Project Summary

A pilot scale remedial event was conducted in Durham, NC at a former dry cleaner site to exhibit the efficacy of a proposed remedial design. The site was identified as having impacted soils and groundwater due to the historical use of tetrachloroethylene (PCE) (fig.1). In April 2011, an 18’ self-contained mobile injection trailer was used to deliver the remedial materials via permanent injection wells. Open rock wells were utilized to deliver materials from 30’ to 40’and create a pilot scale permeable reactive barrier.

Remediation Plan

The injection program at the site consisted of three injection wells utilized to inject a mixture of remedial materials containing blue green algae, sodium sulfite, calcium propionate, zero valent iron, and soluble kelp. A single inflatable TMA 350 packer system was used to inject the materials below 25’ bgs. The remedial mixture was designed to be a pilot scale remedial action at the site to restrict plume migration while also reducing CVOC concentrations locally via enhanced reductive dechlorination. The pilot scale program was to act as a proof of concept and promote anaerobic conditions in the groundwater, thereby enhancing bacterial populations within the anoxic groundwater.
Results

Monitoring well MW-26 is located within the pilot scale remedial treatment area, immediately down-gradient of the three injection points and is screened between 27-37.5 feet bgs. Sampling results from January 2012 show MW-26 was strongly affected by the remedial action and that both the geochemistry and groundwater contamination concentrations changed. Nine months after the injection event, total CVOC concentrations were reduced from 2,540 µg/L to 71.2 µg/L, a 97.2% reduction (fig.2). Tetrachloroethene (PCE) also saw a significant decrease of 99.74% nine months after the initial injection, down from 2,400 µg/L to 6.2 µg/L. Anaerobic daughter products of PCE, trichloroethylene (TCE) and cis-1,2-DCE were also reduced by 24.42% and 55.4% respectively. Vinyl chloride (VC) increased from below the laboratory detection limit to 20 µg/L in January. It is normal to have an initial increase in vinyl chloride because it is a byproduct of cis-1,2-DCE, which explains its slight increase in concentration. Continued reductive dechlorination is expected in the pilot area.

![MW-26 CVOCs](image)

**Figure 2:** Concentrations (mg/L) in Groundwater vs. Time at MW-26 before and after in-situ injection event.