

**The League of Women Voters of Pennsylvania**



**Marcellus Shale Natural Gas Extraction Study  
2009-2010**

## **Study Guide V**

# **Regulation and Permitting of Marcellus Shale Drilling**

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## OVERVIEW

Regulation of Marcellus Shale drilling operations is complex. It involves authorities at federal, state, and municipal levels. The regulatory enigma is perhaps best summed up by Dr. Roxana Witter of the Colorado School of Public Health, Denver, Colorado:

Natural gas is such a unique industry in that there are tens of thousands of point sources, hundreds of thousands across the country. They are essentially hundreds of thousands of factories. The industry is completely different in terms of monitoring or regulating it because it is not like a single, stationary factory or refinery. I don't think public-health researchers or the regulatory agencies have gotten their hands around that problem. (Vaughn, 2009, October 4)

Because of the rapid push to develop natural gas from Marcellus Shale, various authorities and agencies have been forced to balance significant, long-term concerns with industry demands for expedient reviews and acceptance of drilling permits. Economic concerns, coupled with imperatives to reduce carbon dioxide and promote energy independence, accelerate the timelines required to achieve the essential goals of clear parameters and failsafe enforcement.

In Pennsylvania, the main regulatory entities include, but are not necessarily limited to:

### **Federal:**

- U.S. Environmental Protection Agency (EPA)
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- U.S. Department of Interior - Bureau of Land Management
- Occupational and Safety Health Administration (OSHA)

### **State:**

- PA Department of Environmental Protection (DEP) - Bureau of Oil and Gas Management,
  - Bureau of Air Quality
- PA Department of Conservation and Natural Resources (DCNR)
- PA Fish and Boat Commission
- PA Emergency Management Agency (PEMA)
- PA Department of Labor and Industry
- PA Department of Transportation (PennDOT)

### **Municipal/Regional:**

- Susquehanna River Basin Commission (SRBC)
- Delaware River Basin Commission (DRBC)
- PA Municipalities
- PA County Courts
- PA County Conservation Districts (Note: DEP withdrew the involvement of Conservation Districts in the permitting and review process as of April 2009.)

The above agencies uphold numerous laws and regulations pertinent to Marcellus Shale gas operations including the following:

### **Federal**

Clean Water Act (CWA) - regulates surface water quality, pollutant discharges, and storm water runoff; implements National Pollutant Discharge Elimination System (NPDES) permitting

Safe Drinking Water Act (SDWA) - regulates supply of public drinking water (but does not regulate private wells serving under 25 people); authorizes EPA to determine national standards for maximum allowed contaminant levels; regulates Underground Injection Control (UIC) program to protect ground water from injected contaminants; grants states authority (“primacy”) to implement the SDWA within their boundaries; provides funding for water system improvements

Energy Policy Act of 2005 - includes two exemptions relevant to shale gas drilling: (1) amended the SDWA by clearly excluding hydraulic fracturing from the definition of “underground injection” and (2) amended the CWA to effectively exempt “uncontaminated storm water discharges from oil and gas field activities” from federal NPDES permits (*U.S. Storm water rules*, 2006, January 4)

Clean Air Act - authorizes EPA to set limits on particular air pollutants; authorizes EPA to limit air pollutant emissions from point sources

Endangered Species Act - supports the conservation of threatened and/or endangered plants, animals, and their respective habitats

Resource Conservation and Recovery Act (RCRA) - authorizes EPA to manage the generation, transportation, treatment, storage, and disposal of hazardous waste (Certain oil and gas exploration and production wastes are exempt from Subtitle C of RCRA, but may be covered under Subtitle D or regulations other than RCRA.) (*Ground Water Protection . . .*, 2009, April, p. 38)

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as Superfund) - taxes chemical and petroleum industries; authorizes direct federal response in the event of releases or threatened releases of hazardous substances that may pose a danger to public health or the environment

Emergency Planning and Community Right to Know Act (EPCRA) - protects public health, safety, and the environment from chemical hazards through requirements for planning and reporting

Occupational Safety and Health Act - requires employers to maintain a safe and healthy work environment; administered by the Occupational Safety and Health Administration (OSHA)

*Note:* Some federal laws (including the SDWA, RCRA, and CERCLA) contain exemptions relevant to Marcellus Shale operations. These are usually very specific in nature and do not

necessarily exempt the industry from complying with other sections of the same law or act, nor do they preclude the states' rights to regulate the same.

