

Environmental Regulation of Marcellus Drilling

Operators must comply with a variety of regulatory programs.

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The Marcellus Shale gas play spans seven states in the northeastern US, including primarily the states of New York, Pennsylvania, West Virginia, and Ohio and, to a much lesser extent, Maryland, Virginia, and Kentucky. This formation contains abundant volumes of natural gas trapped in the pore spaces of tightly packed, low permeable shale. Pro-

duction of gas from the Marcellus requires the hydraulic fracturing of the shale formation, a process that involves the use of vast quantities of water orders of magnitude greater than might be used in the development of conventional natural gas wells.

Any consideration of natural gas development in the Marcellus Shale requires evaluation of the envi-



ronmental regulatory and permitting schemes governing these development activities. Governmental authorities administer a variety of regulatory programs applicable to drilling and production activities in the Marcellus Shale, and operators must comply with these program requirements, including obtaining environmental permits or other authorizations and complying with their terms.

In evaluating environmental regulatory and permitting programs, a natural gas operator should understand that governmental authorities with jurisdiction over environmental protection may exist at the federal, state, or local levels. Sometimes federal and state governmental authorities may have oversight of a regulated component of environmental protection – such as the emission of air pollutants or discharge of water pollutants – yet the federal authority may delegate responsibility for implementing the program to the state authority.

As a practical matter, however, the drilling and production of oil and natural gas is predominantly a state-regulated activity. This holds true in the Marcellus Shale, where state governments are the primary governmental authority with oversight of natural gas drilling and production activities.

Protecting potable groundwater

There are several critical issues that, in large measure, provide impetus for these regulatory and permitting programs. The first issue is the concern that the drilling or completion process, including hydraulic fracturing, could result in the seepage of downhole chemicals into potable groundwater aquifers, thereby affecting groundwater wells and drinking water supplies.

States have implemented casing and cementing standards for natural gas wells that are designed to protect potable groundwater sources. Compliance with these regulatory standards will typically be an enforceable condition of an operator's drilling permit.

At the federal level, House Democrats have reintroduced a bill (H.R. 1084) that would make hydraulic fracturing subject to regulation under the federal Safe Drinking Water Act (SDWA). Although unlikely to pass the House of Representatives this term, the bill could subject hydraulic fracturing operations to new permitting and

financial assurance requirements; construction specifications; and monitoring, reporting, and recordkeeping obligations imposed under the SDWA. Such legislation also could require the reporting and public disclosure of chemicals used in the fracturing process, which could make it easier for third-party groups opposing the hydraulic fracturing process to initiate legal proceedings based on allegations that specific chemicals used in the fracturing process could adversely affect groundwater.

Acquiring drilling/well work permit

Pennsylvania, West Virginia, and Ohio require the operator of an oil or gas well to obtain a drilling permit before commencing drilling operations. The requirements for each state are similar but not identical. Under the currently applicable regulatory regime, permits generally can be obtained more quickly and easily in West Virginia and Ohio than in Pennsylvania. In all three states, a natural gas well operator must obtain a drilling or well permit from the state and post a bond before commencing a new well. In the permit application, the operator must specify, among other things, the location of the well, the depth of the well, and how the operator will manage waste from the operation.

The SRBC was created in 1970 by the Susquehanna River Basin Compact, an agreement negotiated among the states of Pennsylvania, New York, and Maryland and approved by the United States Congress and the legislatures of all three member states.

Securing sources of water

The massive amount of water that must be withdrawn and stored for use in hydraulic fracturing operations is another issue. Various state environmental agencies and regional river authorities regulate the rate and volume of water withdrawals within their respective jurisdictions. These regional water authorities, including the Susquehanna River Basin Commission (SRBC) and the Delaware River Basin Commission (DRBC), must review and approve applications for withdrawal and use of water for hydraulic fracturing projects from water sources subject to their jurisdiction. State agencies

may also regulate the construction of pits or impoundments within which the withdrawn water is stored. These approvals can take time to obtain, and failure to adequately plan for securing such approvals may result in operational delays or downsizing of projects.

Because hydraulic fracturing of gas wells in the Marcellus Shale requires a substantial amount of water, operators must ensure that they arrange for adequate supplies of water and means to transport water to the well site. Potential sources of water include surface water bodies – such as rivers, streams, and lakes – groundwater, and public or private water providers such as municipal water systems or authorized private users with excess capacity.

In states where the Marcellus Shale is located, authorization to withdraw groundwater from land overlying the mineral lease typically must be obtained from the surface owner. Similarly, the right to use water from surface water bodies within or bordering the land overlying an oil and gas estate usually belongs to the surface owner and must be authorized in writing. Accordingly, the governing oil and gas lease likely addresses the operator's right to use surface and groundwater on the leased premises. An operator also may be able to contract for the right to take ground or surface water from another nearby property owner.

