HYDROCARBON POTENTIAL OF THE BALTIMORE CANYON TROUGH

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ABSTRACT

The Baltimore Canyon Trough, which is in the Mid-Atlantic Outer Continental Shelf (OCS) Planning Area, has a thick sediment accumulation and a large number of structural and stratigraphic traps. It is underlain by a seaward-thickening wedge of postrift sediments separated by an unconformity from older, more areally restricted rift sediments of Triassic and Early Jurassic age. Uplift and erosion landward of a hinge zone and regional subsidence seaward resulted in formation of the Baltimore Canyon Trough, an elongated northeast trending depression filled with over 49,000 ft (15,000 m) of sediments.

Rift sediments are believed to consist of shallow-water carbonates, evaporites, arkosic red beds, and lacustrine shales, all of which are locally intruded by volcanic dikes and sills. These sediments occupy half-grabens landward and seaward of the hinge zone. Seaward, they also form basinward dipping, wedge-like sequences. Post-rift sediments have been penetrated by 32 wildcats and two deep stratigraphic tests drilled between 1978 and 1984. The sediments are shale, siltstone, sandstone and carbonates. The carbonates predominate deep in the basin (lower Middle Jurassic) and in the seaward part of the shelf as shallow-water platform limestones. Along the seaward edge of the trough, the thick platforms are rimmed by a shelf-edge reef complex which developed until Berriasian (earliest Cretaceous) time, after which it was buried by a prograding clastic wedge which spilled onto the continental slope and rise in the form of turbidites, contourites, and hemipelagic drapes.

The top of the hydrocarbon evolution window is generally within the lower Cretaceous at a depth of about 10,000 to 13,000 feet (3,000–4,000 meters) below sea level. Humic-prone (Type III kerogens) Upper Jurassic strata are thermally mature for gas generation. Five wildcats drilled on one prospect tested gas from Jurassic reservoirs. One well also tested oil from an Albian sandstone at a depth of 8,200 feet (2,500 meters) below sea level.

Approximately five hundred million barrels of oil and 10 trillion cubic feet of gas (conditional mean undiscovered conventionally recoverable resources) were estimated to be present in the Mid-Atlantic OCS, according to a 1987 Minerals Management Service study. The Mid-Atlantic Baltimore Canyon Trough is a frontier exploration area with many prospects remaining to be drilled.

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