## **Pennsylvania**

Oil and Gas Act - regulates oil and gas exploration and production, including permitting, drilling, operating, casing, plugging, reporting, financial responsibility, registration, restoration, and gas storage

Oil and Gas Conservation Law – includes special regulations for “conservation wells” that are wells at least 3,800 feet deep and penetrate the Onondaga formation

Coal and Gas Resource Coordination Act - sets forth means of coordinating activities of coalmine and non-conservation gas well operators

Clean Streams Law - authorizes DEP to control water pollution, especially through regulation of discharges to state waters; provides for DEP's implementation of the federal NPDES program in the state; sets forth enforcement policies and penalties for violations

Solid Waste Management Act - authorizes DEP to regulate solid wastes, including municipal, residual (non-hazardous industrial), and hazardous wastes

Dam Safety and Encroachment Act - regulates activities in, along, or across bodies of water

Safe Drinking Water Act - authorizes DEP to enact the federal SDWA within Pennsylvania; authorizes DEP to set maximum allowable levels for contaminants which the EPA has not yet addressed; does not give the state authority to regulate underground injection wells as PA has opted for a direct federally implemented program (Pennsylvania Department of Environmental Protection, n.d., Ch. 2, p. 12)

Water Resources Planning Act – establishes a state water plan that periodically compiles data on how much water is available, how much is currently being used, how much will be used in the future, and where water use will exceed the available water supply (Swistock, B. & Blanchet, H., n.d.)

Worker and Community Right to Know Act - mandates that employers and chemical suppliers provide identification and hazard data for substances used in any workplace

Vehicle Code - sets forth weight restrictions on vehicles and roadways, as well as posting and bonding requirements

Municipalities Planning Code - addresses zoning, subdivision, and land development at the local level

## **The Role of the Pennsylvania Department of Environmental Protection**

The bulk of Marcellus Shale gas regulatory authority in Pennsylvania falls on the State's Department of Environmental Protection and its Bureau of Oil and Gas Management. DEP's website describes this bureau as:

. . . responsible for the statewide oil and gas conservation and environmental programs to facilitate the safe exploration, development, and recovery of Pennsylvania's oil and gas reservoirs in a manner that will protect the Commonwealth's natural resources and the environment. The bureau develops policy . . . and programs for the regulation of oil and gas development and production, . . . oversees the oil and gas permitting and inspection programs; develops statewide regulation and standards; conducts training programs for industry; and works with the Interstate Oil & Gas Compact Commission and the Technical Advisory Board. (Pennsylvania Department of Environmental Protection, 2009, October 23)

In this capacity, DEP reviews and approves bond and well permits; inspects drilling operations, wells, and environmental controls; permits and inspects waste management; enforces state laws pertaining to resource management, well construction, and waste management; responds to complaints concerning water quality issues; and provides industry-relevant training programs.

To better guide operators in the state's requirements, DEP has created the *Oil and Gas Operators Manual*. This handbook summarizes statutes, regulations, DEP assistance, and procedures relevant to oil and gas operations. It contains information on permitting, drilling, best management practices (BMPs) for erosion and sediment control, environmental controls, waste management practices, plugging of wells, and associated activities. Copies of laws and regulations, forms, bonding guidelines, and information on oil and gas wastewater permitting are included as appendices (Pennsylvania Department of Environmental Protection, n.d.).

In its enforcement capacity, DEP has several tools at its disposal. For example, recently DEP has taken the following actions: issued a cease and desist order to U.S. Energy Development Corporation for numerous repeat violations; fined Gas Field Specialist Inc. for residual wastewater violations; and imposed a temporary stop order on all hydraulic fracturing operations by Cabot Oil and Gas in Susquehanna County after three spills occurred within one week. In each of these instances, accountability was clear-cut. However, this is not always the case. Whether from negligence or accident, violations will occur and, most likely, increase with the expansion of natural gas production. As in the case of Pennsylvania's coal legacy, circumstances can become aggravated over time or responsibility cannot easily be determined. Companies come and go, landowners sell their property, corporate officers transfer, and bankruptcies occur. These events make DEP's enforcement role most challenging.

## **PERMITS AND APPROVALS**

Before drilling a Marcellus Shale well, an operator must obtain several permits and approvals. As of October 2009, these include:

Well Drilling Application

Water Management Plan (This supersedes former Application Addendum)

Erosion, Sediment and Storm Water Control Plan or Permit

(A plan is allowable when earth disturbance occurs on fewer than five acres;  
permit is required if earth disturbance occurs on five or more acres.)

Preparedness, Prevention and Contingency Plan

Water Withdrawal Permits

Obstruction and Encroachment Permit

Water Quality Management Permit (This is for pit impoundments of a treatment facility.)

Air Quality Permits (Depending on scope of project, separate permits may be needed for generators, compressors, gas flaring, and diesel trucks.)

