

Groundwater Remediation and Soil Vapour Extraction in Essen, Germany



BAUERUmweltgruppe

Client:	AAV Altlastensanierungs- und Altlastenaufbereitungsverband NRW, Hattingen, Germany
Engineering Design and Supervision:	Dr. Heckemanns & Partner GmbH, Essen
Scope of Work:	Treatment of Contaminated Soil Vapour and Groundwater with Infiltration of the treated Water
Contract Period:	October 2004 until October 2006



Project

Before the remediation equipment could be installed the existing building development had to be deconstructed and the area had to be cleared. Subsequently, a drainage system for soil vapour recovery was installed. The remaining soil impurities were sealed by a surface sealing with a 2.5 mm strong plastic foil. Remediation of soil vapour and groundwater takes place in two separated treatment plant units.

nants are removed from the water. The resulting off gas is then treated. Remaining pollutants in the water are removed by two liquid phase activated carbon filters downstream. Previously suspended matter is eliminated by a gravel filter.

The plant is supervised by long-distance data transmission (telecommunications) and is equipped with a memory programmable logic controller (PLC).



The groundwater treatment unit consists of a pure water and a back washing basin as well as a gravel and an activated carbon filter. Contaminated groundwater is recovered from approx. 20 m depth. Groundwater contamination was found between 10,000 µg/l and 100,000 µg/l for aromatic hydrocarbons and between 1,000 µg/l and 10,000 µg/l for halogenated hydrocarbon.

Remediation Site

Since 1950 a chemical plant stored various chemicals used for the production of antifreezing compounds and lacquer thinners in the middle of a residential area in Essen Schoenebeck. As a consequence of the production process aromatic hydrocarbons and halogenated volatile hydrocarbons contaminated the soil and the groundwater.

Result

Two soil vapour supply systems deliver contaminated soil vapour to the treatment unit.

The soil vapour is recovered from four contamination hot spots by up to 8 m deep wells.

Two blowers suck the soil vapour through a water separator. Then the gas stream is treated by two vapour phase activated carbon filters and the condensate built in the separator is treated by liquid phase activated carbon. The plant is designed for an air flow of 800 m³/h.

In the southern part of the remediation area 13 pumps feed the contaminated groundwater from depths of 15 to 20 m to the surface and transmit it through a collecting pipe to the treatment plant. In the first process step a possibly existing oil phase is separated from the water and collected in a storage tank. In two stripping units switched into series the contami-



The soil vapour recovery system contains five drainage pipes, each is installed in parallel mode. Air-permeable granulates recover predominantly volatile substances.