

# Groundwater Remediation on the Raschig Company Premises in Ludwigshafen



BAUERUmweltgruppe

<b>Client:</b>	Federal State Rheinland-Pfalz / City of Ludwigshafen / Raschig GmbH, Germany
<b>Engineering Design and Supervision:</b>	FWS Filter- und Wassertechnik GmbH
<b>Scope of Works:</b>	Operation of a Groundwater Remediation Plant with Skimming of Light Non-Aqueous Phase Liquids and Groundwater Treatment
<b>Contract Period:</b>	since September 1997



### Project

Since 1997 treatment of a BTEX, Chlorobenzene, LHKW and Naphthalene contaminated groundwater is carried out on the Raschig company premises in Ludwigshafen a cleaning of. The maximum throughput of groundwater in the treatment plant amounts to 140 m<sup>3</sup>/h.

### Remediation Site

The groundwater impurities date from the Second World War. Groundwater remediation became necessary because of the hazardous potential of the existing contamination for the surrounding drinking water wells

### Result

FWS Filter- und Wassertechnik SIPEX technology is used for recovering and collection of the light non aqueous phase liquids. The contaminated groundwater is recovered by 15 wells out of different horizons (6 and 20 m bgl) and led to the remediation plant.

Corresponding to the contaminant concentration the groundwater is collected in two different reservoirs. The treatment plant is divided into two units. The higher contaminated groundwater is led through a high performance unit (approx. 30 % of the groundwater) and the minor contaminated groundwater is led to a low performance unit (approx. 70 % of the groundwater). The high performance unit is equipped with a vacuum stripper, catalytic oxidation, a gas washer and a vapour phase activated carbon stage with impregnated activated carbon for the treatment of halogenated VOC's. The low performance unit uses common vapour phase activated carbon.

The residual contamination is treated by gravel filters with sludge conditioning and a following liquid phase activated carbon stage. The treated water is then discharged into the receiving water or in the public duct system according to the official regulations.

24 hour a day with a technician. Approximately 100% plant availability are guaranteed by these measures.

Additionally optimisation and improvements are discussed and realised in a regular specialist meeting of all project participating clients and contractors.



Contaminant removal adds to 120,000 kg considering the main contaminants Dichloromethane, Monochlorobenzene, Naphthalene, BTEX, VOC's. Additionally 48,000 kg free phase was recovered.



41 % of a total amount of 5,577,000 m<sup>3</sup> (translating to 85 m<sup>3</sup>/h in average) of the treated water was discharged into the public duct system and 59 % into the Rhine river.

Process monitoring takes place by means of process visualisation, inclusive remote control. Regular maintenance by a FWS engineer guarantees the reliable plant operation. Furthermore an automatic alarm system is installed, which communicates