Monday, November 8, 2004

Westchase Hilton • 9999 Westheimer
Social 5:30 p.m., Dinner 6:30 p.m.

Cost: $25 Preregistered members; $30 Nonmembers & Walk-ups

The HGS prefers that you make your reservations on-line through the HGS website at www.hgs.org. If you have no Internet access, you can e-mail reservations@hgs.org, or call the office at 713-463-9476. (include your name, e-mail address, meeting you are attending, phone number and membership ID#).

HGS General
Dinner Meeting

by ***William R. Almon*** *and*
William C. Dawson
ChevronTexaco Exploration Technology Company
Bellaire, TX

Seal Character and Variability Within Deep-Marine Depositional Systems: Seal Quantification and Prediction

Seals are a key element of petroleum systems, yet they have received limited systematic study. Textural and compositional variations permit the recognition of six shale lithofacies in Tertiary deep-marine depositional settings. Each shale type end-member has distinctive textures and fabrics, which record variations in depositional conditions. Textural and compositional variations in shales, considered within the context of sequence stratigraphy, provide a basis for seal risk assessment. As determined from mercury injection capillary pressure (MICP) analysis, the pressure required to attain critical seal pressure (10% non-wetting phase saturation) varies over a considerable range (15 to 20,000 psia). Tertiary shales from offshore Brazil have consistently low critical seal pressures relative to age-equivalent shales from offshore West Africa. Tertiary shales from wells in the Gulf of Mexico have intermediate critical MICP values (mean: 4,700 psia). The organization of shale facies within a sequence stratigraphic framework reveals systematic variations in seal character. Silt-poor shales from uppermost transgressive systems tracts, and some condensed shales, have good to excellent seal potential. In contrast, silt-rich shales from highstand and lowstand systems tracts have moderate to low sealing capacities. Seal quality generally increases as total clay and carbonate content increase; other compositional variables have limited predictive relationship with seal character. Likewise, log-derived parameters lack significant potential to accurately predict critical non-wetting saturation values. Additional seal variability factors include changes in the rate of deposition, early marine cementation, and depositional fabric. Available data provide a compelling argument for textural control of seal character induced by high-frequency stratigraphic cycles. ■

Seal quality generally increases as total clay and carbonate content increase

Biographical Sketch

William R. Almon is a research geologist for ChevronTexaco Exploration Technology Company, Bellaire, Texas. He earned his PhD in geology and an MA in chemistry from the University of Missouri (Columbia). He received an MS in petroleum engineering from the University of Tulsa and an MA in geology and a BA in chemistry from Washington University (St. Louis). His 30-year career includes positions in research management, applied technology and exploration at Cities Service, Anadarko, Texaco and ChevronTexaco. His research interests include sequence stratigraphy and siliciclastic depositional systems, as well as sedimentary geochemistry and diagenesis. He has twice been a recipient of the Leverson award. He is a member of AAPG, SEPM, GCAGS and SPE.

William C. Dawson is a research geologist for ChevronTexaco Exploration Technology Company, Bellaire, Texas. He earned BS and PhD degrees in geology from the University of Illinois at Champaign-Urbana, and an MS degree in geology from the University of Texas at Arlington. His professional experience includes: the Illinois State Geological Survey, Fossil Petroleum Corporation, Eason Oil Company and Texaco Research. His research interests include shale sedimentology, seal characterization, sequence stratigraphy and reservoir diagenesis. He is a former associate editor of the AAPG *Bulletin* and a recipient of the Leverson award. He is a member of AAPG, SEPM, GCAGS and the International Association of Sedimentologists.