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MINOTAURUS: MICROORGANISMS' IMMOBILIZATION: NOVEL TECHNIQUES AND APPROACHES FOR UPGRADED REMEDICATION OF UNDERGROUND - AND WASTEWATER AND SOILS

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Abstract

MINOTAURUS aims to deliver innovative bio-processes (bioaugmentation, enzyme technology, rhizoremediation with halophytes, and bioelectrochemical remediation), which are all based on the concept of IMMOBILIZATION OF BIOCATALYSTS (microorganisms and enzymes), to eliminate emerging and classic organic pollutants. The immobilization-based technologies are/will be applied to engineered (ex-situ) and natural systems (in situ) for the bioremediation of groundwater, wastewater, and soil. The selection and adaptation of modern physico-chemical, biological, and ecotoxicological monitoring tools combined to a rational understanding of engineering and enzymology/microbial physiology aspects is a pertinent approach to open the black-box of our technologies. The reliable process-monitoring constitutes a solid basis to develop and refine our biodegradation kinetics models, which will be the mean to improve the predictability of performances to be achieved with our technologies. A key strength of MINOTAURUS is the possibility of direct implementation of our technologies at five EU reference sites that are confronted with pollutants (two technologies will be tested on-site during the first year). We will deliver not only a set of tools, techniques and processes which will enhance the ability of our communities to respond to the challenges of organic pollutants but also frameworks for structuring and making evidence-based decisions for the most sustainable and appropriate bioremediation measures. MINOTAURUS consortium consists of sixteen partners from eight European and Europe-associated countries. Nine research & education institutions, five SMEs covering the whole chain of our bioremediation approaches (production/monitoring of biocatalysts, bioremediation, and engineering), one large end-user installing wastewater treatment plants, and one environmental agency will work together with the support of an advisory board mainly consisting of environmental decision-makers.
