Evaluation of the Environmental Risk from the Co-Deposition of Waste Rock Material and Fly Ash

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Abstract : The lignite-fired power plants in the Western Macedonia Lignite Center produce more than 8 106 t of fly ash per year. Approximately 90% of this quantity is used for restoration-reclamation of exhausted open-cast lignite mines and slope stabilization of the overburden. The purpose of this work is to evaluate the environmental behavior of the mixture of waste rock and fly ash that is being used in the external deposition site of the South Field lignite mine. For this reason, a borehole was made within the site and 86 samples were taken and subjected to chemical analyses and leaching tests. The results showed very limited leaching of trace elements and heavy metals from this mixture. Moreover, when compared to the limit values set for waste acceptable in inert waste landfills, only few excesses were observed, indicating only minor risk for groundwater pollution. However, due to the complexity of both the leaching process and the contaminant pathway, more boreholes and analyses should be made in nearby locations and a systematic groundwater monitoring program should be implemented both downstream and within the external deposition site.

Keywords : co-deposition, fly ash, leaching tests, lignite, waste rock

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