

An Integrated Approach for Assessment of Lower Goru Reservoir Quality in Western Part of Badin Area, Lower Indus Basin, Pakistan

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Abstract

The Lower Goru Sands are producing reservoir in the Badin area, Lower Indus basin, Pakistan. Nevertheless, G & G data analysis reveals that towards the western part of Badin area, its reservoir characteristic deteriorates. In order to de-risk the prospects mapped based on seismic and to further define combination stratigraphic-structural traps, a reservoir quality study of Lower Goru Sands was carried out. It involves analysis of Logs, Core, Ditch Cuttings, Petrography, XRD / SEM and depositional framework in terms of sequence Stratigraphy and development of depositional schemes. The depositional scheme was integrated into the sequence stratigraphic and depositional framework and as a result, the Gross Depositional Maps and reservoir corridors were mapped in the western part of Badin area around Lakhra High.

This study suggested that the entire Lower Goru succession comprising Upper Sand, Middle Sand, Basal Sand and Massive Sand have dominant Lower Shoreface facies with some tidal influence in a wave-dominated setting. The study concludes for the prolific “A” Sand interval of Upper Sand has a very narrow NE-SW orienting corridor of producing facies. These producing facies comprise moderately bioturbated sandstones with some lithic fragments (which suggest dominated storm input). It is worthy to mention that the “A” Sands is the only stratigraphic interval, which represents reservoir facies. The analysis for Basal and Massive Sand based on Babar-1 and Tuba Deep-1 show non-reservoir facies, mostly distal Lower Shoreface dominated setting. Nevertheless, the discovery of Usman-1, Ahmed-1 and Qasim Deep-1 in the south and west of the Tuba Deep-1 in Massive sand shows westward extension of reservoir facies in the study area and opens a new venue/ play for Massive Sand, analogous to the suggested NE-SW corridor for ‘A Sand’.