

ISCO CASE STUDY: PILOT TEST USING PERMANGANATE FOR TREATMENT OF TCE AND 1,1-DCE, COSTA MESA, CA

In October 2008, JAG Consulting Group performed a successful Pilot Scale injection test using potassium permanganate (KMnO₄) at a TCE and 1,1-DCE contaminated groundwater site in Costa Mesa, CA.



SITE DESCRIPTION

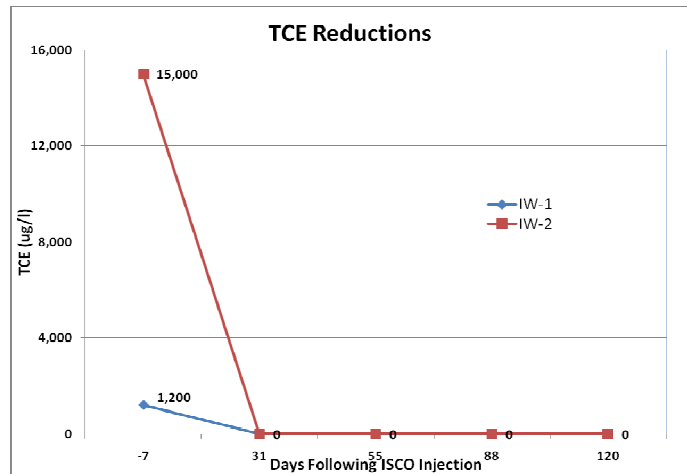
The project site is a large industrial facility located in Costa Mesa, CA. TCE leaking from an underground storage tank caused extensive groundwater contamination beneath the site. A comprehensive site characterization was completed at the site to fully delineate the extent of TCE contamination. The TCE plume measures over 500 feet long and extends off-site from the facility.

PILOT SCALE KMnO₄ TREATMENT

A Pilot Scale test was performed to demonstrate that the TCE/DCE plume could be effectively treated using permanganate. A total 9,100 gallons of 3% KMnO₄ solution were injected into two injection wells located at the source of the TCE plume. The water quality effects of the injection were monitored by collection of field readings of conductivity, oxidation reduction potential (ORP), dissolved oxygen, temperature, turbidity, and pH. Detection of permanganate (as evidenced by a purple-pink color) was observed and monitored in the closest wells within the first few weeks. A radius of influence of 15 to 20 feet was confirmed by measurement of field water quality parameters following KMnO₄ treatment.

PILOT TEST RESULTS

Significant reductions in the TCE levels were measured in the nearest wells following the treatment. TCE levels as high as 15,000 ug/l were reduced to below 1.0 ug/l within 30 days, as shown in the graph below:



In addition, 1,1-DCE levels as high as 140 ug/l were reduced to below 1.0 ug/l within 30 days. No evidence was found that ISCO resulted in the generation of deleterious compounds, such as 1-2-DCE, vinyl chloride, or hexavalent chromium.

Full scale treatment of the entire TCE plume is currently being planned. At the current time, use of 10 injection wells, two parallel 200-foot long horizontal injection wells, and four down-gradient extraction wells are being considered for treatment of the plume.

CONTACT INFORMATION

JAG Consulting Group, Inc.

3340 S. Crawford Glen
 Santa Ana, CA 92704
gary@JAGConsultingGroup.com
 Phone: 714-241-7722
 Fax: 714-241-9922