

Palaeo-environmental Interpretation Using Wireline Log Data; A Case Study from Permo- Carboniferous Sediments of the UAE

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ABSTRACT

Advanced wireline logs viz., the electrical borehole imager and spectroscopy logs were run in a deep offshore well in UAE that penetrated the Permian dolomites and Carboniferous clastics. The geological objective of running these logs was twofold (1) to delineate structural, sedimentary and diagenetic features and (2) to arrive at a depositional model for the litho-units. In addition to the aforementioned log suite, the sonic sonde was also deployed to identify open fractures and analyze effects of insitustresses near the well.

In addition to throwing light on the fracture attributes across the logged units, borehole images also revealed the presence of marked high angle cross-beds in the clastic units. This was confirmed on core. The findings from electrical image coupled with the distribution of elements like silicon, calcium, magnesium, iron and titanium along the logged section obtained from spectroscopy logs helped to attempt assigning a paleo-environmental setting for the Permo-Carboniferous rock units.

In conclusion, the sedimentary sequence studied shows indications of transition from continental (aeolian) to restricted marine setting through a transitional (coastal) environment.