

## USING “COMMON EARTH” PRINCIPLES TO CHARACTERIZE HYDROCARBON SPILL SITES

### **Todd Halihan\***

Oklahoma State University  
School of Geology  
105 Noble Research Center  
Stillwater, OK 74078-3031  
Voice: 405-744-9248  
Fax: 405-744-7841  
[todd.halihan@okstate.edu](mailto:todd.halihan@okstate.edu)

### **Stuart W. McDonald**

Aestus, LLC  
Loveland, CO

Non-Aqueous Phase Liquids (NAPLs) such as gasoline are a ubiquitous subsurface problem with hundreds of thousands of leaks having occurred over the last century at refining, distribution, and marketing facilities. Contrary to popular simplifying assumptions, most site geology is neither homogeneous nor isotropic causing NAPL distribution in the subsurface to be quite complex. Therefore, adequate site characterization and data visualization techniques are the prerequisite to successful remediation of hydrocarbon spills. For nearly twenty years, the use of a screened monitoring well has been questioned for its ability to accurately and effectively monitor the distribution of these compounds. Over the same period of time direct push and relatively new geophysical “scanning” techniques have developed into effective tools to locate NAPL and dissolved phase plumes. These new tools require the ability to integrate the various datasets in a robust and cost effective manner. A ‘Common Earth’ framework provides a 3-D and 4-D model for data integration, visualization, and interpretation of data to effectively understand these sites. Case study examples will be discussed including both recent and weathered plumes; in relatively simple and complex geologies. Results of this approach include reduced project costs/schedule and data which support natural attenuation arguments in some cases. Pitfalls of data collection without integration are also discussed.

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