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Stratigraphic Adventures in the Granite Wash of Hartley County, Texas: A Case History

Hartley county, located in the Dalhart basin in the northwest corner of the Texas panhandle, produces from Pennsylvanian age Granite Wash which was shed from the nearby Bravo dome and other structural positives. Traps here are primarily structural in nature, resulting from compressional tectonic forces at work during the Pennsylvanian. A large structural high was discovered in the southern part of the basin in the 1950's by Standard Oil company using single-fold seismic data. An initial well found oil in a Morrow age sand and in the Canyon Granite Wash. Attempts at completion in the Morrow failed, and the Canyon was completed at 35BOPD as the discovery for the 7-well Rehm field. This remained the only Granite Wash production in the Dalhart Basin until Exxon's 1985 discovery of the Lathem field, 10 miles to the northeast.

In 1993, a 2D prospect north of the Rehm field was purchased initially as a drilling location. This prospect was converted into a lead for a 10sq mi. 3D, which included the north portion of the Rehm field in order to provide a productive analogy. While the general structural trend and 2D lead were confirmed by the 3D, the most attractive area for drilling, risk-wise, appeared to be attic reserves in the north part of the Rehm field.

The initial well came in low to prognosis and flat to the old production in the Rehm field, which had been flooded with fresh water from the Ogallala aquifer, then plugged. Initial excitement over excellent sample shows in the Granite Wash was quenched by low resistivities (3 ohms) in the logs. Failed packers thwarted several DST attempts, so the well was plugged. A second well to the north on the perimeter of the old field yielded similar results; excellent sample shows in the Granite Wash, a failed packer on initial DST, and 3 ohms resistivity which suggested water. The decision was made to try a straddle-pack DST, with expected salt-water being the death knell for further work in the area. The packers held this time, and the DST recovered 2000' of free oil with no water. After seven years, it remains to be seen whether this successful DST was the worst of luck, financially...

This case history tells of the ongoing development of the remaining reserves associated with the largest structural feature in Hartley county, and shows how incorrect geological and engineering assumptions about the complexity of the Granite Wash in this area have adversely affected the financial side of the equation. Whether investment recovery will eventually happen for the initial investors has yet to be determined.