

Paper Number: 3147

Sedimentary Characteristics and Model of Shallowwater Delta System of the Paleogene of Jianquanzi Member in Yaerxia Area, Jiuquan Basin

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A shallow-water delta was identified in Yaerxia area of Jiuquan basin during the period of deposition of the Palaeogene Jianquanzi member. Based on core, logging characteristics, seismic data analysis and previous research results, it is suggested that rivers carried sediment from the source via an alluvial fan sedimentary system located in the northeast of Yaerxia area and formed a high constructional delta deposits in a stable setting. The shallow-water delta developed in Yaerxia area had several characteristics as follows. Sediments had a fine grain size and high maturity and grain-size probability curves indicate obvious traction current characteristics. Abundant sedimentary structures include parallel bedding, cross bedding, bioturbation structures and scour-fill structures. Boulder clay beds suggest a high-energy depositional environment. Gilbert-type delta foresets are not present. Gravity current sediments and mouth bar are not preserved in study area while underwater distributary interchannels are well developed. Several non-continuous normal cycles which were either tangential or overlapping were developed alternately in vertical section. These characteristics make the shallow delta very different from normal deltas. Overlapping vertically and laterally extensive, distributary channel sandbodies are widely distributed and multiple sandbodies are interbedded with bay mudstone between distributary channels and lacustrine mudstones, leading to good reservoir-seal combinations. The shallow delta which has good hydrocarbon accumulation conditions was favorable for the formation of hydrocarbon reservoirs.

