ABSTRAK

PERENCANAAN TEKNIS KEGIATAN REKLAMASI TAHAP OPERASI PRODUKSI PADA AREA TAMBANG BATUBARA DI PT X

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Kegiatan pertambangan batubara menyebabkan gangguan signifikan terhadap struktur lahan dan keseimbangan lingkungan. Oleh karena itu, reklamasi progresif perlu dirancang sejak tahap operasi produksi guna mencegah degradasi lanjutan. Penelitian ini bertujuan menyusun perencanaan teknis reklamasi tahap operasi produksi 2025–2029 pada area bekas tambang batubara di PT X seluas 20,85 hektar. Kajian difokuskan pada persiapan lahan, penatagunaan lahan, dan membuat sistem pengendalian limpasan permukaan melalui saluran drainase terbuka.

Metode penelitian kuantitatif dengan pendekatan teknis melalui analisis produktivitas alat, volume pekerjaan, dan rancangan drainase berbasis hidrologi dan topografi lahan reklamasi. Persiapan lahan mencakup pembersihan vegetasi, pemindahan material bekas tambang menggunakan metode *in-pit dump backfilling*, serta penyimpanan *top soil* sebanyak 62.550 LCM. Pemerataan lahan area reklamasi dikerjakan menggunakan 1 *excavator* Komatsu PC200-8M1, 2 *dump truck* Hino FM 260 JD, dan 1 *bulldozer* CAT D7R Series 2. Hasil perhitungan produktivitas pada *excavator* sebesar 114,82 BCM/jam, yang beroperasi selama 548 jam, *dump truck* 71,83 BCM/jam selama 370 jam, serta *bulldozer* 153,04 BCM/jam selama 409 jam. Pada pengendalian erosi, digunakan jenis alat yang sama, didapatkan produktivitas *excavator* sebesar 129,60 BCM/jam selama 26 jam dan *dump truck* 71,95 BCM/jam selama 23 jam. Saluran drainase dirancang berpenampang trapesium sepanjang 512-734 m^2, dengan lebar dasar 0,74 – 1 m, lebar permukaan 1,49 – 2 m, tambahan tinggi jagaan 20%, debit 0,80–1,79 m^3/s (PUH 15 tahun), dan volume galian 3.328,655 BCM. Rancangan ini dipadukan dengan pola teras datar dengan kemiringan < 5% untuk menekan aliran permukaan.

Hasil kajian menunjukkan bahwa rancangan teknis layak diterapkan secara efisien pada lahan reklamasi. Perencanaan alat mempertimbangkan produktivitas, sedangkan pengendalian erosi diterapkan melalui perancangan saluran drainase yang memperhitungkan risiko limpasan serta penanaman *centrosema pubescens* sebagai *cover crop*, dengan keseluruhan metode reklamasi disusun berdasarkan prinsip *good mining practice*.

Kata kunci: tambang batubara, produktivitas alat, reklamasi, saluran drainase.

ABSTRACT

TECHNICAL PLANNING OF RECLAMATION ACTIVITIES DURING THE PRODUCTION OPERATION STAGE AT THE COAL MINING AREA OF PT X

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Coal mining activities cause significant disturbances to land structure and environmental balance. Therefore, progressive reclamation needs to be planned from the production stage to prevent further degradation. This study aims to design a technical reclamation plan for the 2025–2029 production stage on a 20,85 hectare former coal mining area of PT X. The study focuses on land preparation, land use planning, and surface runoff control through the construction of open drainage channels.

A quantitative method with a technical approach through the analysis of equipment productivity, work volume, and drainage design based on the hydrological and topographical conditions of the reclamation area. Land preparation included vegetation clearing, relocation of former mining material using the in-pit dump backfilling method, and storage 62.550 LCM of topsoil. Land leveling was executed using 1 Komatsu PC200-8M1 excavator, 2 Hino FM 260 JD dump trucks, and 1 CAT D7R Series 2 bulldozer. The productivity analysis showed that the excavator achieved 114,82 BCM/hour with a total operation of 548 hours, the dump trucks reached 71,83 BCM/hour for 370 hours, and the bulldozer 153,04 BCM/hour for 409 hours. For erosion control, the same equipment was utilized, resulting in an excavator productivity of 129,60 BCM/hour for 26 hours and dump truck productivity of 71,95 BCM/hour for 23 hours. The open drainage channel was designed with a trapezoidal cross-section area ranging from 512 to 734 m^2, a base width of 0,74–1 m, a surface width of 1,49–2 m, an additional freeboard of 20%, a discharge capacity of 0,80–1,79 m^3/s (15-year return period), and an excavation volume of 3.328,655 BCM. This design was integrated with a flat terrace system of less than 5% slope to minimize surface runoff.

The results indicate that the proposed technical design is feasible and efficient for land reclamation. Equipment planning was carried out based on productivity, while erosion control was implemented through drainage channel design that considered runoff risks and the establishment of Centrosema pubescens as a cover crop. The overall reclamation methods were formulated in accordance with the principles of good mining practice.

Keywords: coal mining, equipment productivity, reclamation, drainage channel.