

# CASE STUDY: IN-SITU CHEMICAL OXIDATION USING POTASSIUM PERMANGANATE, LA MIRADA, CA

JAG Consulting Group performed a highly successful potassium permanganate (KMnO<sub>4</sub>) pilot test at a TCE and 1,1-DCE contaminated groundwater site in La Mirada, CA.

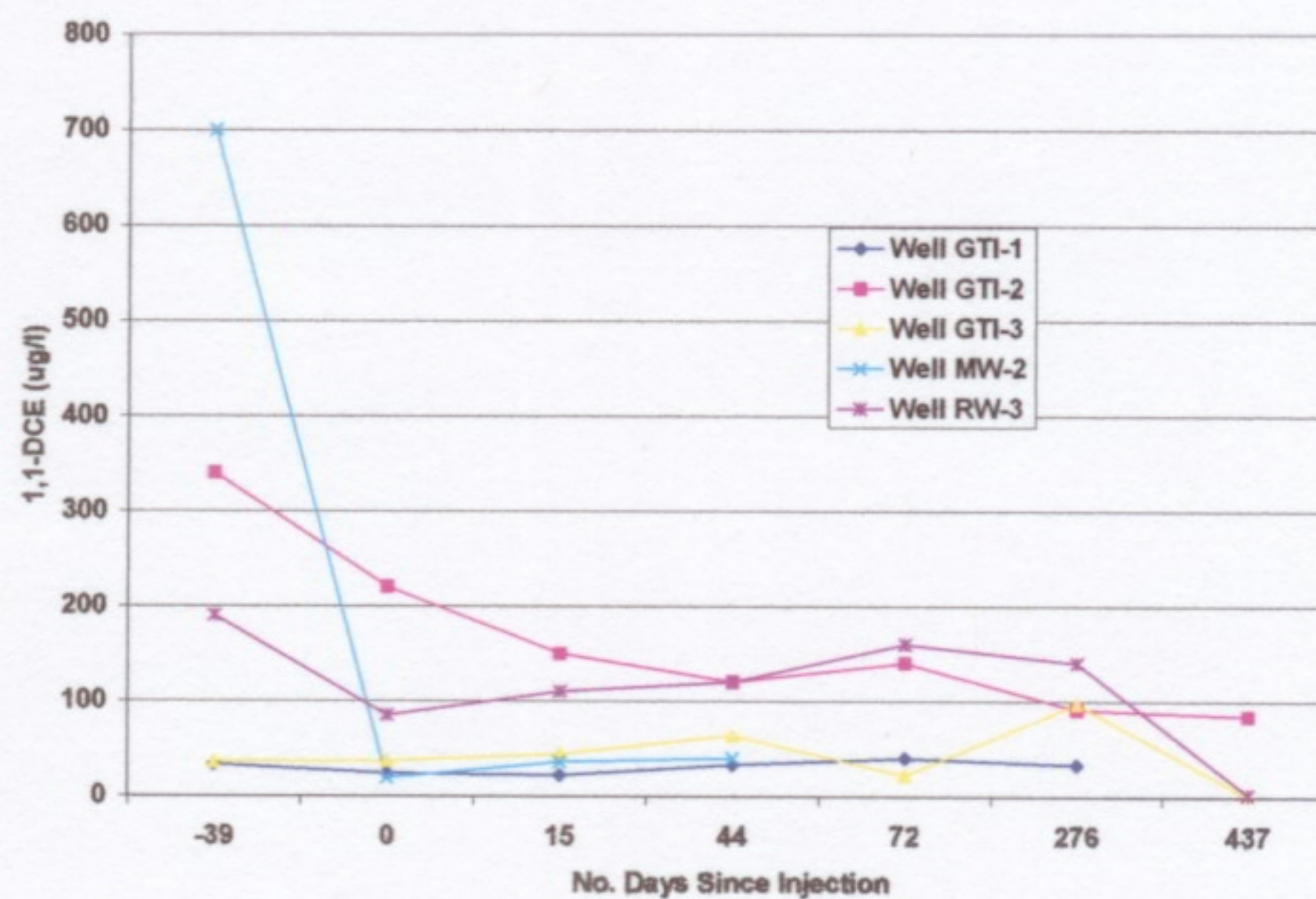
## SITE DESCRIPTION

The project site is a moderately large industrial facility located in La Mirada, CA. TCE leaking from an underground storage tank caused extensive groundwater contamination at the site. A comprehensive site characterization was completed at the site to fully delineate the extent of TCE contamination. The TCE plume measured nearly 225 feet long and extended off-site from the facility approximately 75 feet.

## PILOT SCALE KMNO<sub>4</sub> TREATMENT

A Pilot Scale test was performed to demonstrate that the TCE/DCE plume could be adequately treated using permanganate. Five batch applications of 1,500 gallons each of 5 percent KMnO<sub>4</sub> solution were injected into an injection well centrally located in the TCE plume. The water quality effects of the injection were monitored by collection of field readings of conductivity, oxidation reduction potential, dissolved oxygen, temperature, turbidity, and pH. Immediate detection of the oxidant (permanganate is evidenced by a purple-pink color) was observed and monitored in the closest wells within the first few days. Immediate reductions in the TCE levels were measured in the four nearest monitoring wells following the treatment. TCE levels as high as 450 ppb were reduced to below 50 ppb within 60 days, as shown in the graph below.

In addition, 1,1-DCE levels as high as 700 ppb were reduced to below 40 ppb within the first 30 days, as shown in the graph below:



## PUSH-PULL TECHNOLOGY

A radius of influence of 35 to 45 feet was confirmed by measurement of field water quality parameters following KMnO<sub>4</sub> treatment. As a means of extending the radius of influence, a downgradient well located approximately 60 feet from the injection well was pumped continuously during the pilot test. Using this push-pull technique, the active permanganate solution reached the extraction well in approximately 60 days. This information will be utilized in the full scale design of the TCE plume.

Full scale treatment of the remaining portion of the TCE plume is currently being planned.

## CONTACT INFORMATION

JAG Consulting Group, Inc.  
3340 S. Crawford Glen  
Santa Ana, CA 92704  
[gary@JAGConsultingGroup.com](mailto:gary@JAGConsultingGroup.com)  
Phone: 714-241-7722  
Fax: 714-241-9922

