Vista GeoScience

Expert Environmental Support Services for Site Investigation & Remediation

High Resolution Site Characterization (HRSC) Technology, 3D Data Modeling, and Applying HRSC Data to Remedial Design

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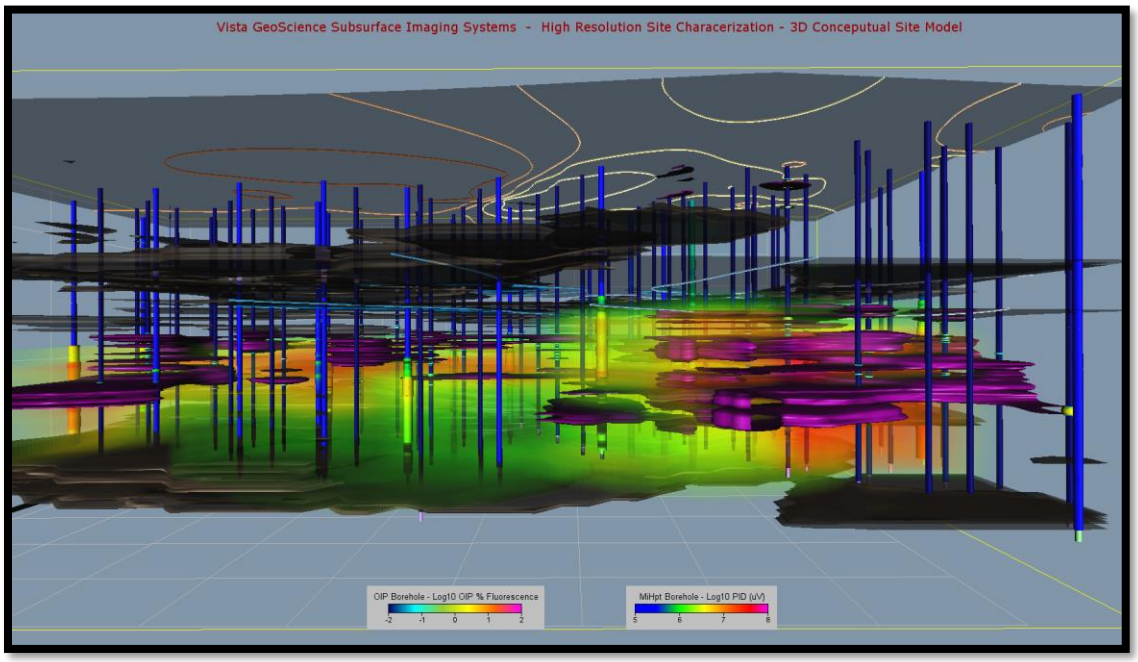
ABSTRACT

Over the past 20 years, site characterization has benefited from the development, and advancement, of direct-push enabled subsurface investigation tools such as the electrical conductivity (EC) probe, hydraulic profile tool (HPT), and membrane interface probe (MIP). These tools have been around for several years, and have advanced recently to include the low-level MIP tool (LL-MIP) for better detection of low concentrations VOCs, combined tools (MiHPT), and the newest tool, the optical image profiler (OIP) tool for identifying NAPL fluorescence. A single combined tool can now log three or more chemical sensors, soil conductivity, hydraulic pressure and flow, hydraulic conductivity, in a single bore hole push. These tools have become significantly more robust over recent years, enabling greater productivity. Data is collected at a vertical density of 20 data points/foot of bore hole, so the vertical resolution is indeed high. Highly detailed data logs give us insight and resolution that cannot that cannot be seen in the physical examination of a core, or from the typical two laboratory samples from the same core. Today's inexpensive computer power allows us to input and process hundreds of thousands of data points into a complex three-dimensional (3D) model, giving us the ability to finally peer underground, and see "what is going on." The presentation will review the current state of the technology, including new tools, recent advancements, and briefly how to obtain and review quality control data from a service provider. The newest tool is a combination of the Optical Image (fluorescence) Profile OIP) tool with the Hydraulic Profile Tool (HPT), known as the OiHPT. Examples of data interpretation and important consideration when creating 3D models of this data are presented. Various uses and applications will be discussed including both initial and supplemental site characterization projects, and remedial design projects. Emphasis will be on how to use of HRSC data to apply the right injection tooling and methods to make an in-situ injection application successful.

Sample of a 3D LNAPL, VOC, and Hydrostratigraphic Model Image



JOHN V. FONTANA, PG - BIOGRAPHY

As President, CEO and owner of Vista GeoScience, John's expertise includes environmental drilling and sampling, high resolution site characterization (HRSC) tools, 2D and 3D data modeling and interpretation, in-situ remediation design and injections technologies, stray gas migration and soil gas investigations. As a professional geologist and licensed water well driller in multiple states, he has over 30 years of experience in these fields, and has co-authored over 100 presentations, keynotes, papers, and workshops, including Battelle. He has provided support services for many large investigation and remediation projects (up to $1.5 million) at DOD, DOE and commercials sites. John is currently serving on two ITRC teams, Optimizing In-Situ Remediation Performance & Injection Strategies, and Implementing the Use of Advanced Site Characterization Tools. In 2013, he was nominated to the EPA's Science Advisory Board on Hydraulic Fracturing. John earned a degree in Geology, Oceanography and Physics from Humboldt State University in California in 1981.