrans in Irvine, CA, the site consultant, to develop a scope of work that would allow Columbia Technologies to characterize the vertical distribution of TCE across the site in just a few days of fieldwork using the Membrane Interface Probe (MIP). “Of critical importance,” according to Lauren Steely, Columbia’s West Coast Operations Manager, “was our ability to push the MIP system to a 70-ft. depth at one location while avoiding cross-contamination of a deep sand unit.”

Lauren enlisted the assistance of Millennium Environmental in Anaheim, one of Columbia’s southern California service partners, to provide a Geoprobe® 6600/PC111 and field team for the project. The Millennium team pushed the MIP logging system through a conductor casing to prevent shallow contaminated groundwater from impacting the deeper aquifer.

The field team made use of both a highly-sensitive Electron Capture Detector (ECD) and a less sensitive Photoionization Detector (PID) to map both very low and very high concentrations of TCE. The MIP data clearly indicated the upper surface of the plume at 7- to 17-ft. below ground surface, and also showed the plume attenuating across the site. The deep borehole through the conductor casing revealed that the source area was distributed vertically in two zones.

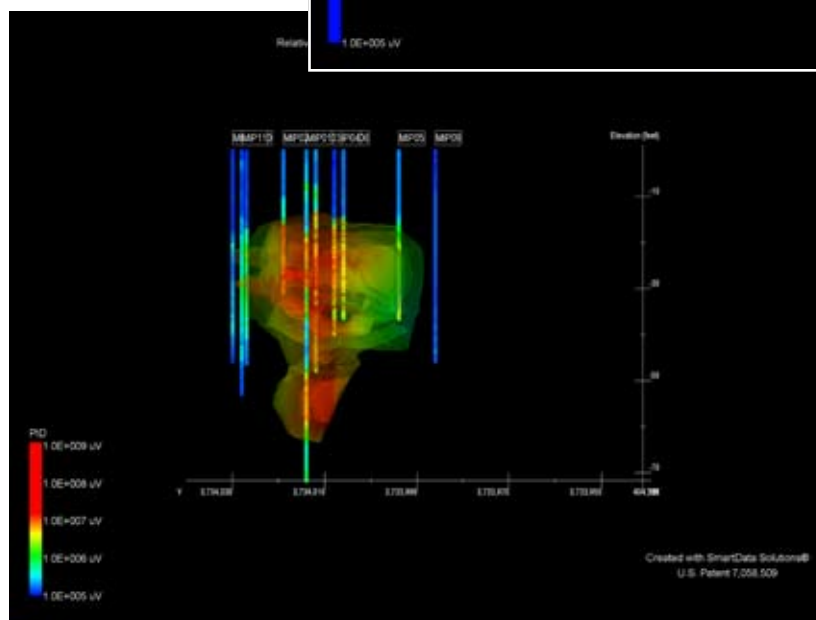
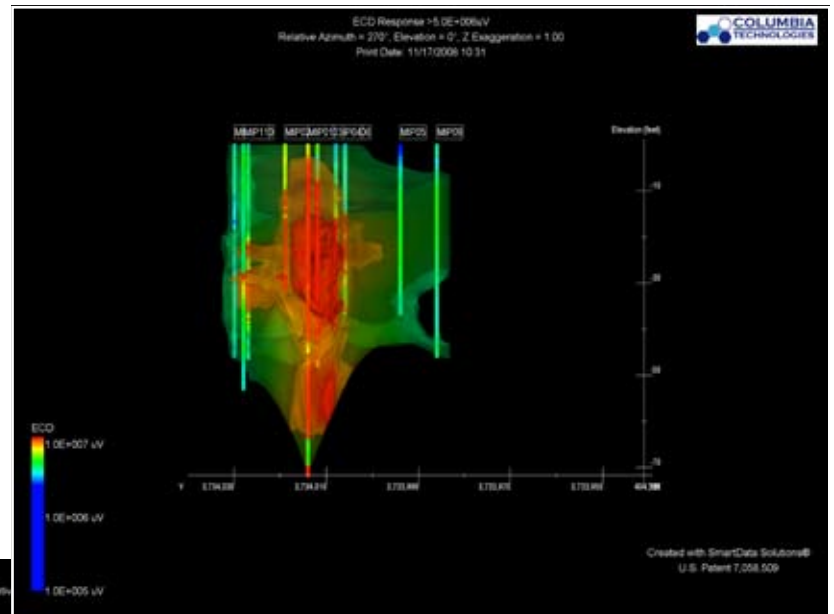
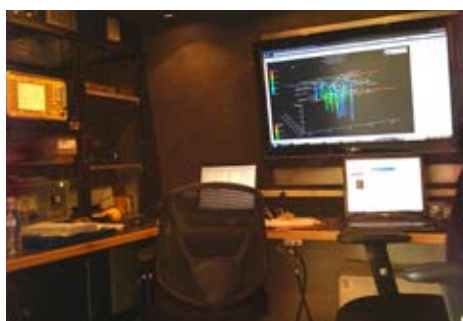
Because of the technology used by Columbia Technologies and Millennium Environmental, Denver Martin, Project Manager for GeoTrans, followed the investigation from the ‘office’ in Columbia’s direct sensing support van on site. He monitored the live data stream, fed by the MIP system, and the emerging 3D site visualizations, created by Columbia’s SmartData Solutions® data delivery package.



