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**Sanace skládky Písečná  
Remediation landfill Písečná**

**Rigorózní práce  
ABSTRACT**

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## ABSTRACT

Waste landfilling on unsecured landfills caused huge pollution of soil and groundwater on many places in the Czech Republic. The landfill Písečná is one of examples of a negative impact and environmental hazard caused by improper hazardous waste management. The majority of waste was formed by galvanic sludges and degreasing agents. The landfill is located in the area of a former quarry.

Hazardous waste landfilling without any technical measure to prevent toxic compounds leakage to groundwater started in late 70ies of the 20. century. Several surveys carried out in the 90ies of the 20. century confirmed the assumption that the site represents a significant risk to the water source Letohradsko.

The aim of this study was to comprehensively assess the progress and results of remedial methods, particularly in relation to the quality of groundwater in the immediate vicinity of the landfill, which is exploited by distant water sources of drinking water.

In the first phase of remediation work a thorough excavation of deposited wastes was carried out, which has significant practical and immediate positive impact on groundwater quality in selected hydrogeological wells. However, because high concentrations of contaminants in groundwater at the site remained, a second phase of remediation works has been launched. The second phase of remediation included venting and pump&treat of groundwater. Further reduction of chlorinated ethene concentrations has been achieved but the efficiency was rather low. The next stage of remediation was injection of zero-valent nano iron to selected wells with the aim to create reductive conditions in groundwater polluted with chlorinated ethenes. Nano iron is oxidized and electrons are produced. These electrons dechlorinates chlorinated compounds to non chlorinated ones.

The results of a pilot test proved fitness for use on the site. After the first round of nano iron injection groundwater quality improved but later the rebounding appeared. Due to presence of free phase in the aquifer and chlorinated alkanes in groundwater even second round of nano iron injection probably would not achieve remediation goals and further remediation will be needed in future.