

Geophysical Imaging for Contaminated Site Characterization

The Environmental Protection Agency (EPA) has inventoried over 30000 major hazardous waste sites in the US of which about 80 percent present some threat to groundwater supplies. The remediation of each of these sites averages nearly 25 million dollars. It is clear that cleanup of only selected critical contaminated sites represents a massive undertaking that will require hundreds of billions of dollars unless new and innovative strategies are developed. Much of the problem and initial cost of subsurface remediation concerns site characterization. A three-dimensional picture of the heterogeneous subsurface is needed in order to identify the key controls on contaminant migration and the location of preferred flow paths. Current methods of site characterization are both inadequate and expensive. They rely on substantial drilling, sampling, and invasive hydraulic testing. With poor site characterization, remediation schemes are unnecessarily expensive because costly over design is used to compensate for uncertainty. This research is aimed at using the superb areal coverage offered by seismic methods to complement existing, classical techniques. Three techniques are investigated: Surface-based reflection seismology, vertical seismic profile and cross-well seismic profile (cross well tomography).



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