Enhanced Abstraction of Chlorinated Solvents using PetroCleanze

An extensive chlorinated solvent plume is treated by pump-and-treat augmented with PetroCleanze injections

Geology	Gravels
Contaminant Of Concern	Chlorinated VOCs (Chlorinated Ethenes and Monochlorobenzene)
COC Range	D/L NAPL
Target Level	2m BGL
Treatment Area	4,760m^2
Former Site Use	Chemical Works
Project Driver	Redevelopment
Product Design details	PetroCleanze & 3DMicroemulsion
Medium	Groundwater
Remediation Cost	c. £150,000

Summary

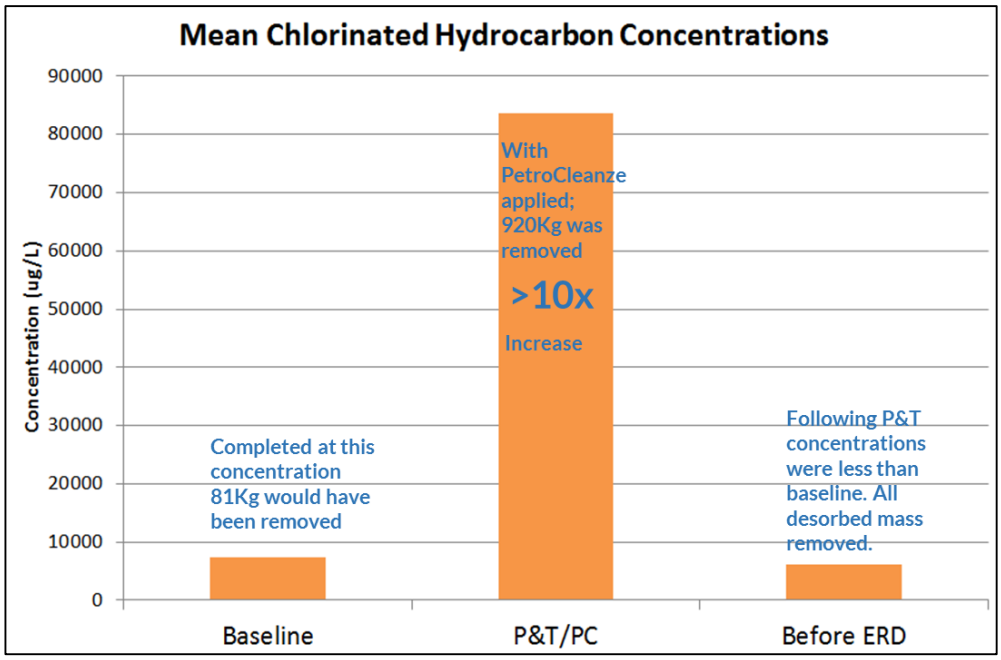
A former chemical works site in England was to be redeveloped as residential properties. During the operational life of the works, the underlying groundwater had become impacted with a wide range of contaminants, including chlorinated solvents, which were found to be providing significant risk to the environment and human-health. The remediation approach chosen was a fixed period of Pump and Treat (P&T) in order to provide a significant reduction in the contaminant mass onsite. In order to maximise the amount of contamination removed, PetroCleanze was injected to temporarily increase desorption of the adsorbed mass. This could then be pumped out by the system, making it more effective. The treatment would then be followed by enhanced reductive dechlorination (ERD) using a single application of 3DMicroemulsion.

Treatment

The pump and treat system was operated on a 10 m grid of boreholes across a site approximately 70 m by 40 m in an 'L' shape, with PetroCleanze applied on a 5 m grid using direct push injection. The abstraction pumps were operated at a high flow-rate for a number of weeks and then the PetroCleanze was applied, at which point the pump-rate was reduced to a minimum. Two weeks were allowed for desorption to take place and then the pumps were switched back up to a high rate to remove the contamination. This process was repeated twice.

Results

During the PetroCleanze application phases, groundwater monitoring showed that the concentration of chlorinated solvents, in the dissolved phase, was increased dramatically due to desorption. After pumping, the final dissolved phase concentration was lower than the baseline, showing that all of the desorbed mass was abstracted by the P&T system.



This means that more chlorinated solvents were abstracted than would have been the case had PetroCleanze not been used. By comparing the mean concentration before and during the treatment, it can be seen that the PetroCleanze allowed the P&T system to remove around 10 times more chlorinated solvents than had it been operated without enhancement. This then gives the ERD phase of works an excellent 'head start' by reducing the amount of adsorbed or free phase mass needing to be remediated.

For more information or to discuss your project, please contact:

Gareth Leonard
Regenesis
Managing Director, Europe

gleonard@regenesis.com
+44 (0) 1833 630 411