

Impact of residual coal extraction from hard coal mining waste dumps on groundwater salinity

Sebastian Stefaniak*, Irena Twardowska

*Polish Academy of Sciences, Institute of Environmental Engineering, 34 Curie-Skłodowska St., Zabrze, 41-819, Poland
Tel +48 322716481; Fax +48 322717470; email: sebstef@ipis.zabrze.pl, irena @ipis.zabrze.pl*

Received 21 January 2010; Accepted in revised form 5 November 2010

ABSTRACT

Re-mining of existing dumping sites for the extraction of coal residues (around 10% wt.) with subsequent reuse of a secondary waste in engineering constructions or its re-disposal in the environmentally safe way is an attractive and economically viable way of coal protection as a valuable natural resource and of adequate reduction of dumped waste volume. These methods of bulk waste re-use may though cause also negative consequences, if not properly controlled. In this article, the adverse environmental impacts of technological processes of coal extraction are exemplified in a coal mining waste dump in the Upper Silesia coal basin (USCB) in Poland, where coal waste has been reprocessed since 1998. Both the disturbance of original waste layers in the dump and altered exposure of the processed rock material to the atmospheric conditions during residual coal extraction, and secondary wastes re-disposal/re-use appeared to result in significant increase of groundwater salinity. Therefore, adverse effects of waste re-use and efficient and cost-effective methods of attenuation of salt loads release from this material should be taken into account.

Keywords: Coal; Coal mining waste; Coal re-extraction; Disposal and reuse of secondary wastes; Salt leaching; Groundwater salinization

* Corresponding author.