

ABSTRACT
EXPLORATION TECHNIQUES IN THE
PALO DURO BASIN

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The Palo Duro Basin was a depo-center only during the Pennsylvanian from post Morrow to late Cisco time. Late Pennsylvanian Cisco and Permian Wolfcampian downwarp of the Midland-Permian Basin effectively eliminated the Palo Duro Basin and included the area as the north flank of the Midland Basin.

Recently developed geophysical techniques appear to provide an effective exploration tool for the area. Mississippian Chappel (St. Louis) and Pennsylvanian Bend Conglomerates, Lower and Upper Strawn reefs and a Cisco-Canyon reef appear to be the prime targets. Sequential paleo-geographic maps are here utilized with "State of the Art" seismic sections to demonstrate exploration techniques.

A series of regressive Permian reefs concentrically ring the area, closing the Midland Basin toward the south. It is doubtful that these reefs will produce north of the Matador Archipelago because of maturation insufficiency. Maturation studies, i.e. S. Dutton, Bureau of Economic Geology, University of Texas, 1981, substantiate the Lopatin-Waples technique which indicates a Lower Pennsylvanian Time-Temperature-Index (TTI) of 120, a Cisco-Canyon index of 16, and a Wolfcampian index of 3.5. The minimum for oil generation is 15.