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Assessment of Undiscovered Oil and Gas Resources of the Montana Thrust Belt Province, Northwestern Montana

The U.S. Geological Survey (USGS) recently completed an assessment of the undiscovered oil and gas resource potential of the Montana Thrust Belt Province of northwestern Montana. The total petroleum system is used as the geologic framework for the assessment. Elements of the total petroleum system include hydrocarbon source rocks (source rock maturation, hydrocarbon generation and migration), reservoir rocks (sequence stratigraphy, petrophysical properties, fracturing), seals, and traps (trap formation and timing). Using this geologic framework, the USGS defined seven total petroleum systems and nine assessment units in the Montana Thrust Belt Province, and quantitatively assessed seven assessment units. The USGS assessed conventional oil and gas and unconventional (continuous) oil resources. For the Montana Thrust Belt Province, the USGS estimated a mean of 8.6 trillion cubic feet of gas (TCFG), a mean of 109 million barrels of oil (MMBO), and a mean of 240 million barrels of natural gas liquids (MMBNGL). Of the 8.6 TCFG, about 7.7 TCFG is estimated to be non-associated gas in the Paleozoic/Mesozoic Total Petroleum System of the Thrust Belt, and about 0.6 TCFG is estimated to be non-associated gas in the Paleozoic Total Petroleum System of the Helena Salient. Of the 109 MMB of undiscovered oil, about 69 MMBO is estimated to be in non-marine reservoirs of the Tertiary Lacustrine Shale Total Petroleum System, and 28 MMBO is estimated to be an unconventional oil accumulation in the Cretaceous Marias River Shale Total Petroleum System.