

grain-size increase from bottom to top; heavy-mineral content related to an Eastern Gulf source; and sedimentary structures comprising mainly cross-bedding of shallow dip to horizontal bedding.

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PHOTOGEOLOGY IN LOUISIANA COASTAL MARSH AND SWAMPS

Local structural movement is a presently continuing phenomenon and there is abundant indisputable evidence in regional basins throughout the world that these movements are occurring in the geologic present.

The geologically young marsh and swamp that comprise the alluvial plain of south Louisiana provide a sensitive geomorphic norm on which surface indications of structural uplift appear in sharp contrasts. Photogeologic anomalies are identified by subtle physiographic deviations from this normal.

Principal criteria for anomaly recognition are defined, reviewed, and illustrated.

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STRUCTURAL GEOLOGY AND HISTORY OF THE FAIRWAY FIELD AREA, HENDERSON AND ANDERSON COUNTIES, TEXAS

The Fairway field area is on an interdomal surface high and seismic prospect well known in East Texas. Fairway field proper covers approximately 23,000 acres, with development still taking place; the field limits are undefined on the southeast and southwest. Two small accumulations, Isaac Lindsey field and Frankston field, are located on the same structural feature.

This paper discusses the structural history of the area as well as the lithology and reservoir characteristics of the producing sections. Oil production in Fairway Field is established in the Massive Anhydrite, Rodessa, James, and Pettet Formations. One fault block on the southwest end of the field produces gas-condensate from the James. The same formation in Isaac Lindsey field is the source of gas-condensate, and in Frankston field of oil. The importance of the time of structural growth in relation to the James reef deposition is discussed in detail.

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IMPROVED INTERPRETATION OF FORMATION PRODUCTIVITY BY COMBINED USE OF CORE ANALYSIS AND ELECTRIC LOG DATA

Basic rock properties, such as permeability, porosity, residual fluid saturations, and capillary pressure characteristics are obtained by direct measurement of core samples. Electric logging devices provide information for computing approximate values for the formation factor or porosity, formation water resistivity, and formation water saturation. In the past, these two formation evaluation tools have been used more or less independently of each other.

This paper presents a method of combining core analysis and electric log information to obtain more reliable interpretations of fluid productivity. The porosity and the immobile interstitial water saturation derived from core analysis may be used to compute a value which is called productive resistivity, or (R_p). Productive resistivity is defined to be the resistivity of a hydrocarbon-productive formation with an interstitial water saturation equal to or less than the immobile value. The

deep investigation electric logging devices, such as the induction log, approach in measurement the true resistivity, or (R_t), from which the formation water saturation can be calculated. If the true formation resistivity measured by the electric or induction log is less than the calculated productive resistivity, it may be concluded that the actual water saturation is greater than the immobile interstitial water, and the formation interval may be either partially or wholly water-productive. On the other hand, if the measured resistivity equals or exceeds the productive resistivity calculated from core analysis, it may be concluded that the actual formation water saturation is no greater than the immobile interstitial water and the sand is probably wholly hydrocarbon-productive. A similar calculation may be made using a higher water saturation value taken from the transitional zone to determine a value called the minimum productive resistivity, or R_{mp} .

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STRATIGRAPHY OF THE CARRIZO-WILCOX OF A PORTION OF SOUTH TEXAS AND ITS RELATIONSHIP TO PRODUCTION

The stratigraphy of the Carrizo-Wilcox is very complex and numerous facies occur within the group. This report shows the relationship between the various facies and the producing fields within the area of interest. Stratigraphic studies are becoming increasingly important in the exploration for oil and gas and a practical application of such a study is presented here.

The subsurface section can be divided into three major subdivisions, of which two are rock units composed almost entirely of non-marine sediments, and the third is further subdivided into time-rock units composed of alternating marine, transitional, and non-marine sediments. Generalized correlations can be made between the surface outcrop and the subsurface section. The various facies that occur within the subdivisions can be defined and the limits delineated both vertically and horizontally. Many of these facies are economically important. The most significant stratigraphic feature is a large delta which occurs within the lower Carrizo-Wilcox. The effects that these different facies have on production is discussed along with the stratigraphic conditions in some of the more important fields.

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DOWNDIP LIMITS OF PRODUCTION IN THE OLIGOCENE OF THE UPPER GULF COAST OF TEXAS

As used in this paper the Oligocene of the Upper Gulf Coast of Texas includes the Anahuac and Frio Formations, and the Vicksburg Group. The productive trend of these units in Railroad Commission District 3 extends in a band 40-50 miles wide paralleling the coast line from Jackson County on the west to the Sabine River on the east.

The Frio accounts for the major part of the production in this trend, with minor amounts of production derived from the Anahuac and Vicksburg.

It is the opinion of the writers that the downdip limits of sand development in the Oligocene have been fairly well defined. These limits in general follow the present-day coastline.

Future exploration will undoubtedly find exceptional sand developments within the downdip limits of the Frio.