

## SARI

*Geophysical Well Logging* ialah metode geofisika untuk mengidentifikasi kedalaman dan ketebalan batubara dalam kegiatan eksplorasi. Kegiatan eksplorasi bertujuan untuk mengetahui estimasi kualitas dan kuantitas batubara dalam model 3 dimensi. Kualitas batubara umumnya ditentukan dari sampel pemboran inti. Analisis statistik korelasi dan regresi dilakukan untuk menghasilkan persamaan estimasi kualitas batubara terhadap sampel hasil pemboran terbuka di Lapangan X dan Y wilayah Izin Usaha Pertambangan Khusus PT. Arutmin Indonesia. Penelitian ini bertujuan untuk mengetahui tingkat korelasi antara log densitas dan nilai *inherent moisture*, *ash content*, *volatile matter*, *fixed carbon* & *calorific value*, serta mengetahui variabel utama kualitas batubara yang mempengaruhi perekaman log densitas, sehingga log densitas dapat digunakan untuk identifikasi kualitas batubara di area penelitian dan menjadi pelengkap dan pendukung variabilitas spasial kualitas batubara dan estimasi sumber daya batubara. Nilai log densitas dan karakteristik kualitas batubara dari 274 sampel batubara dari *seam* grup XU, XM dan XM di Lapangan X, dan 349 sampel batubara dari *seam* grup YU1 dan YU2 di Lapangan Y dikorelasi untuk menentukan tingkat hubungan. Lalu, nilai tersebut diregresi untuk mengetahui besaran pengaruh karakteristik kualitas batubara terhadap perekaman data log densitas. Variabel utama ditentukan ketika karakteristik kualitas batubara bernilai signifikan secara korelasi dan regresi ( $p\text{ value} > 0,05$ ). Variabel utama diregresi kembali untuk mendapatkan persamaan estimasi kualitas batubara sampel pemboran terbuka. Korelasi karakteristik kualitas batubara dan log densitas di lapangan X bernilai signifikan untuk *inherent moisture*, *ash content*, *volatile matter*, *fixed carbon*, *calorific value*. Sedangkan di lapangan Y, korelasi bernilai signifikan untuk *inherent moisture*, *ash content*, *volatile matter*, *calorific value*. Variabel utama di lapangan X berupa *inherent moisture*, *ash content*, *volatile matter*, *fixed carbon*, *calorific value*. Variabel utama di lapangan Y berupa *inherent moisture*, *ash content*, *volatile matter*, *calorific value*. Nilai log densitas akan menurun seiring peningkatan *inherent moisture*, *volatile matter*, *fixed carbon*, *calorific value* dan penurunan *ash content*.

**Kata Kunci:** Kualitas Batubara, Log Densitas, Korelasi, Regresi

## ABSTRACT

*Geophysical Well Logging is a method to identify coal depth and thickness coal in exploration. Exploration activities determine estimated coal quality and quantity in 3d model. Coal quality is determined from core drilling samples. Correlation and regression statistical analysis was carried out to produce coal quality estimation equation for open holes samples at Site X and Y in Special Mining Permit of PT. Arutmin Indonesia. The purposes of study to determine correlation between density logs and inherent moisture, ash content, volatile matter, fixed carbon & calorific value, and determine main variables of coal quality that affect density logs, so can be used to identify estimated coal quality and become support information in coal quality spatial variability and resources estimation. Density log values and coal quality characteristics of 274 coal samples from group seam XU, XM and XM in Site X, and 349 coal samples from group seam YU1 and YU2 in Site Y were correlated to determine relationship value. Then, this value was regressed to determine influence of coal quality characteristics on density log. The main variable is determined when coal quality characteristics are significant in correlation and regression ( $p$  value  $> 0.05$ ). Main variable was continued regressed to obtain coal quality estimation equation for open hole samples. Correlation of coal quality characteristics and log density in Site X was significant for inherent moisture, ash content, volatile matter, fixed carbon, calorific value. In Site Y, correlation value is significant for inherent moisture, ash content, volatile matter, calorific value. The main variable in Site X is inherent moisture, ash content, volatile matter, fixed carbon, calorific value. The main variable in Site Y is inherent moisture, ash content, volatile matter, calorific value. Density log value will decrease with increasing inherent moisture, volatile matter, fixed carbon, calorific value and decreasing ash content.*

**Keyword:** Coal Quality, Density Logs, Correlation, Regression