Wednesday, September 24, 2003

Petroleum Club • 800 Bell (downtown)
Social 11:15 a.m., Lunch 11:45 a.m.

Cost: $28 Preregistered members; $33 Nonmembers & Walk-ups

Make your reservations now by calling 713-463-9476 or by e-mail to Joan@hgs.org (include your name, meeting you are attending, phone number, and membership ID#).

HGS General Lunch Meeting

by ***Tom Fletcher***
Anadarko Petroleum Corporation, The Woodlands, TX

Exploration for Deep Miocene Reservoirs in South Louisiana: The Story of the Etouffee Discovery, Terrebonne Parish, Louisiana

In 1997 Geco-Prakla and Union Pacific Resources secured a seismic option covering all the unleased acreage owned by Continental Land and Fur in western Terrebonne Parish to undertake one of the first regional, truly exploratory, 3D surveys in the onshore of south Louisiana. Earlier 3D surveys had typically targeted producing fields making imaging of deep targets problematic. Etouffee was the first well drilled based on this new 3D survey and was a discovery with estimated reserves of 250 Bcfe. It is one of the largest discoveries made during the 1990s.

The Etouffee discovery south of Kent Bayou Field in Terrebonne Parish is a downdip extension of the prolific middle Miocene *Robulus* "L" producing trend. Prior to the discovery, the closest production from the *Robulus* "L" section was 5 miles to the northeast and structurally 4000 feet higher across a system of large growth faults of varying age. The Etouffee Sands were deposited with thinly bedded shales on the distal front of a shelf-edge delta. Slumping, faulting, and salt tectonics combined to deform the large shelf-edge delta and to control sand distribution. Hydrocarbon migration probably occurred early as the Etouffee Sands formed a typical rollover anticline associated with growth faulting. The overlying *Cibicides opima* section prograded over the Etouffee deltaics forming a southward-thickening wedge of sands and shales. This subsidence of *Cibicides opima* sediments south of Kent Bayou began the rotation of the Etouffee structure onto south dip. Further rotation onto south dip and complications due to *Cristellaria* "I"-aged deposition and faulting completed the formation of the structure as it appears today. From *Bigenerina humblei* time to present, the structure uniformly subsided to its current depth. A 700-foot gas column was preserved on a faulted, downthrown, three-way closure within the *Robulus* "L" aged Etouffee sands.

The Union Pacific Resources Continental Land & Fur #1 reached a total depth of 19226 feet and logged 156 feet of pay between the depths of 18654 and 18954 feet on October 31, 1999. Since that time, five development wells have been drilled with net pay counts as high as 306 feet in the CLF #4. Production rates peaked in April 2002 at 95400 Mcfd, 18600 Bcpd, and 0 Bwpd. The current field rate (6/1/03) is 80000 Mcfd, 18700 Bcpd, and 3000 Bwpd. The Etouffee Sands cumulative total production to date is 66.7 billion cubic feet of gas and 14.4 million barrels of oil and condensate. Converted to gas, the field has produced 153 Bcfe or a little more than half the estimated reserves.

Three separate reservoirs have been recognized based on log correlation, pressure analysis, and fluid properties. The Etouffee 1 and Etouffee 2 sands are high-temperature and high-pressure gas condensate reservoirs. The Etouffee 3 sand is an oil reservoir. Porosities range from 14 to 32 percent with permeabilities ranging from 50 millidarcies to 5 darcies. These rock qualities lead to excellent production rates, especially for reservoirs below 18000 feet. Early onset of overpressure and high bottomhole pressures (17000 psi) have helped to preserve the excellent reservoir parameters. ■

Biograpical Sketch

Tom Fletcher graduated with a Bachelors of Geology from Baylor University, 1984. Masters of Geology, Baylor University, 1986. He joined Sun Exploration and Production Company 1986. He worked a variety of Gulf Coast trends with Sun (which became Oryx) for 12 years. He joined Union Pacific Resources in 1998 working south Louisiana. He currently works the Gulf of Mexico Louisiana shelf with Anadarko Petroleum. His experience includes Frio, Vicksburg, Wilcox, and Yegua trends of south Texas; Miocene and Oligocene trends of south Louisiana and offshore Gulf of Mexico, and the Cretaceous Chalk trend from Mexico to Mississippi.