

Upper Pennsylvanian and Lower Permian of Southeastern New Mexico—Rejuvenation of Underdeveloped Fields Yields Major Reserves

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Carbonate reservoirs in the Cisco and Canyon (Upper Pennsylvanian) and lower Wolfcamp (Permian) sections in the Permian Basin of southeastern New Mexico are significant reservoirs for oil and gas. The 400 fields that produce from the reservoirs have yielded a cumulative 508 million bbls of oil and 3.2 TCF of gas. Sixteen of these fields have been identified that were underdeveloped at some stage in their history.

Although initially underdeveloped, subsequent redevelopment added significantly to reserves and production. For the 16 fields studied, redevelopment accounted for 65% of developed reserves. Redevelopment in the late 1980's and 1990's accounted for more than 95% of total reserves at Dagger Draw, and turned this seemingly insignificant field into the most productive field in New Mexico. Redevelopment of Dagger Draw has reversed the production decline in southeast New Mexico.

Redevelopment in these fields was generally in undrilled portions of the fields and not in overlooked pay zones. Most of these fields are formed by stratigraphic traps, but initially were thought to be structural traps and were developed as such. Because initial development was on structure and off-structure areas were undrilled, most reserves remained unproduced until redevelopment. Because 91% of the Upper Pennsylvanian and lower Wolfcampian fields have less than 10 producing wells and have been developed primarily on structures, significant reserves may remain undeveloped in existing fields.