ABSTRAK

KARAKTERISTIK RESERVOIR BERDASARKAN ANALISIS PETROFISIKA DALAM PENENTUAN ZONA PROSPEK HIDROKARBON, LAPANGAN "OASIS" FORMASI BEKASAP DAN FORMASI BANGKO, CEKUNGAN SUMATERA TENGAH

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Lapangan "OASIS" yang berada pada Formasi Bekasap dan Formasi Bangko, Cekungan Sumatera Tengah, merupakan salah satu daerah yang memiliki potensi hidrokarbon cukup baik. Karakteristik reservoir pada daerah penelitian perlu dianalisis untuk mengetahui karakteristik reservoir dan menentukan zona prospek hidrokarbon. Penelitian ini bertujuan untuk mengidentifikasi litologi, marker sikuen stratigrafi, fasies, lingkungan pengendapan, serta karakteristik petrofisika reservoir pada sumur OA-1, OA-2, dan OA-3.

Metode penelitian dilakukan menggunakan analisis kualitatif dan kuantitatif berbasis data *wireline log, sidewall core*, RCAL, *mud log,* dan *well report.* Analisis kualitatif meliputi interpretasi litologi berdasarkan respon log *gamma ray* yang telah dinormalisasi, analisis marker sikuen stratigrafi berupa *Flooding Surface (FS*), *Maximum Flooding Surface* (MFS), dan *system tract*, serta interpretasi elektrofasies dan lingkungan pengendapan. Analisis kuantitatif dilakukan melalui tahapan *pre-calculation, environmental correction*, normalisasi *gamma ray*, serta perhitungan parameter petrofisika meliputi volume *shale* (Vsh), porositas, dan saturasi air (Sw). Selanjutnya dilakukan penentuan nilai *cut-off* dan *lumping* untuk memperoleh *net sand, net reservoir*, dan *net pay*.

Hasil penelitian menunjukkan bahwa litologi penyusun daerah penelitian didominasi oleh *sandstone, shale,* dan *silt*. Lingkungan pengendapan diinterpretasikan sebagai *tide dominated estuary* dengan asosiasi fasies berupa *tidal channel, tidal bar, tidal sand flat, tidal mixed flat,* dan tidal *mud flat*. Elektrofasies yang berkembang terdiri atas *cylindrical, funnel,* dan *bell*. Zona reservoir prospektif berada pada interval fasies tidal bar dengan nilai volume shale 0.111 – 0.254 V/V, porositas efektif 0.109 – 0.163 V/V , dan saturasi air 0.614 – 0.873 V/V sehingga berpotensi mengandung hidrokarbon. Berdasarkan hasil analisis, Formasi Bekasap dan Formasi Bangko pada Lapangan "OASIS" memiliki potensi reservoir hidrokarbon yang baik untuk pengembangan lebih lanjut.

Kata kunci: *Fasies, Petrofisika, Reservoir, Sikuen Stratigrafi, Wireline Log*

ABSTRACT

RESERVOIR CHARACTERIZATION BASED ON PETROPHYSICAL ANALYSIS FOR DETERMINING HYDROCARBON PROSPECT ZONES IN THE 'OASIS' FIELD, BEKASAP FORMATION AND BANGKO FORMATION, CENTRAL SUMATRA BASIN

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The "OASIS" Field, located within the Bekasap and Bangko Formations of the Central Sumatra Basin, represents an area with significant hydrocarbon potential. Reservoir characterization is essential for evaluating reservoir properties and identifying prospective hydrocarbon-bearing zones. This study aims to determine the lithology, sequence stratigraphic markers, facies, depositional environment, and petrophysical reservoir characteristics of wells OA-1, OA-2, and OA-3.

The study was conducted using qualitative and quantitative analyses based on wireline log, sidewall core, routine core analysis (RCAL), mud log, and well report data. Qualitative analysis included lithological interpretation based on normalized gamma ray log responses, identification of sequence stratigraphic markers such as Flooding Surfaces (FS), Maximum Flooding Surfaces (MFS), and systems tracts, as well as electrofacies and depositional environment interpretation. Quantitative analysis involved pre-calculation, environmental correction, gamma ray normalization, and the calculation of petrophysical parameters, including shale volume (Vsh), effective porosity (PHIE), and water saturation (Sw). Cut-off values and lumping procedures were subsequently applied to determine net sand, net reservoir, and net pay intervals.

The results indicate that the study area is predominantly composed of sandstone, shale, and siltstone. The depositional environment is interpreted as a tide-dominated estuary, characterized by tidal channel, tidal bar, tidal sand flat, tidal mixed flat, and tidal mud flat facies associations. The identified electrofacies consist of cylindrical, funnel, and bell, patterns. Prospective reservoir zones are primarily associated with tidal bar facies, exhibiting shale volume values ranging from 0.111 to 0.254 V/V, effective porosity values ranging from 0.109 to 0.163 V/V, and water saturation values ranging from 0.614 to 0.873 V/V, indicating favorable conditions for hydrocarbon accumulation. The results suggest that the Bekasap and Bangko Formations in the "OASIS" Field possess favorable reservoir characteristics and hydrocarbon potential for further exploration and development.

Keywords: *Facies, Petrophysics, Reservoir, Sequence Stratigraphy, Wireline Log.*