

# Basement removal and soil and groundwater remediation at the site of a former steel works



**Client:** GKI Gesellschaft für Kommunale Immobiliendienstleistungen, Hennigsdorf, Germany

**Planning and Supervision:** ARCADIS CONSULT, Potsdam, Germany

**Scope of Works:** Remediation of contaminant source with demolition of old basement and excavation, groundwater control and remediation

**Period of Works:** October 2003 until February 2004



## The Project:

On the site of a former steel works, the remaining basement in the area of the low temperature carbonisation gas unit (1,000 m<sup>2</sup>) which used to house the pumps was to be demolished and removed. In addition, the area was shown to be contaminated with alkyl phenols, polycyclic aromatic hydrocarbons (PAHs) and total petroleum hydrocarbons (TPHs). The area of the former oil recooling plant was contaminated with total petroleum hydrocarbons (TPHs).



*As the ground consisted of fine sands, it was possible to find remediated zones free from any contamination immediately adjacent to floating nonaqueous-phase liquid in the same excavation pit.*

## Background of the Site:

The site had been cleared of all surface structures and was being prepared for development into an industrial and retail park.

## Execution and Result:

To enable the contaminant source - the old basement which used to house the former pumps - to be removed in an open excavation, it was first necessary to lower the groundwater table.

The extracted groundwater contained up to 300,000 µg/liter of alkyl phenols and up to 250,000 µg/liter of total petroleum hydrocarbons (TPHs). After treatment by UV oxidation and active carbon filtration the values were reduced to well below the required limits of 0.1 µg/liter.



*The floating layer of nonaqueous-phase liquid (NALP) was up to 1 m thick. In total, 80 tonnes of nonaqueous-phase liquid were skimmed off.*

As it was possible to establish the optimum effect of UV oxidation for the specific groundwater composition, BMU designed and carried out a series of tests. On the basis of the test results detergents could be added in exact quantities to facilitate the most effective oxidation process.

The up to 1 m thick nonaqueous-phase liquid (NAPL) was skimmed off and recovered from 8 NAPL recovery wells and from a sump in the excavation pit. In total, 80 tonnes of tar and mineral oil were recovered and moved off site. The basement which housed the former pumps was demolished and the rubble was crushed for transport. The various types of materials that had to be removed off site were either taken to an appropriate disposal site, cleaned in a soil washing plant or treated by a thermal process.



**BAUER+MOURIK**  
**UMWELTECHNIK**