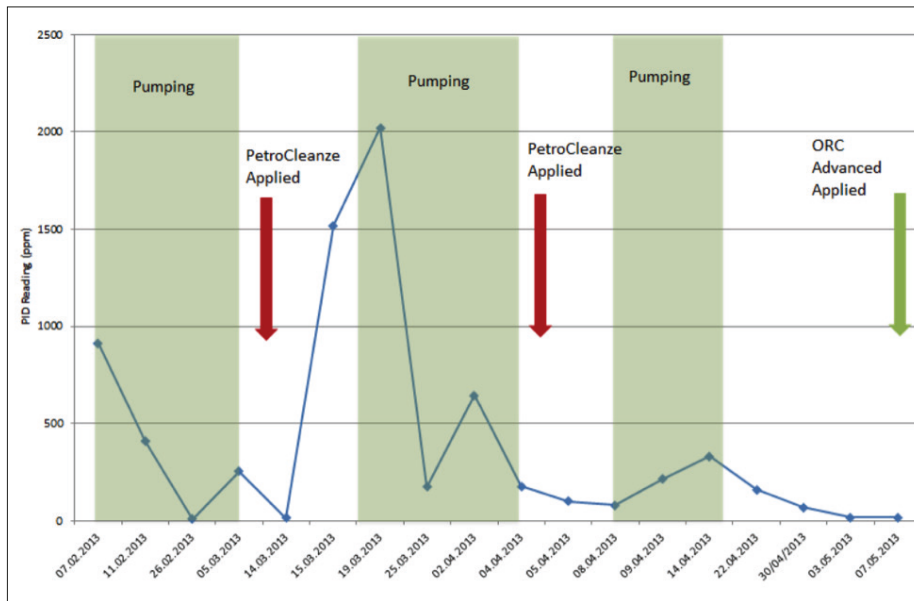


In-situ Remediation of of Petroleum Hydrocarbons in Deep Chalk From LNAPL to <1,000 µg/L in 7 Months



Summary

A former petrol filling station (PFS) site, due to be redeveloped to make way for a housing development, was believed to have a history of leaks in a number of the Above Ground Storage Tanks (ASTs) and Underground Storage Tanks (USTs). A site investigation showed high concentrations of petroleum hydrocarbons, indicative of the presence of free phase product. The SI results confirmed that the petroleum hydrocarbons had percolated through the unsaturated zone, impacting groundwater in the chalk aquifer at 18m BGL. It was determined that benzene was the risk driver and a stringent remedial target was derived, including a significant reduction in total petroleum hydrocarbons (TPH).

Treatment

The consultant designed a remedial strategy comprising the operation of a Pump and Treat (P&T) system, enhanced with PetroCleanze, followed by an application of ORC Advanced in order to accelerate the natural attenuation of the residual groundwater contamination. Down and cross-gradient of the treatment zone, sentinel wells were drilled at the site boundary to monitor the PetroCleanze and abstraction treatment. These were also used for ORC Advanced application later in the project.

What's Special?

In less than three months, two PetroCleanze applications and three phases of pumping had produced a dramatic reduction in contaminant concentrations, reaching the remedial target for benzene. ORC Advanced was then applied to continue the degradation of the residual contamination in the groundwater.

There has been no desorption from a potential secondary adsorbed groundwater source and contaminant levels continue to decline. By incorporating PetroCleanze as an amendment to maximise the efficacy of the P&T system, Land Clean were able to rapidly reach remedial targets, demobilise the P&T system in only a few months and shorten the remediation programme.

Remediation Details

Site Type:

Former Petrol Fuelling Station

Project Driver:

Plume migrating offsite/impacted aquifer

Remediation Approach:

Enhanced Abstraction and Accelerated Aerobic Natural Attenuation

Technologies: PetroCleanze and

ORC Advanced

Geology

| | |
|---|---------|
| X | Bedrock |
| | Gravel |
| | Sand |
| | Silt |
| | Clay |

Medium

| | |
|---|----------------|
| X | Groundwater |
| | Saturated Soil |
| X | Vadose Zone |

COC

| | |
|---|------------------|
| X | Petro HCs |
| X | Petro LNAPL |
| | Chlorinated VOCs |
| | Metals |

COC Concentration Levels:

40,000 µg/L TPH and
1,600 µg/L Benzene

Treatment Depth:

18 m

Area Treated:

1,350 m²