

Slurry Injection BTEX Remediation in California

Contaminants	Application Method	Soil Type	Groundwater Velocity
BTEX	Slurry Injection	Sandy Silt	<0.5 ft/day

A former service station in downtown San Francisco, California was contaminated with high levels of BTEX. Groundwater contamination was the result of leaking underground storage tanks and dispenser islands. The aquifer material consists of interbedded silt and sandy silt overlying a cemented fine- to medium-grained sand interval. The depth to groundwater is approximately 25 feet below ground surface. Groundwater flow direction is predominantly to the south at a velocity ranging up to 0.5 foot per day.

Following approximately one year of soil vapor extraction the majority of the soil contamination was removed. Due to the presence of residual hydrocarbons in groundwater, approximately 2,500 pounds of ORC slurry was injected via 50 push points using a cone penetrometer rig (June, 1997). Approximately 50 pounds of ORC was injected into each push point extending from 10 feet below groundwater through the capillary fringe. Existing wells MW-1, MW-2, MW-3, and MW-4 were used to monitor the reduction of BTEX. A map of the site detailing the injection array and monitoring well locations is presented in Figure 1. The reduction of BTEX in the four wells is graphically presented in Figures 2 through 5. Five months following the installation of ORC, the overall reduction of BTEX was 17% in MW-1, 100% in MW-2, 100% in MW-3, and 66% in MW-4. It is important to note that there was a 67% reduction of BTEX (due to a 74% reduction of TPH) in MW-1 after three months of treatment. Apparently, BTEX levels began to rebound through the fifth month because the well is in an unresolved source area with high oxygen demand and recharge potential. Based on these results, this site has been submitted for closure.

