

Laboratory biological feasibility analysis of the in-situ remediation of chlorinated hydrocarbons (CHC) on environmental damage

Enhanced Natural Attenuation | qPCR | Bioaugmentation

Project description

Aim: To investigate alternative technologies to replace traditional methods of remediation such as, pump and treat. These alternatives are based on promising field studies and involve the laboratory study of material collected from a CHC contaminated site, to determine the rate of CHC degradation.

These new technologies employ autochthonous microorganisms supplemented with cofactors and ozone bioaugmented laboratory cultured bacteria.

Due to the relatively low soil pH, at the site under investigation, a pH neutralizing study was also carried out.

CHC degradation tests were performed under anaerobic conditions, where sample preparation and incubation were done in the presence of nitrogen. The material used in the study, contained active substances and cultures of *Dehalococcoides mccartyi* bacteria, typically found at CHC contaminated sites with evidence of complete dechlorination.

Simple laboratory techniques were used to determine bacterial numbers; whereas, qPCR technology was used to evaluate the rate of CHC degradation.

Ethene and free chlorine were used as controls in the degradation study and were also analyzed.

The results ascertained from the calculation of degradation kinetics, were used to recommend a different approach for measuring the outcome of remediation.

Client

Tauw GmbH, Germany

Order size:

6,500 Euro net / 5 variants, CHC

Time period:

15 weeks



Project areas

Action coordination, conceptual design; sampling, processing lab analysis; result evaluation and recommendations for field action.

Material for study

- 2 kg of soil taken from the site
- 10 L contaminated ground water

Services rendered

- Location data analysis
- Remediation concept
- Reviewing the specific needs of the customer
- Sampling and preparation (if required)
- Laboratory Investigation of process engineering
- Laboratory analysis of harmful and accompanying substances
- Documentation

Customer's tasks

- Determination of the site-specific degradation potential and possible deficiencies
- Integration of results with reconstruction concept
- Need-adjustment of active substance application from start of remediation
- Securing the effective remediation rate

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