

Quantitative Seismic Interpretation in the LP3D Concession, Central of the Sirte Basin, Libya

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Abstract : LP3D Field is located near the center of the Sirt Basin in the Marada Trough approximately 215 km south Marsa Al Braga City. The Marada Trough is bounded on the west by a major fault, which forms the edge of the Beda Platform, while on the east, a bounding fault marks the edge of the Zelten Platform. The main reservoir in the LP3D Field is Upper Paleocene Beda Formation. The Beda Formation is mainly limestone interbedded with shale. The reservoir average thickness is 117.5 feet. To develop a better understanding of the characterization and distribution of the Beda reservoir, quantitative seismic data interpretation has been done, and also, well logs data were analyzed. Six reflectors corresponding to the tops of the Beda, Hagfa Shale, Gir, Kheir Shale, Khalifa Shale, and Zelten Formations were picked and mapped. Special work was done on fault interpretation part because of the complexities of the faults at the structure area. Different attribute analyses were done to build up more understanding of structures lateral extension and to view a clear image of the fault blocks. Time to depth conversion was computed using velocity modeling generated from check shot and sonic data. The simplified stratigraphic cross-section was drawn through the wells A1, A2, A3, and A4-LP3D. The distribution and the thickness variations of the Beda reservoir along the study area had been demonstrating. Petrophysical analysis of wireline logging also was done and Cross plots of some petrophysical parameters are generated to evaluate the lithology of reservoir interval. Structure and Stratigraphic Framework was designed and run to generate different model like faults, facies, and petrophysical models and calculate the reservoir volumetric. This study concluded that the depth structure map of the Beda formation shows the main structure in the area of study, which is north to south faulted anticline. Based on the Beda reservoir models, volumetric for the base case has been calculated and it has STOIP of 41MMSTB and Recoverable oil of 10MMSTB. Seismic attributes confirm the structure trend and build a better understanding of the fault system in the area.

Keywords : LP3D Field, Beda Formation, reservoir models, Seismic attributes

Conference Title : ICSGEG 2019 : International Conference on Structural Geology and Exploration Geophysics

Conference Location : San Francisco, United States

Conference Dates : November 05-06, 2019