

## INTISARI

Heterogenitas batuan reservoir mengakibatkan terjadinya variasi litologi dan properti petrofisika yang beragam. Penelitian ini bertujuan mengkarakterisasi reservoir, mengaplikasikan metode MRGC pada zona *uncored*, dan menentukan zona prospek reservoir hidrokarbon Formasi Talang Akar, Lapangan “DP”, Subcekungan Palembang Selatan. Penelitian ini terdapat pada Sumur DP-1 dan DP-2 dengan data yang digunakan berupa *wireline log* dan *final well report*. Determinasi litologi dianalisis berdasarkan data petrografi, SEM-EDS, dan XRD. Volume *shale* ditentukan menggunakan metode linear dari log *gamma ray*. Nilai porositas total dan efektif dihitung berdasarkan metode densitas-neutron dengan validasi menggunakan porositas total dari *core*. Saturasi air dianalisis menggunakan metode Indonesia dan Simandoux dengan validasi menggunakan nilai saturasi air dari data SCAL. Setelah itu, dilakukan penentuan nilai *cut-off* dari volume *shale*, porositas efektif, dan saturasi air untuk mendapatkan *net reservoir* dan *net pay*. Analisis *petrophysical rock type* dilakukan menggunakan metode *hydraulic flow unit* berdasarkan data porositas dan permeabilitas dari *core*. Penyebaran *petrophysical rock type* pada zona *uncored* didasarkan pada fasies *clustering* dengan metode MRGC. Nilai permeabilitas dihitung menggunakan data *flow zone indicator* dan porositas efektif dengan validasi menggunakan data permeabilitas dari *core*. Hasil penelitian menunjukkan keterdapatannya tiga fasies *petrophysical rock type* (PRT). PRT-1 (reservoir berkategori baik) dengan litofasies *sandstone*, PRT-2 (reservoir berkategori sedang) dengan litofasies *argillaceous-calcareous sandstone*, dan PRT-3 (reservoir berkategori buruk) dengan litofasies *silty-sandy sandstone* dan *claystone*. Perhitungan permeabilitas dari log PRT memiliki tingkat keakuratan tinggi dengan nilai koefisien korelasi ( $R^2$ ) terhadap *core* sebesar 0,79. Terdapat enam zona prospek reservoir hidrokarbon pada Lapangan “DP”, dengan lima zona pada Sumur DP-1 (P1-P5) dan tiga zona pada Sumur DP-2 (P1, P3, dan P6). Prospek reservoir hidrokarbon terbaik memiliki volume *shale* 0,007 V/V, porositas efektif 0,265 V/V, saturasi air 0,308 V/V, dan nilai permeabilitas 274,7 mD. Ketebalan *net pay* berkisar antara 5,75–16,5 ft pada Sumur DP-1 dan 1,5–1,75 ft pada Sumur DP-2.

**Kata kunci:** *Petrophysical rock typing*, zona prospek hidrokarbon, *hydraulic flow unit*, MRGC, Formasi Talang Akar

## ABSTRACT

*The heterogeneity of reservoir rocks manifests in diverse variations in lithology and petrophysical properties. This study aims to characterize the reservoir, apply the MRGC to uncored zones, and determine the prospective hydrocarbon reservoir zones of Talang Akar Formation in 'DP' Field, South Palembang Sub-basin. The research was conducted on wells DP-1 and DP-2 using wireline logs and final well reports. Lithology determination was analyzed using petrographic, SEM-EDS, and XRD. Shale volume was calculated using linear method from gamma ray log. Total and effective porosity were estimated using density-neutron method, validated by total porosity from core. Water saturation was calculated using Indonesian and Simandoux methods, validated by water saturation from SCAL. Cut-off values for shale volume, effective porosity, and water saturation were determined to define net reservoir and net pay. Petrophysical rock type (PRT) was identified using hydraulic flow unit method based on porosity and permeability from core. The distribution of petrophysical rock types in uncored zones was interpreted through facies clustering using MRGC method. Permeability was calculated using flow zone indicator and effective porosity, validated by core permeability. The results of this study indicate the presence of three PRT. PRT-1 has good quality reservoir associated with sandstone lithofacies, PRT-2 has moderate quality reservoir associated with argillaceous-calcareous sandstone, and PRT-3 has poor quality reservoir associated with silty-sandy sandstone and claystone. Permeability estimation from PRT have a high-level accuracy with correlation coefficient ( $R^2$ ) 0.79. There are six hydrocarbon reservoir prospect zones in the "DP" Field, with five zones in DP-1 (P1-P5) and three zones in DP-2 (P1, P3, P6). The best hydrocarbon reservoir prospect has a shale volume of 0.007 V/V, effective porosity of 0.265 V/V, water saturation of 0.308 V/V, and permeability value of 274.7 mD. Net pay thickness ranges 5.75–16.5 ft in DP-1 and 1.5–1.75 ft in DP-2.*

**Keywords:** *Petrophysical rock typing, hydrocarbon prospect zone, hydraulic flow unit, MRGC, Talang Akar Formation*