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Stability valuation of the final slope for highwall mining by empirical and numerical modeling

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ABSTRACT

This paper is a new concept combining empirical and numerical methods through 2D and 3D modeling to assess the rock mass stability at the mine site, continuing the mining activity from the opencut to high-wall mining. The research location is in one of the PT-Z coal mining concessions with resources that are still feasible to be mined using methods other than surface mining. Geologically, this site is included in the Barito Basin, with the Tanjung Formation, the late Eocene age's oldest and most high-calorie coal carrier. In this study, the rock mass's strength and the mine's final slope have been assessed using RMR and SMR as an empirical method. The slope stability and high wall mine opening have been modeled and analyzed using the finite element method through a strength reduction algorithm. Modeling and simulation of the stability of the mine opening and the surface of the mining area are carried out to know the optimum value of carrying capacity and safety factors to be mined. Furthermore, it has calculated the coal recovery and compared the amount of coal remaining after mining.

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