

## Chemical in-situ oxidation of mineral hydrocarbon plume in the unsaturated zone of the ground

Technical installation | Chemical in-situ oxidation | Environmental sensor | Lab analysis

### Project description

The production of roof tiles in the past has led to a substantial contamination of the surrounding soil by petroleum hydrocarbons. The severity of the vertical and horizontal spread of the plume, coupled with plans for the future use of the site, generated the necessity to perform in-situ remediation. Lab analysis and feasibility studies of the contaminated site revealed that the soil was in a poor biological state but nonetheless, favored conditions where in-situ chemical oxidation would be successful for remediation.

The project was designed and carried out based on the expected consumption of the oxidizing agent. The oxidizing agent used was hydrogen peroxide ( $H_2O_2$ ). The project, consisting of 32 injection points, each with three injection depths and temperature sensors were based on the intra-ground injection of  $H_2O_2$  and ventilation. The entire process efficiency was monitored by controlling the reaction temperature around the injection areas.

### Customer

Monier GmbH, Oberusel  
Ingenieurgesellschaft IPP, Kiel

### Project value

Approx. 300,000 Euro

### Project timing

July 2009 – July 2010

### Project areas

Laboratory technical processing, remediation hardware installation, chemo-physical soil remediation, environmental sensor technology

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### Project data

- Contaminant: mineral oil with a maximum concentration of 40,000 mg/Kg
- Plume size: approximately 1000 m<sup>2</sup>, and a depth of 9.5 m
- 93 injection lances with temperature sensors
- Approximately 4,000 m of polyethylene tubing

### Services rendered

- Participation in the concept design of the remediation process
- Soil oxygen demand lab tests
- Design and installation of remediation hardware
- Ongoing monitoring of the remediation progress and injection regime adjustments
- Technical documentation

### Customer expectations

- Unrestricted area use during remediation
- High reliability of the remediation process achieved by combining biology and chemistry
- No cost for waste disposal, significant cost reduction compared to traditional excavation concepts
- High degree of process control using sensor technology