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GEOHAZARDS CAUSED BY MINING ACTIVITIES - AN OVERVIEW

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Any mining activity affects the environment, leading to raw materials-related hazards. Active mining is monitored by companies and mining authorities. Once a mine is closed, awareness of previous activities often fades over time. Even protected areas can reveal hidden hazards years later. Geohazards are phenomena related to geological processes in the atmosphere and lithosphere or phenomena caused by anthropogenic activities. Their effective management is crucial for the mining industry. Countermeasures such as monitoring of changes and appropriate remediation technologies are required, depending on the type of hazard.

Geohazard analysis is key to understanding the long-term effects of mining activities. Research includes the monitoring of geological and environmental changes and the development of post-mining land management strategies. The use of geographic information systems (GIS), fed with multisource geospatial data, and spatial analysis functions makes it possible to accurately detect and monitor these areas. Furthermore advanced data driven statistical and machine learning models allow for identification of potential hazards, predictive modelling and simulation of risk scenarios. Thus, the advanced analytical and visualisation tools available therein support decision-making processes and planning of preventive actions. Continued research into post-mining geohazards using geo-information systems is key to protecting the environment and public health, allowing for more effective risk management and rapid response to identified risks.

This study presents an overview of concepts for the analysis and detection of selected geohazards occurring in areas with active and discontinued mining activities, addressing long-term observations and predicting future changes.