

# Active Wall

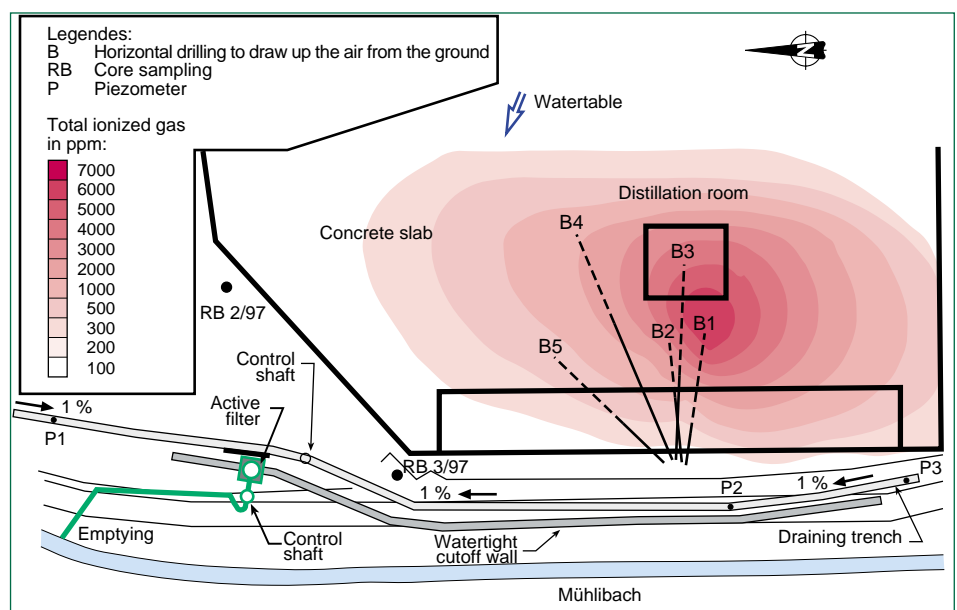
## SOLVA CHEMIE-BÄTTERKINDEN PLANT

BERNE CANTON - SWITZERLAND



### Decontamination of ground water polluted by chlorinated Solvents (vinyl chloride, trichlorethylene, cis 1-2 dichlorethylene)

The solvent reprocessing plant belonging to Solva Chemie is located at Bätterkinden, between Soleure and Berne. Until 1992, without a protective concrete slab, plant subsoil was polluted by chlorinated solvent infiltrations. The source of contamination having run dry, ground water was still polluted by a mixture of chlorinated solvents that canton authorities requested to be eliminated in accordance with the Swiss Federal order on contaminated sites that came into effect on 01/10/98.



Operation diagram

#### Project design

The Geotechnisches Institut studied several solutions and proposed treatment of the natural ground water to the authorities, via an active wall through which solvents would be eliminated.

The characteristic feature of this site is a ground water table with a low flow rate (about 10 l/mn for the whole site) flowing towards Mühlilbach, a subsoil with average perviousness and watertight substratum.

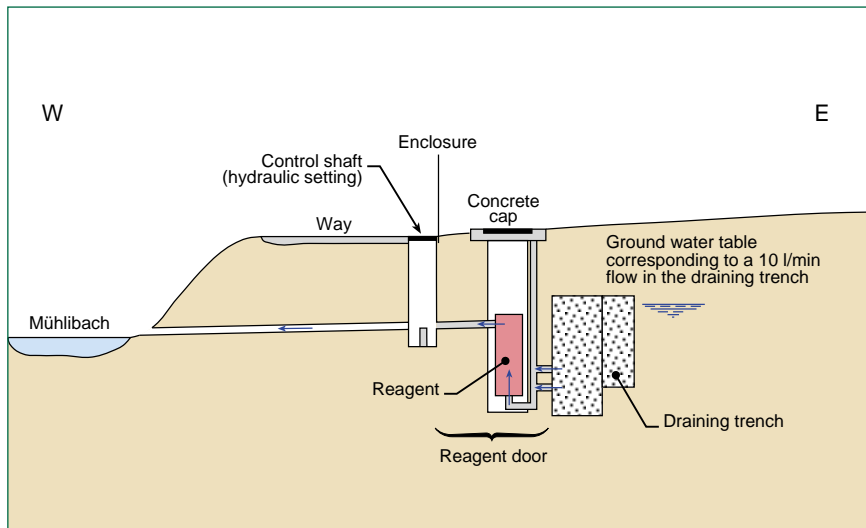
After agreement from the authorities, the Geotechnisches

CLIENT:	SOLVA CHEMIE
ENGINEERING CONSULTANT:	GEOTECHNISCHES INSTITUT
PRODUCT USED FOR TREATMENT:	RHODIA ATE
WORK PERFORMED BY:	SIF GROUTBOR
DATE OF WORKS:	JUNE 1999

#### WORK PERFORMED:

- Draining trench ..... : 150 ml
- Slurry wall ..... : 100 ml
- Depth ..... : 5 m
- 1 filtering gate with outlet and inspection well.





Schematic section



View of installed treating product

Institute chose the solution proposed by Sif Groutbor (Solétanche Bachy subsidiary), associated with ATE, of installing a filtering gate.

### Filtering gate

This system includes the following:

- a water-collecting drainage system: horizontal drilling and draining wall,
- a slurry wall,
- a filtering gate built according to the patented panel-drain technology, containing a filter with a volume of 1 m<sup>3</sup> and weighing about 5 tons, through which water can filter. The also patented treating product is Iron with an added set of catalysts, enabling to lower pollutant levels to canton administration-permitted thresholds. The whole unit is gravity-operated, is always accessible via the top and requires minimal maintenance.
- a discharge system including an observation well and gravity flow towards Mühlbach.

### Treating product

Rhodia ATE has developed a process based on lowering chlorinated compounds using iron with catalysts, which has the following characteristics:

- Highly reactive Iron: half-life of most solvents doesn't exceed 5 mn. Accordingly, the amount of product to be used is fully compatible with their use within filtering gates designed by Solétanche Bachy (Keops process).
- A great range of treatments which, notably, eliminate vinyl chloride via this product (see analysis table here-below), thanks to the use of specific catalysts.

### Performing work

After building drainage and slurry walls, in order to collect water via pumping, then treat it temporarily on active carbon, the following work was performed:

- digger excavation of a slurry panel and lowering the filtering gate,
  - after drying, the 10-30 gravel upstream drain enabled to open the gate, then link it to the draining trench by removing watertight insulation floors,
  - an observation well and 30-m long gravity flow, downstream,
  - installing a filter inside its receptacle.
- Various manholes, both upstream and downstream, enable to check the correct size and take samples confirming the system's efficiency.

**The whole system is guaranteed for ten years**

Dissolved elements (µg/l percentage)	Upstream	Downstream
Vinyl chloride	3	0,23
Trichlorethylene	94	0,46
Cis 1-2 dichlorethylene	199	2
Perchlorethylene	25	0,16
1.1.1. trichlorethane	9	0,22
Methylene chloride		0,08
1.1 dichlorethane	0,67	0,5
trans 1.2 dichlorethylene	0,21	
Chloroform	0,39	
1.2 dichloropropane	0,12	

Analysis results after 15 days of operation



View of filter holder