

Remediation of a former Nuclear Site in Hanau, Germany



BAUERUmweltgruppe

Client:	NUKEM Hanau GmbH, Germany
Engineering Design:	BAUER und MOURIK Umwelttechnik GmbH & Co
Controlling:	NUKEM Hanau GmbH, Germany
Scope of Work:	Soil Remediation at a former Nuclear Site
Contract Period:	February 2004 to March 2005



Project

After the decision to close and remove the nuclear research and production plant enclosed in the industrial site in Hanau in the year 1988 the permission for the remediation works was given in October 2000. Production and storage buildings were demolished from 2004 after their long term use for nuclear research and production of nuclear power elements. Additionally soil remediation became necessary on the site.



Boreholes were refilled after complete removal of the contaminated material with uncontaminated soil.

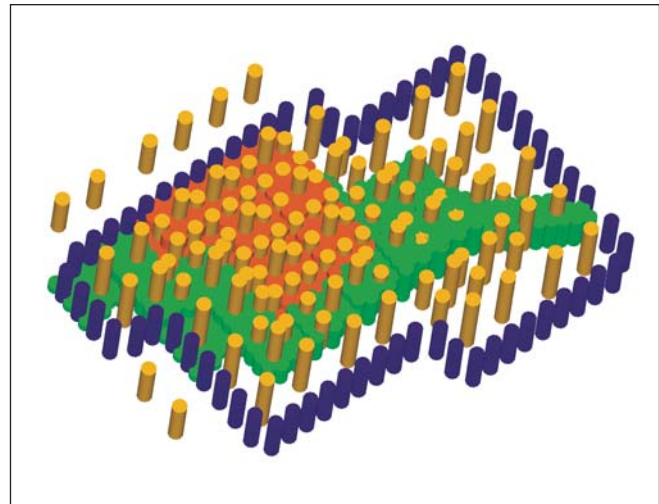
Due to the radioactive contamination high security standards for personnel were necessary. Only personnel with special medical examinations and a so-called radiation monitoring pass were permitted to work on the remediation site. The radioactive dose suffered by the personnel was monitored every day and for all persons. A radiation protection representative of the BAUER Environment Group supervised the ongoing works.



Due to high compaction requirements of the subsequent use of the site the remediated area had to be consolidated by vibrocompaction technology using a BAUER RG22/TR17.

Remediation Site

Radioactive contamination was found in the groundwater saturated zone as well as in the unsaturated zone exceeding the authorised limits. Consequently the replacement of contaminated material with non-radioactive material became necessary. Due to high costs for off site disposal the material had to be separated in radioactive and non-radioactive material. Minimisation of disposal masses was also a major issue to reduce disposal costs. High security standards given by the nuclear laws had to be followed during the remediation process.



Due to results of the up to 10 m deep pre-investigation drillings the remediation drilling scheme was optimised continuously. Thus the remediation cost could be reduced by 50 %.

Result

Remediation in the saturated zone was conducted by replacement drillings. Therefore a pre-investigation scheme was drilled and examined to give a comprehensive overview of the contamination. After identification of the contamination hot spots the contaminated material was replaced by drilling (\varnothing 1500 mm) with casing pipe technology. The boreholes were refilled with uncontaminated soil. Due to the high compaction requirements of the subsequent use of the site the remediated area had to be consolidated by vibrocompaction technology.

For closer site investigation and documentation of the remediation works as well as for the proof of remediation success the BAUER-tachymeter measuring system was successfully used. The expected disposal masses could be reduced by more than 50% by the use of this system.

Soil replacement in the unsaturated soil zone was carried out by conventional excavation technique. Evaluation of soil contaminations and the disposal of the material was accomplished by the client. The necessary intermediate storage and all transport logistics on the remediation site (feeding of the conveyor belt measuring system and loading material for off side disposal) were provided by BAUER und MOURIK Umwelttechnik.