

Towards a framework for the comprehensive classification of tailings deposits: methodology and outlook

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The mining industry is one of the world's largest producers of waste with an estimated amount of 20-25 Gt mineral waste per year (Lottermoser 2011). Much of the processed mineral waste is typically stored in tailings storage facilities (TSF). The subject of this study is an active TSF in Erdenet (Mongolia), which services one of the world's largest copper mines and represents one of the world's largest dams, with a dam height of 100 m and a tailings content of currently 0.83 Gt. TSFs in general can be regarded as anthropogenic mineral resource deposits due to their residual metal content or alternative valorisation pathways for the contained tailings. Unlocking the resource potential of tailings is the goal of the research project ADRIANA. A consortium of seven German and Mongolian academic and industrial partners is developing a cost-efficient methodology to explore the resource potential of tailings with the help of the aforementioned case study site Erdenet. One specific research question aims to establish whether the TSF constitutes a future *reserve* or *resource*. Therefore, a framework to communicate the exploration results on a globally applicable basis is being developed. The United Nations Framework Classification for Resources (UNFC) is adapted, integrated into the approach and applied to the case study site. The focus is on the assessment of site-specific modifying factors that make the TSF competitive to other resource deposits. The factors are transferred from reference case studies from the literature and tested with the help of various valorisation scenarios. A successful application of the UNFC would make the TSF's resource potential comparable to geogenic and other anthropogenic resource deposits. In the long run, an application of the developed framework to other TSFs worldwide could help to foster resource supply security and reduce the mining industry's ecological footprint.