

**Characterization of the Wolfcamp
Reservoir in the Midland Basin
through the Integration of
Sedimentologic, Paleontologic,
Geochemical, Petrophysical
and SEM-EDS Analyses**

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The succession comprising the Upper Wolfcamp (A and B) in the Midland Basin is an Asselian to Artinskian aged heterolithic assemblage of interbedded detrital carbonates, calcareous mudstones, argillaceous and siliceous mudstones which vary systematically at bed, bed-set and bed-complex hierarchies. These deposits are a series of sediment gravity flows that are characterized as debrites, hybrid beds, dilute turbidity flows and either hemipelagic or tractional mudstones that appear to have been deposited in a restricted basin with oxygen stressed waters which aided in the preservation of organic matter. The mineralogy, organic content and porosity systems covary and are recognizable in core, log and SEM-EDS mineralogical analyses. The kerogen content is type II (Organofacies B) which at our point of investigation is within the oil window (%Ro 0.80-0.85). The high amount of hydrocarbons present in the Wolfcamp, despite having lower TOC on average (~2.25 wt %) compared to other source rock reservoirs is due to in part relatively low expulsion efficiency (54%).

Based on a one well profile here we present a series of stratigraphic subdivisions in the Wolfcamp based on biostratigraphic and stacking pattern analysis, sedimentologic and petrofacies models, depositional models as related to the lateral distribution of lithologies and reservoir properties and petrophysical characterization of the entire Wolfcamp interval through the integration of log and SEM-EDS analysis. These products are part of the

first phase of a regional Midland Basin study that will evaluate the reservoir and petroleum system(s) from the Wolfcamp through Spraberry Formations from core, log and seismic data to generate products to predict and uplift well performance.

