

Use of CSIA to Understand Risks at Complex Petroleum-Impacted Sites

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Background/Objectives. At petroleum refining facilities, the subsurface is typically impacted by light nonaqueous phase liquid (LNAPL) related to historical releases and incidentally by release(s) during on-going operations. To effectively manage these sites, understanding the distribution and character of LNAPL and associated dissolved impacts in the subsurface is critical. This study demonstrates the effectiveness of using more advanced techniques to enhance understanding of risks associated with off-site dissolved phase MTBE plume over time, so that a more robust site management plan can be implemented.

Approach/Activities. Risk can vary depending on types of products and potential of hazardous constituents to partition to environmentally sensitive media (e.g., groundwater and air). For gasoline range products, compounds of most concern are BTEX and oxygenates. This case study uses multiple rounds of compound specific isotope analysis (CSIA) to monitor MTBE degradation over time of the dissolved phase plume originating from a refinery.

Results/Lessons Learned. The CSIA data demonstrate the onset and progression of natural attenuation of the dissolved phase MTBE that has migrated offsite. The findings provided unequivocal evidence for off-site MTBE biodegradation and critical information to manage off-site risk.