

ENVIRONMENTAL FRACTURING APPLICATIONS



PERMEABILITY ENHANCEMENT AND INJECTION OF SLOW RELEASE OXYGEN

... enhanced *in situ* bio-remediation with fracturing offered the town a cost-effective remedial alternative to excavation or Monitored Natural Attenuation.

PROBLEM

Residual gasoline contamination is present in clay soils underlying Main Street in a small town. Ex situ remediation is unfeasible due to nearby buried utility corridors.

OBJECTIVES

- to remediate soil and ground-water without disrupting town commercial activities and subsurface infrastructure.

FIELD PROGRAM

Consisted of fracturing shallow clay soils from 2.5 to 4.5 m depth at 7 fracture locations within the contaminant plume on Main Street. A total of 21 fractures containing 15 tonnes of highly permeable sand were placed under the roadway with no impacts to buried utility corridors. One tonne of slurry containing slow release oxygen was subsequently injected into the fractures to biodegrade residual phase hydrocarbons.

TECHNICAL EVALUATION

Predictive modelling on this ongoing project using BIOSCREEN estimates that fracture-enhanced bioremediation with slow release oxygen will reduce hydro-carbon levels in soil and ground-water to acceptable criteria with 3 to 5 years compared to over 15 years if relying solely on Monitored Natural Attenuation.

Fracturing of gasoline impacted clay soils underlying Main Street to enhance *in situ* bio-remediation.

