

## **Facts Relating to the Karst in Monroe County, WV**

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1. The karst forming unit in Monroe is the Lower Carboniferous Greenbrier Limestone which covers about 70 square Miles centered around Union, Pickaway and Sinks Grove, with smaller patches around Greenville and Wolf Creek.
2. A count of 168 large sinkholes was determined from the central zone giving a density of four per square mile.
3. No surface streams occur over much of the karst except near the margins where the flow can be shown to be underground during dryer seasons, confirming that underground flow occurs most of the time. This is true of Indian Creek and its tributaries, Laurel Creek and Hans Creek around Greenville.
4. The Greenbrier Limestone has low porosity so polluted water entering the cave system would not benefit from the natural filtration effects of the groundwater table, but would pass directly into wells and beyond into the Greenbrier and New Rivers.
5. The Greenbrier karst phenomenon is limited to Monroe, and adjacent Greenbrier Counties and to a smaller extent, Pocahontas County. (Caves are present in the folded rocks of the Valley and Ridge Province of the Appalachians but are mostly limited to the much older Cambro-Ordovician formations which are not subject to deep drilling.)
6. Surface exposures of the Greenbrier Limestone are riddled with fissures so the general picture is of an anastomising meshwork of large and small caves which continue to be discovered and mapped but have not been fully tested with die tracers to determine flow patterns.
7. The conclusion is that the Greenbrier Limestone poses a major challenge to proposed gas drilling.
8. Questions arising are:-
  - A. How could wells be adequately cased in such a formation?
  - B. How could failures of the highly pressurized "fracking" process be avoided?
  - C. How will the containment ponds be designed to avoid rupture?
  - D. How will trucking accidents be avoided on the narrow, switch-back roads typical of Monroe County?