



Petrophysical Evaluation of the Eocene Chorgali Formation, Meyal Oil Field, Potwar Plateau, Pakistan.

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Abstract

The predominant oil producing Potwar sub-basin is located at the northern margin of the Upper Indus basin of Pakistan. The petrophysical studies of the Eocene Chorgali Formation including porosity (Φ), effective porosity (Φ_e), permeability (K), hydrocarbon saturation (S_{hc}) and volume of clay (Vcl) have been analyzed using Senergy Software (Interactive Petrophysics, IP V 4.2) in three wells (Meyal-01, Meyal-08P and Meyal-10P) of the Meyal Oil Field, Potwar Plateau, Pakistan. Meyal-01, Meyal-08P and Meyal-10P penetrated through the Chorgali Formation at 3732 m to 3798 m; 3681.4 m to 3757.3 m and 3822.8 m to 3889.9 m with corresponding thickness encountered in these wells 66m, 75.9m and 67.1m respectively. The Formation is divided into different net reservoir zones based on aforementioned key petrophysical parameters. Three net reservoir zones observed in Meyal-01 and Meyal-08P well while two net reservoir zones in Meyal-10P. In Meyal-01, the average values of porosity (Φ), effective porosity (Φ_e), permeability (K), hydrocarbon saturation (S_{hc}) and volume of clay (Vcl) at the net reservoir zones are 11.8 %, 10.27 %, 45.95 mD, 68.9 % and 12.6 %. At the net reservoir zones in Meyal-08P and Meyal-10P the average values of Φ , Φ_e , K, S_{hc} and Vcl are 26.2 %, 22.5 %, 46.9 mD, 74 % and 8 % and 17.45 %, 12.32 %, 46.51 mD, 45 % and 13.55 % respectively. The hydrocarbon saturation increases from the upper reservoir unit towards the lower reservoir unit with a maximum value of 87.6 % in case of Meyal-08P. The higher values of porosity, effective porosity, permeability, hydrocarbon saturation and lower the values of water saturation and volume of clay are indicators of a hydrocarbon reservoir with promising potential. Based on these petrophysical analysis of three wells in Meyal oil field, the Meyal-08P is interpreted to have high potential for generating hydrocarbons as compared to Meyal-01 and Meyal-10P.

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