

MICROBIAL COMMUNITIES OF SOILS AND ACID MINE DRAINAGE BIOREMEDIATION

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As a result of restructuring in 1990-2000 and occupation in 2014 the coal-rich Donetsk Basin saw massive mine closures. Leaving behind acid mine drainage, dam failures, non-remediated areas and cases of direct discharges into waterways that could lead to serious and long-term environmental impacts. The elimination of mines leads to changes in natural conditions for the living organisms and the formation of unfavorable environmental situations, such as.[1]

Acidic mine drainage occurs naturally in some environments as part of rock weathering, but is enhanced by large-scale soil disturbances common in mining [2]. Acid mine drainage neutralization depends on its chemistry, electron donors / receptors, temperature, and pH. Iron-reducing bacteria and sulfate-reducing bacteria form the root component of these bioreactors. Acidophilic heterotrophic bacteria promote the oxidation of ferrous to ferric iron in acidic waters.

Different cleaning methods exist, but active cleaning methods are expensive, require regular maintenance such as chemicals, mechanical systems, labor intensity to keep them running continuously. Passive, treatment use the ability of microorganisms to generate alkalinity and immobilize metals. They require low construction costs, ease of operation and maintenance, with good processing efficiency [3].

Passive treatment systems provide a controlled environment innatural chemical and biological reactions that help in the treatment of acid mine drainage can occur. The design selected will ultimately depend upon site characteristics and other specific criteria [4].

Mining sites left without proper care are flooded, leaving behind acid mine drainage, dam failures, seepage, and could lead to serious and long-term environmental impacts. We are essentially looking at ways of stimulating existing microorganisms to clean up potential waste. Bioreactors and different bacteria that are usually used in biomining can perform a vital role in remediation of mining sites.

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