

LINSETH, ROY O., Teknica Resource Development Ltd., Calgary, Alberta, Canada

Synthetic Sonic Logs for Delineation of Petroleum Reservoirs

A recent development in digital process technology yields synthetic sonic logs from seismic reflection data recorded at the ground surface. Synthetic sonic logs are similar to, and have most of the properties of, long source-receiver borehole sonic logs. The synthetics have been found to be particularly useful for the delineation of petroleum reservoirs, including the extent, thickness, and porosity of the reservoir rocks.

In a typical survey, field data, obtained from seismic line profiles across reservoirs, yield a sequence of synthetic sonic logs. Continuous vertical cross sections which display color-coded transit time units can be interpreted in terms of lithology, porosity, and related subsurface information, within the limits of interpretation of the single sonic curve and the resolution of the method.

Applications include the optimization of development drilling patterns to obtain maximum production, the design of secondary recovery programs and the positioning of injection wells, and the location of offshore drilling platforms to ensure maximum recovery.

LINK, MARTIN H., Los Angeles Harbor College, Wilmington, CA

Turbidite-Deltaic Complex, Piru Gorge Sandstone Member of Ridge Rouge Formation (Pliocene), Ridge Basin, California

The Piru Gorge Sandstone member of the Ridge Route Formation (Pliocene) was deposited as a turbidite-deltaic complex within the tectonically active Ridge basin. In cross section, the Piru Gorge Sandstone is 190 m thick and over 5 km long. The sandstone consists of (1) a lower turbidite sequence, overlain by (2) multistacked channel-levee cycles, and (3) interchannel deposits. These sequences are arranged into several megasequences, each up to 60 m thick. The lower turbidite interval is up to 10 m thick and consists of facies B, C, and D of Mutti and Ricci Lucchi. The interval is interbedded with, and grades laterally into, lacustrine shale. The channel-levee sequence is up to 30 m thick and consists of crossbedded channel sandstone, slump folded strata, and levee deposits arranged in fining- and thinning-upward cycles. The sequence makes up the middle and upper parts of each megasequence. Interchannel deposits are interbedded with, and laterally transitional with, the channel-levee sequences. The deposits consist of thick intervals of organic-rich, bioturbated, mudcracked mudstone and sandstone that locally have rootlets and animal tracks.

Paleocurrent, thickness, and petrographic studies indicate the Piru Gorge Sandstone was derived primarily from the north-northwest with minor contributions from the east and west. Petrographic data indicate the arkosic sandstones were derived from granitic source terranes.

LIPSEY, JAMES A., and L. D. CLARK, Exxon Co., USA, Houston, TX

Computer Processing of Production Data—Exploration Tool

Computer processing of monthly gas and oil production rates reported to the Texas Railroad Commission is being used as an exploration tool. This production data, reported by operators to the Railroad Commission, is available commer-

cially in digital form and is updated on a monthly basis. The data include monthly production figures for both primary production and by-products along with test results. Computer programs have been developed to display this information as inventories, reports, and graphic plots. Summation logic incorporated in the programs allows the presentation of production curves (monthly and cumulative) for individual wells, reservoirs within a field, individual operators within a field, entire fields, formations within one or more counties, or any combination thereof.

Detailed monitoring of wells and fields leads to improved predictions of production sustainability. The effects of stimulation techniques can also be easily recognized. Production data from selected wells can be combined to generate a production history for a typical well.

Decisions regarding well completions have been made utilizing this data. Performance of key wells and fields near areas of interest are regularly monitored with data processing output. A minimal amount of manpower is required to keep updated production histories available for exploration use.

LISTER, KENNETH H., Pennzoil Exploration & Production Co., Houston, TX

Paleoecology of Miocene Barstow Formation Insect Fauna, Calico Mountains, California

The Upper Miocene Barstow Formation crops out in the western Mojave Desert. In the southern Calico Mountains, green petroliferous shale beds of the Barstow Formation contain calcareous nodules from which silicified organisms can be recovered by acid etching. Reconstruction of the physical environment during the time of deposition of the fossil-bearing beds is made by comparing the insects of the Miocene fauna with their modern analogs. The Barstow Formation in this area was deposited in a fairly large, warm lake whose waters were rich in dissolved minerals. Periodically the lacustrine environment was disturbed in a way which resulted in the death and preservation of many soft-bodied organisms. The Miocene lake was surrounded by grassy plains and upland areas supporting a grassy woodland. The climate of the region was semiarid with hot summers and mild winters.

LOCKER, STANLEY D., Univ. Texas Marine Science Inst., Galveston, TX, and A. CONRAD NEUMANN, Univ. North Carolina, Chapel Hill, NC

Holocene Facies Succession and Depositional Environments of Semi-Enclosed Windward Lagoon off Great Abaco Island, Bahamas

The Abaco windward lagoon, bounded bankward by Great Abaco Island and seaward by the discontinuous Abaco Cays, exhibits up to 6 m or more of lagoonal, non-reef derived sediments, 5 km from the marginal escarpment of northwestern Little Bahama Bank. Six sedimentary facies, distinguished by texture, composition, and molluscan fauna, record the changing depositional environments as water depth and circulation increased during the Holocene transgression. A skeletal grainstone and mixed (skeletal-oid-aggregate) grainstone are limited to inter-island channel areas. Away from these channel energy windows, a maximum sequence of 4 depositional facies is observed. The bulk of sediments are a normal marine (N.M.) skeletal wackestone or mixed (pellet-skeletal) packstone. The N.M. wackestone dominates the western half of Abaco lagoon while the packstone occurrence