Addressing Low Permeability Reservoir in Arthit Graben Trend

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Abstract

The Arthit concessions are located in The North Malay Basin, in the Gulf of Thailand. The Arthit Graben trend covers the southeast part of Arthit 15 block. This trend is structurally complex which seems to affect the reservoir quality. Results from exploration and development wells drilled in this trend show some pay zones using standard petrophysical cut-offs that were non-productive. The results from the petrophysical parameters integration with the core analysis were undertaken in an attempt to understand the Petrophysical properties in the Arthit Graben Trend. Significant net pay was computed using the standard workflow, procedures and cut-offs but subsequent RFT pressure measurements and well tests showed several of these pay zones to be non-productive.

Rapid decline in porosity and permeability with increasing burial depth relating to several geological factors results in low mobility in Arthit Graben Trend. These factors such as depositional environment, provenance, diagenesis, very high geothermal gradients were damage from over drilling mud weight and inconclusive TST testing. In this study, the data in Arthit Graben Trend were observed from TST showing low-no flow and dry-tight from RFT. Understanding of reservoir rocks has been one of the key aspects in Arthit petroleum exploration and production.

The reservoir composition, cementation, porosity will be investigated directly from some conventional core samples of unit 2A and unit 2B through the petrographic study and scanning electron microscope (SEM) in order to help understanding diagenetic history. Then integrated study with well data (such as RFT-TST), palaeogeographic maps and seismic data are useful to understand deposition environment and stratigraphic evaluation predicting reservoir distribution and properties. Moreover, this presentation describes how the integrated data were used and what impact on field development plan of Arthit Graben Trend. In conclusion, the uncertainties of low mobility reservoirs and their impacts on field development plan have been discussed along with recommendations for additional studies.