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### **3-D Seismic-Geologic Model of Big Piney Field, Sublette County, Wyoming**

The purpose of this study is to document, seismically and geologically, the Upper Cretaceous-Lower Tertiary stratigraphic section of the Big Piney field, which is located on the La Barge Platform in southwestern Wyoming, in the west-central part of the Green River basin.

Big Piney field is faulted by a major east-dipping thrust fault, herein termed a backthrust, and east-west oriented tear faults. Tear faults occur at the south end of Big Piney field. The detachment surface of the backthrust is located at the top of the K Marker. Thrusting offsets upper Cretaceous through Lower Tertiary rocks above the K Marker. However, lower units are unaffected. Sediments associated with the hanging wall of the thrust fault have been folded into an anticlinal structure. The major hydrocarbon accumulation at Big Piney field is related to this feature.

A 3-D velocity model was built from synthetic seismograms to perform the time-to-depth conversion of horizons and faults. Depth-converted horizons were adjusted to match log tops using a back-interpolation process. Faults were converted to depth using the velocity model.

A 3-D geologic model and 3-D property model with multiple cross-sections were built to understand the geometry and lateral continuity of the hydrocarbon producing sandstones. These results were integrated to identify subtle hydrocarbon traps and recommend nine vertical and horizontal well locations. These proposed wells were mainly located in thick, continuous sand bodies in the Almy and Mesaverde formations.