

Site Characterization Technology for Long-Term Monitoring System Application

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The U.S. Army Engineer Research and Development Center (ERDC) developed sensor and sampler technologies in response to a critical need of the U.S. Government to rapidly characterize Department of Defense installations for soil and water contamination. The ERDC, under the sponsorship of the U.S. Army Installation Restoration Research Program, the Tri-Service Site Characterization and Analysis Penetrometer System (SCAPS) Research Program, and the Department of Energy EM-50 Office of Science and Technology, developed a suite of direct push sensor and sampler technologies with the capability to interrogate subsurface soil and/or groundwater *in situ*. The SCAPS multisensor penetrometer system provides a rapid cost-effective screening method for determining geophysical and contaminant properties of subsurface media in near real-time. The SCAPS multisensor penetrometer probe configurations have demonstrated the capability to provide simultaneous interrogation of subsurface soil and/or groundwater for multiple contaminant speciation and quantification, for soil geophysical properties, and for soil classification of subsurface layers *in situ*. The utilization of multisensor site characterization technologies and the deployment of multisensor long-term monitoring systems provide near real-time onsite interrogation results and typically save from 25-50 percent per site when compared to conventional sampling and offsite laboratory analysis techniques. This paper addresses the utilization of single and multisensor site characterization technologies in long-term monitoring applications for the detection, speciation, and quantification of contaminants such as heavy metals, volatile organic compounds, radionuclides, and other contaminants applicable to long-term monitoring.