

STRUCTURAL AND STRATIGRAPHIC TRAPS RELATED TO EXTRUSIVE ROCKS IN SOUTH CENTRAL TEXAS

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A B S T R A C T

Paralleling the Balcones Fault Zone, yet most numerous in the Uvalde Salient and the Zavala Syncline, are several dozens of discovered, but ill-defined, olivine-basalt extrusives, most of which have been altered to serpentinite. Both oil and gas production, from rocks of the Late Cretaceous to the Tertiary, exists over the crest and off the flanks of many of these domal features. There are as many more domal extrusive complexes known from reconnaissance exploration, but, as yet, untested by the drill bit.

Age and rock type of the objective reservoir rocks is determined by the time at which the underlying igneous body was extruded. Structural deformation, or stratigraphic development, over these effusive masses follows, and is primarily influenced by, the presence of extruded rock on an older rock surface. Clastic reservoirs dominate in number over the domes. Oil or gas affinity for accumulation in either sand or limestone seems indiscriminate. The serpentinite itself may serve as reservoir rock. Outpourings of igneous magma are concentrated in the Late Cretaceous. Structure and stratigraphy of the overlying rocks are affected into the Tertiary sediments.

Hydrocarbon production over the domes varies in depth from a few hundred feet to approximately 4,000 feet. The shallowest production is found over those extrusives which are themselves shallowest, markedly demonstrating their structural and stratigraphic influence.

Exploration methods include surface geology, magnetics, subsurface geology, and core drill, near-surface geology. All methods are extremely effective in a locality where the particular geological specialty may be applied. From the standpoint of geology, land and drilling, profitable size objectives may be explored for minimum costs.