

# Costs, Cost Savings, and Best Practices for High Resolution Site Characterization at Petroleum Underground Storage Tank Release Sites

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**Background/Objectives.** The presentation will present the results of an evaluation that U.S. Environmental Protection Agency (EPA) Office of Underground Storage Tanks (OUST) is conducting on high resolution site characterization (HRSC) at petroleum underground storage tank (UST) sites. Traditional assessment techniques at UST sites involve placing successive rounds of monitoring wells and laboratory analysis of groundwater samples until the horizontal and vertical extent of the contamination has been determined. Generally, two or three rounds of borings and monitoring well placement are needed to characterize petroleum UST sites; however, five or more rounds may be needed on more complex UST sites. Multiple rounds of investigation can lead to increased costs and multi-year delays in the implementation of the remedial action on complex sites. In addition, investigations based on soil borings and monitoring wells can miss small scale features such as thin layers of high permeability and finer grained soils that bind to petroleum. HRSC can often rapidly determine the extent of the LNAPL, direction of dissolved phase plume movement, and permeability of soil strata in fine detail. While more expensive than a typical single round of monitoring well placement, HRSC has been promoted as saving money on complex sites by reducing the number of monitoring wells required, and improving the conceptual site model, which leads to more effective remediation. While some practitioners report that HRSC provides excellent value at petroleum UST sites, others contend that HRSC is not necessary and the results are not worth the extra expense for petroleum UST sites.

**Approach/Activities.** The primary goals of EPA's study are: 1) to quantify the costs of HRSC; 2) to determine where there might be potential project cost savings and their magnitude; and 3) to identify situations where HRSC could provide a benefit at petroleum UST release sites. The study is being conducted by interviewing over 30 Federal, State, and private project managers with experience using HRSC to assess petroleum UST release sites, followed by an expert panel review, specifically, a Delphi Panel to consolidate the results of the project manager interviews.

**Results/Lessons Learned.** The results of EPA's study might help drive the 60,000 open petroleum UST remediation projects toward completion and could point to a more productive process for future assessments of the 175,000 currently active petroleum UST sites.