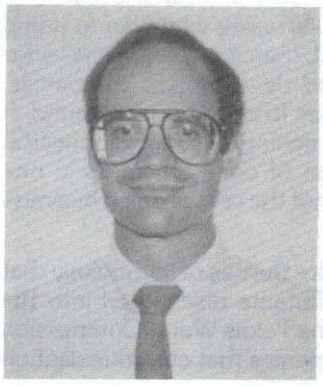
MEETINGS

HGS DINNER MEETING— OCTOBER 7, 1991

GREG BERNASKI—Biographical Sketch



Greg Bernaski is a development geologist with BP Exploration Offshore Business Unit in Houston, TX.

He received his B.S. (1981) and M.S. (1985) degrees from the University of Wyoming. His thesis topic was "Laramide deformation in the southeastern Uinta Mountains, Colorado and Utah."

Mr. Bernaski joined BP Exploration (then Sohio Petroleum Co.) in Houston in 1985, where he initially worked in the Exploration Operations Group. He transferred in 1987 to the Offshore Production Group and worked on the deep-water Snapper platform development project on East Breaks Block 165 and a subsea development project on High Island Block 587, offshore Texas. He currently is working on deep water development projects in the Mississippi Canyon Block 763 and 807 areas, offshore Louisiana.

DEEP-WATER FIELD DEVELOPMENT OF HYDROCARBON RESERVOIRS IN PLIO-PLEISTOCENE TURBIDITE SANDS, EAST BREAKS BLOCK 165, GULF OF MEXICO

The stratigraphic and structural complexity of the Plio-Pleistocene section in the East Block 165 field is readily demonstrated after the completion of exploration and development drilling. Two main problems recurring during field development involved: 1) prediction of turbidite sand facies distribution and thickness, and 2) identification of fault offsets in the highly variable reservoir sands. Well control and a 3-D seismic data set provided the basis for reservoir description and an intra-slope basin turbidite sand depositional model for the East Breaks 165 area.

Four main productive sand intervals were encountered in the Plio-Pleistocene section: 1) the GF *(Glob. flexuosa)* sands, 2) the TA *(Trimosina "A")* sands, 3) the GM *(Glob. miocenica)* sands, and 4) the GA *(Glob. altispira)* sands. All the sands were deposited within an upper slope intra-slope basin. Approximately 85% of the EB 165 field reserves are contained in GA sand reservoirs.

All reservoir sands are characterized by rapid lateral thickness and/or facies changes. Sand packages are composed of both clean channel facies and fining-upward to muddy channel levee and overbank facies. Variable sand thicknesses resulted from: 1) the non-uniform lateral migration of turbidite channel systems across the basin, and 2) lateral changes from clean channel facies to silt and mud-prone inter-channel deposits. Facies changes in localized areas within the channel systems resulted in the formation of stratigraphic traps.

The main reservoir trap is an anticlinal closure formed downthrown to two regional-scale northeast-trending extensional faults. Numerous small-scale faults which offset the anticlinal crestal area have added considerable complexity to the field development. The faulting resulted from the growth and subsequent collapse of a salt-cored anticlinal ridge. Timing of maximum structural relief along the anticlinal ridge is inferred from log and seismic evidence which indicates that 800-1000' of section representing the Aftonian and Kansan stages is missing from the crestal area of the EB 165 structure.

Recognition of the complex structural environment and the development of a turbidite channel and channel levee/overbank depositional model has been important in delineating future recompletion and development drilling targets in the East Breaks 165 field. The stratigraphic models developed for this area may also prove to be useful analogs for exploration and development programs in other Gulf of Mexico intra-slope basins.