STRATIGRAPHY & TECTONIC ARCHITECTURE OF THE NORTH WESTERN PART OF THE KOHAT BASIN, NWFP, PAKISTAN

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The detailed mapping of the study area has resulted in establishing nine lithostratigraphic units, which range in age from Eocene to Pliocene. These units fall within three groups, which are from bottom to top as Chharat, Rawalpindi, and Siwalik Groups. The Chharat group is represented by five formations in the area including Panoba shale at the base, overlain by Jatta Gypsum along with its lateral equivalent Sheikhan Limestone, Kuldana and Kohat Fonnations. The Chharat group is unconformably overlain by the Murree and Kamlial Fonnations of the Rawalpindi group. The representative units of the Siwalik group in the area are Chinji and Nagri Formations.

The structural geometry of the area comprises large scale, east west trending folds and thrust faults. The fold structures include narrow anticlines and anticlinoria mostly cored by thrust faults. The synclinal folds are open, with both their limbs overturned and reflect fangeometry. The faults include fore and back thrusts. The back thrusts are mostly overturned at their surface exposures and have changed their vergence from north to south.

The proposed structural model based on surface and seismic data shows a series of large-scale hinterland dipping listric thrust faults emerging from the basal decollement. All these faults are steeply dipping at surface and become gentle with depth. Other prominent features are associated pop-ups and triangle zones which are the result of north verging splays from the listric thrust faults. The presence of triangle zones bounded by thrust faults of opposing vergence have resulted in the tectonic overprinting and delamination of different horizons at various levels. All the above-mentioned features are characteristics of the foreland fold and thrust belts in different parts of the world.

The basal detachment is located at the base of Salt Range Formation at a depth of around 8 km and 8.4 km in the southern and northern parts of the study area respectively. The restored version of the defom1ed state cross-section shows about 19.5 km (equal to 43 %)shortening for the mapped area. The proposed model is unique in the sense that it has been successfully tested during the recent exploratory activities in the region.