

Petroleum Resources in Permian, Pennsylvanian and Upper Mississippian Age Reservoirs in the Anadarko Super Basin: Oklahoma, Texas, Kansas and Colorado, USA

The greater Anadarko Basin area in western Oklahoma, the Texas Panhandle, the western two-thirds of Kansas and a small portion of southeastern Colorado has been producing oil and gas from a variety of Paleozoic age reservoirs since 1915. In one hundred and five years the estimated total oil and gas production exceeds 13 billion barrels of oil and 186 trillion cubic feet of natural gas. This production has come from over 300,000 producing wells at depths ranging from less than 1,000 feet (305 m) to 25,000 feet (7,260 m). The reservoir ages range in age from Pre-Cambrian to Lower Permian with very minor Cretaceous gas production in southeastern Colorado. This presentation reviews the petroleum systems present in late Mississippian through early Permian strata. To date we calculate that reservoirs in Chesteran (Mississippian) thru Wolfcampian (Permian) ages have produced more than 6.3 billion barrels of oil (48% of basin total) and 147 trillion cubic feet of gas (79% of basin total). Key factors in both local and regional distribution of oil and gas in the studied intervals includes presence and thermal maturity of source rocks, migration pathways, reservoir lithologies and trapping mechanisms. The dominance of these reservoirs versus older, pre-Chesteran reservoirs in total basin gas production is explained primarily by organic composition and thermal maturity of the petroleum source rocks that generated the produced gas. Regional isopach maps of major stratigraphic intervals and distribution of production to date along with identification of source rock and migration pathways will be discussed. Possible future exploration and production opportunities and challenges will be presented.