

Structural Geometry of the Manzai Fold and Thrust Belt, Northern Sulaiman Range, Pakistan

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Abstract

The Manzai fold and thrust belt (MFTB) is the western most extension of the Trans Indus ranges in north Pakistan. It is also considered as the northern part of Sulaiman Range and forms an integral part of the Himalayan foreland fold and thrust belt. The MFTB along with the Pezu-Bhittani Range surrounds the northwestern apex of Tank Basin. Geographically, the Bannu Basin lies to its northeast, Tank Depression to the southeast, Sulaiman Range to the south whereas Kurram Fault along with associated Mélange Zone is marking the western boundary of the MFTB. The MFTB is characterized by north-south structural pattern comprising of NNE-SSW striking en-echelon anticlinal and synclinal folds, occupying the hanging walls of the major thrust faults, mostly detached either at the base of Siwalik rocks or within Ghazij shale of the Eocene age. At surface, no rocks older than Siwalik cropping out in the eastern part of the MFTB. However, in the west, the rocks ranging in age up to Cretaceous-Jurassic are exposed. Detailed geological mapping in the MFTB and its surrounding area indicates that the MFTB defines an east verging and thin-skinned, deformed fold-thrust-belt structural system where the structural style is presumably characterized by decollement related thrusting associated with hanging wall folded structures, typical of compressional tectonic regime. Considering the structural and stratigraphic aspect of the MFTB, combined with interpretation of limited seismic data. It is strongly believed that potential anticlinal culminations of en-echelon nature, developed due to fault bending and / or propagation present all along the hanging walls of major thrust faults, which are prime hydrocarbon exploration targets in the MFTB. Additionally, the potential structures may exist beneath the synclinal folds evidenced by seismic data as well as stratigraphic fabric of the MFTB.