An operator who withdraws water from a surface or groundwater source may face liability to other surface or groundwater users if the operator's withdrawal of water reduces or affects other users' access to the water resource. Liability for reducing or affecting other water users' ability to access water supplies varies from state to state. In Ohio and West Virginia, such liability is largely governed by common law. In Pennsylvania and New York, such liability is governed by a combination of common law and statute and may depend on whether the water source falls under the jurisdiction of the SRBC or the DRBC.

Operators are more likely to avoid liability to other water users by purchasing water from a public or private water provider rather than withdrawing surface or groundwater from the leased premises. Costs for transporting water from such sources to the well site, however, may make this option less attractive.

Obtaining the contractual right to withdraw water

and arranging for a means to transport the water to the well site are not the only prerequisites the operator faces. In order to legally withdraw water from any source for hydraulic fracturing purposes, the operator likely will need to obtain the approval of governmental agencies with jurisdiction over the water source.

Acquiring approval to withdraw water

Operators of Marcellus natural gas wells in Pennsylvania and West Virginia must, in most cases, obtain the approval of one or more government agencies before withdrawing water from any source for use in hydraulic fracturing operations. The trigger points and specific requirements for authorization vary from state to state. In Ohio, either prior approval or simple registration may be required, depending on the quantity of water to be withdrawn and the area of the state where the withdrawal will occur. As with obtaining a drilling permit, because of the current respective permitting schemes the procedure generally is faster and simpler in West Virginia and Ohio than in Pennsylvania.

The SRBC has jurisdiction over the area drained by the Susquehanna River and its tributaries, which includes parts of Pennsylvania, New York, and Maryland. The SRBC has the responsibility, among many others, to allocate, manage, and protect water resources in the Susquehanna River Basin.

The SRBC requires operators to obtain approval before withdrawing or using any amount of water to develop Marcellus wells in the Susquehanna River Basin. The SRBC has two mechanisms for approving water withdrawals and uses. It offers an expedited "approval by rule" process for water purchased from a source that has already received withdrawal authorization from the SRBC. Examples include public water systems and other private users who already have SRBC approval but are not utilizing their maximum authorized withdrawal amounts. SRBC personnel have reported that requests for approval by rule usually are processed and authorized by the SRBC within 30 to 40 days.

The DRBC – created in 1961 when the legislatures of Pennsylvania, New York, New Jersey, and Delaware and the US Congress passed concurrent compact legislation – has jurisdiction over the area drained by the Delaware River and its tributaries, which includes

parts of Pennsylvania, New York, New Jersey, and Delaware. Like the SRBC, the DRBC has the responsibility to allocate water among various users.

The DRBC requires anyone to obtain prior approval before withdrawing groundwater or surface water in amounts equal to or exceeding 100,000 gallons per day, averaged over a 30-day period, from any location in the Delaware River Basin; or groundwater in amounts exceeding 10,000 gallons per day, averaged over a 30-day period, from wells within the Southeastern Pennsylvania Ground Water Protected Area.

Since May 2009, the DRBC has maintained a de facto moratorium on drilling for natural gas in the Delaware River Basin. Although the moratorium is still in place, the DRBC released proposed regulations in December 2010 that would allow for drilling in the basin. The proposed regulations require, among other things, commission approval for withdrawing water from the watershed. A streamlined approval process is available for certain projects, however. In reaction to these proposed regulations, in April 2011 New York Attorney General Eric Schneiderman threatened to sue the DRBC under the National Environmental Policy Act (NEPA), which requires federal agencies to extensively review any action that may result in a significant impact on the environment.

If successful, the suit would force the DRBC to undertake a review of the safety and public health risks of natural gas development in the Delaware River Basin. Such a review could potentially delay drilling in the basin for years.

Identifying and obtaining approval/ methods for flow-back water disposal

Another issue of critical importance concerns the disposal of hydraulic fracturing water returned to the surface after drilling (flow-back water). Such flow-back water could potentially contain metals and other contaminants picked up during the hydraulic fracturing process. Operators must construct or obtain adequate facilities to store flow-back water. States may require permits and likely will have construction standards for impoundments and pits designed to store flow-back water.

Furthermore, care must be taken in securing appropriate discharge outlets, which typically require state

permits and adequate disposal facilities that can accept and dispose of the flow-back water generated by fracturing activities. Municipal wastewater treatment facilities may not be able to properly treat the flow-back water due to concentrations of inorganic pollutants contained in the water, and the regional geology of the area where drilling is planned may preclude operators from injecting the flow-back water into deep disposal wells. There are various water purification companies that can treat flow-back water so that it can be reused instead of being discharged, but these treatment services can increase the cost of fracturing.

