

3D Pore Pressure Prediction Model on Talang Akar and Gumai Formation of Betara Structure, Jambi Sub-basin

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ABSTRACT

Betara structure is located in the northern part of South Sumatra Basin (SSB). It is formed by the mega sequences tectonic processes of rifting and inversion with various stratigraphic sequences from land to marine. Refer to the schematic map of global overpressure occurrences, mostly Indonesia region including Sumatra are overpressure region. The Indications of overpressure zone in the Betara structure are in Gumai and Talang Akar Formation where the syn-rift to post-rift sequence dominated by fine grained sediments (shales) with low permeability. A Preliminary study has been done with availability data to make 3D pore pressure prediction model in the Betara structure.

The study used as input data from wireline logs, pressure test (RFT), geochemistry, 3D seismic, and drilling parameters. In Betara structure, the presence of overpressure zone is marked by significant reversal sonic log data as increasing in depth from the normal compaction trend from several existing wells. Therefore, pore pressure calculation is estimated by Eaton Method from sonic log which is calibrated to measured pore pressure from RFT data. The 3D pore pressure distribution is based on pore pressure log in wells of Betara structure.

Results showed overpressure zone occurs in the Betara structure with characteristic low overpressure in the Gumai interval and high overpressure in the Upper Talang Akar interval. Overpressure distributes throughout wells which has high pore pressure in the deep structure area as in the North and South of Betara structure whereas low pore pressure in shallow structure area as in the middle of Betara structure. The distribution of 3D pore pressure has relationship between pore pressure and velocity which is low velocity as indication of high pore pressure. This study result can be used to support future drilling program especially for drilling mud weight prediction and mitigation of overpressure as a drilling hazard.