

# ENVIRONMENTAL FRACTURING APPLICATIONS



## FRACTURE-ENHANCED CONDENSATE RECOVERY

...the use of environmental fracturing to recover subsurface liquid hydrocarbon saved the client \$1.5 million in clean-up costs compared to the best alternative remedial options.

### PROBLEM

Soil and groundwater contamination at a former gas plant site. An estimated 400 m<sup>3</sup> of liquid hydrocarbon condensate was present in silts and clays at the water table.

### OBJECTIVES

- to recover liquid hydrocarbons from the subsurface;
- to halt further off-site migration of hydrocarbon contamination.

### FIELD PROGRAM

Placement of 60 tonnes of sand into soils to create 85 sand filled fractures originating from 14 recovery wells. Surfactants injected during fracturing to promote flow of liquid condensate. Mapping of fracture locations and geometry using surface-mounted tiltmeters. Total duration of fracturing program was 7 days.

### TECHNICAL EVALUATION

Soil fracturing resulted in the following performance enhancements:

- a 10<sup>2</sup> increase in bulk hydraulic conductivity;
- 5 x greater radius of influence;
- 15 x greater condensate recovery; and,
- reduction in remediation time from 18 to 5 years.

Below: Fracturing operations being conducted in contaminated silts and clays.



Frac Rite Environmental Ltd.