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## Carbonate Margin Progradation and Clastic Basin Filling Sequences Mesopotamian Basin

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The Mesopotamian Basin (MB) of Iraq contains known reserves of over 100 billion barrels of oil. It initiated as the deep-water Gotnia Basin (GB) in Jurassic time. During Cretaceous time prograding carbonate margins and clastic wedges stacked in a series of 2nd-order highstand and lowstand sequence sets. In Tertiary time the Zagros Foredeep developed as the third basin in the same location.

Regional well correlations, biostratigraphic, and seismic data are integrated into a stratigraphic framework of 2nd order Cretaceous sequences. Facies and environment of deposition (EOD) maps show a series of alternating carbonate shelf margins and clastic sequences which prograde from the west and south, filling, and eventually covering, the NW-SE trending GB. A flooding surface near the base of the Cretaceous demarks a significant shift in environment and sedimentary type, from the evaporitic and carbonate conditions of the Jurassic GB, to the more marine conditions of the Cretaceous MB that led to the deposition of carbonate and clastic sequences.

The stacking pattern and sedimentary facies of the Lower and Middle Cretaceous sequences create reservoir-seal relationships composed of high-energy carbonate margins and bioherms, sealed by regional transgressive marine shales, and of shallow-marine sands, sealed by thin intra-formational and terminal transgressive marine shales. Source rocks in the Jurassic GB and early Cretaceous MB underlie these trends. The stacking pattern of source rocks, numerous reservoirs, and seals gives rise to prospective strandline and shelf margin trends, that flank the western and southern margins of the MB, and a robust petroleum system with fields characterized by numerous pay zones.

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