

Stratigraphy and Composition of Turbidite Deposits, Jackfork Group, Eastern Oklahoma

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This paper presents a subsurface study of the early Pennsylvanian (Morrowan) Jackfork Group turbidites in the Lynn Mountain Syncline—Potato Hills area of Eastern Oklahoma. Goals are to (1) determine the level of reliability that can be anticipated in well-to-well stratal correlations and to (2) establish criteria for developing a well-log based stratigraphic framework for sub-regional stratigraphic analysis. The structural complexity of the area and lateral variability in these turbidite facies make current correlations and interpretations of conventional subsurface data difficult.

Two gas-producing wells that penetrate the Jackfork are being studied in detail utilizing conventional logs, borehole image and dipmeter logs, and cuttings. These data provided a means to identify major faults through the Jackfork, and thus to subdivide the wells into discrete fault-bounded stratigraphic intervals. Sedimentary features that were not discernible on conventional well logs were identified from the borehole image logs and dipmeter patterns. These features provided a means of identifying stratigraphic turbidite elements. Also, complementary cutting thin section analysis permitted us to distinguish three sandstone types in the gas producing intervals: highly, quartz-cemented, friable and siderite-cemented sandstones. Bitumen is present in all sandstone types. Relations between stratigraphy and the sandstone types have been established. These results help to understand the factors that control the gas production in the area.