

HGS North American Explorationists and International Explorationists Joint Dinner Meeting, February 19, 1996

Play Attributes of Cretaceous Rudist Reef Reservoirs— Examples from the Gulf of Mexico and Middle East

By Jeffrey J. Dravis, Dravis Interests, Inc.

The distribution of Cretaceous rudist reef reservoirs around the Gulf of Mexico and in the Middle East is controlled principally by physiographic setting and preexisting topography. Play attributes, however, are often influenced by structural setting and diagenetic history, since most reservoirs are structural-stratigraphic traps. Understanding how physiographic setting influences carbonate sedimentation can be the key to exploiting some of these play relationships.

Major rudist reef reservoirs occur along edges of steeper platforms facing open oceans and include Fateh Field (Dubai) and those in the Stuart City reef trend of south Texas. However, important reservoirs occur in platform interiors on structurally controlled paleohighs, a physiographic setting historically ignored as unproductive. Black Lake (Louisiana) and Fairway (Texas) Fields are representative case studies. Reservoirs also exist on offshore basinal paleohighs, like Golden Lane Field (Mexico) and Isis Field (Tunisia). Other Cretaceous reservoirs produce from sediment shed from platform margin rudist reef complexes. Poza Rica Field (Mexico) produces from coarser skeletal grainstones shed from leeward platform margin reefs. Word Field (Stuart City reef trend) produces hydrocarbons (gas) from highly

micritic, back-reef facies dominated by secondary microporosity, as does part of Bu Hasa Field in Abu Dhabi (oil); both represent "diagenetic chalk" reservoirs.

This presentation will review the play attributes of these Cretaceous reservoirs, including their facies and reservoir quality. Relationships gleaned from Bahamian Quaternary carbonates provide useful guidelines concerning the influence of physiographic setting on potential play development, and may explain why a Poza Rica analog has never been found in south Texas. Enhanced petrographic techniques demonstrate that not all preserved secondary porosity in these reservoirs is related to near-surface freshwater diagenesis; some can be related to later burial diagenesis.

Despite their abundant secondary porosity and lower matrix permeabilities and the absence of much fracturing, many of these reservoirs have produced considerable quantities of oil and gas; several constitute giant fields. The ultimate recovery efficiencies of these reservoirs should allay some of the misconceptions about carbonate reservoirs in general and Cretaceous rudist reef reservoirs in particular. ■

Jeff Dravis is a consulting carbonate geologist and president of Dravis Interests,



Inc. Over the past 10 years, he has consulted on numerous domestic and international exploration and development projects, including projects in Canada, Russia,

and Texas. Jeff also teaches several applied carbonate in-house and field seminars each year, having taught over 60 since 1987. Jeff received his B.S. (Geology) from St. Mary's University (San Antonio), M.S. (Marine Geology) from University of Miami (Florida) and Ph.D. (Geology) from Rice University. From 1978 to 1986, he was employed by Exxon Production Research Company. He has been an adjunct Professor of Geology at Rice University since 1987.

