AMPLIFIED GEOCHEMICAL IMAGING LLC

CASE HISTORY

GRID SAMPLING HELPS DETERMINE EXTENT OF DRY CLEANER CONTAMINATION

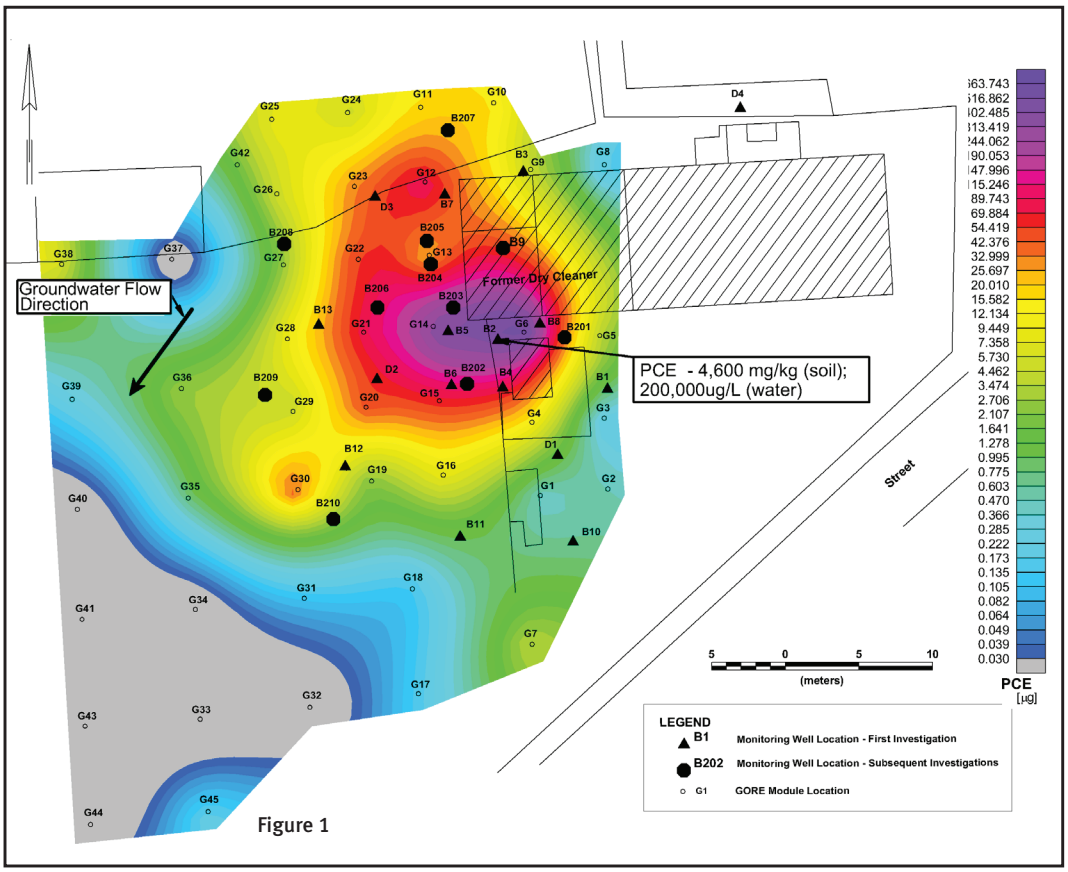

Figure 1

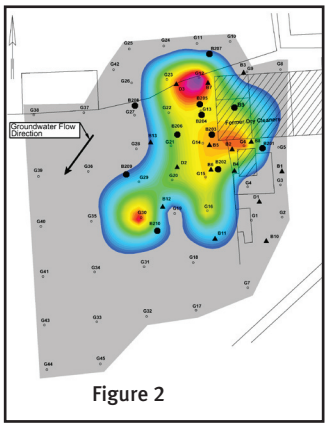

Figure 2

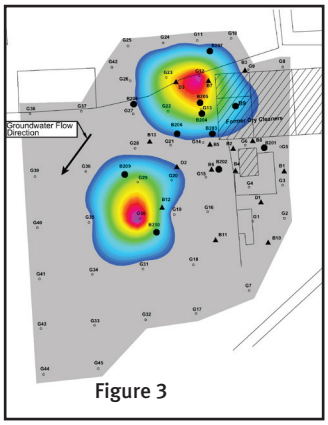

Figure 3

The AGI Survey was deployed in a tight grid pattern – average spacing 16 – 20 ft. apart, in an attempt to define the extent of downstream contamination. Results shown in Figure 1 accurately delineate PCE contamination, while Figures 2 & 3 illustrate breakdown compound distributions TCE (Figure 2) and cis-1,2-DCE (Figure 3).

