Abstract:
The Milton Field, Harris County, Texas, Produced Before Discovery
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The Milton field is located approximately 15 miles northwest of Houston in northwestern Harris County, Texas. The field was discovered in November, 1953, and has produced approximately 827,000 barrels of oil and 3600 MMCF of gas to January 1, 1961, from a productive area of approximately 925 acres and from 20 completed wells. The field includes some interesting features from a geological and petroleum engineering standpoint. Oil and gas production from the Fairbanks sand is from a lenticular buried sand dune or buried offshore bar. Oil and gas accumulation within the Fairbanks sand of the Milton field is controlled by the up-to-the-north fault at the south edge of the field. The Fairbanks reservoir pressure was subnormal at discovery. It is interpreted that the fault seal at the south edge of the field became ineffective after pressure drawdown in sands in juxtaposition with the Fairbanks sand in the North Houston field to the south. Drainage across this fault plane occurred prior to discovery of the field. It is estimated that approximately three and one-half million barrels of fluids were drained from the Milton field prior to date of discovery. Pressure drawdown within the Milton field is greater than warranted by present production and drainage across the fault is believed to be current. Oil saturation within the Fairbanks sand, approximately 17½ per cent of the pore space, has been noted within the Fairbanks sand to depths of 23 feet or more below the proved water level at date of discovery. This zone is considered to have been drained prior to discovery. Structural maps relative to the problem were presented of the Milton and North Houston fields as contoured on top of the Frio sand; on the top of the first Yegua sand or the top of the "D-Y" sand; on the top of the Fairbanks sand; on the base of the Fairbanks sand; and on the top of the Look sand. An isopachous map of the Fairbanks sand lens is presented for the purpose of showing the lenticular nature of the Fairbanks sand zone. A cross section extending from north to south across the Milton field and into the North Houston field and comprising a portion of the Yegua section is presented for the purpose of showing the juxtaposition of the "D-Y" sand in the North Houston field to the Fairbanks reservoir in the Milton field and the apparent relationship of the discovery water level of the Milton Fairbanks reservoir to the structural position of the top of the "D-Y" sand in the North Houston field. A bottom hole pressure decline curve of the Fairbanks sand in the Milton field and a well-head pressure decline curve of the North Houston field is presented to illustrate some unique pressure characteristics within the North Houston "D-Y" reservoir and the apparent date (January, 1950) that the fault seal between the two reservoirs became ineffective. A profile drawn along the fault plane is presented for the purpose of showing the structural position of the top and base of the "D-Y" sand on the downthrown side of the fault in the North Houston field; the structural position of the top and base

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of the Fairbanks sand in its upthrown position in the Milton field; the cross sectional areas of the Fairbanks sand occupied by gas, oil and water in the Milton field at date of discovery; the cross sectional area of the Fairbanks sand in the Milton field as it presumed to have been drained prior to discovery and the cross sectional area (in excess of two and one-half acres) where the "D-Y" sand on the downthrown side of the fault is adjacent to and in juxtaposition with the Fairbanks sand on the upthrown side of the fault. It is the conclusion of the authors that (1) pressure withdrawal in the "D-Y" sand in the North Houston field due to production from that reservoir broke the effective seal of the fault in the Fairbanks reservoir of the Milton field prior to discovery; (2) bottom hole pressures within the Fairbanks sand of the Milton field declined in excess of 500 pounds prior to date of discovery; (3) approximately three and one-half million barrels of fluids were drained from the Fairbanks reservoir of the Milton field in the approximate seven year period from date of first production in the North Houston field to the date of discovery of the Milton field; and (4) based on present pressure decline curves within the Fairbanks reservoir of the Milton field and governed by reservoir voidage from the oil and gas reservoirs, it appears probable that there is current drainage of fluids across the fault plane from the Fairbanks reservoir in the Milton field to the "D-Y" sand in the North Houston field.