
Geologic Characterization of the Hydrocarbon Resource Potential of the Upper Cretaceous Tuscaloosa Marine Shale in Mississippi and Louisiana, U.S.A.

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ABSTRACT

Recent oil production from the Upper Cretaceous marine shale of the Tuscaloosa Group (Tuscaloosa marine shale; TMS) has elevated the formation, previously assessed by the U.S. Geological Survey (USGS) in 2011 as part of the Eagle Ford Group, to its own distinct assessment unit for an upcoming assessment. Geologic characterization in preparation for the assessment has included the analysis of rock samples and produced oils, and the interpretation of well logs and biostratigraphic data. Results include new mapped extents of the reservoir, which reaches a maximum thickness of almost 500 feet in southern Mississippi and central Louisiana, and geochemical interpretations which support a self-sourced origin for high gravity (36–48 American Petroleum Institute [API] low sulfur oil. Programmed pyrolysis and petrography indicate the TMS contains dominantly type III gas-prone kerogen with some type II oil-prone kerogen present in the most organic-rich samples. TMS samples contain an average of 47 weight percent total clays, had organic carbon content which ranged from 0.14 to 4.0 weight percent, and had a thermal maturity of 0.57 to 0.99 percent vitrinite reflectance in the productive area. These characteristics were the same for the TMS within an area defined as a ‘high resistivity zone’ and outside of it. These results will be integral to the planned USGS assessment of the TMS.

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