INTERDISCIPLINARY WATERFLOOD OPTIMIZATION AND RESERVOIR MANAGEMENT SALT CREEK FIELD UNIT, KENT COUNTY, TEXAS

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ABSTRACT

Optimization of the nearly forty year old waterflood at the Mobil operated Salt Creek Field Unit, Kent County, Texas is the foundation of an efficient ongoing reservoir management program. Waterflood optimization is approached on a pattern by pattern basis by analyzing multiple aspects of the geology, reservoir history, and individual well history. A well developed detailed geologic model based on biostratigraphic and sequence stratigraphic concepts, using cores, cuttings, logs and seismic data, provides the framework to define and correlate geologic zones as well as flow zones. Reservoir and well history information used for thorough analysis consists of: 1) current and historical completion information; 2) historical test information including swab tests, DSTs, chlorides, fluid levels, and pressures; 3) current and historical injection profiles and volumes; 4) allocation of injection by flow zone; 5) production curves by well and by pattern; and 6) current production by well and pattern including volumes and oil cut. Integration of this information with the geologic interpretation allows all aspects of an injection pattern to be evaluated and appropriate work identified. Such work includes: 1) injection profile modification; 2) add pay in producers; 3) producer squeezes; and/or 4) drill deeper.

This interdisciplinary approach is highly versatile and allows rapid adaptation to changes in the overall reservoir management strategy. The result is efficient reservoir management with maximized oil production, minimized water production and efficient use of injection water.

PERMIAN BASIN PLAYS: TOMORROW'S TECHNOLOGY TODAY, October 31-November 1, 1991