

ABSTRAK

EVALUASI GEOLOGI TEKNIK DAN ANALISIS KESTABILAN LERENG UNTUK MITIGASI BENCANA LONGSOR DAERAH TANJUNG BELIT DAN SEKITARNYA KECAMATAN JUJUHAN, KABUPATEN BUNGO, PROVINSI JAMBI

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Lokasi penelitian berada pada tambang terbuka yang terletak pada Zona UTM 47S Desa Tanjung Belit, Kecamatan Jujuhan, Kabupaten Bungo, Provinsi Jambi. Aktivitas penambangan batubara metode tambang terbuka berpotensi menghasilkan lereng dengan kondisi geometri yang kompleks sehingga rentan mengalami penurunan kestabilan. Penelitian ini bertujuan untuk menganalisis kestabilan lereng tambang dengan menghitung nilai SMR dan Faktor Keamanan untuk mengidentifikasi zona lereng yang berpotensi longsor. Penelitian ini dilakukan dengan kombinasi metode kualitatif dan kuantitatif yang meliputi tinjauan pustaka, pengambilan data lapangan, pengolahan dan analisis data, hingga pembuatan laporan hasil penelitian. Daerah penelitian tersusun atas satu bentuk asal yaitu antropogenik dan tiga bentuk lahan yaitu galian tambang, timbunan tambang, dan *sump*. Daerah penelitian tersusun atas tiga satuan batuan yaitu Satuan batulempung Sinamar, Satuan batupasir Sinamar, dan Satuan konglomerat Sinamar yang terendapkan pada lingkungan *upper delta plain* pada Kala Oligosen. Struktur geologi yang ditemukan berupa sesar normal dan kekar gerus. Analisis geologi teknik dilakukan dengan metode *Slope Mass Rating* dan kesetimbangan batas menggunakan kriteria keruntuhan Mohr-Coulomb. Berdasarkan metode SMR, tingkat kestabilan pada lereng 1 termasuk tidak stabil sedangkan lereng 2 hingga 5 termasuk cukup stabil. Berdasarkan pengolahan menggunakan kriteria keruntuhan Mohr-Coulomb didapatkan nilai Faktor Keamanan sayatan A-A' sebesar 1,063, sayatan B-B' sebesar 1,20, dan sayatan C-C' sebesar 1,49. Nilai Faktor Keamanan sayatan A-A' dan sayatan B-B' belum termasuk aman sehingga mitigasi bencana longsor diperlukan. Mitigasi yang dilakukan pada penelitian ini adalah dengan melakukan optimasi geometri lereng tambang. Setelah dilakukan perubahan geometri lereng, didapatkan nilai Faktor Keamanan baru sayatan A-A' sebesar 1,33 dan sayatan B-B' sebesar 1,25.

Kata kunci: Faktor keamanan, Geologi, Kestabilan Lereng, Longsor, Mitigasi

ABSTRACT

GEOTECHNICAL EVALUATION AND SLOPE STABILITY ANALYSIS FOR LANDSLIDE DISASTER MITIGATION IN THE TANJUNG BELIT AREA AND SURROUNDING AREAS JUJUHAN DISTRICT, BUNGO REGENCY, JAMBI PROVINCE

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The research location is an open-pit mine situated in UTM Zone 47S, Tanjung Belit Village, Jujuhan Subdistrict, Bungo Regency, Jambi Province. Open-pit coal mining activities have the potential to create slopes with complex geometric conditions, making them prone to instability. This study aims to analyze the stability of mine slopes by calculating the SMR and Safety Factor to identify slope zones with potential for landslides. This study was conducted using a combination of qualitative and quantitative methods, including a literature review, field data collection, data processing and analysis, and the drafting of a final report. The study area consists of one land-use type—anthropogenic—and three landforms: mine pits, mine dumps, and pits. The study area consists of three rock units: the Sinamar Claystone Unit, the Sinamar Sandstone Unit, and the Sinamar Conglomerate Unit, deposited in an upper delta plain environment during the Oligocene. The geological structures identified include normal faults and weathering joints. Geotechnical analysis was performed using the Slope Mass Rating method and limit equilibrium analysis based on the Mohr-Coulomb failure criteria. Based on the SMR method, the stability rating for Slope 1 is classified as unstable, while Slopes 2 through 5 are classified as sufficiently stable. Based on analysis using the Mohr-Coulomb failure criteria, the Safety Factor values for section A-A' were 1.063, for section B-B' were 1.20, and for section C-C' were 1.49. The Safety Factor values for sections A-A' and B-B' are not yet considered safe, so landslide mitigation measures are required. The mitigation implemented in this study involves optimizing the mine slope geometry. After modifying the slope geometry, the new Safety Factor values for section A-A' were 1.33 and for section B-B' were 1.25.

Keywords: Safety factors, Geology, Slope stability, Landslides, Mitigation