

# SEQUENCE STRATIGRAPHY OF THE MIXED CARBONATE-SILICICLASTIC SYSTEM OF THE EOCENE NISAI FORMATION, PISHIN BASIN: DISTRIBUTION OF SOURCE ROCKS AND RESERVOIR FACIES

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The Paleocene ophiolite obduction divided the Neo-Tethys oceanic floor into Indus basin on the Indian Shield and Pishin Basin between Ophiolites and Afghan Block. The basin started to receive sediments in Eocene times from the northeast direction that continued until Pleistocene. The unexplored sediments of Pishin frontier basin of Pakistan deserve sequence stratigraphic approach as a first hand exploration tool. Early to Late Eocene Nisai formation, which is a mixed carbonate-siliciclastic system, is focused upon for its physical stratigraphy, sedimentary facies, depositional environments and biostratigraphy in order to outline the source rocks and reservoir facies within the sequence stratigraphic framework.

Within Nisai formation, one 2nd order sequence and nine 3rd order sequences have been identified in two surface sections. Their regional correlation through fine tuned dating helped to develop basin fill model and to understand facies dynamics. A facies belt comprising a wide range of carbonate and siliciclastic facies characteristic of shallow marine inner shelf to slope-basinal setting is associated with these sequences and represents southwestward progradation. Four horizons showing two types of source rock facies (dark gray to black shales and black limestone) mostly associated with transgressive and highstand system tracts are delineated. The lowstand deposits (conglomerates, coquinal limestone and calcareous sandstones) and highstand deposits (coquinal and reefal limestone) from the basinal turbidites and shelf settings, respectively identified, are the potential reservoir facies. This study indicates that the Nisai formation possesses a complete petroleum system with multiple source rock and reservoir targets for future exploration.