

2D seismic interpretation and petrophysical analysis of Miano-02, Central Indus Basin, Pakistan

Saif-Ur-Rehman K. Jadoon¹; Muhammad F. Mehmood²; Zohaib Shafiq²; Muhammad Owais Zaib¹ and Ishtiaq A. K. Jadoon¹

¹Comsats Institute of Information Technology, Abbottabad

*²Bahria University, Islamabad
saif_jadoon@outlook.com*

Abstract

Miano Block covering about 814.02 km² is located in the Central Indus Basin, Sindh province, Pakistan. The Central Indus Basin is generally characterized by an extensional regime with the presence of normal faulting. Tectonically the block lies on NW-SE oriented Panno-Aqil Graben between two highs i.e., Jacobabad-Khairpur toward southwest and Mari-Kandhkot towards northeast. Seismic and well data were used for structural analysis and evaluation of Cretaceous reservoirs in the block. For structural interpretation of the study area, four migrated seismic lines were used; P2092-111, P2092-113 and P2092-115 (dip lines) and P2092-110 (strike line). Time and depth contour maps of four horizons i.e., top Habib Rahi limestone, Sui Main limestone, Ranikot and Lower Goru Formations were generated with interpretation of gently dipping strata towards the east along with the presence of a set of high angle N-S oriented normal faults with dip either towards E or W. Furthermore, the faults are observed to exhibit a slight disruption of strata with limited displacement to the order of maximum about 50m in Lower Goru Formation. Thus, due to the dominant extensional tectonics of the area horst and graben structures are interpreted. The N-S oriented normal faults are oblique to the NW-SE orientation of the regional structures such as the Jacobabad-Khairpur and Mari Kandhkot Highs which indicate about the complexity of deformation. Petrophysical parameters were calculated through petrophysical analysis of the Miano-02 well, which was drilled to a depth of 3548m with the primary target as B-Sands of Lower Goru Formation belonging to Lower Cretaceous age while secondary target was the A-Sands of Lower Goru Formation of the same age. Two potential zones of reservoir (zone 1 and zone 2) were marked within the Lower Goru Formation based on the values of average porosity, volume of shale, water and hydrocarbon saturation calculated from the well log data. The average hydrocarbon saturation calculated from the log data of Miano-02 for zone 1 was 63.5% and that of zone 2 was 68.9%.