Exploring Nontraditional Hydrocarbon Traps for Gas Resource Additions in the Shallow Gulf of Mexico Shelf, U.S.A.

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Abstract

The Gulf of Mexico (GOM) shelf, U.S.A., is one of the most prolific gas provinces in the world, having produced more than 128 Tcf of gas by 1999, with an estimated 258 Tcf remaining to be produced. Although all of the large structures in the shallow shelf appear to have been drilled, numerous smaller (5-10 Bcf) structural and stratigraphic opportunities remain. A study in the GOM Central Planning Area (CPA) completed through joint research efforts of The University of Texas at Austin, the U.S. Department of Energy, and Texaco E&P, has identified several nontraditional, underexploited target types that offer opportunities for increasing shelf gas reserves. First-order normal faults associated with deep salt movement set up the formation of major structural highs in the CPA of the GOM. Many second-order normal faults set up smaller closures in the structural saddles between these large four-way highs. Recent tests of these saddle-perched traps indicate that each can contain several BCF of gas resources. Prolific stratigraphic traps occur within the Plio-Miocene-age strata throughout the CPA. Architectural heterogeneity within large incised valleys creates opportunity for untapped reservoirs within these containers. Isolated distributary or tributary incisions create potentially hundreds of hydrocarbon-filled stratigraphic traps across the region. Recent tests of these high-amplitude, incised features indicate significant untapped reserves in each of these features. Three-dimensional seismic data, high-resolution sequence stratigraphy, and advanced attribute extraction techniques can significantly reduce the uncertainty involved in exploration for these nontraditional, smaller traps. Deeper strata below 15,000 ft offer the largest opportunity to add gas resources beyond existing shallow structural and stratigraphic closures.