
A Geochemical Analysis of the Tuscaloosa Marine Shale (Upper Cretaceous) Core Recovered from the Eads Poitevent #1 Well, Louisiana

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ABSTRACT

A core recovered from Eads Poitevent #1 well in the Lacombe Bayou Field of St. Tammany Parish, Louisiana, contains a complete section of the Tuscaloosa Marine Shale (TMS). The TMS was deposited on the shelf of the Gulf of Mexico during the Upper Cretaceous and is an organic-rich shale interbedded with sandstones and siltstones. Regionally, the TMS extends from central Louisiana to western Mississippi and is estimated to encompass an area of 8250 square miles and can be found at depths as great as 15,000 feet. Due to the Gulf of Mexico being a mature producing province, the TMS is believed to be a possible unconventional resource play that contains up to 7 billion barrels of oil. During the Late Cretaceous, the Gulf of Mexico experienced periods of anoxia, including the Oceanic Anoxic Event 2. This anoxic event is believed to have occurred at the Cenomanian and Turonian boundary, which could be recorded in the TMS. A geochemical proxy of the TMS will be created by completing different analyses to determine the geochemical stratigraphy of the core. X-ray diffraction (XRD) will be used to determine the mineralogic composition of the core. X-ray fluorescence (XRF) is used to determine the ratio of trace elements found in the core which will give insight into oxidation conditions of the Gulf of Mexico shelf during the Late Cretaceous. RockEval is used to determine kerogen type and amount of TOC found within the core. Finally, stable isotope data, paleo data and biostratigraphy will be completed. Trends in both major and trace elements will be determined to correlate geochemical conditions at the time of deposition, and to help determine the chemical stratigraphy of the core. The precise location Oceanic Anoxic Event 2 and its resulting in organic-rich black shale deposition will be determined within the TMS.

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