

ENVIRONMENTAL FRACTURING APPLICATIONS



EMPLACEMENT OF EHC-G MICRO IRON FOR REMEDIATION OF TCE IMPACTS IN BEDROCK

...over 100 tons of a micro-iron/cellulose substrate was emplaced in bedrock aquifer sediments, including under the existing silo structure, to reduce TCE levels by an order of magnitude after just 90 days.

PROBLEM

Trichloroethylene (TCE) impacts upwards to 4,000 ppb were present in a sandstone aquifer under-lying a former missile silo facility. An *in situ* approach was stipulated to mitigate TCE due to the depth of impacts and impracticality of ex situ remedial methods.

OBJECTIVES

- to emplace "EHC-G", a micro-iron and soluble cellulose amendment into deep bedrock sediments for promoting biotic and abiotic reduction of TCE.

FIELD PROGRAM

A total of 206,000 lbs of EHC-G was emplaced into aquifer sediments between 35 to 62 ft. depth using frac packers. EHC-G was incorporated into a linear gel slurry and injected at nine borehole locations within the TCE source area dissolved plume area. Subsurface distribution of placement was mapped using 3D tiltmeter geophysics to evaluate EHC-G performance.

TECHNICAL EVALUATION

Emplacement of EHC-G was successfully distributed in affected bedrock, resulting in:

- coverage over a 41,700 ft² area of TCE source area, including under the missile silo structure
- a 50-90% decline in groundwater TCE concentrations within 90 days after EHC-G placement, from concentrations in the thousands ppb to hundreds ppb. Phase 2 treatment planned for 2011.

Fracture - emplacement of 103 tons of EHC-G micro-iron/cellulose into sandstone bedrock at a former missile silo site in Colorado, USA.

