

# Redevelopment of Former Manufacturing Facility, Northern Italy

## Low concentration chlorinated solvent treatment via ERD



### Summary

Industrial activities at a former industrial site undergoing redevelopment in Northern Italy resulted in chlorinated solvent groundwater contamination requiring remediation. Contamination consisted of chlorinated constituents 1,2-Dichloropropane at 9 µg/L and 1,1-Dichloroethene at 1 µg/L.

However, the aquifer also showed a marked concentration of a competitor electron acceptor (approx. 1,000 µg/L sulphate). Due to very low target contaminant concentrations and difficult geology, physical and chemical remediation methods were rejected, and in-situ anaerobic bioremediation using Regenesi's 3-D Microemulsion was deemed the most cost effective approach.

### Treatment

A total of 17,000 L 3-D Microemulsion was applied by Direct-Push into 26 No. injection points in a grid configuration with 3m by 3m spacing. Target treatment depth was 2m to 6m BGL within a saturated soil matrix with clay lenses formation.

### Overcoming Challenges of Low Concentrations in Low Permeability

The challenge of treating very low contaminant concentrations within a low permeability formation was overcome by enhanced anaerobic bioremediation. Additionally, a mix of contaminants and competing electron acceptors did not hinder the performance of 3-D Microemulsion. Remedial works were completed in 2012 and long-term monitoring is ongoing.

### Remediation Details

#### Site Type:

Former industrial facility

#### Remediation Driver:

Site redevelopment

#### Remediation Approach:

Anaerobic Bioremediation / Enhanced Reductive Dechlorination (ERD)

#### Technologies:

3-D Microemulsion®

### Geology

	Bedrock
	Gravel
X	Sand
	Silt
	Clay

### Medium

X	Groundwater
	Saturated Soil
	Vadose Zone

### COC

	Petro HCs
	Petro LNAPL
X	Chlorinated VOCs
	Metals

#### COC Concentration Levels:

Dichloropropane - 9 µg/L

Dichloroethene - 1 µg/L

#### Treatment Depth:

2m to 6m BGL

#### Remediation Cost:

€30,000