INTISARI

KARAKTERISASI RESERVOIR DAN PERHITUNGAN VOLUMETRIK HIDROKARBON BERDASAR ANALISIS PETROFISIKA DAN PEMODELAN GEOSTATISTIKA PROPERTI RESERVOIR DI LAPANGAN ORION, CEKUNGAN SUMATRA SELATAN

Perhitungan *stock tank original oil in place* (*STOOIP*) berdasarkan hasil analisis petrofisika, pemodelan fasies, dan karakterisasi properti reservoir telah dilakukan di lapangan "Orion", formasi Talang Akar, cekungan Sumatra Selatan. Bersadarkan hasil pemodelan fasies diketahui zona –zona reservoir tersusun atas deposisi *channel sand*, *delta front sand*, *shaly sand*, serta *shale* dalam sistem pengendapan *fluvial – deltaic – shallow marine*.

Analisis petrofisika dari 14 sumur dilakukan untuk menentukan properti – properti fisis batuan (seperti volume *shale*, porositas efektif, dan saturasi air). Volume *shale* dihitung dengan menggunakan *baseline* pada *spontaneous potential log*. Porositas efektif dihitung dengan membandingkan metode *RhoB – NPhi*, regresi turunan volume *shale*, dan *artificial neural network*. Sedangkan, saturasi air dihitung dengan menggunakan persamaan Indonesia.

Pemodelan properti – properti reservoir dilakukan dengan simulasi kondisional sekuensial *Gaussian* yang dikontrol oleh peta persebaran impedansi akustik dan model variogram dari properti - properti reservoir pada tiap – tiap lapisannya. Hasil dari distribusi pemodelan properti di dalam kerangka struktur 3D digunakan untuk menghitung cadangan hidrokarbon di lapangan Orion.

Kata kunci: karakterisasi properti reservoir, pemodelan reservoir, simulasi kondisional sekuensial, *STOOIP*.

ABSTRACT

RESERVOIR CHARACTERIZATION AND HYDROCARBON VOLUMETRIC CALCULATION BASED ON PETROPHYSICAL ANALYSIS AND GEOSTATISTICAL RESERVOIR PROPERTY MODELING IN ORION FIELD, SOUTH SUMATRA BASIN

Stock tank original oil in place (STOOIP) calculations based on petrophysical analysis results , facies modeling, and reservoir property characterization have been done in Orion field, Talang Akar formation, South Sumatra Basin. Based on facies modeling results, it is known reservoir zones are composed by deposition of channel sand, delta front sand, shaly sand and shale in fluvial – deltaic – shallow marine depositional system.

Petrophysical analysis of 14 wells was conducted to determine rock's physical properties (such as shale volume, effective porosity and water saturation). Shale volume was calculated by using Spontaneous Potential log baseline. Effective porosity was calculated by comparing three methods (RhoB - NPhi, derivative regression of shale volume, and artificial neural network). Meanwhile, water saturation was calculated by using Indonesia equation.

Reservoir properties modeling was done by using conditional sequential Gaussian simulation which is controlled by acoustic impedance distribution map and variogram model of reservoir properties in each layers. The result of property modeling distribution in 3D framework was used to calculate hydrocarbon reserve in Orion field.

Keywords: petrophysical property characterization, reservoir modeling, conditional sequential simulation, STOOIP.