ABSTRACT

SANDSTONE RESERVOIR CHARACTERIZATION AT NGRAYONG FORMATION “ANUGERAH” FIELD USING AVO AND LMR ANALYSIS

By

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Amplitude Variation with Offset (AVO) and seismic inversion methods are useful for characterizing oil and gas reservoir. Both of them are also used to determine the sandstone’s anomaly and its’ distribution at Ngrayong Formation, North-East-Java Basin. From this research can be conclude that reservoir on well Mg 2 and well Mg 3 are both class III sandstone’s anomaly with stronger seismic amplitude and gradient toward offset and has lower Acoustic Impedance (AI) than its’ cap rock. Meanwhile reservoir on well Mg 4 and well Mg 5 are both class I sandstone’s anomaly with lower seismic amplitude and gradient toward offset and have higher Acoustic Impedance (AI) than its’ cap rock. Lambda-Rho ($\lambda_\rho$) and Mu-Rho ($\mu_\rho$) are sensitive physics parameter to determine reservoir lithology and fluid content. Both of them are transformed from Acoustic Impedance (AI) and Shear Impedance (SI). Range value of it’s horizontal section and time slice map of Acoustic Impedance (AI) and Shear Impedance for all well are 5600-6500 ((m/s)*(g/cc) and 2500-3000 ((m/s)*(g/cc), while range value of Lambda-Rho ($\lambda_\rho$) and Mu-Rho ($\mu_\rho$) are 20-30 ((GPa)*(g/cc) and 5-12 ((GPa)*(g/cc). High value of Lambda-Rho ($\lambda_\rho$) and Mu-Rho ($\mu_\rho$) are indicated as oil sandstone reservoir because oil has more incompressibility and sandstone is also more rigid than shale. From it’s time slice map known that Mu-Rho ($\mu_\rho$) is not good shown laterally, it is because the lithology of the reservoir is not clean sandstone but shally-sand which also known from the high Gamma Ray value. The distribution of potential sandstone oil reservoir is NE-SW.

Key words: reservoir characterization, Amplitude Variation with Offset (AVO), Seismic Inversion, and Lambda-Mu-Rho (LMR) Transformation.