

SARI

Lapangan 'Z' adalah salah satu lapangan minyak dan gas bumi pada wilayah kerja PT. Pertamina Hulu Rokan Zona 4 yang berada di Sub Cekungan Palembang Selatan, Cekungan Sumatera Selatan. Salah satu reservoir utama pada Lapangan 'Z' adalah interval Batupasir 'X' yang berada pada Formasi Talang Akar Atas. Seiring berjalannya waktu, produksi minyak pada Lapangan 'Z' terus mengalami penurunan disertai dengan peningkatan nilai *water cut*, sehingga perlu dilakukan beberapa upaya pengembangan. Sebelum upaya pengembangan tersebut dilakukan, perlu dilakukan studi guna mengetahui geometri dan distribusi reservoir, tak terkecuali pada Reservoir Batupasir 'X'. Penelitian ini bertujuan untuk mengetahui geometri dan distribusi dari Reservoir Batupasir 'X' dengan membangun model fasies 3 dimensi. Penelitian ini dilakukan dengan integrasi analisis data *log* sumur dan analisis seismik 3 dimensi. Metode yang digunakan dalam pemodelan adalah kombinasi antara *Truncated Gaussian With Trends* (TGS) dan *Sequential Indicator Simulation* (SIS). Berdasarkan analisis data *log* sumur, didapatkan fasies yang berkembang pada Formasi Talang Akar terdiri dari asosiasi *tidal channels*, *tidal flats*, dan *sand sheets* dengan lingkungan pengendapan berupa *tide dominated estuary – shallow marine*. Formasi Talang Akar terdiri dari 15 parasekuen dan dua *system tracks* yaitu *transgressive system track* dan *highstand system track*. Secara kronostratigrafi, Reservoir Batupasir 'X' berada pada interval Parasekuen 9. Struktur yang berkembang pada Lapangan 'Z' berupa antiklin bersumbu tenggara – barat laut dan sesar sesar normal berorientasi timur laut – barat daya. Reservoir Batupasir 'X' terdiri dari fasies batupasir, *shaly sandstone*, *shale*, dan batubara yang membentuk geometri *sand sheet*. Berdasarkan model fasies 3 dimensi, fasies batupasir dan *shaly sandstone* pada Reservoir Batupasir 'X' menyebar di seluruh lokasi penelitian dengan geometri *blanked sand* pada asosiasi *sand sheet* dan pola secara vertikal mengkasar keatas dan terdapat lensa lensa *shale* dan batubara pada tubuh batupasir serta membaji di beberapa tempat.

Kata kunci: sekuen stratigrafi, pemodelan fasies 3 dimensi, Formasi Talang Akar, Sub Cekungan Palembang Selatan.

ABSTRACT

'Z' Field is one of the oil and gas fields in the working area of PT. Pertamina Hulu Rokan that located in South Palembang Sub Basin, South Sumatera Basin. One of the main reservoirs that has been proven is 'X' Sandstone Reservoir in the Upper Talang Akar Formation. Oil production in 'Z' Field continuous naturally decline, accompanied by an increase in water cut, so several development actions need to be initiated. Before these development actions are initiated, it is necessary to take a comprehensive study to understand the geometry and distribution of the reservoir, including 'X' Sandstone Reservoir. This research aims to determine the geometry and distribution of 'X' Sandstone Reservoir by constructing a 3-dimensional facies model. This research was carried out by integrating well log data analysis and 3-dimensional seismic analysis. The method that used in facies modeling is a combination of Truncated Gaussian With Trends (TGS) and Sequential Indicator Simulation (SIS). Based on the analysis of well log data, facies that developed in Talang Akar Formation consist of tidal channels, tidal flats, and sand sheets associations. The depositional environment of Talang Akar Formation was a tide-dominated estuary into shallow marine. Talang Akar Formation consists of 15 parasequences and two system tracks, transgressive system track and highstand system track. Chronostratigraphically, 'X' Sandstone Reservoir is located within 9th-Parasequence. Geological structure that developed in 'Z' Field consists of southeast-northwest trending anticlines and east-northeast to west-southwest trending normal faults. Facies that developed in 'X' Sandstone Reservoir consist of sandstone, shaly sandstone, shale, and coal, forming a sand sheet geometry. Based on the 3-dimensional facies model, sandstone and shaly sandstone facies in 'X' Sandstone Reservoir are relatively distributed along the research area with a blanked sand geometry and sand sheet facies association and vertically coarsening upward also there are shale and coal lenses in the sandstone bodies with channeling in some places.

Keywords: *sequence stratigraphy, 3-dimensional facies modelling, Talang Akar Formation, South Palembang Sub Basin.*