

Is there a natural gas boom in Maryland's future?

INFORMATION CONCERNING THE MARCELLUS SHALE AND THE SEARCH FOR NATURAL GAS IN WESTERN MARYLAND

(prepared by the staff of the Maryland Geological Survey, Department of Natural Resources, 2300 Saint Paul St., Baltimore, MD 2118)

Since roughly mid-2006, Garrett and Allegany Counties have been receiving considerable interest by energy companies as a possible source of natural gas from a geologic formation known as the Marcellus Shale. The Marcellus Shale has long been known as an organic-rich shale in the Appalachians, occurring at the surface and in the subsurface from New York to eastern Tennessee. However, the Marcellus had never been a target for gas exploration because it was not economical for the companies involved.

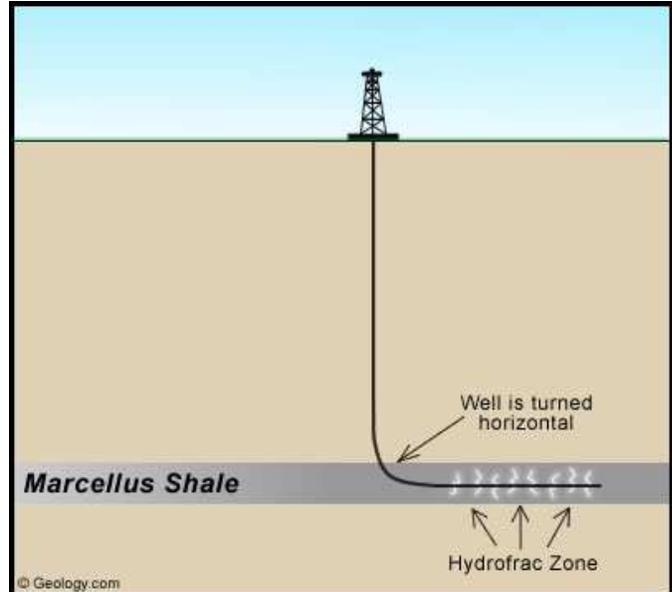
That is about to change, as drilling techniques developed in the past ten years are being used in the Marcellus in Pennsylvania (and to a lesser extent in West Virginia) and will soon be used in New York and Maryland. The techniques involve (1) hydraulic fracturing the shale by pumping water under pressure into the shale to create vertical fractures in the shale layer, while at the same time introducing sand into the rock to keep the fractures open once the water is removed; and (2) drilling horizontally through the layer of shale to intersect the vertical fractures in the rock.

Companies from as far away as Texas and Oklahoma have been reviewing existing geologic and geophysical data as a first step in developing plans for leasing the mineral rights and drilling test wells in Western Maryland.

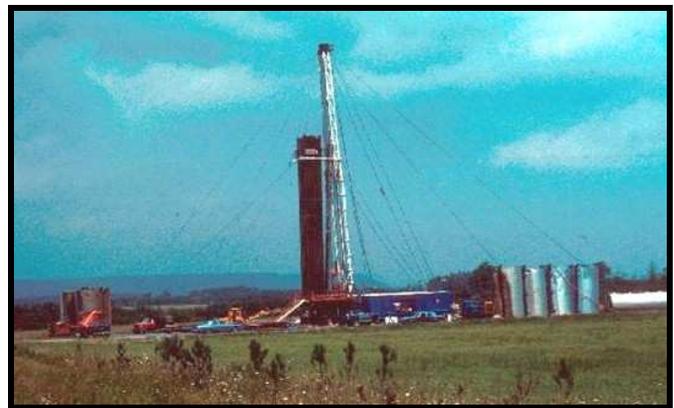
The second step soon followed, as Garrett County began seeing the arrival of "land men," an industry term for those who come to an area in advance of the actual drilling of test wells for natural gas. It is the land men who typically contact land owners (and mineral rights owners) to arrange to lease the land on which to drill.

The legalities and technicalities of selling or leasing mineral rights can seem overwhelming, especially to land owners who are inexperienced in such transactions. Two things land owners should do is to acquaint themselves with such matters by reading (see the following links, for example) and to consult an attorney familiar with the leasing of mineral resources, including natural gas.

Questions of environmental impact and land use also arise. Generally speaking, the "footprint" for a gas well is on the order of four acres and the degree of disturbance is roughly equivalent to building a house. Protection of aquifers and surface water is of the utmost importance, and falls under the regulatory and permitting authority of the Maryland Department of the Environment (MDE). "Dry holes"



Conceptual sketch to illustrate the concept of horizontal drilling and hydrofracturing. (By permission of Geology.com.)



Conventional gas well, drilling about 8,000 feet in West Virginia, near the southwestern corner of Garrett County, Md. (Photo by Maryland Geological Survey.)

are common. However, if a well turns out to be a gas producer, the drilling equipment is removed and the wellhead fitted with valves and pipes, known as a "Christmas Tree" (right).

Mineral rights, leasing, and related matters do not fall within the purview of either the Maryland Geological Survey in DNR or the Minerals, Oil & Gas Division in MDE, but both have received many inquiries from the public. Therefore, in an effort to provide answers to basic questions about such things, we are providing links to several informative websites (below). Although their focus is on Pennsylvania and West Virginia, the generalities and principles should be helpful to the average citizen and land owner in Garrett and Allegany Counties, Maryland.



Appearance of a producing gas well in Allegany County, Maryland, showing limited environmental impact (about the same as home construction). (Photo by Maryland Geological Survey)

<http://www.dcnr.state.pa.us/topogeo/pub/pageolmag/pdfs/v38n1.pdf> -- This is the Spring 2008 issue of *Pennsylvania Geology* magazine, containing a 12-page article about the Marcellus Shale.

<http://geology.com/articles/marcellus-shale.shtml> -- A good introductory overview of the gas boom in Pennsylvania.

<http://geology.com/articles/mineral-rights.shtml> -- Basic information about mineral rights, surface rights, oil and gas rights, royalties, etc.

<http://geology.com/news/2008/marcellus-shale-on-governors-list.shtml> -- Links to many good articles about Marcellus issues in Pennsylvania.

<http://geology.com/articles/marcellus-leases-royalties.shtml> -- Basic information about leases and royalties for natural gas.

<http://www.earthworksaction.org/pubs/OGAPMarcellusShaleReport-6-12-08.pdf>

<http://www.wvsoro.org/resources/marcellus/index.html> -- This website of the West Virginia Surface Owner's Rights Organization contains link to West Virginia Surface Owner's Guide to Oil & Gas and many other potentially useful materials for property owners.

<http://www.petroleumgeology.org/worldofpetroleum.cfm> -- A new website by the American Association of Petroleum Geologists summarizes many aspects of the industry. It does not directly address the Marcellus Shale, but does provide a variety of general background information.

If you have questions about the geology of the Marcellus Shale, please contact the Maryland Geological Survey, Department of Natural Resources (phone 410-554-5500). For questions dealing with drilling permits and regulations, please contact the Minerals, Oil & Gas Division, Maryland Department of the Environment (phone 410-537-3557).