MEETINGS

GSH/HGS JOINT DINNER MEETING—MARCH 9, 1992

Social Period, 5:30 p.m.,
Dinner and Meeting, 6:30 p.m.
The Houstonian

DR. ROBERT J. FINLEY—Biographical Sketch

Dr. Robert J. Finley is Associate Director responsible for natural gas and coal resources research at the Bureau of Economic Geology, The University of Texas at Austin. Dr. Finley has been with the Bureau since 1975 where he has conducted research on the geology of oil and gas reservoirs and on remote sensing for mineral and hydrocarbon applications. He currently directs studies on increased natural gas recovery and is active in studies of tight gas sandstones, heterogeneity of clastic reservoirs, oil and gas reserve growth, and has directed the development of an atlas of major Texas gas reservoirs. He is an author of a major assessment of the Nation's natural gas resources prepared in 1988 for the U.S. Department of Energy. He served on the National Research Council's Committee on Undiscovered Oil and Gas Resources and currently serves on the Source and Supply Task Group of the National Petroleum Council's Committee on Natural Gas. He holds a Ph.D. in geology from the University of South Carolina, specializing in sedimentary geology, and is a past Chairman of the American Association of Petroleum Geologists' Committee on Development Geology.

INTEGRATED GEOLOGICAL AND GEOPHYSICAL CHARACTERIZATION OF GULF COAST RESERVOIRS FOR INCREMENTAL NATURAL GAS RECOVERY

Incremental recovery of natural gas beyond standard development practices in structurally simple, conventional permeability reservoirs is dependent on understanding of reservoir heterogeneity. Such heterogeneity, where not structural, is a function of the original depositional system modified by diagenesis. Investigations focusing on Frio fluvial reservoirs of Seeligson and Stratton fields in South Texas, supported by the Gas Research Institute, the U.S. Department of Energy, and the Bureau of Economic Geology, illustrate how facies and diagenetic variability can result in boundaries or baffles to gas flow. Recompletions and strategic infield drilling are means of overcoming such compartmentalization and producing gas from untapped or incompletely drained reservoirs.

At Seeligson field, reservoirs tend to have better lateral connection than at Stratton field and have been more intensively completed. Fluvial and splay sandstone reservoirs tend toward a multilateral geometry at Seeligson. Nevertheless, 3-D seismic data show discrete, meandering channel thalwegs and AVO analysis illustrates a distribution of gas reflecting the channel form in an analysis of the 19C-04 reservoir in that field. Careful use of zero-offset VSP data have allowed the optimum tie of stratigraphy to the geophysical data for seismic surveys completed at different times. Recompletions made in Seeligson have been based on cased-hole logging and have encountered pressures of about 1,000 psi that were 2 to 3 times reservoir fieldwide average. Five recompletions in bypassed reservoir compartments made 1.4 Bcf of incremental gas in about 18 months and are projected to recover about 4 Bcf of gas.

At Stratton field, greater vertical separation of reservoirs has allowed aggressive incremental development by the operator, mostly in the late 1980's. Analysis of publicly available data shows 33 Bcf of shallow (<7,000 ft) and 15 Bcf of deeper gas reserve growth in an area of about one-third the area within the field. Fieldwide production decline was reversed beginning about 1987. Reservoirs in the F series, for example, have seen new completions in the 1980's with static bottom-hole pressures (BHP) of 1,800-2,300 psi in the same reservoir where previous completions have been abandoned with BHP's of 200-300 psi. Single-well transient tests and interference tests are underway to characterize the nature of the reservoir compartmentalization involved. Two 3-D seismic grids with VSP's for velocity control have been designed to further determine the nature of reservoir variability at Stratton field. Evidence such as that from Seeligson and Stratton fields demonstrates that strategic targeting of heterogeneous reservoirs using new approaches can lead to economic recovery of incremental gas resources from the Frio and other major Gulf Coast fluvual-deltaic reservoirs.