Combined In Situ Remedial Approach Using Activated Carbon and Bioremediation to Treat and Prevent Off-Site Migration of a Chlorinated Solvent Plume in Southern California

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Background/Objectives. Assessment activities at a 6-acre industrial property in southern California revealed chlorinated solvent impacts to soil, soil vapor, and groundwater resulting from historical property uses involving spray painting, printing, and various aerospace-related operations. A dilute groundwater plume consisting of tetrachloroethylene (PCE), trichloroethylene (TCE), cis-1,2-dichloroethylene (cis-1,2-DCE), and 1,4-dioxane was identified in the southern portion of the property, with the highest concentrations present in the vicinity of a clarifier. While the plume was largely confined to the property, the potential for off-site plume migration was a concern to the property owner. Tetra Tech was retained to quickly devise and implement a cost-effective remedial strategy to address the impacts in order to position the property for a quick sale.

This presentation will describe the details of a remedial-focused investigation and innovative remedial strategy to quickly and cost-effectively address the data gaps present, obtain site-specific information, and remediate the impacts while preventing further offsite migration of the groundwater plume.

Approach/Activities. Tetra Tech combined the use of fine activated carbon (1 to 2 µm) and in situ bioremediation to rapidly sorb and then degrade the chlorinated solvent impacts. Activated carbon was selected as it is particularly effective at treating low concentrations of chlorinated solvents and 1,4-dioxane in groundwater and preventing further migration of contaminants. Once sorbed to the activated carbon, the contaminants are then treated through reductive dechlorination by adding an electron donor and *Dehalococcoides* (DHC), which were determined to not be naturally present in the aquifer. Approximately 10,000 gallons of activated carbon is injected through temporary injection points surrounding and immediately downgradient of the clarifier to address the source area impacts and prevent further off-site migration. The electron donor and DHC are then injected at separate locations to distribute the substrate throughout the treatment zone.

Results/Lessons Learned. The presentation will present the results of the remedial-focused investigation and the ability of activated carbon along with in-situ bioremediation to cost-effectively treat the chlorinated solvent plume and prevent further offsite migration. Post-injection groundwater monitoring results will be compared to the pre-injection concentrations to demonstrate the effectiveness of the chemical injections.