In addition, a well site bond must be posted before any drilling activity occurs. This is one way “to ensure that the operator will adequately perform the drilling operations, address any water supply problems the drilling activity may cause, reclaim the well site, and properly plug the well upon abandonment” (Pennsylvania Department of Environmental Protection, 2009, October). To comply with state Vehicle Code regulations a roadway bond is usually required as well.

As interest in Marcellus Shale gas exploration and drilling has steadily climbed, so too has the DEP’s related workload. Through August 2009, the number of Marcellus Shale drilling permits granted by the DEP showed a 45 percent gain over the total number of similar permits issued for the entire 2008 year (Stouffer, 2009, September 1). A new fee structure took effect in April 2009. It raises the initial permit cost for a Marcellus Shale well from a flat \$100 to \$900. There is also a sliding scale surcharge based on well bore type and length. The higher fees help provide funding not only for the increased volume of permit reviews and site inspections but also for the addition of more than 30 new staff members to perform related duties.

Although the DEP handles most shale gas regulatory issues, two federal-interstate compact government agencies also have jurisdiction: The Susquehanna River Basin Commission (SRBC) and the Delaware River Basin Commission (DRBC) have legal authority over water quality and quantity regulation in their respective areas. Because of the large amount of water required for hydraulic fracturing and the equally high volume of industrial-classified wastewater resulting from drilling activities, these commissions are very concerned about natural gas extraction operations. As a result, to drill within SRBC or DRBC areas, operators must apply for and obtain additional approvals from these respective commissions and submit them to the DEP.

The Water Management Plan (listed above) is another important component of the permitting process. Developed through the cooperative efforts of the DEP, SRBC, and DRBC, this plan helps address the high volume of water necessary for drilling, particularly in areas that are not covered by the SRBC and DRBC, i.e., in the Ohio, Potomac, Erie, and Genesee Basins. It contains a set of statewide permitting rules for water withdrawal, usage, treatment, and disposal. Additionally, it requires operators to provide a description of anticipated impacts of drilling and water withdrawals on water resources.

### **The Role of Municipalities**

Municipal regulation of shale gas drilling is extremely limited due to preemption by the Pennsylvania Oil and Gas Act. Aside from road bonding and maintenance agreements, local officials have very little control over the location of wells, on-site safety, water supply protection, permit notification, and well-site bonding. While zoning, subdivision, and/or land development ordinances may be used “to guide growth and development that results from the gas boom and to protect community assets” (Pennsylvania Department of Conservation and Economic Development, n.d.), they cannot be used to regulate gas operations already covered by the Oil and Gas Act. Attempts to clarify their authority, or lack thereof, have left municipalities without recourse except through court action.

For example, local officials have gone to court to reconcile their legislative powers as set forth in the state’s Municipal Planning Code with the largely preemptive state Oil and Gas Act.

In February 2009, the Pennsylvania Supreme Court handed down decisions in two pivotal cases, *Huntley & Huntley v. Borough Council of the Borough of Oakmont* and *Range Resources-Appalachia, LLC v. Salem Township*. Although far from identical, both rulings validate some degree of municipal authority through traditional zoning ordinances that designate particular land uses. Not surprisingly, the rulings also leave room for interpretation. But, Holly M. Fishel of the Pennsylvania State Association of Township Supervisors (PSATS) pointed out, “These are important rulings for local government because oil and gas well drilling is now treated like every other use and subject to reasonable land use regulations” (2009, August 19). Elam Herr, a director of the same association further said, “We are not asking to regulate drilling, which would duplicate state regulations, but to have oversight of well locations, like other uses” (Hawbaker, 2009, January).

The PSATS has identified several other salient issues. These include: road damage caused by extensive heavy truck use and 30-year-old road bonding limits far below current repair costs; the lack of notification requirements to the appropriate municipalities and counties once DEP has granted a permit; possible contamination of private water wells; insufficient number of treatment facilities for wastewater; limited resources and expertise available to local and volunteer fire departments for handling well fires; and the current exclusion of oil and gas reserves from property tax assessment (coal and other minerals are allowed to be assessed with a property tax).

### **The Role of Conservation Districts**

Pennsylvania’s County Conservation Districts, dedicated to conserving the state’s natural resources, are involved at the regional level. These districts are designated “to work in close cooperation with landowners and occupiers, agencies of Federal and State Government, other local and county government units and other entities . . .” Conservation District Law, n.d., Section 2, “Declaration of Policy”). Until April 2009, these well-informed agencies served an important role as part of the review and permitting process with oversight over erosion, sedimentation, and storm water control. As of that date, with virtually no advanced notice, DEP rescinded the involvement of conservation districts by creating a more “efficient” centralized system. Now all reviews are performed by one of DEP’s own regional offices. Some question these revised procedures and believe that each conservation district had the local expertise needed for protecting public health and the environment. Others wonder if DEP’s staff understands the limitation of the local areas and if recent staff increases are sufficient to manage the ever-increasing workload.

