

ENVIRONMENTAL FRACTURING APPLICATIONS



FRACTURE-ENHANCED BIOREMEDIATION OF TCE SOLVENTS IN GROUNDWATER

...enhanced in situ bio-remediation of chlorinated hydrocarbon solvents was achieved by fracturing silty clay soils and injecting "chitin" as a bioamendment

PROBLEM

TCE solvent contamination at a former brickyard has contaminated groundwater in silty clays and sands. An innovative approach using BIOFRAC™ soil fracturing with injection of slow release poly-glucosamines was evaluated.

OBJECTIVES

- to enhance anaerobic biodegradation of solvents by increasing soil permeability and injecting a bio-amendment.

FIELD PROGRAM

Placement of 8,800 kg of sand and 2,350 kg of chitin into silty sands and clays to create 36 sand filled fractures originating from 11 fractured boreholes. "Chitin" was successfully incorporated and injected during fracturing to enhance the reductive dechlorination of solvents in low permeability sediments. Fractures were mapped using tiltmeter geophysics

TECHNICAL EVALUATION

Soil fracturing resulted in the following performance enhancements:

- an order of magnitude increase in bulk hydraulic conductivity;
- delivery of bio-amendment resulted in complete anaerobic dechlorination of trichloroethylene within contaminant source area in 12 months.

Soil fracturing in source area and placement of chitin in silts and clays at a US EPA Superfund site in Kentucky, USA.

