

PALO DURO BASIN PROVINCE (043)

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INTRODUCTION

The Palo Duro Basin Province covers an area of about 22,700 sq mi in the Texas Panhandle, eastern New Mexico, and Oklahoma. The largest geologic feature in the province is the Palo Duro Basin which is bounded to the north by the Amarillo Uplift, to the south by the Matador Arch, and to the east and west by minor structural highs that separate it from the Hardeman and Tucumcari Basins.

The Palo Duro Basin, containing about 10,000 ft of sedimentary rocks ranging from Precambrian to Tertiary, deepens generally from north to south; however, some of the more deeply buried rocks occur in a down-dropped block south of the Amarillo Uplift. The central portion of the province does not currently produce oil or gas, but production does exist along the southern border (Matador Arch) and along the northern border south of the Amarillo Uplift in rocks of Mississippian, Pennsylvanian and Permian age. One play was defined and individually assessed in the province, the Upper Paleozoic Play (4301).

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CONVENTIONAL PLAYS

4301. UPPER PALEOZOIC PLAY

The definitive characteristics of this play are its setting in the central portion of the Palo Duro Basin and the Pennsylvanian and Permian ages of its reservoirs. The main weakness of this play is apparent lack of source rock.

Reservoirs: Reservoirs are mainly of granite wash with a limited amount of limestone. Ages include Pennsylvanian and Permian. Porosities range from 10 to 18 percent, and permeabilities range from 30 to over 600 mD. Drilling depths vary between 3,500 and 7,100 ft.

Source rocks: The source of this play's oil and gas is unknown. The deepest local structural depression is the Wittenburg Trough, where sediment-rock thicknesses reach 9,000 ft.

Timing and migration of hydrocarbons: Traps, reservoirs, and seals were all in existence by the end of Permian time. It follows that maturation and migration commenced at some later time and may continue to the present.

Traps: Traps are predominantly structural, with four of six fields listing anticlines as the controlling structure.

Exploration status: The production from this play through 1990 consists of 15.5 MMBO and 16 BCFG. Of the play's five oil fields, Manante, discovered in 1969, is the largest with a production of 44 MMBO. Kerrick, discovered in 1954, is the play's only gas field and has produced 16 BCFG. The first oil discovery occurred in 1954 but four of the play's oil fields were discovered in 1979-1983. The lack of identifiable source rocks in this play probably explains the relatively small size and number of its hydrocarbon accumulations.

Resource potential: Apparent lack of source rock limits potential for discoveries in this play.

UNCONVENTIONAL PLAYS

There are no unconventional plays described in this province report. However, unconventional plays listed in the surrounding provinces may include parts of this province. Individual unconventional plays are usually discussed under the province in which the play is principally located.

REFERENCES

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SYSTEM	SERIES	STRATIGRAPHIC UNIT
TERTIARY		Ogallala Formation
CRETACEOUS	Comanchean	
TRIASSIC	Upper	Dockum Group
PERMIAN	Ochoan	Dewey Lake Formation
		Alibates Gypsum
		Salado Formation
	Guadalupian	Artesia Group
		Pease River Group
	Leonardian	Clear Fork Group Wichita Group
	Wolfcampian	Brown Dolomite
		Wolfcamp Limestone
PENNSYLVANIAN	Virgilian	Cisco Group
	Missourian	Canyon Group
	Desmoinesian	Strawn Limestone
	Atokan Morrowan	Bend Group
MISSISSIPPIAN		"Chester Limestone" "Merramec Limestone" "Osage Limestone"
ORDOVICIAN		Ellenburger Group
CAMBRIAN		? ? Hickory Sandstone
PRECAMBRIAN		