Integration - Key to Success of Austin Chalk and Eagle Ford Wells: A Case Study of the Sugarkane Cretaceous Field, Live Oak Co., Texas

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The Sugarkane Cretaceous Field in and around Live Oak County, Texas comprises the Austin Chalk and the Eagle Ford Formations. Horizontal well technology is required to make this new play (Eagle Ford) and down-dip extension of an old play (Austin Chalk) economic. Because the reservoir has a very tight matrix, fracture porosity is an important component of storage, and fracture permeability is the primary means of deliverability. High temperature and high pore pressure, along with the inherently poor predictability of fracture location and character, can cause expensive drilling problems in horizontal wells in this unconventional reservoir.

Integration of the geoscience data with drilling, reservoir and completion information in a small pilot drilling program has helped to bring well costs down and improve reservoir productivity. Seismic techniques, such as fault mapping, edge detection, azimuth and dip extraction, curvature and coherency analysis, have proven effective in highlighting prospective fracture fairways, especially in relay zones between en echelon faults. Microseismic data illustrate the interval affected by hydraulic fracturing. Core analysis, geosteering interpretation, mudlogging data and mechanical modeling are integrated with the seismic interpretation. A petrophysical model developed with specialty logs from vertical pilot holes incorporates core-log calibration to define the most productive stratigraphic zones within both intervals. This geological and geophysical reservoir characterization, from the regional to microscopic scale, provides the means for effective well placement.