ABSTRACTS

Abstracts †

ABBOTT, WARD OWEN, Occidental Exploration and Production Co. Bakersfield, CA

Outcrop, Subsurface, and Seismic Mapping of a Basal Transgressive Sand

Basal transgressive sands can be defined by a careful integration of outcrop, well, and seismic data within the concept of an unconformity-bounded depositional sequence. This integration permits accurate prediction of potential stratigraphic traps. Only moderate attention has been paid to the basal transgressive sand as a prime objective reservoir for oil and gas accumulation. In the past it has generally not been recognized as a separate genetic unit, but grouped with the underlying deltaic and/or fluvial sand. The basal transgressive sand can be easily distinguished commonly only over areas of igneous, metamorphic, and folded sedimentary terrains. Through analysis of the lithologic, biologic, acoustic, and bore-hole characteristics of the basal transgressive sand, potential hydrocarbon trap geometries can be identified.

This approach has been applied in an analysis of geologic and geophysical data from the United States, Argentina, and Australia.

ABRY, CLAUDE G., Abry & Associates, Inc., Houston, TX

Exploration for Stratigraphic and Combination Traps by Use of Low-Cost Interactive Computer Work Station

In mature basins where independent oil companies are active, the abundance of well and seismic data makes the task of geologists and geophysicists slow and tedious. An interactive work station has been implemented to display exploration data in the form of base maps, contour maps, and cross sections, with emphasis on the use of lithologic data. Lithologic tops and bases are used to compute net sand, sand percentage, and number-of-sand-layers contour maps or their carbonate facies equivalents. In conjunction with log-curve shapes, these lithofacies maps provide indication of depositional environments. In addition, the cross sections display lithologic successions along well bores, facilitating the location of lateral facies variations, updip pinch-outs, or erosional truncations. The relative low cost and ease of use of the work station make it easier for smaller oil companies to compete successfully in the search for stratigraphic and combination traps.

ADAMS, G. STEVEN, Pennzoil Exploration and Production Co., Corpus Christi, TX, and DOUGLAS B. WATKINS, Texaco USA, New Orleans, LA

Subsurface Glen Rose Reef Trend of East Texas, Louisiana, and Mississippi

Two major episodes of shelf-margin reefing that occurred during the Early Cretaceous (Aptian-Albian-Cenomanian) are represented by the transgressive Hosston-Sligo complex and the regressive Glen Rose-Edwards complex. The Glen Rose-Edwards sequence can be broken up into 3 distinct carbonate buildups: middle Glen Rose, upper Glen Rose, and Edwards. Eustatic sea level rise, subsidence, and reef growth or sediment accumulation were dominant influences on shelf-margin deposition. The respective reef trends thicken eastward from east Texas into central Louisiana and southern Mississippi due to increased rate of subsidence and sea level rise in that direction.

Well cores and cuttings indicate that similar lithofacies occur throughout the Lower Cretaceous shelf margin. However, lithologic and diagenetic factors combined to produce extraordinary sections of facies-controlled porosity within the middle Glen Rose reef buildup. Although both hydrodynamic and organic processes were important factors in growth and maintenance of the middle Glen Rose reef buildup, the buildup is best described as an ecologic (organic) reef. A regional meteoric hydrologic system was responsible for extensive secondary moldic porosity in the skeletal-supported and grain-supported sediments. Algal binding within the reef interval contributed to the development of fenestral-moldic porosity. Extensive dolomitization is common and acted to create or destroy porosity.

Hydrocarbon production from the Lower Cretaceous shelf margin in the east Texas-Louisiana-Mississippi region has been limited mainly to the Edwards section. Application of recently developed facies and diagenetic models may increase further exploration potential of the entire Cretaceous shelf margin.

ADDY, SUNIT K., H. W. DEJONG, GEORGE W. WHITNEY, and RALPH E. WORTHINGTON, ARCO Exploration Co., Denver, CO

Geophysical Review of Trans-Pecos Area of West Texas

The Trans-Pecos has intrigued and baffled the oil industry, and all exploratory efforts so far have remained fruitless. Our geophysical findings along with other geologic information allow us to analyze the overall hydrocarbon potential for this area.

Gravity and magnetic data were helpful in regional mapping but were unreliable for localized information owing to numerous extrusive and intrusive rocks.

Seismic mapping shows many undrilled structures. However, the success ratio for the structures already drilled is disappointing (e.g., on the Diablo platform, out of 22 structural leads, 11 have been drilled and all were dry, and in the Marfa basin 17 out of 41 leads were drilled without success). Results were similar in Salt-Flat graben. Many of these wells had good hydrocarbon shows and almost all yielded fresh water. Tectonically the area has undergone several periods of orogeny, the result of the latest being numerous Basin and Range faults. The area is still seismically active and shows appreciable geodetic movement. It is suggested that the traps were destroyed with subsequent leakage of hydrocarbon and repeated induction of fresh water. Trap destruction is apparently beyond the scope of seismic detection.

The Chihuahua trough (United States), in spite of many discouraging facts, such as high heat flow, thermal waters, etc, shows some promise because seismic data reveal large thrust anticlines in the lower Paleozoic rocks (approximately 15,000 ft) that are yet to be adequately tested.

Other smaller undamaged stratigraphic traps (reefs, truncations, pinch-outs, etc) are possibly present and could be targets for future exploration.

ADEY, PETER P., and STEVEN SERPATI, Exxon Co., U.S.A., New Orleans, LA

Interactive Information Management in Exploration

Conversational software provides a continuous dialog between the explorationist and the computer. Interactive procedures of this type create an environment in which storage, retrieval, manipulation, reporting, and mapping of information are integrated into one system. Automation of an exploration office provides increased speed, accuracy, and flexibility to the exploration effort. With present technology, noncomputer-orientated employees can easily access existing data files with computer programs, which produce a variety of information. From the creation of detailed base maps to interpretative geological mapping, interactive software has proven its usefulness.

A rapid preliminary evaluation of an area will be performed using interactive information systems. A hypothetical geologic setting in Plaquemines Parish, Louisiana, serves as the setting for this reconnaissance study. All available information will be retrieved, manipulated, and displayed using conversational software. Base maps and reports created from existing well, seismic, velocity, and cartographic computer files comprise the initial information. Existing well marker depths and seismic times will aid in a more accurate interpretation of the geology. As the interpretation evolves, information is periodically updated and mapped to further develop the study. Computer-generated contour maps provide a rapid and reliable evaluation of the subsurface geology.

†Conversion table at end of abstracts.