Survey Summary

Location: Frederiksborg Co., Denmark

Property: Dry cleaner (indoor and outdoor)

Objective: Determine the extent of PCE contamination in groundwater

- A total of 24 monitoring wells failed to define the distribution
- Low permeability clays and a shallow water table prevented the use of active soil gas sampling
- Groundwater known to be impacted significantly; spatial extent unknown collection methodology

Survey Objective

The Danish EPA's Technology Development Program needed to find a method for determining soil and groundwater contamination for use in situations where pore air cannot be measured accurately using active soil gas sampling methods. A dry cleaner site in Frederiksborg County was one example, where shallow groundwater and tight, low permeability soils provided such a challenge.

GRID SAMPLING HELPS DETERMINE EXTENT OF DRY CLEANER CONTAMINATION

Site Background & Geology

- Dry cleaner, Frederiksborg Co., Denmark
- 1.5 ft. moraine clays above 40 ft. glacial till
- Groundwater depth – 3-6 ft.
- Known heavy PCE usage from 1970s through 1980s
- Previous investigations included the installation of 24 monitoring wells
- Soil samples taken near entrance to dry cleaner showed 4,600 mg/kg of PCE; 200,000 ug/liter of PCE in groundwater

AGI Survey

- 45 AGI passive samplers
- Avg. 16-20 foot sample spacing in grid pattern
- 3-ft. install depth
- 14-15 day exposure
- Modified EPA method 8260/8270 GC/MS analysis at AGI labs

Survey Results

Repeated site assessment efforts, using costly monitoring wells totaling 24 in all, proved ambiguous in delineating the extent of the groundwater and soil contamination surrounding a PCE "hot spot." The AGI Survey was deployed in a tight grid pattern – average spacing 16 – 20 ft. apart, in an attempt to define the extent of downstream contamination. The survey successfully charted the tetrachloroethene contamination plume, along with breakdown compounds trichloroethene, and cis- and trans-1,2-dichloroethene.

Survey Conclusions

The AGI Survey was utilized successfully at this dry cleaning facility to fully characterize the impact by chlorinated solvents to the subsurface soils and water. Elevated soil gas mass was observed in subsurface areas known to have significant solvent impact.

How to Develop a Robust Site Model

Accurate site assessment plays a key role in determining whether subsequent sampling and remediation activities will be focused, effective and, ultimately, completed within a reasonable amount of time at a reasonable cost. Utilizing tools such as soil gas sampling during the early stages of assessment can bring definition and delineation to the conceptual site model, thereby informing the entire remediation planning process.

Passive soil gas sampling, in particular, is one proven and economical means of enriching the site assessment with multiple data points, gathered at close and regular intervals. The key here is utilizing a sample collection tool that can be deployed in virtually all soil and groundwater conditions, with a robust analysis capable of identifying a broad range of compounds. The AGI Survey is one such tool. Uniform, dense sample collection is achieved using the AGI passive sampler, with its waterproof, vapor-permeable membrane enabling deployment in conditions ranging from tight clays to saturated soils, even direct in-water sample collection. The module's proprietary sorbent blend is capable of detecting a wide range of volatile and semi-volatile compounds present in low concentrations.

Thus, an entire 'blanket' survey can be deployed uniformly, with data rich results. In this way, unknown sources – as well as unsuspected contaminants – can be identified early on, just as readily as the obvious suspects.

Compared to other methods of site assessment, passive soil gas sampling using a versatile collection tool like the AGI passive sampler, is a relatively cost-effective, efficient and quick way of capturing an accurate, data-rich picture of the site. With this foundational knowledge in place, subsequent work plans and dynamic on-site assessment activities can proceed in a more deliberate and refined fashion, with remediation efforts focused on rapid site success.

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