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Long term sustainable approaches to soil and groundwater remediation – military site example

Janusz Krupanek (1), Mariusz Kalisz (1), Lauge Clausen (2), Stefan Trapp (3), Marcel Stalder (3), Manfred Flum (3), Eugeniu Martac (4), and Nicolas Fatin-Rouge (5)

(1) Instytut Ekologii Terenów Uprzemysłowionych Poland, Katowice, Poland (krupanek@ietu.katowice.pl), (2) Technical University of Denmark, Lyngby, Denmark, (3) SolGeo AG, Solothurn, Switzerland , (4) Fugro Consult GmbH., Mössingen, Germany, (5) Université de Franche-Comté, Institut UTINAM, Besançon, France

Successful and sustainable revitalisation of degraded postindustrial and postmilitary areas requires improvements in approaches of their reclamation. It concerns both characterization of the problems occurring at a given site, planning of remediation in regard to selected land use functions. These issues are the concern of scientific project " Tailored Improvement of Brownfield Regeneration in Europe - acronim TIMBRE, to be carried out in the years 2011-2014, and funded by 7th European Union Framework Program for Research and Technology Development.
One of the objectives of the project is to strengthen development and practical application of cost-efficient and sustainable remediation strategies for contaminated megasites. Solutions researched in the project are applied in practical cases of contaminated areas. One of the model sites is the former soviet army airbase in Szprotawa, Poland.
The history of the airfield in Szprotawa started in 30-ties of the XX century when German airfield was established with intensification of military activities after the Second World War when the area was developed as soviet major air base in the region. Careless conduct of the military operations lead to extensive contamination of the site with soil and groundwater degradation threatening water resources.
Basic remediation of the site was performed in the late 90-ties of the XX century with stripping of the free product in the source zone area. The action was focused on removal of the source and successful in reducing the risk of spreading the contamination in groundwater towards drinking water wells in the nearby villages. Nevertheless, the residual contamination, although diminished through natural processes, still remains at the site lowering essentially soil quality.
The results of site characterization performed in the project were used for defining environmental constrains and/or requirements for environmental acceptable status with regard to desirable land use scenarios. On this basis remediation needs were formulated, and technological options of remediation are determined with focus on cost-efficiency and sustainability.
The site is a good example of challenges of combining brownfield redevelopment with long term natural attenuation. The main challenge today is to plan in a sustainable way, further development of the site with regard to the remaining contamination. The key issue is the potential of long term natural regeneration of the site, with respect to activities to be carried at the site including infrastructure development, nature protection, management of the forested area.
Timbre project approach applied to the site incorporates various aspects within GIS based tool, site characterization, modeling of remediation processes, risk assessment and testing selected aspects of remediation.