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Abstracts of Papers

trapped oil accumulation situated midway between two older established production trends: one lies along the Nesson Anticline in the center of the basin, the other lies along the northern side of the basin in fields created by up-dip anhydrite-sealing stratigraphic traps. Nearest current production is 22 to 28 mi away in any direction. In Stanley Field, 17 wells currently produce from the Bluell and Sherwood zones of the Mission Canyon Formation with estimated recoverable reserves of at least 1.6 to 2.0 million bbls. The pay interval (maximum thickness 120 ft) was cored in 19 wells in and near the field.

The distribution of different depositional facies and their subsequent diagenesis provides the trap and controls the quality of the reservoir at Stanley Field. During upper Mission Canyon time, low intertidal-supratidal barrier banks and islands developed in the area of the field. Islands were separated by marine channels. A shallow-water lagoon existed behind (east of) the island-bank barrier. Where channels entered the lagoon, tidal-delta sand bodies accumulated. Island sediments were syndepositionally cemented by beach-rock-like marine cement and meteoric cement; marine sediments escaped early cementation.

The reservoir is formed of porous (primary interparticle porosity), marine grainstone-packstone and fractured island sediments that locally retain open fenestral porosity. Trapping is accomplished by a combination of overlying massive anhydrite and lateral updip compacted (lagoonal) mudstone and wackestone.

Mechanical compaction of carbonates at Stanley Field is significant for the following reasons:

- 1) Compaction implies lack of early cementation, thus suggesting why primary porosity is preserved in the reservoir facies.
- 2) Compaction reduced interparticle pore volume in marine sections, thus reducing porosity in marine reservoir facies and improving the effectiveness of the updip trap.
- 3) Only marine sediments were mechanically compacted, thus isopach maps of the upper Mission Canyon and overlying Charles Formations reflect distribution of depositional facies in the upper Mission Canyon.

BEACH, DAVE, Marathon Oil Co.

Stanley Field, North Dakota: A New Model for a New Exploration Play

The geology of Stanley Field provides a new model for a new exploration play in the Mission Canyon Formation of the Williston Basin. Equally important, it establishes the economic significance of early mechanical compaction of shallow-water marine carbonates.

Stanley Field, discovered in 1977, is a stratigraphically