

Aplikasi metode inversi impedansi akustik berbasis model dan analisis petrofisika untuk karakterisasi reservoir Batu Pasir formasi Ngrayong Lapangan "Sandara" = Applications acoustic impedance inversion based model and petrophysical analysis for reservoir characterization Sandstone formation Ngrayong field "Sandara"

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Abstrak

[ABSTRAK

Penelitian dilakukan pada lapangan ?Sandara‟ yang terletak kurang lebih 22 km di sebelah timur laut kota Cepu pada Cekungan Jawa Timur Utara. Tujuan penelitian ini adalah untuk mengidentifikasi perbedaan batupasir formasi Ngrayong pada horison L1 dan L5 serta mengetahui karakteristik reservoir batupasir tersebut dengan memanfaatkan data seismik 3D yang dianalisis dengan metode inversi seismik impedansi akustik berbasis model dan data log sumur SAN-01, SAN-02, SAN-04, dan SAN-07 yang di analisis petrofisika dengan metode determin. Hasil menjelaskan bahwa batu pasir pada area sekitar sumur SAN-01, SAN-02 dan SAN-04 yang terdapat di sebelah barat laut area penelitian merupakan reservoir dengan kandungan lempung bernilai antara 30 ? 50%, saturasi air antara 60 ? 70%, dengan porositasnya bernilai 15 - 20%, permeabilitasnya bernilai lebih dari 250 mD, dan nilai impedansi akustiknya kurang dari 7000 m/s*gr/cc. Sedangkan area yang berada disekitar sumur SAN-07 mengarah sebelah tenggara area penelitian mendeskripsikan reservoir dengan nilai kandungan lempung bernilai rendah yaitu 30%, namun nilai saturasi air bernilai cukup tinggi mendekati 90%, nilai porositasnya lebih rendah yaitu sebesar 10%, permeabilitasnya juga lebih rendah bernilai dari 163 mD dan nilai impedansi akustiknya lebih dari 8000 m/s*gr/cc. Berdasarkan hasil analisa petrofisika dan inversi impedansi akustik, rekomendasi titik bor selanjutnya dapat disarankan pada daerah yang dangkal (di area puncak antiklin), memiliki nilai impedansi di bawah 7000 m/s*g/cc dan berada di sekitar sumur SAN-01, SAN-02, SAN-04.

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ABSTRACT

The study has been held in ?Sandara? field which located approximately 22 km in the northeast of Cepu region, Northeast Java Basin. The purpose of this study are to identify differences in the sandstone formations of Ngrayong L1 and L5 horizon and to determine the characteristics of the sandstone reservoir by utilizing 3D seismic data that is analyzed with acoustic impedance seismic inversion method based on model and log data from SAN-01, SAN-02, SAN-03, and SAN-04 wells in petrophysical analysis by determin method. The results is the sandstone around SAN-01, SAN-02, and SAN-04 wells have composition of shale volume is between 30 ? 50%, water saturation is between 60 ? 70%, the porosity value is between 15 - 20%, the permeability is above 250 mD, and the acoustic impedance is bellow 7000 m/s*gr/cc. Meanwhile, the area around SAN-07 well or the area which is located in the southeast direction of the study area have composition of shale volume is around 30%, water saturation is almost 90%, the porosity value is near 10%, the permeability is at 163 mD, and the acoustic impedance is above 8000 m/s*gr/cc. Based on the petrophysical analysis and the acoustic impedance seismic inversion results, the recommendations of the next drilling point are suggested in the crest of the anticline area and have an

impedance value below 7000 m/s*g/cc, and located near the SAN-01, SAN-02, SAN-04 wells., The study has been held in “Sandara” field which located approximately 22 km in the northeast of Cepu region, Northeast Java Basin. The purpose of this study are to identify differences in the sandstone formations of Ngrayong L1 and L5 horizon and to determine the characteristics of the sandstone reservoir by utilizing 3D seismic data that is analyzed with acoustic impedance seismic inversion method based on model and log data from SAN-01, SAN-02, SAN-03, and SAN-04 wells in petrophysical analysis by determin method. The results is the sandstone around SAN-01, SAN-02, and SAN-04 wells have composition of shale volume is between 30 – 50%, water saturation is between 60 – 70%, the porosity value is between 15 - 20%, the permeability is above 250 mD, and the acoustic impedance is bellow 7000 m/s*gr/cc. Meanwhile, the area around SAN-07 well or the area which is located in the southeast direction of the study area have composition of shale volume is around 30%, water saturation is almost 90%, the porosity value is near 10%, the permeability is at 163 mD, and the acoustic impedance is above 8000 m/s*gr/cc. Based on the petrophysical analysis and the acoustic impedance seismic inversion results, the recommendations of the next drilling point are suggested in the crest of the anticline area and have an impedance value below 7000 m/s*g/cc, and located near the SAN-01, SAN-02, SAN-04 wells.]