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### **Enhanced Temperature Gradient in the Deep Tuscaloosa Trend – Is it really there?**

Understanding the thermal regime in the deep Tuscaloosa trend, which extends across the state of Louisiana and hosts a number of overpressured gas reservoirs, will improve modeling of hydrocarbon generation. Uncorrected bottom-hole temperature (BHT) data from wells along the trend show a pronounced increase in geothermal gradient commencing at or near the top of the Cretaceous chinks and extending downward into the Tuscaloosa Formation, coincident with the usage of high mud weights. However, application of the commonly used AAPG depth correction for BHT data greatly diminishes the temperature “dogleg”. Examination of the correction function shows that the algorithm is not supported by the data at depths greater than 14,000 feet. Using uncorrected BHT data, temperature gradients below the top of chalk range from 2.0 to 2.9°F per 100 ft, substantially greater than above the chalk. The low thermal conductivity required to maintain a high temperature gradient in overpressured formations may be a combination of the effects of clay content, gas saturation, temperature, effective stress, and porosity.