Reservoir characterization and sequence stratigraphic interpretation of well log data of Turkwal Deep-01, Eastern Potwar, Punjab, Pakistan

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Abstract

The rock units drilled in the Turkwal Deep-01, Eastern Potwar, are investigated in terms of sequence stratigraphy and reservoir characterization using well logs. The well data was provided by Land Mark Resources with the approval of Directorate General of Petroleum Concessions (DGPC). Total depth of Turkwal deep-01 is 4300 m. The drilled rock units range in age from Pleistocene to Pre- Cambrian. Various petrophysical parameters were calculated for each rock unit. Based on these parameters, the Chorgalli Formation is turn out to be possible major reservoir while the Sakessar, Lockart, Warchha and Dandot Formations are the minor characteristics of a reservoir.

Two log intervals are marked in the Turkwal Deep-01, one comprising of the Jhelum Group while other is the Nilawahan Group. Based on log and published literature data different environment of deposition are assign to the different rock units. The Khewra sandstone has facies ranges from shallow marine, transitional (deltaic) and terrestrial facies indicating a regression phase of sea level. The Kussak Formation is deposited in marginal marine to shallow marine environment indicating a transgression of sea level. The Jutana Formation in again showing another episode of regression, while its facie are documented as shallow marine, followed by subtidal then intertidal and some supratidal facies are presents.

The Tobra Formation which contains glacial facies and showing a fall in the sea level. The Dandot Formation again record a rise in sea level as its facies are ranging from marginal marine to shallow marine environment. The Dandot Formation is followed by terrestrial fluvial sediments of the Warchha Formation which again marks a prominent fall in the sea level, while upward the Sardhai Formation record transitional to restricted environment (Lagoon) facies which were deposited in the transgression phase.