

## SUCCESS STORY

"We were able to save the client time and money by replacing a long term (20 year) pump and treat system, while eliminating ongoing O&M costs."



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## PROJECT DETAILS:

**Location:** Southern United States

**Project Type:** EZVI, Bioaugmentation

## PROJECT SUMMARY

This project was performed at a site in the Southern United States. PCE and its daughter products were the constituents of concern (COCs), and a long term (20 plus years) pump and treat system had been in place. The client's goal was to eliminate the ongoing cost of operating and monitoring the pump and treat system. This project was located immediately adjacent to an active railroad track, which presented a unique set of Health and Safety challenges. An extensive site investigation was performed in order to determine what remediation technologies would be most effective at the site. The objectives of the site investigation were to gather information necessary to develop remedial goals and a remediation plan for the site.

## REMEDIATION PLAN

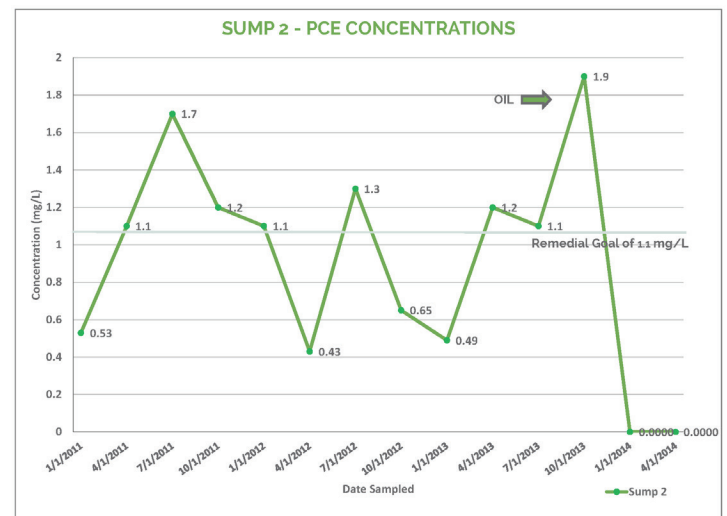
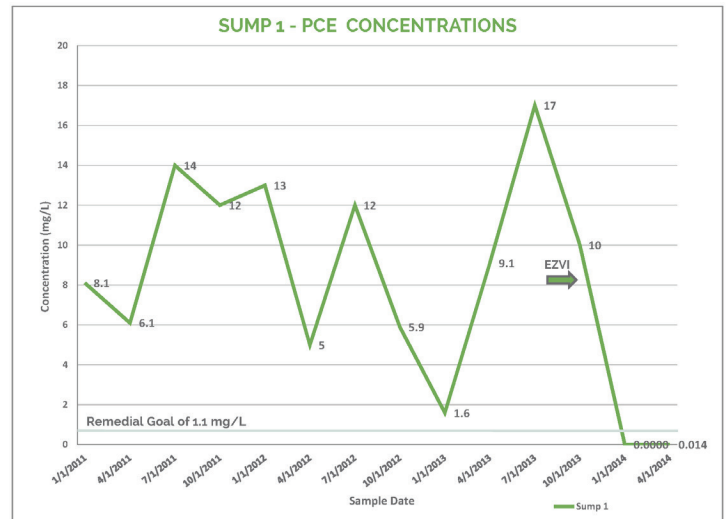
Historically, groundwater concentrations suggestive of the presence of DNAPL had been reported in Sump 1. The proposed CAP strategy to remediate the subsurface clays and pit groundwater in Pit #1 included Injection of emulsified zero-valent iron (EZVI) on top of the clay layer underlying the pit sand fill in order to treat residual DNAPL in the subsurface clays and as a result to reduce dissolved concentrations in groundwater and co-inject food grade vegetable oil (VO) and Dhc (with vcrA) cultures in order to augment the biodegradation of dissolved chemicals of concern (COCs) in pit groundwater.

PCE concentration marginally above the standard was reported in Pit #2. As a proactive and precautionary measure to prevent possible excursions above the RECAP standard in the future, augmented bioremediation was proposed and injections of Dhc microbes (with vcrA gene) with a co-injection of food grade vegetable oil as a carbon source were used. A total of 21,000 gallons of EZVI, 6000 gallons of vegetable oil, 750 gallons of sodium lactate, and 30 liters of KB-1 were injected over an 8 day period. Two separate treatment areas (sumps) were treated with 37 temporary injection points at intervals ranging from 14-24 ft. below ground surface.

## THE RESULTS

Soil and groundwater monitoring results indicate that the concentrations of the site COC have been remediated to levels that are below the cleanup objectives and pose no threat to human health or the environment. Risk assessment, in-situ chemical reduction (ISCR), and the knowledge of the existing remediation system were synergistically combined to expedite site cleanup in a manner that eliminated years of pump and treat operation and maintenance. Based on these results, regulatory approval has been given to develop a site closure plan.

### Post Injection Analysis



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ADVANCED REMEDIATION PRODUCTS

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