



Consulting Group, Inc.

ISCO CASE STUDY: USE OF HIGH pH ACTIVATED SODIUM PERSULFATE, GAS STATION SITE, MILPITAS, CA

INTRODUCTION

JAG Consulting Group recently performed a high pH activated sodium persulfate treatment at an active gas station site located in Milpitas, CA. Sodium hydroxide (25%) was used to induce the high pH conditions. Due to the shallow groundwater conditions (5 feet bgs), direct push injection was selected as a cost effective means to inject the chemicals.



PROJECT BACKGROUND

Elevated levels of BTEX, MTBE, and TPH gas from a leaking UST were present at this active gas station site. The soils at the Site consisted primarily of alternating sands and silts. The depth to groundwater was approximately 5 feet below ground surface (bgs).

ISCO DESIGN

The treatment area consisted of an area which measuring approximately 2,600 square feet in size. A total of 16 direct push borings were advanced to a depth of 23 feet bgs. Each injection boring was estimated to have a radius of influence of approximately 7-10 feet. The injections were performed at 2 feet depth intervals from a bottom depth of 23 feet up to 5 feet (bottom up injection).

Over the course of five days, a total of 2,300 gallons of sodium hydroxide and 4,500 gallons of sodium persulfate were injected into the subsurface. Low

injection pressures (less than 35 psi) and moderate injection flow rates (5 to 9 gpm) were applied in an effort to minimize the potential for chemical daylighting. As a result, no daylighting occurred during the injections.



ISCO EFFECTIVENESS

The injections attained moderate VOC destruction results, with up to 74% destruction of TPH as gas, 85% reduction of Toluene, 89% reduction of xylenes, 76% reduction of ethylbenzene, and 29% reduction of benzene.

The pH of the groundwater in the nearby monitoring wells was not raised to over 10.5 pH units during the injections and therefore, it was determined the persulfate was not properly activated. After further Bench Scale Testing, it was further determined this site has a very high Soil Buffering Capacity (7.16 g NaOH/kg soil) which caused problems with the proper activation of persulfate. This was due to an improperly designed Bench Scale Test (performed by another company).

CONTACT INFORMATION

You can contact Gary Cronk at JAG Consulting Group:

Phone: 714-241-7722

Email: gary@jagconsultinggroup.com