1. Research project objectives/ Research hypothesis (in English)

The project is aimed at assessing role of soil microorganisms in spontaneous colonization of smelter wastelands by plants and gentle phytostabilization of the wastelands and heavily contaminated soils. It is assumed that impact of microorganisms on ability of plants to grow in this toxic environment is substantial and, so far, not sufficiently recognized. The detailed objectives include:
evaluating microbial diversity in rhizosphere on smelter wastelands, determining microorganisms contributing to colonization of wastelands by spontaneous plant species and in gentle phytoremediation systems,
evaluating role and impact of soil microorganisms on trace element bioavailability and plant growth in smelter wastes, assessing potential for supporting gentle phytoremediation of wastelands by rhizosphere inoculation with microorganisms.

2. Research project methodology (in English)

The project involves field studies on the smelter wastelands, greenhouse pot experiments and laboratory measurements and tests. Soil (waste) and plant samples will be handled and analyzed and data integrated within the 5 project tasks. The field studies will include smelter wastelands in Piekary (slags) and Dołki (flotation waste), covering both spontaneous plants and long-term phytostabilisation experiments.

3. Expected impact of the research project on the development of science, civilization and society (in English)

Current state of art refers to screening plant species spontaneously colonizing the wastelands or soil amendments reducing metal solubility. The proposed project makes a major step forward, offering new information within these areas through deep study of microbiological aspects of wasteland management.