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Petroleum Resource Assessment of the Central and Northern Parts of the Appalachian Basin, Eastern U.S.A.

The U.S. Geological Survey completed an assessment of the technically recoverable, undiscovered oil and gas resources within the central and northern parts of the Appalachian Basin in 2002. The assessment was based on the identification of the major Total Petroleum Systems (TPS) in the basin. The TPS approach to hydrocarbon assessments requires the identification of the major source rocks and an understanding of the following: (1) thermal maturation and expulsion of hydrocarbons from their source rocks, (2) the migration of hydrocarbons, and (3) the entrapment of hydrocarbons within their principal reservoirs. Five major petroleum systems were identified: the (1) Conasauga-Rome/Conasauga TPS; (2) Sevier-Knox/Trenton TPS; (3) Utica-Lower Paleozoic TPS; (4) Devonian Shale-Middle and Upper Paleozoic TPS; and (5) the Carboniferous Coal-bed Gas TPS. These five systems were divided into 25 assessment units that were classified either as conventional or continuous (unconventional) based generally upon the presence or absence of the gravitational separation of gas, oil, and water within structural and/or stratigraphic traps, respectively. Undiscovered oil resources in the Appalachian Basin are associated primarily with 10 conventional assessment units, whereas most of the undiscovered natural gas and natural gas liquids are associated with 15 continuous reservoirs. Conventional hydrocarbon resources, associated with TPS 1-4, were assessed at the mean as 54.3 million barrels of oil (MMBO), 4.3 trillion cubic feet of gas (TCFG), and 39.3 million barrels of natural gas liquids (MMBNGL). Continuous hydrocarbon resources associated with TPS 3-5 were assessed at the mean as 65.98 TCFG and 833.2 MMBNGL.