

I-17-05

POGGIO SAN LORENZO - ITALY

Context

The site is located near to Poggio San Lorenzo (ITALY), alongside a house and a restaurant. By the past the location has been occupied by a petrol station which spilled diverse contaminants in the ground.

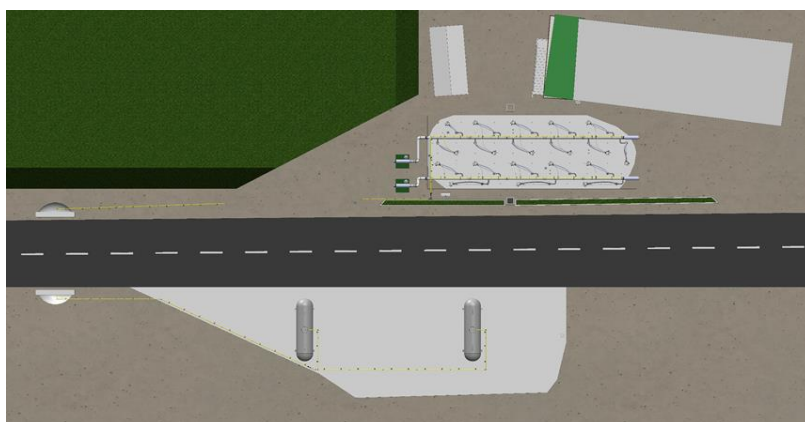


1. Poggio San Lorenzo - Italy.

Project description

The project is made on a 128m² heating zone at 8m depth with 19 gas burners (V5) and 19 secondary heating tubes with a reburn system.

The exact display of the heating tubes, the thermocouple tubes and the pressure tubes are illustrated on hereunder.



2. The site layout

Monitoring

Based on data given by our partner SIRAI, the concentrations of hydrocarbons in the vadose zone of the polluted area are shown in the table below

Contaminant	Average (mg/kg)	Maximum (mg/kg)	Treatment Goal (mg/kg)
Hydrocarbons	1000	3170	50

3. Site contamination and objectives

The legislation in Italy imposes a concentration of hydrocarbons below 100 mg/kg. However, the targeted concentration of the contaminants at the end of the treatment is below 50 mg/kg.

The treatment started on the 24th of July 2017 with 8 burners and the 11 other burners were started on the 4th of August 2017.

Key facts

Contaminants

TH : C₁₀ – C₄₀
BTEX

Max. Concentration

3170 mg/kg DM

Volume

1024 m³

Tonnage

1946 tons

Heating elements

38 (L: 13m)

Temperature target

220°C

Heating duration

90 days

Treatment objectives

<50 mg/kg DM

Area

Poggio San Lorenzo - Italy

Future use

Residential

Client

Petroltechnica

Consultant

SIRAI

Date

2017





Key facts

Contaminants

TH : C₁₀ – C₄₀
BTEX

Max. Concentration

3170 mg/kg DM

Volume

1024 m³

Tonnage

1946 tons

Heating elements

38 (L: 13m)

Temperature target

220°C

Heating duration

90 days

Treatment objectives

<50 mg/kg DM

Area

Poggio San Lorenzo - Italy

Future use

Residential

Client

Petroltecnica

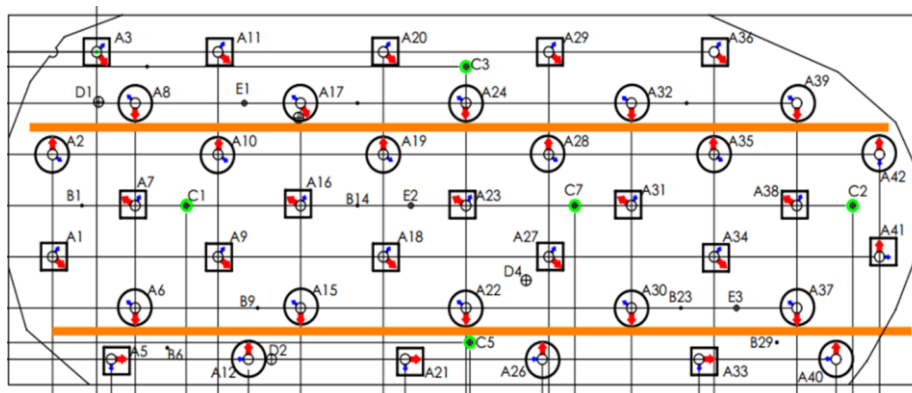
Consultant

SIRAI

Date

2017

Polluted zone



3. Thermocouple tubes (C1, C2, C3, C5, C7), pressure tubes (E2 and E3), primary and secondary heating tubes (A...) display

Analysis results

Analyze description	Unit	Reference value	SC3 - 2m	SC3 - 3m
Size fraction from 2cm to 2mm	% p/p		66,1	66,2
Moisture	% p/p		<0,05	0,12
Benzene	mg/kg	<0,1	0,004	<0,0034
Etylbenzene	mg/kg	<0,5	<0,0034	0,007
Styrene	mg/kg	<0,5	<0,0034	<0,0034
Toluene	mg/kg	<0,5	0,005	0,005
Xylene	mg/kg	<0,5	<0,0068	<0,0068
Total aromatic compounds	mg/kg	<1	0,02	0,02
Hydrocarboms C<=12	mg/kg	<10	<0,68	<0,68
Hydrocarboms C>12	mg/kg	<50	<10	<10

3. First sampling analyses : all values are below the target of 50ppm.

Planning: Installation: 2 weeks - Treatment: 13 weeks

Analyses & reports: 1 week - Demobilization: 2 weeks

Conclusion:

The main issue encountered was the management of the ground water level. The groundwater management system was not efficient, and it had consequences for the soil temperatures, and as such for the project's duration. Indeed, the presence of water close to the working area impacted on the growth of temperatures, especially at 8m depth.

Thermal desorption depends on temperature AND time. Thus, without the possibility to reach the initial target temperature at the deepest points, we compensated by extending the heating time. And we completed with the contractual objectives and even more since the achieved residual concentration were all under 50ppm: the measured concentration were below the laboratory equipment detection limits.