

Evaluation of Deep Basin-Center Gas Systems

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ABSTRACT

The U.S. Geological Survey (USGS) has prepared a priority list of potential basin-center gas accumulations that may contain significant deep, undiscovered technically-recoverable gas resources. Detailed geologic analyses are now available for accumulations in the Hanna, Albuquerque, and Crazy Mountains Basins of the Rocky Mountain region, the Columbia Basin of Washington, and the Cotton Valley Group and Travis Peak Formation of the northern Gulf Coast region at <http://geology.cr.usgs.gov/maps/bulletins.html>. Potential accumulations were prioritized using available data as to overall level of confidence of their existence, magnitude of presumed resource, 30-year impact on the Nation's gas supply, and geologic risk associated with exploitation.

Gas accumulations in the Hanna Basin, Wyoming and in the Columbia Basin, Washington are among the deepest in the U.S., and although deep drilling is sparse, data provide insights into the geologic variability of gas resources. Data from deep wells in the Hanna Basin indicate the presence of gas-charged overpressuring in the Niobrara and Frontier Formations along the southern margin of the basin. This overpressured trend may be part of a basin-center accumulation that continues downdip into the undrilled basin center. In the Columbia Basin data are sparse, but the sedimentary sequence does not appear to be extensively gas-saturated. Formation test results indicate that large volumes of water prohibited development of a typical basin-center gas accumulation. The volume of gas expelled from source rocks may have been inadequate to effectively de-water reservoirs. A Miocene-age regional hydrothermal event may have altered the plumbing of the basin and destroyed any earlier basin-center gas systems.