

Reclamation of Sulfur Borehole Mine Sites and Environment Consequences of S Extraction¹

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Abstract: Sulfur contamination of topsoil, spatial distribution of contamination and surface water chemistry were investigated on an area of over 200 ha of a new forest ecosystem. Common birch and Scots pine growth reaction, vitality, and nutrients supply, as well as wood small-reed (*Calamagrostis epigejos* (L.) Roth) chemical composition were assayed. The chemistry dynamics of soil leaching and the sulfur load leached from the sulfur-contaminated soil-substrates were analyzed. The remediation effect of the birch and pine litter was assayed in an experiment under controlled conditions. It was found that reclamation was effective in a majority of the post-mining site, however hot spots with sulfur contamination reaching even 45,000 mg kg⁻¹, pH <2.0, and EC 6,500 μ S cm⁻¹ were reported. Surface waters typically displayed elevated concentrations of sulfate ions (average 935 mg L⁻¹), calcium ions (up to 434 mg L⁻¹) and high EC (average 1.8 μ S cm⁻¹), which was connected both with sulfur contamination and sludge lime used in neutralization. Wood small-reed was found to be species adapting well to the conditions of elevated soil salinity and sulfur concentration. We noted that an addition of organic matter had a significant impact on the chemistry of soil solutions but did not indicate in short term experiment a remediation effect by increased sulfur leaching³.

Additional Key Words: sulfur; reclamation; acid mine drainage, salinity, soil contamination.

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