OIL AND GAS POSSIBILITIES IN THE PEDREGOSA BASIN

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Oil and gas has been found in the Pedregosa Basin area. Will it be found in commercial quantities? Geologists such as Kottlowski, Wengerd, Foster, and Zeller have suggested the oil potential of various horizons. Analogies have been drawn between environmental and structural similarities of the Pedregosa basin and nearby oil-producing basins. Shows of oil have been reported from shallow water wells in southwestern New Mexico, southeastern Arizona, and the northern part of the state of Chihuahua. Zeller (1965) reported oil shows in the Big Hatchet Mountains in the Cretaceous strata and good petroliferous odor from Paleozoic rocks. The Hachita Dome well drilled in 1953 near the town of Hachita reported shows of oil from lower Paleozoic limestones. Humble Oil and Refining Company's B. A. State, drilled south of the Big Hatchet Mountains, recovered gas on a DST from Permian rocks. The Humble well was reentered a few years ago by a group of independent oil men in an attempt to make a commercial gas well. They reported gas flow at the rate of 0.5 MMCFPD but lost the hole when attempting to acid frac the gas zone. Oil shows were reported in the Cockrell well drilled north of Coyote Hills. Sample shows have been reported in the Pemex well drilled at Los Chinos in northern Chihuahua, Mexico. Oil shows in the surface exposure of the Mississippian near Bavispe, Chihuahua, were noted by Pemex surface geologists.

If oil is found, what formations are most likely to produce?

Porosity in the middle sand member of the Cambrian Bliss Sandstone is present in the exposures at Big Hatchet Mountains (John Cys, personal commun.). Cambrian sands produce on anticlines on the eastern shelf of the Midland basin of West Texas.

Eight hundred feet of porous Silurian Fusselman Dolomite, present in the Franklin Mountains, was eroded by Middle Devonian uplift and erosion in the Big Hatchet Mountains area (Kottlowski and Pray, 1967) . The eroded scarp was covered by sapropelic shale and dark cherts of the Upper Devonian. Similar conditions on the eastern shelf and central basin platform of the Permian basin of West Texas and southeastern New Mexico produce structural and stratigraphic oil.

Ordovician El Paso-Ellenburger dolomite is present and should be covered by the Devonian shale west of the Fusselman subcrop. The Ellenburger is an excellent producer on structure in the Permian basin of West Texas and southern New Mexico.

Bioherms of Mississippian crinoids occur in the Sacramento and San Andres Mountains and very massive limestone cliffs up to 500 feet thick are present in southwestern New Mexico and southeastern Arizona.

Horquilla reefs, 1200 feet thick, are described and photographed by Zeller (1965) in the Big Hatchet Mountains. The reef started growing in Desmoinesian time and grew into early Wolfcampian. Numerous reefs in West Texas and southeastern New Mexico grew at the same time and have produced billions of barrels of oil.

Porous Epitaph Dolomite is visible in the Big Hatchet Mountains (John Cys, personal commun.), and reefs are present in the Mustang Mountains with lagoonal evaporites in the Whetstone Mountains of Cochise County, Arizona. Presence of back-reef evaporites up to 200 feet thick (Zeller, 1965) lends evidence that this Leonardian-age rock could be analogous to the prolific Abo production of southeastern New Mexico.

Lower Cretaceous beds contain rudistid, corralline, algal, bioclastic banks up to 500 feet thick in the Big Hatchet Mountains (Zeller, 1965) and 200 feet thick in the Mule Mountains of southeastern Arizona (Hayes, 1970) .

A large basin with more than 25,000 feet of sedimentary rocks exists. For most of Paleozoic time, the basin had a similar history of environment and structural evolution as the Permian basin of West Texas and southeastern New Mexico. Billions of barrels of oil and tens of trillions of cubic feet of gas have been produced in the Permian basin. I believe a like amount will be found in the Pedregosa basin.

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