DNAPL Zone Characterization and Treatment: State of the Practice

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Abstract. Understanding of the significance of subsurface nonaqueous phase liquid (NAPL) was not widespread until relatively recently, and the failure to consider its effect on dissolved plume persistence is largely responsible for the inability of many early remediation efforts to achieve groundwater cleanup goals, particularly at sites with dense NAPL (DNAPL). Due to considerable technical challenges, accurate characterization and significant removal of DNAPL (especially residual DNAPL) was generally considered unfeasible. Consequently, the strategy for many sites with known or suspected DNAPL has consisted primarily of long-term plume remediation and/or control. Recent development of several promising characterization and remediation technologies has increased interest in DNAPL zone investigation and treatment, although there is scientific uncertainty and debate regarding the benefit of partial DNAPL removal. Various established and emerging DNAPL characterization and remediation techniques that have demonstrated or promising field application are described, and additional research needs are discussed.

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