

PETROPHYSICAL AND GEOLOGICAL CHARACTERIZATION OF THE SPRABERRY TREND, MIDLAND BASIN, TEXAS

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Abstract

The Spraberry Trend, is a subsurface accumulation of Permian fine-grained siliciclastic and carbonate strata, located within the Midland basin of West Texas. Since its discovery, conventional hydrocarbon production within the Spraberry Trend has been inconsistent due to sparse geological studies of low permeability reservoirs. A modern petrophysical study of the Spraberry Trend will aid in determining the unconventional reservoir potential of the northwestern Midland basin. Research on the Spraberry Trend will also further the understanding of the regional geology of the Permian Basin.

The purpose of this research project is to complete a detailed petrophysical evaluation of the Spraberry Trend within Martin and Andrews counties of West Texas. Using public data from 100 wells, an industrial petrophysical-workflow will document geologic heterogeneities throughout the Spraberry Trend. Petrophysical parameters of the Spraberry Trend will be determined through (1) well-log data conditioning, (2) deterministic and probabilistic well log-analysis, (3) sedimentological core-descriptions, (4) rock-to-log calibration, (5) scanning electron microscopy, (6) stratigraphic analysis, and (7) attribute maps.

I anticipate the results of this project will demonstrate the importance of combining geologic knowledge and petrophysical attributes to fully characterize unconventional reservoirs. Results from this project will compliment previous work completed on the Spraberry Trend, by implementing modern petrophysical techniques to characterize an otherwise under-studied region of the Midland basin. Oil companies and future researchers will be able to use data from this project to further characterize the larger “Wolfberry play” within the Permian Basin