

High-Resolution Foraminiferal Biostratigraphy of Cenomanian and Turonian Sandstones, Tyler County, Texas

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ABSTRACT

Ergon Exploration, Inc., has operated or participated in 26 fractured Austin Chalk wells south of the Sabine Arch in Tyler County, Texas, in the past 5 1/2 years. Nine wells were taken deeper to test Woodbine/Eagle Ford sandstones. Reservoir-quality sandstones were encountered in most wells. Both coarsening-upward sand packages and thinner fining-upward sequences occur. High-resolution foraminiferal data were collected in 10-ft interval cuttings from the lowermost Austin Group through the uppermost Buda Formation. Microfauna study by Applied Biostratigraphix, Houston, Texas, concentrated on identification of specific foraminifera useful for relative age dating and documentation of foraminiferal abundance and diversity changes. Identification of distinct planktic and benthic foraminiferal species resulted in: 1) recognition of Maness-equivalent sandstones (Washita Group, lower Cenomanian); and 2) recognition of Woodbine-equivalent (lower and middle Cenomanian) and Eagle Ford-equivalent (upper Cenomanian to Turonian) sandstones. Relative changes in foraminiferal abundance were recognized to different degrees in all nine wells and served as local correlation markers. Foraminiferal variations allowed the detrital column to be divided into 5 sections. Foraminiferal abundance and diversity aided in the recognition of depositional sequences. The sandstone-rich sequences formed as progradational deltaic complexes in inner to middle shelf settings. Coarsening-upward sandstones are interpreted as delta-front sandstones, and fining-upward sequences closely associated with the delta-front sandstones are interpreted as distributary channels. Foraminiferal abundance and diversity were greatest during parasequence-scale transgressions associated with the sand-rich highstand system tracts.