Operators planning to engage in hydraulic fracturing must develop a plan for handling flow-back water and obtain the requisite approvals or permits from applicable government agencies. Available options for disposing of flow-back water may include land application, injection into an authorized deep-injection well, treatment and disposal at an authorized publicly owned treatment works (POTW), treatment and disposal at a facility with a valid national pollution discharge elimination point source permit (NPDES) or equivalent state permit, or reuse. Disposal of flow-back water into municipal wastewater treatment plants may result in those plants discharging effluent with elevated levels of metals, chlorides, or dissolved solids. Therefore, any flow-back water offered by operators to treatment plant operators for discharge will be subject to strict scrutiny to assure compliance with the treatment plant effluent limitations.

Flow-back water also may require on-site treatment before it can be



reused to prevent well corrosion. Several companies have developed technology for treating flow-back water at the well site to make it suitable for reuse.

In Pennsylvania, however, Governor Tom Corbett called on all Marcellus Shale natural gas drilling operators to cease delivering wastewater from shale gas extraction to POTWs by May 19, 2011.

Most natural gas operators do not attempt to construct and permit their own deep-injection well or treatment facility at the well site, although these options are theoretically possible. Instead, most operators arrange for their flow-back water to be transported to an existing permitted treatment or injection well facility and pay the operator of the facility to lawfully dispose of the flow-back water. Regardless of which option for disposal an operator chooses, approval from a regulatory agency will likely be required.

construct a new pipeline, the pipeline operator must first obtain an easement or right-of-way from every landowner whose land the new pipeline will cross. In most oil and gas leases, the lessor consents to the construction of necessary gathering systems through his property. Obtaining the consent of land owners who are not party to the pertinent oil and gas lease is more challenging. Contracting for the necessary easements from such non-party landowners may be slow and expensive. Eminent domain – the authority of the government to take private property at a fair price for public use – will most likely not be available to aid in acquiring easements for construction of a private gathering system. Eminent domain condemnation authority is typically limited to open access “common carrier” pipelines that agree to provide general gas transportation services to multiple customers.

A deep-injection well must be permitted pursuant to the federal Underground Injection Control (UIC) program or approved state equivalent program. Pennsylvania and New York do not have approved UIC permitting programs, so permits for injection wells in Pennsylvania and New York must be obtained from the US Environmental Protection Agency (EPA). West Virginia and Ohio, on the other hand, have federally approved UIC permitting programs. Permits for injection wells in West Virginia can be obtained from WVDEP, and injection well permits in Ohio can be obtained from ODNR.

A treatment facility that discharges treated water to a surface water body or wetland must obtain a federal NPDES permit or state equivalent. Pennsylvania, West Virginia, Ohio, and New York have federally approved NPDES permitting programs, so a party seeking to discharge treated flow-back water to a surface water body or wetland could obtain the required discharge permit from PDEP, WVDEP, the Ohio EPA, or the New York Department of Environmental Conservation, as applicable. Approval from the SRBC or the DRBC may also be required if the discharge would be to an injection well or body of water located within the jurisdiction of either of those agencies.

Delivering produced gas to market

Before an operator can begin producing gas from a natural gas well, the operator must arrange for a means to transport the gas from the wellhead to market. Accordingly, the operator must ensure that a gathering pipeline system is or will be in place in the vicinity of its well site, arrange to connect the well to the pipeline system, and enter a transportation agreement with the pipeline operator.

Clearly, new natural gas pipelines must be constructed to connect new wells in the Marcellus Shale to existing natural gas infrastructure. In order to

In addition to contracting for necessary easements from landowners, other environmental and land use restrictions may slow or preclude pipeline construction along certain routes.

For example, constructing a pipeline through a protected wilderness area may not be allowed. Additionally, if the proposed pipeline crosses a wetland or can potentially impact the habitat of any designated endangered species, additional state or federal government approvals or permits may be required. Furthermore, the government agency granting such authorizations or approvals may be required to pre-

pare an environmental impact statement before granting the necessary authorization. The need for such authorizations could delay construction for several months.

Potential liability

Failure to comply with the applicable regulatory and permitting programs may result in the assessment of administrative, civil, and criminal penalties, as well as the imposition of remedial obligations or compensatory damages for adverse impacts to property and natural resources. Any failure to comply with applicable laws or regulations, or a failure to obtain a permit in a timely manner (or even failure to provide required notices to property owners or other interested parties), could result in the issuance of orders enjoining operators from performing some or all of their operations until such time as compliance with applicable legal requirements is achieved.

Operators also must be cognizant of the potential for litigation resulting from operating natural

gas wells in the Marcellus Shale. Recently, several toxic tort suits have been filed in Pennsylvania as a result of hydraulic fracturing practices. An operator may be exposed to liability under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in the event that soil is contaminated by hazardous substances that may be used in hydraulic fracturing. ■

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