ABSTRAK

PEMODELAN STATIK RESERVOIR DAN PERHITUNGAN VOLUME HIDROKARBON PADA LAPISAN "X", LAPANGAN "NAYO", FORMASI TALANGAKAR, CEKUNGAN JAWA BARAT UTARA

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Lapangan "NAYO" terletak pada Cekungan Jawa Barat Utara, khususnya pada Formasi Talangakar yang berkembang pada sistem pengendapan darat-transisi. Formasi Talangakar berperan sebagai batuan sumber yang baik, selain itu Formasi Talangakar juga berperan sebagai batuan reservoir.

Studi ini bertujuan untuk membangun model statik tiga dimensi yang menggambarkan distribusi persebaran fasies, properti petrofisika, dan potensi hidrokarbon berdasarkan data sumur, *core* analisis, dan *completion log*. Metode yang digunakan untuk membuat model fasies yaitu dengan metode *Truncated Gaussian Simulation* (TGS), pemodelan properti petrofisika dengan *Sequential Gaussian Simulation* (SGS), dan analisis kontak fluida minyak dengan air berdasarkan data *log*.

Hasil dari penelitian menunjukkan Formasi Talangakar tersusun atas litologi batupasir, serpih, dan batugamping yang diendapkan pada fasies *intertidal estuary* dengan asosiasi fasies *sand flat, mixed flat, mud flat,* dan *tidal bar,* serta fasies subtidal dengan asosiasi fasies *sand sheet maargin*. Interpretasi marker stratigrafi berupa *transgressive surface* (TS), *maximum flooding surface* (MFS), dan *flooding surface* (FS). Pemodelan lapisan "X" dengan fasies *intertidal estuary,* memiliki lingkungan pengendapan transisi yang memiliki arah relatif utara-selatan. Model properti yang dihasilkan mampu merepresentasikan distribusi nilai properti porositas berkisar 0,01-0,31 dan properti saturasi air berkisar 0,1-1. Hasil dari perhitungan volume hidrokarbon didapatkan *volume bulk* sebesar 66.400 acre.ft, *net volume* 32.500 acre.ft, *pore volume* 50×10^3RB, *hydrocarbon pore volume oil* (HCPV Oil) sebesar 30×10^6RB, dan *stock tank oil initialy in place* (STOIIP) sebesar 20×10^6RB.

Kata kunci: Fasies, Formasi Talangakar, Pemodelan Statik, Reservoir Minyak, Volume Hidrokarbon

ABSTRACT

STATIC RESERVOIR MODELING AND HYDROCARBON VOLUME CALCULATION OF THE 'X' LAYER, 'NAYO' FIELD, TALANGAKAR FORMATION, NORTHWEST JAVA BASIN

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The "NAYO" field is located in the North West Java Basin, specifically within the The "NAYO" field is located in the North West Java Basin, specifically within the Talangakar Formation, which developed within a terrestrial-transitional depositional system. The Talangakar Formation serves as a good source rock; furthermore, it also functions as a reservoir rock.

This study aims to develop a three-dimensional static model that depicts the distribution of facies, petrophysical properties, and hydrocarbon potential based on well data, core analysis, and completion logs. The methods used to create the facies model include the Truncated Gaussian Simulation (TGS) method, petrophysical property modeling using Sequential Gaussian Simulation (SGS), and analysis of the oil-water contact based on log data.

The results of the study indicate that the Talangakar Formation consists of sandstone, shale, and limestone lithologies deposited in an intertidal estuary facies associated with sand flat, mixed flat, mud flat, and tidal bar facies, as well as a subtidal facies associated with marginal sand sheet facies. Stratigraphic marker interpretations include transgressive surfaces (TS), maximum flooding surfaces (MFS), and flooding surfaces (FS). Modeling of the "X" layer with an intertidal estuary facies reveals a transitional depositional environment oriented in a relative north-south direction. The resulting property model is capable of representing a distribution of porosity values ranging from 0.01-0.31 and water saturation values ranging from 0.1-1. The results of the hydrocarbon volume calculations yielded a bulk volume of 66,400 acre-feet, a net volume of 32,500 acre-feet, a pore volume 50×10^6 barrels, a hydrocarbon pore volume of oil (HCPV Oil) of 30×10^6 barrels, and a stock tank oil initially in place (STOIIP) of 20×10^6 barrels.

Keywords: Facies, Talangakar Formation, Static Modeling, Oil Reservoir, Hydrokarbon Volumetrics