

DEPOSITIONAL SYSTEMS, LITHOFACIES, AND GEOCHEMISTRY OF THE JURASSIC (OXFORDIAN) SMACKOVER AND BUCKNER FORMATIONS IN VAN ZANDT COUNTY, TEXAS: A TYPE-CORE SECTION

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ABSTRACT

The Late Jurassic Smackover Formation is part of a prolific petroleum system along the northern rim of the Gulf of Mexico with a long history of exploration. Most investigations into the Smackover have taken place in sub basins east of the East Texas basin and primarily focus on upper Smackover oolitic grainstone reservoirs, but only a few studies have been completed on the lower Smackover source rocks. Because of this, there is a lack of understanding related to the conditions under which the lower Smackover was deposited. This study provides a more complete understanding of the Smackover deposits in the East Texas through investigation of a long continuous 713-ft core drilled from the

Sun Oil Travis GU No. 1 well in Van Zandt County, Texas. It contains a continuous section of Smackover lithofacies from lower Smackover mudstones to upper Smackover grainstones and contains a large portion of the overlying Buckner Anhydrite. The goal of this investigation is to lithologically and chemically characterize the Smackover Formation in order to create a type section for future studies and create a refined depositional model for East Texas Smackover deposition. High-resolution geochemical data composed of x-ray diffraction analysis (XRD), total organic carbon (TOC) and Rock-Eval, x-ray fluorescence (XRF) analysis, and isotope data was taken to fully characterize the section chemically. This geochemical dataset provides insight into controls on organic matter accumulation and destruction, diagenetic fluids, and local and global isotope signatures. With understandings of lithofacies distribution, depositional controls for organic accumulation and porosity development, and diagenesis the unconventional and conventional potential of the Smackover can be assessed.



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