Resolving the Feasibility of Treating Contaminants Stored in Plumes

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Abstract. Management of historical releases of chlorinated solvents remains as a major technical challenge. Most recently it has been recognized that plumes are becoming chronic cost drivers at many facilities. Contaminants stored in groundwater plumes (via diffusion into low permeability zones and sorption) can sustain dilute plumes long after sources are depleted. Unfortunately, the scenario of slow release of contaminants stored in plumes leads to the observation that facility owners may be faced with multiple decades of plume management and monitoring at thousands of sites.

To investigate the mechanisms of back diffusion, visualization studies have been conducted at Colorado State University. Laboratory scale experiments also suggest that large amounts of contaminant mass can be stored in plumes. The next step is to resolve if treatment of contaminants stored in low permeability zones is technically feasible. Currently, this project is exploring innovative strategies for treating contaminants in plumes. These include:

- Sonication
- Drifting chemical oxidants and degradable carbon sources into plumes
- Iron sulfide

The results of the ongoing bench scale experiments will be presented. The preliminary results show promise with iron sulfide.

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