

Bitterfeld megasite

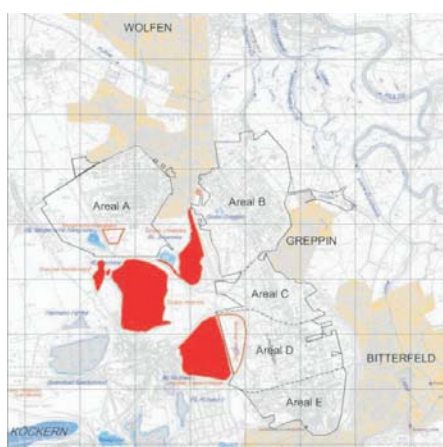


Megasite description

The former industrial plants "Chemiekombinat Bitterfeld" and "Filmfabrik Wolfen" are situated in the center of East Germany. The availability of lignite as energy source was the main factor for the development of the chemical industry at the site. Industrial exploration of the site was begun more than 100 years ago and has resulted in the development of three main industries:

- open-cast lignite mining;
- production of energy;
- chemical industries.

Up to 1990, in an area covering about 10 km², more than 5.000 different products and compounds were produced.



Distribution of contaminants

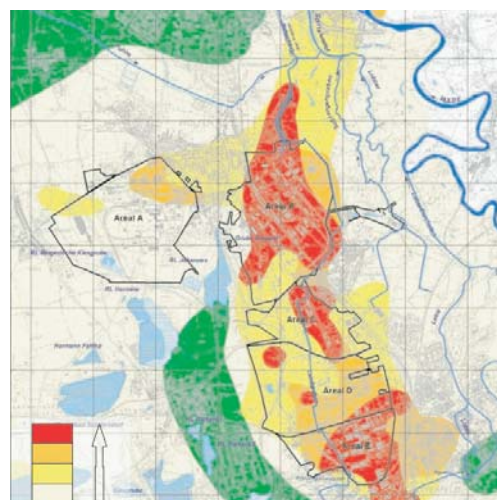
A large-scale soil as well as groundwater contamination, estimated about 100 million m³ of contaminated water, resulted from chemical production at the site. The megasite includes more than 15 chemical waste disposal landfills in abandoned open-cast lignite mines (e.g.

"Johannes", "Antonie", "Hermine", "Greppin").

Major contaminants are:

- Aromatic Hydrocarbons (BTEX);
- Chlorinated aliphatic compounds;
- Chlorobenzenes.

Almost all substances that were produced onsite, can be found in the groundwater today.



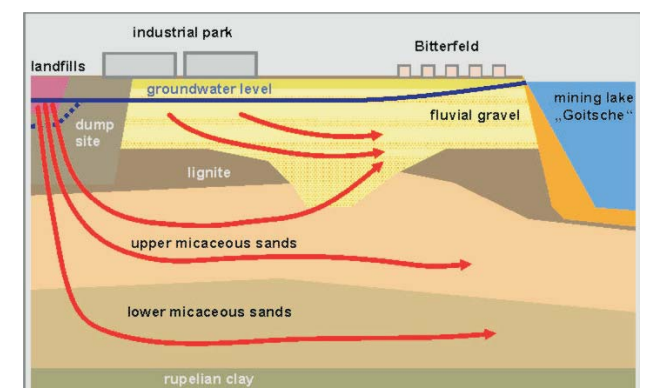
The remediation of the megasite is managed within a large-scale ecological project. The LAF (State Authority for Exemption from Pollution Liability) has the technical and financial responsibility for the general remediation framework. The MDSE Ltd., as the project manager of the site, is in charge of remediation measures and site investigation.

Ground- and surface water situation

Two main aquifers divided by a lignite layer are presented in Bitterfeld:

- Quarternary Aquifer;
- Tertiary Aquifer.

The base of the Tertiary Aquifer consists of a Rupelian clay barrier. The flow direction of the groundwater is partly directed to the receiving river Mulder and partly to the Goitsche lake. Discontinuation of the pumping measures related to the mining activities in the past, now causes a rising of the groundwater table and a change in groundwater flow direction.



Conceptual model of the Bitterfeld site.

Different systems of running waters (Strengbach/Leine, Lobber, Schlangengraben, Fuhne/Spittelwasser, Schachtgraben, Mulde) must be considered as well as different abandoned and flooded open-cast lignite mines (Freiheit II, Goitsche, Johannes mine "Silver lake"). For some of the running waters, influence of the groundwater was determined.

Risk assessment

The risk assessment of the groundwater of the Bitterfeld megasite includes a tiered approach consisting in the following four steps:

1. Risk based assessment of groundwater regarding EU-threshold values.
2. Risk based site assessment.
3. Transfer based assessment of potential receptors.
4. Derivation of suitable and acceptable remediation measures.

By derivation of risk clusters, which include potential receptors of concern, an optimal set of remediation measures is defined for each cluster using the IMS-approach of the WELCOME project.