Figure 1

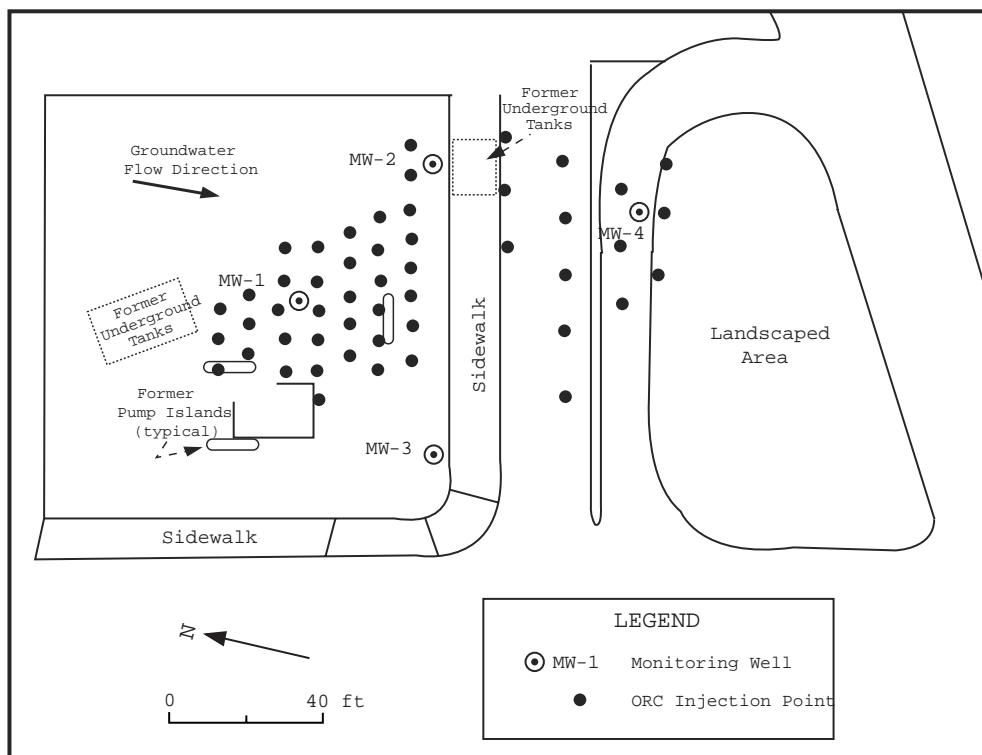


Figure 2

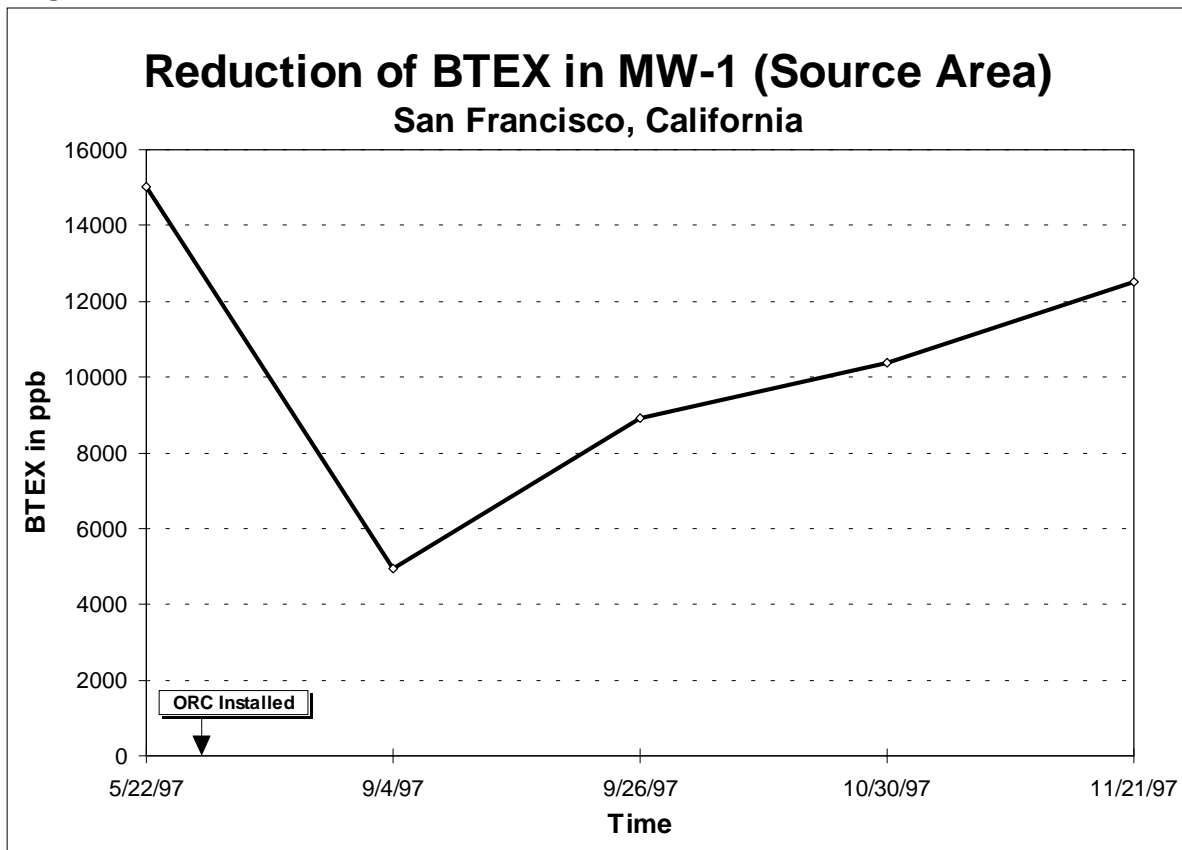


