SOUTHWEST LAKE ARTHUR FIELD, CAMERON PARISH, LOUISIANA

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ABSTRACT

Southwest Lake Arthur Field is a classic example of one of the rare, non-salt associated stratigraphic traps found in Southwest Louisiana by geological-geophysical exploration techniques. The stratigraphic trap is constituted by an east-west trending sand barrier bar and a tabular shaped marine sand that shales out to the north, west and south. The sand deposits are superimposed on a present day southeast dipping homocline.

Integration and review of the geology and geophysics of this documented stratigraphic trap was undertaken in order to determine whether the Planulina #2 Sand pinchout could be visually observed on the available conventional split-spread reflection seismic record section and if essential criteria could be developed to locate similar fields.

The procedure employed was: 1) A thorough geological study was made from logs, cores and production data of numerous wells in and around the field from which structure and isopachous maps were made of the reservoirs constituting the stratigraphic trap; 2) The original field records were transcribed onto magnetic tape and then to a processed seismic record section; 3) A synthetic seismogram was constructed from a Sonic log of a well near the seismic line along with the Spontaneous Potential and Resistivity curves of the same well plus another well along the section; 4) The digitized Spontaneous Potential and Resistivity curves for these wells were converted to a time scale using the values of time depth derived from the integrated Sonic log; 5) The synthetic seismogram and digitized logs were superimposed and compared to the record section. A change of character was observed which showed thickening of the section approximately equal to the developed sand. Since conventional seismic recordings in the area are generally plagued with various noise problems, this change of character may be coincidental. Additional work is needed to confirm such a liberal interpretation.

Production is from the Planulina #2 Sands which occur in the Erath member of the Anahuac Formation (Goheen, 1959). This member coincides with the *Planulina palmerae* biostratigraphic zone which is Lower Miocene.

SHEAR STRENGTH OF SEDIMENTS MEASURED IN PLACE NEAR THE MISSISSIPPI DELTA COMPARED TO MEASUREMENTS OBTAINED FROM CORED MATERIAL

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ABSTRACT

A cooperative investigation was made at a site in 95 m of water off South Pass by Texas A & M University, University of Illinois, Urbana, and ESSA, Miami, aboard the anchored R/V ALAMINOS in March-April, 1969. In place shear strength was measured in 30 cm increments, to a distance of 2.5 m below the bottom, by a 7.6 X 15.2 cm vane attached to telemetering equipment. High quality gravity cores up to 1.8 m long were raised from the same site. Shear strength was measured in three of the cores on board the ship using a laboratory vane shear machine. Three other cores were similarly investigated at Texas A & M and the University of Illinois seven weeks later. Laboratory-type vane shear strength data from short gravity cores collected during a commercial boring investigation and measured aboard the drilling ship, were also compared.

At a depth of about 10 cm, the in-place, shipboard, ashore, and boring strengths were in the range of 0.05 to 0.1 metric tons/m^2. At one meter, values were 0.4, 0.4, and 0.25 and 0.2 tons/m^2, respectively. At 2.2 m the in-place shear strength was 0.55 tons/m^2, and the boring value was 0.2 tons/m^2. Remolded shear strengths obtained by all methods were nearly zero near the surface. At 1 and 2.2 m the in-place values were greater by factors of 2 to 2.5. The significance of this study is that in-place shear strengths at the location investigated are higher by a factor of 2 to 3 at depths below the bottom of about 1 m. Our results suggest that the foundations of engineering structures designed on the basis of shear strength data obtained from cores may be conservative and have an unnecessarily large factor of safety.

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