

RINGKASAN

PT. Mitra Indah Lestari (MIL) merupakan perusahaan pertambangan yang bergerak sebagai penyedia jasa usaha pertambangan (kontraktor). Lokasi penelitian berada pada *pit* GS *Jobsite* LHI, Kecamatan Samarinda Utara, Kota Samarinda, Provinsi Kalimantan Timur. PT. Mitra Indah Lestari dalam melakukan proses penambangannya menerapkan sistem tambang terbuka dengan metode *stripe mine*. Kegiatan pengupasan *overburden* dilakukan menggunakan kombinasi alat gali dan muat Excavator Doozan S500LC dan alat angkut Komatsu HM400-3R.

Lokasi penelitian dibagi menjadi dua dengan tempat *front* kerja, *jalan*, dan *disposal* yang berbeda. Berdasarkan hasil penelitian di lapangan, terdapat geometri jalan angkut yang tidak sesuai dengan standar diantaranya; terdapat beberapa segmen jalan angkut yang memiliki lebar jalan minimum kurang dan kemiringan jalan melebihi 8%. Selain itu, masih terdapat amblasan jalan yang melebihi dari 5cm (*high severity*). Faktor-faktor lainnya yang mempengaruhi bertambahnya konsumsi bahan bakar ialah; *percepatan*, RPM, beban kerja, dan *brake horsepower* mesin. Permasalahan yang muncul ialah konsumsi dan/atau rasio bahan bakar melebihi standar perusahaan, tercatat data pada bulan Maret 2019 konsumsi dan rasio bahan bakar alat angkut mencapai 29,11 liter/jam dan 0,47 liter/BCM dari standarnya yaitu 25 liter/jam dan 0,35 liter/BCM.

Analisis dilakukan untuk mengetahui pengaruh kondisi jalan angkut terhadap konsumsi bahan bakar alat angkut. Setelah dilakukan perhitungan, diketahui bahwa setiap penambahan 1% *rolling resistance* maka konsumsi bahan bakar akan bertambah sebesar 1,20 liter/jam, sedangkan setiap penambahan 1% *grade resistance* maka konsumsi bahan bakar akan bertambah sebesar 0,65 liter/jam. Perhitungan teori konsumsi bahan bakar dilakukan menggunakan dua metode yaitu berdasarkan rimpul dan RPM. Diketahui bahwa konsumsi bahan bakar pada dua jalan angkut berdasarkan perhitungan rimpul ialah 27,11 liter/jam dan 29,41 liter/jam, sedangkan berdasarkan RPM ialah 32,39 liter/jam dan 34,02 liter/jam.

Setelah dilakukan perbaikan pada geometri jalan terdiri dari pelebaran jalan angkut dan kemiringan jalan angkut $\leq 8\%$ serta amblasan jalan angkut $\leq 5\text{cm}$ atau berada pada *medium severity* akan menurunkan konsumsi bahan bakar dan produktivitas bertambah. Berdasarkan perhitungan dengan rekomendasi tersebut, konsumsi bahan bakar menggunakan perhitungan rimpul pada dua jalan yaitu; 24,81 liter/jam dan 24,69 liter/jam sedangkan rasio bahan bakar turun menjadi 0,348 liter/BCM dan 0,310 liter/BCM.

Kata Kunci: *rolling resistance*, *grade resistance*, *rpm*, produktivitas, konsumsi bahan bakar dan rasio bahan bakar.

SUMMARY

PT. Mitra Indah Lestari (MIL) is a mining company that operates as a provider of mining business services (contractors). The research location is in the pit GS Jobsite LHI, North Samarinda District, Samarinda City, East Kalimantan Province. PT. Mitra Indah Lestari in its mining process applies an open pit mining system using the stripe mine method. Overburden stripping is carried out using a combination of a digging and loading Doozan S500LC excavator and the Komatsu HM400-3R conveyance.

The research location is divided into two with different work fronts, roads, and disposal sites. Based on the results of research in the field, there is a haul road geometry that is not by standards including; there are several haul road segments that have a minimum road width that is less and the road slope exceeds 8%. Besides, there are still road subsidence over 5cm (high severity). Other factors that influence the increase in fuel consumption are; acceleration, RPM, workload, and engine brake horsepower. The problem that arises is the consumption and/or fuel ratio exceeds company standards, the data recorded in March 2019 consumption and fuel transport ratio reached 29.11 liters/hour and 0.47 liters / BCM from the standard that is 25 liters/hour and 0.35 liter / BCM.

The analysis was carried out to determine the effect of the haul road conditions on the fuel consumption of the conveyance. After calculating, it is known that for each addition of 1% rolling resistance, fuel consumption will increase by 1.20 liters/hour, while for each addition of 1% grade resistance, fuel consumption will increase by 0.65 liters/hour. The calculation of fuel consumption theory is done using two methods, namely based on the rimpull and RPM. It is known that the fuel consumption on two haul roads based on the calculation of the rimpull is 27.11 liters/hour and 29.41 liters/hour, while based on the RPM is 32.39 liters/hour and 34.02 liters/hour.

After repairs to the geometry of the road consisting of the widening of the haul road and the slope of the haul road $\leq 8\%$ and the haul road hauling $\leq 5\text{cm}$ or being on medium severity will reduce fuel consumption and increase productivity. Based on calculations with these recommendations, fuel consumption on two roads with rimpull calculation namely; 24.81 liters/hour and 24.69 liters/hour while the fuel ratio dropped to 0.348 liters / BCM and 0.310 liters / BCM.

Keywords: rolling resistance, grade resistance, rpm, productivity, fuel consumption, and fuel ratio.