

## **ECONOMIC EVALUATION OF PUMP AND TREAT VERSUS CHEMICAL OXIDATION**

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Conventional treatment on the majority of the contaminated groundwater sites in the U.S. is by pump and treat technology. Although effective in containing the migration of the groundwater plume and quickly reducing elevated contaminant levels, all pump and treat systems have a similar problem in that the contaminant concentrations reach an asymptotic level after several years of operation. The remaining dissolved levels of contaminants after five years or more of treatment are commonly still at high enough levels that closure of the site is not obtainable. This is especially true for sites contaminated with TCE, PCE, MTBE, and other recalcitrant constituents.

An economic evaluation was performed to compare the costs of treating groundwater using in-situ chemical oxidation as an alternative to pump and treat technology. A cost evaluation was performed on three groundwater pump and treat sites in California. At two of the sites, an existing pump and treat system was terminated after several years of operation in favor of chemical oxidation treatment as a means of expediting the timeframe to achieve risk-based groundwater cleanup levels. Chemical oxidation was performed using two types of oxidants: potassium permanganate and Fenton's oxidation. The costs for chemical oxidation treatment varied ranged from a low of \$305,000 for permanganate to a high of \$360,000 for Fenton's oxidation treatment. These chemical oxidation costs are believed to be typical for moderate-sized groundwater plumes, although actual costs will vary somewhat depending on site conditions. Based on this evaluation, the cost to cleanup groundwater using in-situ chemical oxidation can typically be paid for in as little as one to two year of continuing with the pump and treat.