

Lithostratigraphic mapping and modeling of Bara Nala, Sindh, Pakistan

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Abstract

Pab Sandstone as a potential reservoir in Bhit and Zamama gas field, trigger to carry out the study in Bara Nala section which is of great stratigraphic significance being the only locality in the Southern Indus Basin where Upper Cretaceous to Pleistocene succession can be studied. The structure of the Bara Nala section is an anticline fold, is pitching in both directions (north and south) forming domal anticline. Comparison of the outcrops on both flanks of the anticline suggests probably two major faults. Lithostratigraphic modeling shows that the Hemipneustes Limestone (Moro Formation) is the lowest exposed bed in the area with thickness of 10.3m. The Pab Sandstone is medium to fine grained with cross bedding and ripple marks generally absent in the lower part where as they are prominent in the middle part. The shallow marine to fluvio-deltic environment shows short lived transgressive events with multiple coarsening upward cycles. The maximum thickness is 250m in Bara Nala where as in Khadro Nala its 219m. The Ranikot group contains Khadro and Bara Formation. The *Cardita beaumonti* bed overlies the Pab sandstone with 12m thick Basalt /Trap, equivalent to Daccan trap containing 3 individual flows with maximum thickness of 3.5m. The Bara Formation contains sandstone with variegated color, ripple marks and cross bedding with thickness varies from 50 to 65 m. The Laki limestone is well jointed and highly folded exposed as prominent scarps with dip more than 80°. The thickness of Laki limestone, Tiyon and Manchar Formation is 121m, 52m and 86m respectively.