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Hussain Z. Al-Ajmi¹, Saikh Abdul Azim² (1) Kuwait Oil Company, Ahmadi, Kuwait (2) Kuwait Oil Company, 61008 Ahmadi, Kuwait

Sequence Stratigraphy, Depositional Environment and Reservoir Geology of Albian Reservoirs in Kuwait

The Albian stage occupies the most important place in Mesozoic chronostratigraphy of Kuwait with high frequency tectonic changes. A rapid sea level fall in early Albian initiated the deposition of Burgan clastic reservoirs over the Shuaiba Carbonates. The lower Burgan Formation was deposited in a lowstand systems tract represented by massive sandstone reservoirs. High frequency sealevel changes have resulted in deposition of shoreface sands and extensive marine shales within an overall fluvial setting. The middle part Burgan was deposited in a transgressive systems tract. The upper part witnessed a relative sealevel fall in a lowstand systems tract with deposition of sand prone facies in estuarine channels. The clastic cycle was terminated by initiation of Maaddud carbonate sedimentations in transgressive systems tract. A combined effect of allocyclic nesting of sequence stratigraphic packages and autocyclic ramp profile were the primary factors controlling the lithofacies association. The overlying carbonates of highstand systems tract comprises of large-scale stepwise regressive packages, terminated by a transgressive systems tract. The amalgamated braided channel sands of the Lower Burgan Formation traps giant pools in Kuwait with active bottom water drive. Estuarine channel sand deposits dominate upper part of the Burgan Formation. Reservoir characteristics of the Maaddud carbonates are strongly affected by post-burial diagenesis. The high-energy grainstones and clean packstones preserve primary rock fabric. The mud-rich packstones and wackestones show high degree of degradation of reservoir properties due to growth of carbonate concretionary cements. Early emplacement of hydrocarbons arrested the concretion growth, while in water leg the growth continued till the primary porosity is destroyed. The paper discusses genetic impacts of depositional environment over reservoir characteristics in detail.