



Decreasing the contamination and toxicity of a heavily contaminated soil by in situ bioremediation

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An experimental plot of 140 m² consisting of acidic soil heavily contaminated with uranium, non-ferrous metals (mainly Cu, Zn and Cd) and arsenic was treated in situ under real field conditions using the activity of the indigenous soil microflora. This activity was enhanced by suitable changes of some essential environmental factors such as pH and water, oxygen and nutrient contents of the soil. The treatment was connected with solubilization and removal of contaminants from the top soil layers (horizon A) due to the joint action of the soil microorganisms (mainly acidophilic chemolithotrophic bacteria) and leach solutions (diluted sulphuric acid). The dissolved contaminants were transferred to the soil horizon B and were removed from the soil profile through a system of drainage collecting pipes. The contaminated soil effluents were treated by means of a multi-component passive system consisting of an anoxic alkalizing drain, a permeable reactive multibarrier and a rock filter. The contamination and toxicity of the soil were regularly tested during the cleaning procedure and were considerably decreased at the end of the treatment.