Estimasi Pemodelan Kecepatan Shear Terbaik untuk Karakterisasi Reservoar dengan Metode Inversi Simultan pada Lapangan XXX Cekungan Natuna Barat = Comparison of Estimates-Shear Velocity (Vs) and Its Application to Seismic Simultaneous Inversion: "Case Study of West Natuna Basin X-Field"

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Abstrak

[ABSTRAK
Lapangan XXX merupakan lapangan minyak di cekungan Natuna Barat dengan reservoir utama berupa reservoir batu pasir. Ketebalan reservoir pada lapangan ini sangat bervariasi sehingga hasil inversi hanya dapat memetakan ketebalan reservoir yang mendekati ketebalan tuning.
Berdasarkan uji sensitifitas, parameter AI di setiap sumur tidak dapat membedakan hidrokarbon, sehingga parameter akustik saja tidak dapat diaplikasikan dalam karakterisasi reservoir lapangan ini. Namun ketika parameter densitas terpisah dengan parameter kecepatan P, sebaran hidrokarbon dapat dibedakan dengan baik. Kecepatan S tidak tersedia di semua sumur padahal data ini sangat diperlukan untuk melakukan pengolahan data dengan metode inversi simultan. Oleh karena itu akan dilakukan beberapa estimasi untuk mendapatkan data kecepatan S antara lain dengan metode castagna, metode gassmann, metode parsial, metode Xu-White dan metode Lee. Data kecepatan S yang dipakai adalah kecepatan S terbaik yang diperoleh dari metode Xu White dikarenakan hasil log poisson?s rationya paling mendekati tren kurva saturasi air. Selain itu aspek rasio batuan yang mempertimbangkan nilai porositas dan volume clay, serta kontrol kualitas Vp model dari metode Xu-White memiliki rasio error minimum jika dibandingkan dengan nilai Vp dari data log.
Metode inversi simultan dengan data pre-stack atau partial stack memungkinkan dilakukannya prediksi parameter Impedansi P, Impedansi S, dan densitas dari data seismik. Selain itu meode inversi simultan dapat dipergunakan multi wavelet dalam pengolahan datanya. Hasil penampang inversi yang diperoleh menunjukkan bahwa inverse densitas dapat menjelaskan letak sebaran batuan reservoir dan fluida berdasarkan cut off sensitifitas yakni nilai dibawah 2,26 gr/cc.
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ABSTRACT
X field is an oil field in West Natuna Basin with sandstone reservoir as primary target. There was varying reservoir thickness, so the inversion method that could only be applied to map reservoir thickness, which close to tuning thickness.
Based on sensitivity analysis, Acoustic Impedance parameters couldn?t indicate hydrocarbon appearance for each well, so Acoustic Impedance cannot be

applied for reservoir characterization in this field. Density versus Acoustic Impedance could map hydrocarbon appearance.
Shear velocity weren?t available where those data was needed for running simultaneous inversion method. Predicting velocity shear would be carried out by using several method such as Castagna, Gassmann, Parsial, Xu-White, and Lee. The best estimated velocity shear would be used for inversion, The best estimated shear velocity from Xu-White method because Xu-White?s poisson ratio log presents similar trend with water saturation log (Sw). Moreover, Xu-White?s ratio aspect is also considering porosity and clay volume value. Based on quality control result, Vp model of Xu-White had minimum error ratio compared to Vp from log.
Simultaneous inversion with pre-stack and parsial stack data what can be used for predicting P-Impedance, S-Impedance, and density from seismic data. Otherwise, this method is also used not only for single wavelet but also multi wavelet. The inversion result from this study can mapping out the hydrocarbon appearance for reservoir target based on cut off value from sensitivity test of less than 2,26 gr/cc.;X field is an oil field in West Natuna Basin with sandstone reservoir as primary target. There was varying reservoir thickness, so the inversion method that could only be applied to map reservoir thickness, which close to tuning thickness.
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