Wednesday, November 29, 2006

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

Cost: $30 with advance reservations, $35 for walk-ins, space available ($15 for Emeritus and Honorary).

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 Luncheon Meeting

by ***Larry Zarra, David Rains, and Dave Meyer***
Chevron

Emergence of the Lower Tertiary Wilcox Trend in the Deepwater Gulf of Mexico

The Wilcox has long been recognized as an important petroleum resource, producing from deltaic, fluvial and shallow marine sandstone reservoirs since the 1930s. Recent drilling in the Perdido Fold Belt (PFB), Alaminos Canyon, Offshore Continental Shelf (OCS) area, Keathley Canyon and Walker Ridge has confirmed a new exploration play in the deep basin component of the Wilcox petroleum system, with significant discoveries in distal turbidite systems.

The Wilcox Group in the Gulf of Mexico Basin spans much of the Upper Paleocene and Lower Eocene. In outcrop the Wilcox is characterized by a variety of paralic and very shallow marine depositional settings, and is represented by interbedded sandstone and shale plus locally abundant lignite. Updip of the Lower Cretaceous shelf edge, relatively dense shallow subsurface well control allows documentation of fluvial and deltaic depositional systems. Downdip from the Lower Cretaceous shelf edge, the Wilcox consists of delta front, open shelf, estuarine and widespread prodelta depositional facies. Relatively sparse well control shows mostly sand-poor sections for the prodelta and shelf depositional systems. Downdip from the shelf and prodelta, the next Wilcox well penetrations are 250 miles farther in the basin, in the southern Alaminos Canyon OCS area referred to as the PFB in the deepwater Gulf of Mexico.

The emerging Wilcox trend has the potential of delivering 3–15 billion barrels of oil equivalent from many structures throughout the depositional basin, and individual prospects have a resource potential of 50–500 million barrels of oil equivalent.

Recently released drilling and test data shed new light on play concepts and the hydrocarbon potential of the trend. To date the distribution and quality of the reservoir is considered the most significant risk element for the trend. Key results of the BAHA wells (AC 600 #1 and AC 557 #1) document a thick (>4000 ft) progression of Lower Tertiary deepwater facies and establish the presence of extensive Wilcox equivalent turbidite sands located more than 250 miles downdip from their fluvial and deltaic equivalents. Similar thick turbidites have also been discovered 200 miles to the east, in new exploration wells in this emerging trend. Sand character and distribution interpreted from wireline logs, core, paleo and seismic data indicate a systematic progression from lower slope to regionally extensive basin-floor fan systems to sediment-starved distal basin plain.

Since the deep test at BAHA in 2001, 20 additional deep wildcats have been drilled in the Lower Tertiary Trend, all encountering thick, low-permeability turbidite sands. Recognizing the uncertainty in deliverability from this new trend, Chevron, Statoil and Devon embarked on an extended well test at their Jack discovery. Leveraging technical work for the much shorter duration Tahiti well test (2004), Chevron planned a more complex and extensive well test at Jack. This test exceeded expectations and delivered more than 6000 barrels a day from a portion of the overall Jack reservoir. Currently, Chevron and other operators are examining various development scenarios, including utilizing a floating production, storage and offloading (FPSO) system to develop 3–4 wells in a field to mitigate the risk of the reservoir deliverability. With continued exploration and appraisal success, the entire Wilcox trend has become an increasingly important exploration and development play in the deepwater Gulf of Mexico. This emerging trend has the potential of delivering 3–15 billion barrels of oil equivalent from many structures located throughout the deepwater turbidite Wilcox depositional basin, and individual prospects have a resource potential of 50–500 million barrels of oil equivalent. ■

This presentation is an update to one given at a Northsiders Luncheon on May 17, 2005, titled "The Wilcox—Outcrop to Deep Water," by Larry Zarra, David Meyer and Scott Neal.

Biographical Sketches

Larry Zarra has a BA from Rutgers College (1979) and an MS from the University of Delaware (1988), both in geology. He worked onshore Texas exploration at Exxon before joining Chevron in 1991. He is presently **General Luncheon** *continued on page 23*

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a stratigrapher on the Deepwater GOM Regional Geology Team, integrating core interpretation, reservoir architecture and regional depositional systems for several exploration and appraisal projects. Larry has worked the Wilcox on and off for the last 22 years.

David Rains received his MS in geology in August 2001 from Texas A&M University and earned his BS in geology from Baylor University in December 1998. David's master's research was with Shell's research lab studying unconfined deepwater fans. David joined Chevron in 2001 where he was assigned to the GOM Deepwater Business Unit on the Western Trends Exploration Team. As an exploration geologist, Dave has worked on the ground floor of the emerging Lower Tertiary Trend, being associated with both the St. Malo and Jack discoveries. Dave followed both discoveries into DWEP Appraisal as the project geologist. Since October 2004, Dave has served as the Jack Project Coordinator.

Dave Meyer has an MS (marine geology, 1981) from Florida Institute of Technology and a BS (geology, 1977) from the University of Wisconsin - Eau Claire. Dave is presently the OCS Lease Sale team leader for the deepwater GO. He has 25 years of experience since joining Chevron in 1981, working various assignments throughout the Gulf of Mexico basin. The past 11 years have been spent as an exploration geologist working the deepwater GOM, developing exploration plays and building Chevron's deepwater portfolio.