

ABSTRAK

ANALISIS PETROFISIKA DALAM PENENTUAN ZONA HIDROKARBON PADA LAPANGAN “PANDAI”, FORMASI MENGKALA, CEKUNGAN SUMATERA TENGAH, PROVINSI RIAU

Oleh

Muhammad Habib Albanna

NIM: 111210114

(Program Studi Sarjana Teknik Geologi)

Penelitian ini dilakukan di Provinsi Riau, tepatnya pada Formasi Mengkala, Kelompok Sihapas, Cekungan Sumatera Tengah, Lapangan 'PANDAI' yang memiliki 14 sumur. Tujuan dari penelitian ini adalah untuk mengetahui variasi litologi, sikuen stratigrafi, identifikasi fasies, lingkungan pengendapan, serta menentukan zona prospektif hidrokarbon dan ketebalannya, penelitian ini menggunakan dua pendekatan, yaitu analisis kuantitatif dan analisis kualitatif. Analisis kualitatif dilakukan melalui interpretasi litologi, analisis sikuen stratigrafi, identifikasi fasies, serta lingkungan pengendapan, dengan melakukan korelasi antar sumur. Analisis kuantitatif dilakukan perhitungan properti *reservoir* berdasarkan evaluasi petrofisika melalui perhitungan *volume of shale*, porositas, permeabilitas, dan saturasi air, serta penentuan harga untuk mengetahui zona prospektif hidrokarbon. Hasil analisis ini divalidasi dengan data *core* dan data *sidewall core*. Litologi utama penyusun Lapangan "PANDAI" terdiri atas batupasir dan serpih. Fasies yang teridentifikasi meliputi *Tidal Sandflat*, *Mixed Flat*, dan *Mud Flat* yang terbentuk pada lingkungan pengendapan *tide dominated estuary*. Zona yang prospektif mengandung hidrokarbon terdapat pada fasies *Tidal Sandflat* memiliki bentuk elektrofases didominasi *Cylindrical shape*. Berdasarkan hasil perhitungan parameter petrofisika diperoleh nilai *volume of shale* dengan rata-rata 11 – 17%, porositas efektif dengan rata-rata 15 – 25% memiliki kualitas baik, Permeabilitas dengan rata-rata 19.7 hingga 769.62 *milidarcy*, dan saturasi air dengan rata-rata 24 – 63%.

Kata kunci: Cekungan Sumatera Tengah, Formasi Mengkala, Fasies, Petrofisika

ABSTRACT

PETROPHYSICAL ANALYSIS IN DETERMINING HYDROCARBON ZONES IN THE "PANDAI" FIELD, MENGGALA FORMATION, CENTRAL SUMATRA BASIN, RIAU PROVINCE

By

Muhammad Habib Albanna

NIM: 111210114

(Geological Engineering Undergraduated Program)

This research was carried out in Riau Province, precisely in the Menggala Formation, Sihapa Group, Central Sumatra Basin, and the 'PANDAI' Field which has 14 wells. The purpose of this study is to determine the variations in lithology, stratigraphic sequences, identification of facies, sedimentation environment, and determine the prospective zone of hydrocarbons and their thickness, this study uses two approaches, namely quantitative analysis and qualitative analysis. Qualitative analysis was carried out through lithological interpretation, stratigraphic sequence analysis, facies identification, and sedimentation environment, by correlating between wells. Quantitative analysis was carried out to calculate reservoir properties based on petrophysical evaluation through calculation of volume of shale, porosity, permeability, and water saturation, as well as price determination to determine the prospective zone of hydrocarbons. The results of this analysis were validated with core data and core sidewall data. The main lithology that makes up the "PANDAI" Field consists of sandstone and shale. The facies identified include Tidal Sandflat, Mixed Flat, and Mud Flats that form in tide dominated estuary sedimentation environments. The prospective zone containing hydrocarbons is found in the Tidal Sandflat fasies that have electrophacies in the form of electrofacies dominated by Cylindrical shape. Based on the results of the calculation of petrophysical parameters, the volume value of shale with an average of 11 – 17%, effective porosity with an average of 15 – 25% is of good quality, permeability with an average of 19.7 to 769.62 millidarcy, and water saturation with an average of 24 – 63%.

Keywords: Central Sumatra Basin, Menggala Formation, Fasies, Petrophysics