

# APACHE LINEAMENT THRUST AND ASSOCIATED WRENCH FAULTS

G. Pat Bolden  
Consultant Geologist  
Midland, Texas

## ABSTRACT

The Downie Roadcut eight miles north of Sanderson, Texas on State Highway 285 is a north-south roadcut a quarter mile long with 60 foot high walls. Four wrench fault sets plus active thrust faults along three bedding planes are exposed along the roadcut where it transects the Apache Lineament.

The Apache Lineament extends from the Apache Mountains 175 miles northwest of this spectacular roadcut and on through to the San Felipe Springs at Del Rio, Texas 120 miles to the southeast. The Primary Shear (P) zone ( $320^{\circ}$ -True) is exposed in the roadcut extending to the surface lineaments shown on areal photography and Thematic Mapper (TM) Landsat. Between the Apache Lineament and the Texas Lineament lies the Marathon Thrust Belt. Within this Apache Lineament zone is the Downie Roadcut with an active thrust fault displaying the same vergence as the Marathon thrusting. The dip of the Cretaceous Fredricksburg (Kf) is  $3^{\circ}$  to the southeast. The overriding beds of the thrust (hanging wall) are moving northwest in an updip direction at a rate of 27 inches in 25 years. The roadcut was accepted by the Texas Highway Department in April, 1965. The drill holes for blasting are 3 inches in diameter making it easy to measure fault displacement. There are 3 thrust plates. The lowest one has moved 3 inches, the second 6 inches and the upper one 18 inches. The thrust surface can be seen and has grooves on the bedding surface.

The P Shear is left lateral and many individual faults can be seen with abundant horizontal slickensides. Other slickensides are visible at odd angles. There are also vertical slickensides superimposed over horizontal ones. The Conjugate Riedel faults are right lateral and  $45^{\circ}$ -True. These are highly brecciated and most faults are high angle reverse exhibiting beautiful horizontal slickensides. The breccia is varicolored. The Riedel Shear is left lateral, east-west and is tensional. The Riedel Shear exhibits pull apart and grabens of 10 feet across are formed. The Fold Fault can only be positively identified in one place in the roadcut, it is right lateral and  $355^{\circ}$ -True. A second possible location of the fold fault is obscure.

This roadcut lies in a position where the Apache Lineament crosses a drainage divide and a deep roadcut exposed it. It is a moving cut because all the elements are present and each can be measured and a determination of direction of movement is easily made. Some horizontal grooves within the slickensides can be measured on a scale of inches.