

THE INDIAN BASIN UPPER PENNSYLVANIAN GAS FIELD EDDY COUNTY, NEW MEXICO

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We will be crossing the Indian Basin gas field on this field seminar starting at mileage point 58.1 on Day Three. Several of the wells have been drilled in the canyon that the road follows. A few of the wells have been drilled on top of the hills both to the north and the south. This valley was cut through the Seven River Hills by Rocky Arroyo. The bulk of the field lies to the west of the Seven

River Hills escarpment in the Indian Basin, which lies between the escarpment and the Huapache monocline on the west.

The Indian Basin Upper Pennsylvanian Field is a large field covering most of 57 sections. It is one of the few fields in New Mexico that has been developed on section spacing. This was feasible because the reservoir rock is

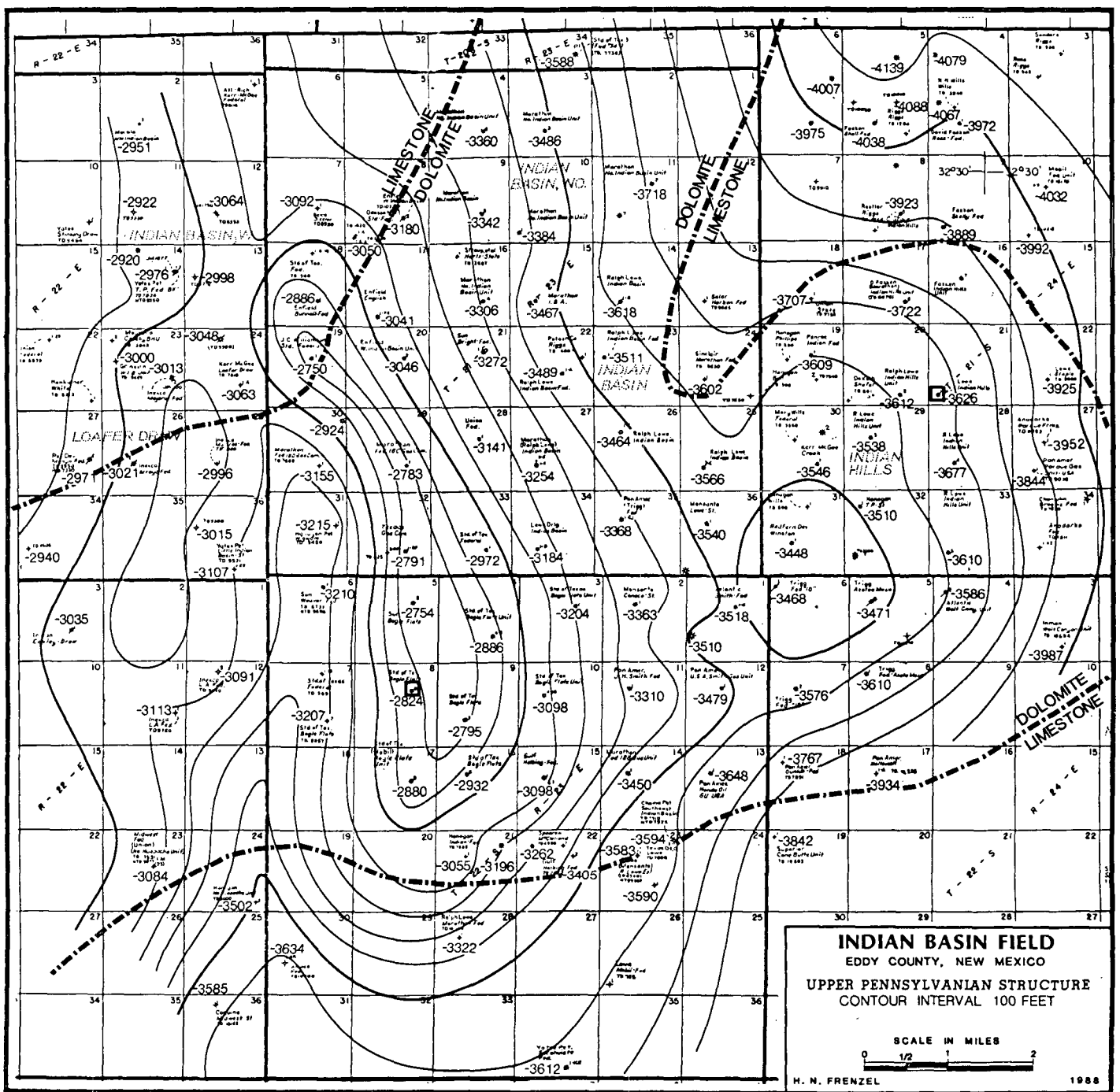


Figure 1.

extremely permeable. Production through 1986 included 1.089 trillion cubic feet of gas, 7.487 million barrels of condensate, and 3.88 million barrels of water.

The field was discovered by the Ralph Lowe No. 1 Indian Basin test, which was completed February 5, 1963, after drilling to a depth of 10,111 ft in Silurian dolomite. J. C. Williamson had completed a well in the area, his No. 1 Standard Federal a year earlier, January 18, 1962, but this well contained no dolomite and is believed to produce its gas from a limestone zone lower in the section than the Indian Basin dolomite. The Ralph Lowe test had been drilled on a seismic structure shot by Marathon Oil Company as a Siluro-Devonian prospect, and Marathon and Sinclair oil companies participated in the drilling of the unit well.

The Upper Pennsylvanian reservoir includes rocks of both Cisco (Virgil) and Canyon (Missouri) age and is almost entirely dolomite. The trapping mechanism is very complex, with structural, stratigraphic, and hydrodynamic factors all playing a part. The accompanying structure

map shows the structure on top of the Upper Pennsylvanian carbonate. A narrow north-south trending anticline runs along the west side of the field, and about 250 ft of closure is indicated. The producing area extends about 6 mi east of the closing contour.

The stratigraphic factor involves the distribution of the dolomite. Northwestward, the dolomites of the field abruptly grade into shelf limestones and thin shale beds that lack porosity. Basinward, to the southeast, the dolomites pinchout into a thin shale section with stringers of limestone. The dashed lines on the map define the dolomite distribution.

A southwest to northeast flow of water through the porous dolomite sets up a hydrodynamic condition that tilts the gas-water contact from -3138 ft below sea level at the squared well on the west, to -3770 ft below sea level at the squared well on the east. This gives a total gas column of 632 ft. The average pay thickness is 207 ft and the maximum pay thickness is 319 ft.