

## SMACKOVER OIL PROSPECTS IN THE APALACHICOLA EMBAYMENT

A. V. Applegate, F. A. Pontigo, Jr., and J. R. Rooke<sup>1</sup>

### ABSTRACT

Although no commercial accumulation of oil has been found in the Apalachicola embayment, core analysis of a well in northwestern Gulf County, Florida disclosed residual oil locked in a dense impermeable section (77 feet thick) of Smackover limestone. Additional oil staining was found in seven feet of conglomeratic calcareous sandstone core considered to be the Norphlet formation. Total thickness of the Smackover limestone was 163 feet. A well in Gulf County in the deeper part of the basin encountered 196 feet of Smackover. Forty five feet of core recovered in this well consisted of 70 percent dark gray micrite and 30 percent dark gray calcareous shale. Ditch samples for the remaining Smackover consisted of dark and light gray micrites and dark gray shales, with a few fine grained calcareous sandstones. Another well located in Franklin County, was cored and had oil stain throughout the Smackover. For this section of the Smackover porosity was visually estimated at 10 percent from cores and log calculations. This well encountered 186 feet of Smackover. Other non-confidential wells encountered much thinner sections of dense micrites.

The Apalachicola embayment is defined by a synclinal axis lying just to the east of the Apalachicola River and plunging south-southwest about 65 feet per mile into St. Joseph's Bay. The up-dip limit of the Smackover has been partially defined by eight wells which encountered this formation in Bay, Calhoun, Franklin, Gulf and Liberty counties and by an additional six deep tests up-dip of the Smackover limit. The area underlain by Smackover in the embayment is about 2,000 square miles, hence drilling density (eight wells) is one per 250 square miles. The up-dip limit to the west has not been delineated because of insufficient drilling.

Seven tests which penetrated the Smackover have been drilled within the last three years by Charter, Hunt, Placid, and Exxon; the only exception being a Mobil well drilled in 1968. One of the wells drilled by Exxon in the area of interest is in confidential status at this time. Results of all others have been released, and cuttings, cores and electrical logs are in open file at the Florida Bureau of Geology.

During the past two years, the Florida Bureau of Geology has conducted a regional gravity meter survey. A total of 370 station measurements were made, and a regional Bouguer anomaly map prepared on a one milligal contour interval. The results show a very definite positive anomaly centered about four miles west of the town of Sopchoppy in Franklin County. An additional, but less intense, positive anomaly is centered in Apalachicola Sound, about five miles east of the community of East Point in Gulf County. These two positive gravity anomalies coincide with positive magnetic anomalies on a regional magnetic map. They may represent massive intrusions of diabase sills or dikes in Eagle Mills or Paleozoic sediments or a basic basement complex, which was above sea level during Smackover deposition. If so, there is a good possibility that stratigraphic traps may exist on the flanks of these structures.

A negative gravity anomaly lies to the northwest of the two positive anomalies previously described and is believed to show the trend of Louann salt deposition. This anomaly is located in northwest Liberty County, to the east of the Apalachicola River. Two wells encountered this salt. One of these wells was drilled through a relatively thin up-dip Smackover section into the Louann salt. The other well was outside of the up-dip limits of the Smackover and drilled through 705 feet of Louann salt before encountering the Eagle Mills Formation.

With the sparse well control in the embayment, indirect evidence indicates possible faulting, which would afford Smackover structural traps. The two positive gravity anomalies have not been tested by the drill bit. If they formed in pre-Smackover time and were buried by younger sediments, it is unlikely that Smackover limestone is present over the crests of the anomalies. However, stratigraphic pinch-out traps may exist on the flanks of these structures.

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<sup>1</sup>Florida Department of Natural Resources, Bureau of Geology, Tallahassee, Florida