

Thermail Soil Remediation

Remediation beneath industrial laundry | Case Study

Customer

The Capital Region of Denmark

Location: Taastrup, DK

Technology

Thermal Conduction (TCH)

Keyfacts

Treatment area: 275 m²

Depth of treatment zone: 8 m

Treatment volume: 1.730 m³

Geology: Clay till

Contaminant: PCE

Target temperature: 100 °C

Remediation target: 1 mg/kg

Heating period: 106 days

The client's needs

Beneath a functioning industrial laundry, significant pollution with free phase PCE and other chlorinated solvents was discovered. The chlorinated solvents had migrated through a clay till layer to a secondary sandy aquifer at 8 meters below ground.

The challenge was to remediate the clay till to a level of maximum 1 mg/kg chlorinated solvents below existing buildings, and secure that no hot water or steam was migrating from the site in the secondary aquifer.

Our solution

40 heater vacuum wells were installed over the 275 m² target treatment area. Heaters were installed to a depth of approximately 9.5 meters below ground into the sandy aquifer below the clay.

The building floor was insulated with Rockwool floor batts and a temporary wooden floor was installed to make the treatment area accessible during operation. Cable trenches in the building were also insulated to keep the laundry buildings functional during operation of the facility.

Combined ventilation and groundwater pumping wells were installed in the secondary aquifer. Temperature resistant pressure driven pumps were installed in the wells.

Observation wells were installed in the secondary sandy aquifer outside the treatment area to monitor possible movement of steam generated in the aquifer.



Wells, extraction system and treatment plant were installed from December 2011 to March 2012 and operation of the facility was maintained from March to June 2012.

To ensure structural stability of the buildings level measurements were performed during and after operation.

Results

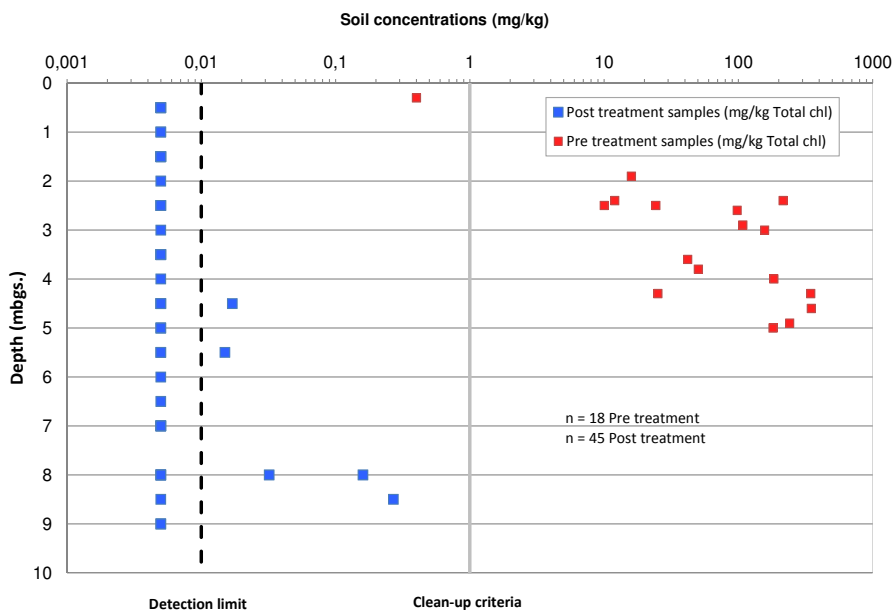
The site was operated without any nuisance and we were capable of maintaining pneumatic and hydraulic control. Target temperatures were reached within the treatment area.

After a treatment period of 106 days, 45 soil samples were taken at different depths in 5 borings within the treatment area.

The results were:

- 40 samples were below detection limit
- Average concentration: 0.01 mg/kg
- Maximum concentration: 0.27 mg/kg (using half of the detection limit for samples below detect limit)
- No steam zone outside the treatment area was found to exist

During operation we were able to control groundwater movement and secure any steam production from escaping the treatment area.



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