INTISARI

Karakterisasi Reservoir Dan Perhitungan Volume Cadangan Hidrokarbon Berdasarkan Analisis Petrofisika pada Batupasir 1st Wall Creek Formasi Frontier (F1WC), Lapangan Teapot Dome, Cekungan Powder River, Natrona Country, Wyoming, Amerika Serikat

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Analisis petrofisika dan interpretasi data seismik telah dilakukan pada reservoir batupasir berpotensi mengandung hidrokarbon 1st Wall Creek formasi Frontier (F1WC). Analisis ini bertujuan untuk menghitung besar nilai properti petrofisika sekaligus jumlah volume cadangan hidrokarbon yang terkandung di dalam reservoir tersebut. Properti petrofisika yang diperoleh dari penelitian ini adalah kandungan serpih, porositas, saturasi air, dan permeabilitas. Properti tersebut kemudian dipetakan persebarannya untuk melihat karakter dari reservoir ini. Properti tersebut juga digunakan untuk perhitungan cadangan hidrokarbon yang terkandung dalam reservoir.

Analisis petrofisika dilakukan pada 9 sumur yang tersebar dari utara hingga selatan area lapangan penelitian. Metode yang digunakan dalam penelitian ini adalah metode deterministik menggunakan perangkat lunak Paradigm Geolog 7. Hasil analisis berupa properti petrofisika menunjukkan bahwa reservoir F1WC memiliki kualitas cukup hingga baik. Interpretasi data seismik dilakukan dengan menghasilkan peta struktur melalui picking sesar dan horizon. Hasil interpretasi data seismik ini menunjukkan adanya sesar normal yang membagi area penelitian menjadi 2 (dua) blok, utara dan selatan.

Hasil penelitian menunjukkan bahwa reservoir F1WC memiliki porositas efektif antara 8% hingga 11%, saturasi air antara 28% hingga 54% dan permeabilitas 7 mD hingga 19 mD. Parameter tersebut menunjukkan kualitas reservoir memiliki kualitas cukup hingga baik. Adapun pemetaan properti petrofisika menunjukkan bahwa blok bagian selatan mengandung hidrokarbon relatif lebih banyak daripada blok utara. Total volume gas atau *Gas Initial in Place* yang terkandung di dalam F1WC adalah 1.877,45 juta SCF (*standard cubic feet*).

Kata kunci : karakterisasi reservoir, properti Petrofisika, reservoir, volumetrik

ABSTRACT

Reservoir Characterizarion And Hydrocarbon Reserve Volume Calculation Based On Petrophysical Analysis on 1st Wall Creek Sandstone Frontier Formation (F1WC), Teapot Dome Field, Powder River Basin, Natrona Country, Wyoming, United States

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Petrophysical analysis and seismic data interpretation have been done on hydrocarbon potential sandstone reservoir named 1st Wall Creek Frontier Formation (F1WC). It aims to calculate the value of the petrophysical properties well as the number of hydrocarbon reserves volume contained in the reservoir. The petrophysical properties obtained from this study is the shale content, porosity, water saturation, and permeability. The properties were then mapped by its distributions to see the character of this reservoir. The properties were also used for the calculation of hydrocarbon reserves contained in the reservoir.

Petrophysical analysis performed on 9 (nine) wells that are spread from the north to the southern area of the field of the study. The method used in this study was a deterministic method using software such as Paradigm Geolog 7. The results of the analysis indicated that the reservoir petrophysical properties have a fair to good in quality as a reservoir. Interpretation of the seismic data has done by generating a map structure through faults and horizons picking. The result showed the normal fault that divides the study are into 2 (two) blocks, north and south.

The study results showed that the reservoir F1WC have effective porosity were about 8% up to 11%, water saturation were about 28% up to 54% and permeability were about 7 mD up to 19 mD. It showed that the reservoir have a fair to good in quality. In addition, petrophysical properties mappings showed that the southern part of the block containing hydrocarbons relatively more than north block. The total volume of Gas in Place contained in F1WC is 1877.45 million SCF (standard cubic feet).

Keywords : reservoir characterization, petrophysical properties, reservoir, volumetric