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Comparison of Producing and Prospective Shale Gas Plays in the U.S.A. and Canada

With the ongoing success in the Barnett Shale, Ft. Worth Basin, a comparison of this unconventional shale gas system to other productive and prospective shale gas systems is appropriate. It may not necessarily provide a model for all other systems, but it certainly can provide insights into how these systems can be evaluated and possibly made commercial. The Mississippian Barnett Shale has analog systems among the Foreland Basins of the Ouachita Thrust Front (OTF) such as the Caney, Fayetteville, and Floyd shales as well as the Barnett Shale in the Permian Basin. Other producing and prospective horizons include various Paleozoic, Cretaceous, and Tertiary shales such as the Devonian Woodford Shale of the Permian, Anadarko, Arkoma, and other basins along the OTF and also Devonian shales such as the Chattanooga, Ohio, and Marcellus of the Appalachian Basin. Rocky Mountain basins include similar play possibilities primarily in Cretaceous systems, but also some Paleozoic systems and also including the Basin and Range of Nevada (Great Basin) that contains the Mississippian Chainman Shale. Western Canadian Basin shales also have shale gas potential and data from those systems are included in this comparison.

It is important to characterize shale gas systems by system type. Six potential systems are described consisting of biogenic and thermogenic systems, which can be subdivided into sub-categories based on thermal maturity and intra-formational sequences. A mixed system consisting of both thermogenic and biogenic gas is a combination shale gas system.

Characterization of these systems include organic geochemical characteristics such as system type, organic richness, thermal maturity, kerogen type, and product yields at maturity, gas contents, lithological and mineralogical variations, and geological age. The variability of these systems is reflected in their rates of decomposition and the product yields at varying thermal maturity. Geological and geochemical reconnaissance can help identify plays that can yield good shale gas prospects either as primary or secondary production objectives.