

## SARI

Cekungan Sumatera Selatan adalah salah satu cekungan penghasil hidrokarbon utama di Indonesia, dengan mayoritas cadangan terkonsentrasi di reservoir Formasi Talang Akar. Lapangan 'NAF', yang reservoir utamanya adalah batupasir Formasi Talang Akar, telah mengalami penurunan laju produksi sejak awal tahun 2000-an. Studi validasi fasies dan distribusi reservoir sangat diperlukan untuk mengoptimalkan pengembangan lapangan, seperti pengeboran *infill* atau *Enhanced Oil Recovery* (EOR). Penelitian ini bertujuan untuk menentukan fasies, lingkungan pengendapan, dan konsep sekuen stratigrafi pada Seri Lapisan 'X' dan Seri Lapisan 'Y' Formasi Talang Akar, serta menghasilkan model fasies 3 dimensi untuk mengetahui persebaran batupasirnya. Penelitian ini menggunakan integrasi data sumur (*log wireline*) dan data seismik 3 dimensi untuk membangun model fasies 3D di Lapangan 'NAF'. Tahapan dimulai dengan penentuan fasies, lingkungan pengendapan, dan analisis sekuen stratigrafi berdasarkan *log wireline* kualitatif untuk membangun kerangka kronostratigrafi. Pemodelan fasies 3D dilakukan menggunakan metode bersifat stokastik yaitu metode *Truncated Gaussian Simulation* (TGS), yang disesuaikan dengan konsep geologi endapan *meandering channel* dan ketersediaan data yang ada. Fasies yang dimodelkan meliputi batupasir (*sand*), serpih (*shale*), dan batubara (*coal*). Hasil penelitian menunjukkan bahwa Seri Lapisan 'X' dan Seri Lapisan 'Y' diendapkan pada lingkungan *fluvial meandering channel* dengan asosiasi fasies utama berupa *point bar*, *crevasse splay*, dan *floodplain*. Kedua lapisan berada dalam fase *Lowstand System Tract* (LST) berdasarkan kronostratigrafi serta fase *Low Amalgamated System Tract* (LAST) dan *High Amalgamated System Tract* (HAST) berdasarkan rasio suplai sedimen dan ruang akomodasi. Pemodelan fasies 3D menunjukkan Seri Lapisan 'X' didominasi oleh batupasir (68,46%) dengan ketebalan (0 ft –40 ft). Seri Lapisan 'Y' memiliki persentase batupasir lebih rendah (39,1%) dan ketebalan lebih tipis (0–26 ft), kedua lapisan tersebut tersebar sebagai *amalgamated point bar*. Dimana persebaran ketebalan batupasir searah dengan arah pengendapan yaitu ke arah selatan batupasir semakin tebal.

**Kata Kunci :** Pemodelan Fasies 3D, Seri Lapisan 'X' dan Seri Lapisan 'Y', batupasir, lingkungan pengendapan, persebaran.

## ABSTRACT

*The South Sumatra Basin is one of Indonesia's major hydrocarbon-producing basins, with the majority of reserves concentrated in the Talang Akar Formation reservoir. The 'NAF' field, whose main reservoir is the Talang Akar Formation sandstone, has experienced a decline in production rates since the early 2000s. A facies validation and reservoir distribution study is essential to optimize field development, such as infill drilling or Enhanced Oil Recovery (EOR). This study aims to determine the facies, depositional environment, and stratigraphic sequence concept in the 'X' and 'Y' layers of the Talang Akar Formation, as well as to produce a 3-dimensional facies model to determine the distribution of sandstone. This study uses integrated well data (wireline logs) and 3D seismic data to construct a 3D facies model in the 'NAF' Field. The stages begin with the determination of facies, depositional environments, and stratigraphic sequence analysis based on qualitative wireline logs to construct a chronostratigraphic framework. 3D facies modeling was performed using a stochastic method, namely the Truncated Gaussian Simulation (TGS) method, which was adapted to the geological concept of meandering channel deposits and the availability of existing data. The modeled facies included sandstone, shale, and coal. The results of the study show that Layer 'X' and Layer 'Y' were deposited in a meandering channel fluvial environment with the main facies associations being point bars, crevasse splays, and floodplains. Both layers are in the Lowstand System Tract (LST) phase based on chronostratigraphy and the Low Amalgamated System Tract (LAST) and High Amalgamated System Tract (HAST) phases based on the sediment supply and accommodation space ratio. 3D facies modeling shows that Layer 'X' is dominated by sandstone (68.46%) with a thickness of (0 ft –40 ft). Layer 'Y' has a lower percentage of sandstone (39.1%) and a thinner thickness (0–26 ft), both layers are distributed as amalgamated point bars. The distribution of sandstone thickness is in line with the direction of deposition, namely towards the south where the sandstone is thicker.*

**Keywords:** 3D facies modeling, Layer 'X' and Layer 'Y', sandstone, depositional environment, distribution.