

**The Pennsylvanian Lower Strawn Group, Jack and Wise Counties,
Fort Worth Basin: Facies distribution and stratigraphic architecture**

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ABSTRACT

The Lower Strawn Group in Jack and Wise counties of the Fort Worth Basin are laterally and vertically heterogeneous deltaic deposits comprising sandstones, siltstones, and shales with thin, discontinuous carbonates and coal seams reflecting variable icehouse conditions. Given a lack of differentiation of individual sequences in the Lower Strawn in Jack and Wise counties, this study delineates a stratigraphic framework and highlights relationships between component facies of the Lower Strawn with depositional controls and their effects on reservoir predictability.

Based on core description and interpretation, depositional environments of the Lower Strawn Group include prodelta, medial delta front, interdistributary-bay, channel mouth bar, and distributary-channel deposits. These interpreted depositional environments, their well-log pattern, and vertical facies relationships enable an interpretation of fluvio-deltaic depositional systems dominating in the Lower Strawn Group. Wireline log correlations of regionally-extensive maximum flooding surfaces were utilized in developing a sequence stratigraphic framework that identified eleven regressive-transgressive, fluvio-deltaic sequences averaging 90-240ft thick, collectively spanning a thickness of 1,000-2,700 ft. (305-823 m.) as the interval onlapped the forebulge of the foreland basin. A south-southwest overall direction of progradation was identified based on the distribution of net sandstone thickness trends. The depocenters contained within these sequences reflect similar geometries to those described from fluvio-deltaic systems of the Mississippi River and Yukon River Deltas. With elevated porosity trends found to be associated with homogeneous channel-mouth bar and distributary-channel deposits, a better understanding of internal reservoir characteristics and distribution helps improve predictability for operators pursuing stratigraphically-complex hydrocarbon resources in similar depositional settings.



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