RANCANGAN GEOMETRI LERENG PENAMBANGAN NIKEL LATERIT PADA PIT BRAVO ROMEO 2 PT. SULAWESI CAHAYA MINERAL SULAWESI TENGGARA

RINGKASAN

PT. Sulawesi Cahaya Mineral merupakan perusahaan pertambangan yang bergerak di bidang industri nikel yang sedang melakukan kegiatan eksplorasi detail. PT. Sulawesi Cahaya terletak di Desa Lalomerui, Kecamatan Routa, Kabupaten Konawe, Provinsi Sulawesi Tenggara. Rencana sistem penambangan yang digunakan adalah sistem tambang terbuka dengan membentuk lereng hingga *bedrock*.

Lereng penambangan akan berpotensi longsor apabila geometri lereng yang digunakan tidak sesuai dengan karakteristik massa tanah dan batuan, sehingga diperlukan adanya perancangan geometri lereng pendahuluan yang aman dan stabil sesuai karakteristik massa tanah, batuan, jenis potensi longsor dan pe faktor pengaruh kestabilan lereng.

Lokasi penelitian dilakukan pada rencana pit Bravo Romeo 2 dengan penampang sayatan west-east pada lubang bor Q152105/GT03/SCM dan P163321R/GT02/SCM yang ditargetkan hingga kedalaman 25 meter. Material pada lokasi penelitian didominasi tanah sehingga berpotensi mengalami longsor busur. Perhitungan pada dinding lereng penambangan yang berpotensi longsoran busur meggunakan metode Bishop. Metode analisis dalam perhitungan Faktor Keamanan menggunakan metode kesetimbangan batas *(limit equilibrium method)* dengan Metode Bishop *(Circular Failure)* dan Analisis Probabilistik *(Probabilistic of Failure)* serta dengan pendekatan perhitungan kriteria keruntuhan Mohr-Coulomb. Permodelan dilakukan dengan pendekatan sifat fisik dan mekanik data hasil uji laboratorium. Analisis lereng tunggal menggunakan variasi kemiringan 30° dan 70° dengan kondisi lereng kering dan jenuh. Analisis lereng keseluruhan menggunakan variasi lebar *bench* dengan kondisi MAT menurut Hoek and Bray, 1981 (kering, 8H, 4H, 2H dan jenuh), faktor seismik 0,5g dan beban alat mekanis diabaikan. Lereng tunggal dianggap stabil jika Faktor Keamanan (FK) ≥ 1,1 dan lereng keseluruhan stabil apabila FK ≥ 1,2 (sesuai dengan Keputusan Menteri Energi dan Sumber Daya Mineral Republik Indonesia No. 1827 K/30/MEM/2018).

Hasil analisis menggunakan metode kesetimbangan batas dengan program Slide Rocscience v.6.0 diperoleh hasil lereng tunggal yang direkomendasikan dengan geometri lereng tinggi 5 meter dan sudut 35°, untuk lereng keseluruhan west-east pada lubang bor Q152105/GT03/SCM ketinggian 25 meter dengan sudut lereng 23° dan lebar bench 6 meter dalam kondisi lereng agak kering (8H) untuk lereng keseluruhan west-east pada lubang bor P163321R/GT02/SCM ketinggian 25 meter dengan sudut lereng 26° dan lebar bench 4 meter dalam kondisi lereng agak kering (8H). Analisis menghasilkan lereng optimum dalam kondisi lereng agak kering (8H) sehingga analisis area pengaruh MAT diperlukan untuk mengontrol kestabilan lerneg akibat perubahan MAT berupa pemasangan standpipe piezometer dan kegiatan drainase serta penyaliran.

ABSTRACT

PT. Sulawesi Cahaya Mineral is a mining company engaged in the nickel industry which is carrying out detailed exploration activities. PT. Sulawesi Cahaya is located in Lalomerui Village, Routa District, Konawe Regency, Southeast Sulawesi Province. The mining system plan used is an open-pit mining system by forming slopes to bedrock.

Mining slopes will have the potential for landslides if the slope geometry used is not in accordance with the characteristics of soil and rock mass, so it is necessary to have a safe and stable preliminary slope geometry design according to the characteristics of soil mass, rock, type of landslide potential and the effect of slope stability.

The location of the study was carried out on the Bravo Romeo 2 pit plan with a cross section of the west-east incision in drill holes Q152105 / GT03 / SCM and P163321R / GT02 / SCM targeted at a depth of 25 meters. The material in the study location was dominated by land so that it could potentially experience an arc landslide. Calculations on the mining slope walls that have the potential for an avalanche using the Bishop method. The analytical method in calculating the Security Factor uses the boundary equilibrium method with the Bishop (*Circular Failure*) Method and Probabilistic Analysis (*Probabilistic of Failure*) and with the approach to calculating Mohr-Coulomb's collapse criteria. Modeling is done by approaching the physical and mechanical properties of laboratory test results. Single slope analysis uses a slope variation of 30° and 70° with dry and saturated slope conditions. Overall slope analysis uses variations in bench width with MAT conditions according to Hoek and Bray, 1981 (dry, 8H, 4H, 2H and saturated), 0.5 g seismic factors and the load of mechanical devices is ignored. The single slope is considered stable if the Safety Factor (FK) 1 1,1 and the overall slope is stable if FK $\geq$ 1,2 (according to the Decree of the Minister of Energy and Mineral Resources of the Republic of Indonesia No. 1827 K / 30 / MEM / 2018).

The results of the analysis using the boundary equilibrium method with the Rocscience v.6.0 Slide obtained single slope results recommended with a 5 meter high slope geometry and 35ri angle, for the west-east overall slope at drill hole Q152105 / GT03 / SCM 25 meters high with a slope angle 23° and 6 meter bench width in a rather dry slope condition (8H) for the west-east overall slope at P163321R / GT02 / SCM drill hole 25 meters high with 26° slope angle and 4 meter bench width in slightly dry slope conditions (8H). The analysis produced the optimum slope in a rather dry slope condition (8H) so that the analysis of the effect area of MAT was needed to control the stability of the lerneg due to the change in MAT in the form of a piezometer standpipe and drainage and drainage activities.