

Aplikasi seismik petrofisik dalam karakterisasi reservoir lapangan gas cekungan Sumatra Selatan = Seismic petrophysics application in reservoir characterization of gas field South Sumatra Basin

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Abstrak

Metode seismik petrofisik diaplikasikan pada zona target sebagai pendekatan praktis untuk memahami lebih lanjut karakter reservoir pada lapangan "G"; Cekungan Sumatra Selatan melalui analisis seismik petrofisik data log sumur dan data seismik 2D. Evaluasi formasi rutin dilakukan untuk menghitung volume lempung, porositas, dan saturasi air pada lokasi sumur. Plot silang data log sumur dan hasil evaluasi formasi dibuat untuk menguji sensitifitas data log sumur terhadap perubahan litologi, porositas, dan kandungan fluida dalam reservoir. Data log gelombang S merupakan hasil derivasi dari persamaan Castagna.

Sedangkan impedansi P, impedansi S, rasio V_p/V_s , $\Lambda\rho$, dan $\mu\rho$ dihitung menggunakan persamaan transformasi Λ - μ - ρ LMR.

Properti elastis reservoir diekstrak dari data gather seismik 2D melalui proses inversi simultan. Hasil analisis petrofisika dan sebarannya melalui panduan data seismik menghasilkan bahwa zona prospek pada lapangan "G"; berada pada interval 1600 ndash; 1650 ms dengan batupasir yang bertindak sebagai reservoir memiliki kandungan volume batulempung dibawah 35 , porositas diatas 10 , dan saturasi air dibawah 65 sebagai zona potensial hidrokarbon.

Seismic petrophysics technique were applied to "G" filed of South Sumatra Basin as a practical approach to understand more about the reservoir through integrated interpretation of logs and 2D seismic gather. Routine formation evaluations were done to calculate shale volume, porosity, and water saturation at well location. Cross plots of log data were generated to test the sensitivity parameters of log curves to changes in lithology, porosity, and fluid content in the reservoir. P impedance, S impedance, V_p/V_s ratio, $\Lambda\rho$, $\mu\rho$ and density were calculated through a Λ μ ρ LMR transform.

Volumes of elastic properties were extracted from simultaneous inversion process of 2D gather and analyzed to capture lithology and fluid changes in the reservoir. Petrophysical analysis and its distribution based on seismic data results in prospect zone at interval 1600 ndash 1650 ms with sandstone reservoir characterized by shale volume less than 35 with porosity higher than 10 and water saturation below 65 identified as potential hydrocarbon zone.