## **ISSUES AND CONCERNS**

### **Federal Water Issues**

Federal regulations address pertinent water issues involved in natural gas extraction from Marcellus Shale. Currently, Congress is considering two bills that address hydraulic fracturing. One is in the Senate (S. 1215) and the other is in the House (H.R. 2766). This Fracturing Responsibility and Awareness of Chemicals (FRAC) Act seeks, among other things, to require drilling companies to fully disclose all chemicals used in their hydraulic fracturing operations and places hydraulic fracturing under the jurisdiction of the federal government. It would remove an exemption from the federal Safe Drinking Water Act (SDWA) for hydraulic fracturing which was inserted in the Energy Policy Act of 2005. Currently, “the EPA does not

have authority to investigate the fracturing process under the Safe Drinking Water Act” (Lustgarten, 2009, August 25). Opponents of the FRAC Act maintain that the states already adequately regulate hydraulic fracturing. Proponents argue that federal oversight is imperative to protecting the nation’s water supply, especially as it will facilitate broad EPA impact studies. On October 29, 2009, the House approved an appropriations bill that provides for a new EPA study on hydraulic fracturing and its impacts on drinking water supplies. The bill is pending Senate approval and signature by President Obama.

### **State Water Issues**

Compared to some states, Pennsylvania has relatively comprehensive hydraulic fracturing regulations (Wiseman, 2009, Spring) that require full chemical disclosure. A summary of Marcellus Shale fracturing solutions is available at the DEP’s website. The specific quantities used in any given solution, however, are still considered proprietary information. Despite the state regulations already in place, there is “one critical yet overlooked aspect in Pennsylvania, the lack of a requirement to monitor groundwater quality in a drilling zone” (McConnell, 2009, June 10). Testing for water quality before, during, and after drilling is voluntary. Although the state’s Clean Streams Law would cover groundwater if pollution did occur, “this state law . . . does not require proactive water quality testing, including aquifers, making pollution detection difficult” (McConnell, 2009, June 10). Compounding the issue is the fact that groundwater contamination by hydraulic fracturing has not been definitively confirmed nor disproved (Gjelten, 2009, September 23).

Another area of growing concern is the elevated level of total dissolved solids (TDS) polluting Pennsylvania’s waterways. Sources of TDS range from storm water runoff to sewage and industrial discharges, including gas well drilling. Pennsylvania’s water systems are even less able to handle TDS due to the chronic discharges from abandoned coal mines. Starting in the fall of 2008, samples taken at the Monongahela River exceeded water quality limits for TDS. Although remedial steps have been taken, the problem persists.

In April 2009, the DEP proposed new limits for high TDS wastewater discharges to be in place by January 2011. Until that date, the DEP plans to follow an interim Permitting Strategy that “will focus on those new sources that have the greatest potential to adversely affect the quality of Pennsylvania’s receiving streams. Currently, those sources are wastewaters generated from fracturing and production of oil and gas wells in the Marcellus Shale formation” (Pennsylvania Department of Environmental Protection, 2009, April 11, p.4). This plan addresses the important issue of cumulative effects:

. . . a strategy for permitting these discharges also must involve an allocation strategy to address those situations in which multiple discharges cause or contribute to downstream water quality standards violations, even if only predicted through modeling. An allocation strategy is the plan to allocate the assimilative capacity of the watershed (the acceptable loading in lbs/d of TDS and/or chlorides) among multiple sources. (Pennsylvania Department of Environmental Protection, 2009, April 11, p. 4)

If implemented, this provision would be a significant, new direction for state regulations. As Jan Jarrett, president and CEO of PennFuture testified, “Neither the Oil and Gas Act nor the Oil and Gas regulations in Chapter 78 require, or even contemplate, that DEP will assess the probable