Millennium Environmental from Anaheim, CA, provided the Geoprobe® 6600/PC111 and partnered with Columbia Technologies from Los Angeles to complete site investigation work in Los Angeles County. MIP data was uploaded to a project website in real time so project team members at various locations could follow the progress of the site investigation even when they weren't in the field.

MIP technology provide real-time subsurface information, but it also kept costs down by providing information the Project Manager could use to pinpoint the accurate placement of monitoring wells. “Neither we nor our client were interested in placing monitoring wells in the wrong location or wrong depth,” Denver added. “With this approach, we could see the pattern of the contamination first. Then we were able to identify the key locations and target depth for well installation before we installed the wells. Not only did it save the owner money, it also assured us that the information we collect from the wells will provide us optimum information about the site contamination.”

Columbia Technologies specializes in high-resolution site investigations using direct sensing tools. Since opening their Los Angeles office in 2008, they have been applying their advanced approach to site characterization at numerous sites across California.

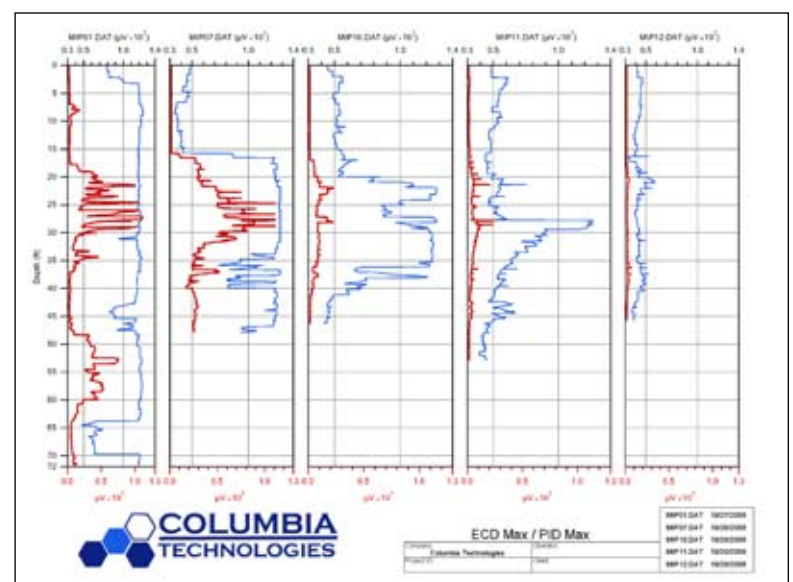


3D cross-sections of the ECD and PID data reveal the extent of the source area and surrounding soil contamination. The MIP survey revealed that the source was distributed vertically in two zones. Multiple borings confirmed the existence of a shallow zone from 15 to 40 feet which attenuates across the site. The one deep location revealed a second zone from 48 to at least 70 feet.

“The MIP technology employed by Columbia, and enhanced by SmartData Solutions® high resolution graphics, clearly delineated the contaminants both vertically and laterally,” according to Denver. “The pattern displayed allowed us to see the arms and plume of the contaminants ... where it is, where it’s going ... all shown in a continuous reading, which was really key for me. I’m an engineer, but I’m really a data guy.

I appreciated the high technical level of presentation this approach provided and the professional way the data was presented while allowing us to interpret it.”

Not only did the



A cross-section of selected MIP logs illustrates the vertical definition of the TCE plume and shows its attenuation across the site. Columbia Technologies uses this information to produce the 3D graphics in their SmartData® Solutions software.

(left) The office inside the Columbia Technologies’ MIP support van provides space for the site Project Manager to monitor the live data stream generated by the MIP system and other high-resolution tools, access the internet, and to review 3D graphics that are updated throughout the day via Columbia’s SmartData Solutions® package.