

WATERFLOOD PERFORMANCE OF THE LOPEZ FIELD, WEBB AND DUVAL COUNTIES, TEXAS

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ABSTRACT

The Lopez Field is located in Webb and Duval Counties, Texas, 20 miles west of the town of Freer, and produces from the First Mirando sand at a depth of approximately 2,300 feet. The discovery well was drilled in 1935, and a total of 351 producing oil wells have been drilled on a density of one well to 10 acres. The original oil productive area of the field was approximately seven miles long and three-quarters of a mile wide. Cumulative oil production up to the time of initiation of waterflood operations amounted to approximately 20 million barrels.

The original oil productive limits of the Lopez Field were bounded on the downdip side by an oil-water contact and on the updip side by a gas-oil contact. Further updip reservoir closure is effected by a strand-line pinchout of the First Mirando sand. The average net thickness of the oil-bearing portion of the First Mirando sand is about 13 feet.

During the primary life of the field downdip water partially advanced into the originally oil productive area, and many of the wells on the downdip side of the field were abandoned because of high water production. However, after about 10 years of primary producing life the frontal water encroachment essentially ceased, and it became evident that there was insufficient natural water drive to fully flush the oil productive portion of the reservoir. The updip gas cap that was originally present was blown down by early production practices and depleted to the extent that no reservoir drive was available from an expanding-gas-cap source. Accordingly in secondary recovery operations it has been necessary both to augment downdip water encroachment and to fill the updip void space created by the depletion of the original gas cap. For this reason a peripheral pattern has been adopted in waterflooding operations, utilizing injection wells on both the downdip and updip sides of the reservoir.

Currently three waterflooding units are operative in the Lopez Field. Two of these were initiated by Jake L. Hamon, Magnolia (Mobil), Sunray, and Humble in late 1955. The third was initiated by a predecessor of Texstar Petroleum Company in 1959. Economically attractive increases in oil production have been obtained from all three units as a result of water-injection operations, and their performances have demonstrated that a reservoir of this nature can be commercially waterflooded.

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