cumulative impacts of gas drilling on the natural resources . . .” (2009, March 31, p. 12). This DEP proposal for new limits on high TDS wastewater discharges is being studied and evaluated by the Chapter 95 Task Force. This special group, composed of representatives of industry, environmental, and state agencies, was formed under the guidance of the Water Resources Advisory Committee (one of several DEP advisory groups). Another joint effort is embodied in the Marcellus Shale Wastewater Partnership, a collaborative venture between the DEP and natural gas industry. However, unlike the Chapter 95 Task Force, no members from the environmental sector are involved in this partnership that primarily focuses on wastewater and new technologies designed for its treatment. With regard to erosion, sediment control and storm water management, the DEP has submitted relevant proposed changes. According to Acting Secretary of the DEP John Hanger, “We are shifting the focus of water quality protection from reviewing paperwork to holding permittees more accountable, conducting more on-the-ground inspections to verify that best management practices are being implemented and maintained, and increasing protections for our waterways” (Pennsylvania Department of Environmental Protection, 2009, August 31). One aspect of the proposal is a permit-by-rule option aimed at shortening the permit processing time for “eligible low-risk construction projects” (Pennsylvania Department of Environmental Protection, 2009, August 31). The 90-day public comment period on this particular proposal is scheduled to close November 30, 2009.

### **Air Quality Issues**

Wells drilled after 1980 have been exempted from the National Emission Standards for Hazardous Air Pollutants (NESHAP), which falls under the Clean Air Act. NESHAP regulates small sources of toxic air pollution grouped in close proximity. With this exemption, natural gas and oil drill sites are not treated as an aggregated unit if they are located outside of areas with a population of one million or more (Horwitt, 2009, March; Mall, Buccino, & Nichols, 2007, October; Legal Information Institute, n.d.). Since most Marcellus Shale natural gas wells will not occur in urban areas of this population density, air quality permits will be granted per “point source,” e.g., a compressor engine, a dehydrator. Each of these point sources, basically pieces of mechanical equipment, typically meets the DEP administrative and technology standards. Permits are thus granted routinely within 30 days (Barbara Hatch, personal communication, August 5, 2009). However, with multiple Marcellus wells likely being drilled in a restricted geographic area, the aggregate pollution of the many small sources of air pollution could become problematic. This has been the experience in Colorado (Earthworks, 2006). To underscore the importance of this issue, the National Park Service has warned its employees of this potential source of air pollution in the Eastern United States (National Park Service, 2008).

To determine the nature and extent of air pollution, air quality monitors are needed. Providing air quality monitors involves both the Federal EPA and the Commonwealth DEP. EPA sets the criteria for air quality monitor placement and the Commonwealth has the ability to place additional monitors in specific places. Currently, many of the counties in which natural gas is being extracted from Marcellus Shale have few, if any, such monitoring devices. As a result, there is no data regarding the nature of air quality prior to drilling, during drilling, and/or during production.

### **Streamlining the Process**

Numerous application forms, coupled with long lead times, have become costly and frustrating to both companies and authorities alike leading to pressure to streamline the process. But

streamlining only makes sense if it can be done without sacrificing regulatory integrity. A case in point occurred in August and September 2009 when the Chesapeake Bay Foundation filed appeals with the PA Environmental Hearing Board. The charges assert that the DEP granted drilling permits (for Fortuna Energy Inc. and Ultra Resources, Inc.) without adequately evaluating erosion and sediment control ramifications. The Foundation specifically cited an expedited permitting option implemented by the DEP in April 2009. Matt Royer, an attorney for the Chesapeake Bay Foundation, pointed out that this procedure does not require the DEP to do a technical review concerning “the environmental impacts on wetlands or streams . . . which is illegal under state and federal clean streams law” (Hopey, 2009, September 10). In response to the Chesapeake Bay Foundation's action, the DEP re-evaluated the questionable permits. Its investigation found enough deficiencies to warrant revocation of the permits. As a result of this action by a “watchdog” group, DEP also issued violation notices to several licensed professionals responsible for upholding regulations.

Within its jurisdiction, the SRBC has also addressed the need for expediency. One of its main objectives has been "to streamline the approval process for consumptive use, yet simultaneously require all consumptive water users in the basin to comply with monitoring, reporting, and mitigation requirements. This allows the SRBC to better manage the cumulative impact of such consumptive use" (Susquehanna River Basin Commission, 2009, January, p. 3).

## **CLOSING**

Owing in part to its multi-tiered framework, Marcellus Shale gas drilling regulation is inherently problematic. On an extremely simplified level, much of the confusion and debate revolves around at least one of the following:

- the scope and content of the regulations themselves;
- the process creating the regulations;
- the enforcement of the regulations; and
- accountability for violations.

In addition to vigilant oversight and related enforcement, the nature of regulation and monitoring of natural gas extraction from Marcellus Shale will determine its legacy. It is imperative that all agencies – municipal, regional, state, and federal – work together to preserve the public good and provide clear guidance to the natural gas industry.

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*The web addresses for the references below have all been checked by the committee. However, we recognize that some of the documents may not be maintained at the addresses given. If the links do not work for you, we recommend entering the title of document into your web browser.*

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