Figure 3

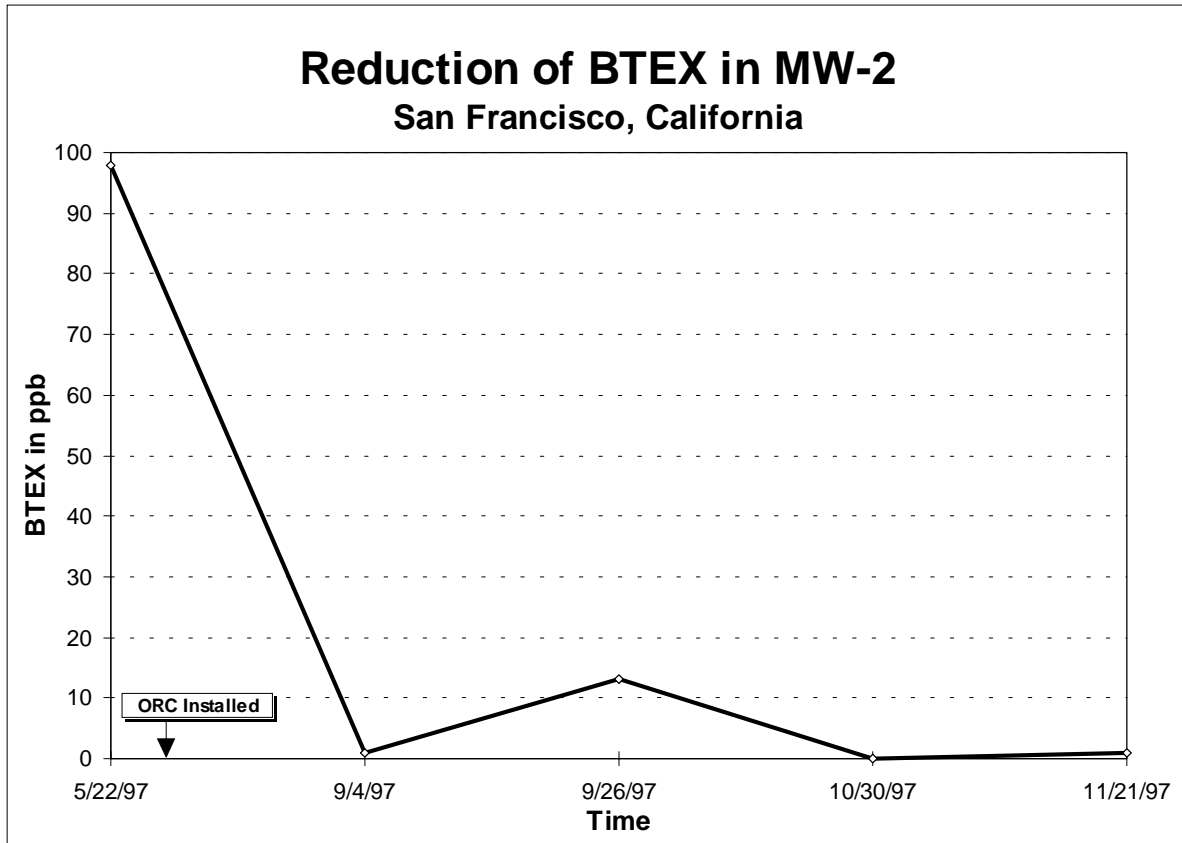


Figure 4

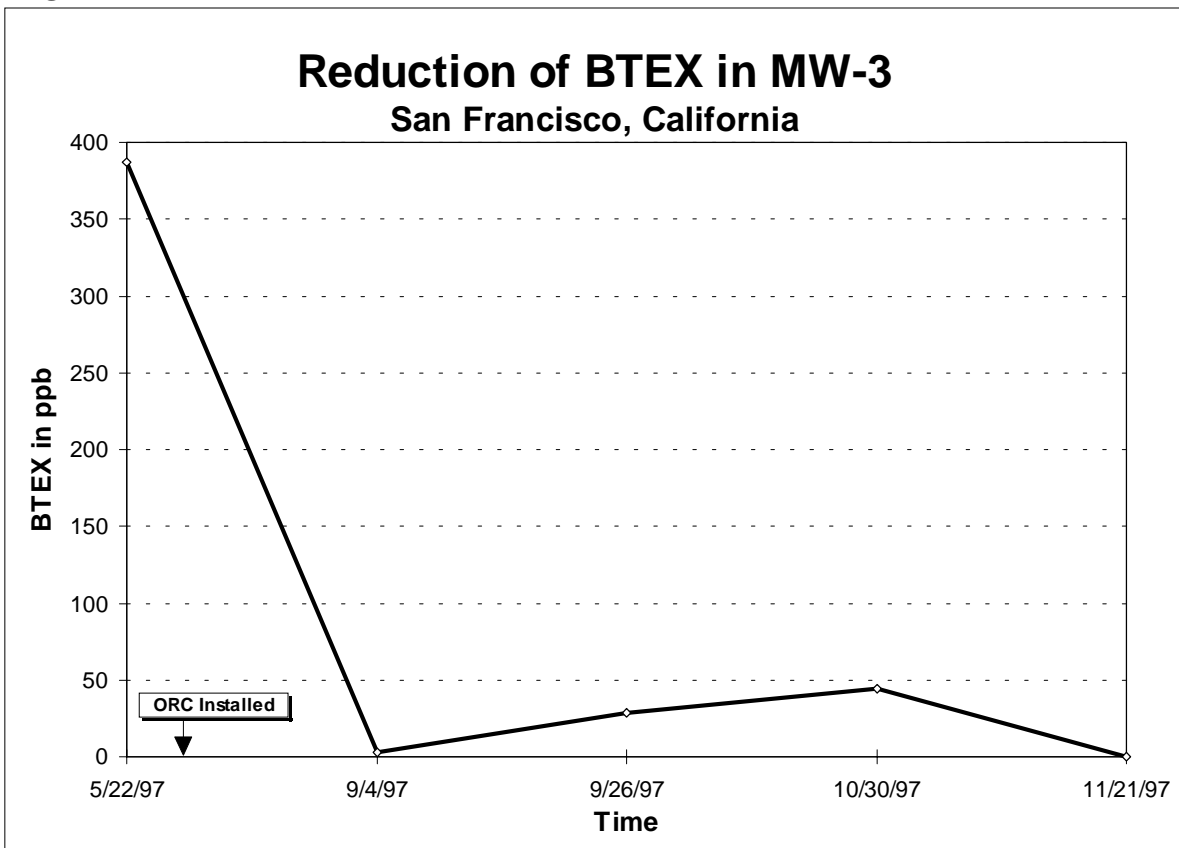


Figure 5

