



PILOT CASE STUDY: PCE CONTAMINATED GROUNDWATER REMEDIATION AT A DRY CLEANER FACILITY IN NEW MEXICO

BACKGROUND

- AMEC Earth & Environmental Inc. is the current consultant
- INTERA Inc. formerly Duke Engineering & Services (DE&S), completed remedial investigation of the site in Jan. 2003
- Source Dry Cleaner Facility with release of DNAPL - Source: DNAPL, Dissolved phase plume: PCE
- Site consists of an approximately 58-acre plume of contaminated groundwater extending in an elliptical shape approximately 0.75 miles south, southeast of the source
- The estimated mass of PCE DNAPL in the source zone: 300 pounds (based on results from soil sampling), Dissolved-phase plume: approximately 275 pounds of PCE and its breakdown products
- The hot-spot bioremediation treatment area is located at the head of the ground water plume, within a group of privately-owned properties
- PCE concentrations within the hot-spot portion of the ground water plume (excluding the source area), along the plume centerline, range from approximately 5,000 to 40,000 ug/L
- Major Concern: The contaminated ground water plume is in a sole-source drinking water aquifer for the City of Española, the Santa Clara Pueblo trust lands, and nearby populations in the state of New Mexico

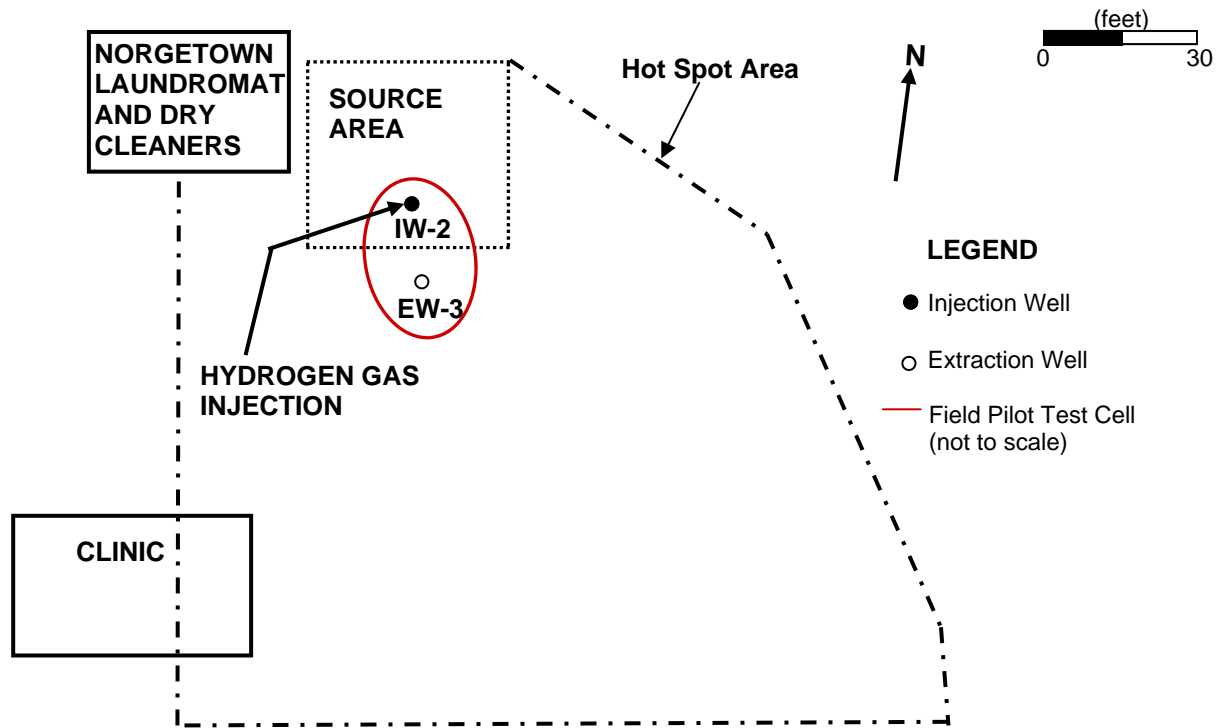
inVentures STRATEGY

- Demonstrate that gPRO[®] LP as an effective tool for transferring hydrogen gas (H₂) into groundwater
- H₂ is an effective gas for the bioremediation of PCE

CLEAN-UP STRATEGY

- AMEC is investigating a number of bioremediation strategies at this site:
 - Dissolved Hydrogen in groundwater coupled with Emulsified Vegetable Oil
 - Emulsified Vegetable Oil
 - Dairy Whey
 - Ethanol
- A design reaction concentration of H₂ addition 1,000 ug/l planned
- gPRO[®] LP to be used to provide the H₂ in the groundwater
- gPRO[®] LP in a tank set up attains the desired concentration of H₂ and then the water is injected into the aquifer
- Initial activity of the electron donors (H₂ in groundwater) will promote rapid consumption of dissolved oxygen and other electron acceptors such as nitrate, manganese, iron, and sulfate
- Emulsified vegetable oil will promote a slow fermentation process that generates dissolved H₂ gas at levels compatible with growth of microorganisms capable of reductive dechlorination
- AMEC has already tested the gPRO[®] LP to assure that it will function and provide the concentration levels they require during their remediation investigations

SITE MAP



PRELIMINARY RESULTS

- As noted above, AMEC Initial system trials demonstrated the gPRO[®] LP system was able to achieve the target concentration of 1 mg/l H₂ in water flowing through the infusion tank at 2.5 GPM