

SARI

ANALISIS HUBUNGAN ANTARA TEMPERATUR BATUBARA DAN KUALITAS BATUBARA TERHADAP NILAI KALORI (GAR) PADA DAERAH KUTAI KALIMANTAN TIMUR PT. *SURVEYOR CARBON CONSULTING* INDONESIA (SCCI)

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Penelitian ini menganalisis hubungan antara temperatur dan kualitas batubara terhadap nilai kalor (*Gross As Received* atau GAR) pada batubara di daerah Kutai, Kalimantan Timur, PT. Surveyor Carbon Consulting Indonesia (SCCI), dengan fokus pada fenomena swabakar. Metodologi penelitian meliputi studi pustaka, pengumpulan data primer (pengambilan sampel batubara di PIT dan ROM sesuai ASTM D4596; pengukuran temperatur *stockpile* dengan *thermocouple*) dan sekunder (peta geologi). Pengolahan data melibatkan preparasi sampel (reduksi ukuran dengan *double roll crusher*, CMD, *hammer mill*, RSD; pengeringan di *drying shed*; penghalusan dengan *Raymond mill* sesuai ASTM D2013, D4749). Selanjutnya, analisis laboratorium dilakukan untuk kualitas batubara (proksimat: TM, IM, Ash, VM, FC; total sulfur dengan LECO S832; nilai kalor dengan Parr 6200 Calorimeter, sesuai standar ASTM terkait). Analisis statistika menggunakan regresi, *scatter plot*, koefisien determinasi, dan korelasi Pearson. Hasil penelitian menunjukkan batubara terklasifikasi *lignite A* hingga *sub bituminous C* (ASTM D388) dengan nilai kalor GAR sekitar 3000-an cal/gr. Meskipun temperatur umum wajar, beberapa titik melebihi batas kritis 45 °C, mengindikasikan potensi swabakar. Ditemukan hubungan timbal balik signifikan antara temperatur batubara, kualitas batubara (kadar air), dan nilai kalor. Kenaikan temperatur memicu penguapan kadar air, meningkatkan nilai kalor. Hubungan ini dijelaskan melalui konsep segitiga swabakar, dipengaruhi juga oleh *handling material* dan durasi penyimpanan.

Kata Kunci: Batubara, Kualitas Batubara, Nilai Kalor, Temperatur, Swabakar, Analisis Proksimat, Geostatistika.

ABSTRACT

ANALYSIS OF THE RELATIONSHIP BETWEEN COAL TEMPERATURE AND COAL QUALITY ON CALORIFIC VALUE (GAR) IN THE KUTAI AREA, EAST KALIMANTAN, PT. SURVEYOR CARBON CONSULTING INDONESIA (SCCI)

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This study analyzes the relationship between coal temperature and coal quality with calorific value (Gross As Received or GAR) for coal in the Kutai area, East Kalimantan, managed by PT. Surveyor Carbon Consulting Indonesia (SCCI), focusing on the phenomenon of spontaneous combustion. The research methodology encompasses literature review, data collection (primary data: coal sampling at PIT and ROM according to ASTM D4596; stockpile temperature measurement with a thermocouple) and secondary data (geological maps). Data processing involves sample preparation (size reduction using a double roll crusher, CMD, hammer mill, RSD; drying in a drying shed; further pulverization with a Raymond mill according to ASTM D2013, D4749). Subsequently, laboratory analysis is conducted for coal quality (proximate analysis: TM, IM, Ash, VM, FC; total sulfur with LECO S832; calorific value with Parr 6200 Calorimeter, all according to relevant ASTM standards). Statistical analysis employs regression, scatter plots, coefficient of determination, and Pearson correlation. Research results indicate that the coal is classified as lignite A to sub bituminous C (ASTM D388) with an average GAR calorific value of approximately 3000 cal/gr. Although general temperatures are within reasonable limits, some measurement points exceeded the critical threshold of 45 °C, suggesting a potential for spontaneous combustion. A significant reciprocal relationship was found between coal temperature, coal quality (moisture content), and calorific value. Increased temperature triggers moisture evaporation, which in turn increases calorific value. This relationship is explained through the fire triangle concept, also influenced by material handling and storage duration.

Keywords: Coal, Coal Quality, Calorific Value, Temperature, Spontaneous Combustion, Proximate Analysis, Geostatistics.