

INTISARI

Identifikasi Porositas Vuggy Menggunakan Inversi Seismik, Analisis Lingkungan Pengendapan dan Asosiasi Fasies pada Formasi Baturaja Lapangan “Neko”, Cekungan Jawa Barat Utara

Oleh

Nur Indah Setyawati

16/394065/PA/17156

Lapangan “Neko” merupakan lapangan dengan reservoir karbonat yang sangat menarik untuk dipelajari. Penelitian ini difokuskan pada reservoir karbonat dari Formasi Baturaja yang memiliki porositas *vuggy* dan bertujuan untuk mengidentifikasi daerah yang terindikasi adanya porositas *vuggy* yang kemudian dilakukan analisis fasies dan lingkungan pengendapan. Dengan menggunakan data seismik 3D *post-stack time migration*, data sumur, *mudlog*, *checkshot*, *marker*, *Fullbore Formation Microimager (FMI)*, data batuan inti, dan data geologi.

Sumur NNA-12 merupakan sumur kunci yang terbukti adanya porositas *vuggy*, dibuktikan dengan data *FMI*. Kemudian dilakukan *crossplot* AI-RHOB dengan AI-PHIE sehingga diperoleh rentang nilai AI yang menunjukkan adanya porositas *vuggy*. Metode inversi seismik yang digunakan dalam penelitian ini adalah *model based*, *bandlimited*, dan *sparse spikes*. Hasil inversi terbaik dari ketiga metode tersebut kemudian digunakan untuk analisis lebih lanjut. Keberadaan adanya *sweet spots* diperjelas menggunakan atribut *instantaneous frequency*. Interpretasi kuantitatif dilengkapi dengan interpretasi kualitatif dari asosiasi fasies dan lingkungan pengendapan.

Berdasarkan hasil *crossplot*, *pseudo volume AI*, dan *slicing* diperoleh nilai impedansi akustik pada batuan karbonat dengan porositas *vuggy* sebesar 12.800 – 18.200 ((ft/s).(gr/cc)), porositas matriks 18.250 – 24.950 ((ft/s).(gr/cc)), karbonat *tight* 25.000 – 48.000 ((ft/s).(gr/cc)), dan batuserpih 6.000 – 12.000 ((ft/s).(gr/cc)). Batuan karbonat dengan porositas *vuggy* berupa fasies *inner ramp (shallow ramp)*, dan lingkungan pengendapan berada di *inner ramp (shallow ramp)*. Sumur usulan selanjutnya terletak di timurlaut daerah penelitian.

Kata kunci: *porositas vuggy*, inversi seismik, *instantaneous frequency*, fasies, lingkungan pengendapan

ABSTRACT

Identification of Vuggy Porosity Using Seismic Inversion, Depositional Environment Analysis and Facies Association in Baturaja Formation at “Neko” Field, Northwest Java Basin

By

Nur Indah Setyawati

16/394065/PA/17156

“Neko” Field is the most interesting field with a carbonate reservoir to study. This study focused on the carbonate reservoir of Baturaja Formation which contains vuggy pores and aims to identify vuggy pores which are then performed facies analysis and depositional environment. Using 3D seismic data post-stack time migration, well logs, mud log, checkshot, marker, Fullbore Formation Microimager (FMI), core data, and geology data.

NNA-12 is a key well which proven by vuggy pores, proven by FMI data. Crossplot analysis was performed using AI-RHOB and AI-PHIE so we got a range of AI values that indicated vuggy pores. Seismic inversion methods that used in this research are model-based, bandlimited, and sparse spikes. The best result from these methods then used for further analysis. Sweet spots were clarified by the instantaneous frequency attribute. The quantitative interpretation was completed with quantitative interpretation from facies analysis and depositional environment.

Based on crossplot, pseudo volume AI, and slicing, AI value on limestone with vuggy pores ranging from 12.800 – 18.200 ((ft/s).(gr/cc)), limestone with matrix porosity 18.250 – 24.950 ((ft/s).(gr/cc)), tight limestone 25.000 – 48.000 ((ft/s).(gr/cc)), and shale 6.000 – 12.000 ((ft/s).(gr/cc)). Limestone with vuggy pores is a form of inner ramp (shallow ramp) facies, and depositional environment located in inner ramp (shallow ramp). Moreover, the area which is expected to be a favorable place for further exploration wells is located in the northeast of the research area.

Keywords: vuggy pores, seismic inversion, instantaneous frequency, facies, depositional environment