

ABSTRAK

RANCANGAN *MINE SEQUENCE* PENAMBANGAN BIJIH NIKEL UNTUK MENCAPAI SASARAN PRODUKSI DI BLOK 2 PADA *PIT 1* PT SUMBER PERMATA MINERAL

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PT Sumber Permata Mineral berencana membuka area penambangan baru pada Blok 2 *Pit 1* dengan sasaran produksi sebesar 120.000 ton bijih nikel per bulan. Untuk mencapai target tersebut diperlukan rancangan tahapan penambangan (*mine sequence*) sebagai pedoman kemajuan tambang yang terencana dengan mempertimbangkan batas *stripping ratio* maksimum sebesar 2,3. Penelitian ini bertujuan menyusun rancangan *mine sequence* penambangan bijih nikel pada Blok 2 *Pit 1* yang mampu memenuhi sasaran produksi, merancang jalur angkut dan area penimbunan *waste dump* yang sesuai dengan kapasitas material pengupasan, serta menentukan kebutuhan alat mekanis. Tahapan penelitian yang digunakan meliputi studi literatur, observasi lapangan, serta pengumpulan dan analisis data primer dan sekunder. Data primer terdiri dari waktu edar, panjang dan geometri jalan angkut, serta jenis alat mekanis, sedangkan data sekunder meliputi data *block model*, topografi, nilai *cut-off grade*, nilai SR maksimum, sasaran produksi, rekomendasi geoteknik, data curah hujan, dan spesifikasi alat mekanis. Hasil penelitian menunjukkan bahwa rancangan *mine sequence* mampu memenuhi sasaran produksi sebesar 120.000 ton bijih nikel per bulan dengan nilai *stripping ratio* sebesar 2,18. Total cadangan yang tertambang sebesar 642.480 ton bijih nikel dengan volume *waste* sebesar 1.406.950 BCM sehingga umur penambangan *Pit 1* diperkirakan selama 5 bulan 6 hari. Area *waste dump* direncanakan pada dua lokasi dengan total kapasitas 1.432.144 BCM. Berdasarkan perhitungan kebutuhan alat mekanis untuk memenuhi sasaran produksi, diperlukan 4-6 unit alat muat dan 25-40 unit alat angkut untuk pengupasan *waste*, serta 2 unit alat muat dan 6-10 unit alat angkut untuk penambangan bijih nikel.

Kata kunci: area timbunan, *mine sequence*, sasaran produksi, *stripping ratio*

ABSTRACT

MINE SEQUENCE DESIGN OF NICKEL ORE MINING TO ACHIEVE PRODUCTION TARGET IN BLOCK 2 AT PIT 1 PT SUMBER PERMATA MINERAL

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PT Sumber Permata Mineral plans to open a new mining area in Block 2 Pit 1 with a production target of 120,000 tons of nickel ore per month. To achieve this target, a mine sequence design is required as a guideline for systematic mine development while considering the maximum stripping ratio limit of 2.3. This study aims to design a mine sequence for nickel ore mining in Block 2 Pit 1 to achieve the production target, to design haul roads and waste dump areas that correspond to the stripping material capacity, and to determine the required mechanical equipment. The research stages include literature study, field observation, and collection and analysis of primary and secondary data. The primary data consist of cycle time, haul road length and geometry, and types of mechanical equipment, while the secondary data include block model data, topographic data, cut-off grade value, maximum stripping ratio value, production target, geotechnical recommendations, rainfall data, and mechanical equipment specifications. The results of this study demonstrate that the mine sequence design is able to meet the production target of 120,000 tons of nickel ore per month with a stripping ratio of 2.18. The total mineable reserve is 642,480 tons of nickel ore with a waste volume of 1,406,950 BCM, resulting in an estimated mine life of 5 months and 6 days for Pit 1. The waste dump area is planned at two locations with a total capacity of 1,432,144 BCM. Based on the calculation of mechanical equipment requirements to achieve production targets, 4–6 loading units and 25–40 hauling units are required for waste removal, while 2 loading units and 6–10 hauling units are required for nickel ore mining.

Keywords: dump area, mine sequence, production target, stripping ratio