

STEPHENVILLE, TX - AUTO PARTS MANUFACTURER

SITE OVERVIEW

A ruptured degreaser at an auto parts manufacturing site resulted in the release of TCE. The shallow surficial aquifer consisted of silty sands with groundwater contamination of up to 500 mg/L TCE near the site of the release and the contaminant plume extended 200 feet down gradient of the source area with concentrations of TCE in excess of 100 mg/L.

GOALS AND CHALLENGES

High initial TCE concentrations in both the source area and dissolved plume were the primary treatment challenges. High concentrations of chloroethene contaminants in groundwater often indicates that dense non-aqueous phase (DNAPL) solvents are present in source area soils. Effective contact of the amendment with the contaminant was a challenge due to the silty soils and possible presence of DNAPL. The high TCE concentrations also had the potential to inhibit microbial activity. A lower than optimal pH combined with a lack of native Dehalococcoides (Dhc) microbes resulted in a DCE stall which required the application of buffer and bioaugmentation.

REMEDIATION APPROACH - NEWMAN ZONE EVO & ZERO VALENT METAL

A combined treatment approach utilizing Newman Zone® emulsified vegetable oil (EVO) and a zero valent metal product was chosen to address the high concentration of TCE for both the source area and dissolved plume. A total of 59 temporary injection wells were completed inside the former manufacturing facilities building with an additional 19 injection wells outside of the building. The first phase of injections were completed in the Fall of 2008 and Spring of 2009. Although rapid degradation of TCE to DCE was observed after the first injection no vinyl chloride or ethene was produced. Lower than optimal pH and a lack of native Dhc bacteria was determined to be the cause of the DCE stall. A second injection was completed in 2011 with EVO, zero valent metal, buffer and a low pH tolerant Dhc bioaugmentation culture.

RESULTS

Within months of the first Newman Zone EVO injection over 90% of the TCE had been reduced to DCE. Two years after injection no TCE was detected in monitoring wells but further reduction of DCE to VC or ethene was not observed. Addition of a Dhc bioaugmentation culture and a second injection resulted in rapid reduction of DCE to ethene. Monitoring three years after injection indicated no rebound of the chloroethene contaminants and a "No Further Action" site closure is anticipated.

