



Mining

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Special Issue Reprint

Application of Empirical, Analytical, and Numerical Approaches in Mining Geomechanics

Edited by: Mohammad H.B. (Farzine) Nasser, Bibhu Mohanty and Kamran Esmaili

Over the past few decades, mining activities and operations have benefited from the application of geomechanical and geotechnical approaches in mine planning/design and ground control management to minimize unsafe working conditions and avoid catastrophic mine failures. Appropriate mine planning and design and its subsequent modifications for any mine site require a detailed level of ground condition investigation by an experienced geomechanical expert with sound judgment. In addition, a ground control management strategy at any mining site should oversee the geotechnical uncertainty at the design execution phase in order to avoid and mitigate the magnitudes of unfavorable results to a tolerable level.

The aim of this Reprint is to highlight how improved knowledge of rock mass behavior; the development of empirical, analytical, and numerical approaches for geomechanical mine design; and proper evaluation of how material characteristics under different loading conditions have contributed toward the safer execution of mining activities and the management of geotechnical risks. Continuous geotechnical data collection and its optimization using smarter ground support instrumentation and the application of advanced data analysis techniques have proven to be essential tools in providing proactive measures to enhance mine production efficiency and limit the potential risk of geomechanical failures.



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