



**A Citizen's Guide To
Legal Issues of Marcellus Shale Gas Drilling**

**Prepared by
The Widener School of Law's
Environmental & Natural Resources Law Clinic**

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INTRODUCTION

Thank you for your interest in our updated Citizens Guide. The Clinic receives many inquiries about issues arising out of Marcellus Shale gas drilling, and so the purpose of this Guide is to provide you with some basic information concerning such drilling to help you understand and put in context the complex legal issues that often arise. That complexity increased when Pennsylvania passed Act 13, which significantly changed the central laws governing drilling activity.

The Guide is *informational* in nature—that is, it does not provide strategy about particular legal issues as much as give you some sense of what the issues can be so that you can work with your attorney to formulate a strategy. The Guide is *general* in its scope – it covers many but not all legal issues, and does so in a way that does not and cannot be definitive for a particular situation. Our hope instead is that you will know the basics so that you can understand this complex subject better and start to see the questions you can ask your lawyer.

There are many people and organizations that assisted in the preparation of this Citizens Guide. First and foremost are Widener Law students who poured so much into the research and writing of this Guide, especially Brian Calabrese, Matthew McDonnell, Jon Johnson Jonathon Spadea, and Sarah Stoner. The Widener Environmental Law Center, and especially co-directors (and Widener Professors) John Dernbach and James May, provided valuable assistance and guidance. Finally, none of this would be possible without the Pennsylvania Chapter of the Sierra Club, whose general grant supported the opening of the Harrisburg office of the Clinic in January 2010 and the establishment of the Widener Environmental Help Line (1-888-953-6853) which has fielded and continues to field the many calls on Marcellus Shale issues.

I hope you will find the information in this Citizens Guide useful as we confront one of the most complex issues facing Pennsylvania today.

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THE BASICS OF GAS DRILLING IN THE MARCELLUS SHALE FORMATION

The Marcellus Shale Formation refers to a geologic region of natural gas-rich shale extending from New York to West Virginia, including large portions of Pennsylvania. Estimates of the natural gas reserves in the Marcellus Shale range as high as 489 trillion cubic feet.¹ With such a large and valuable resource below us, the development of the Marcellus Shale will likely have significant economic impacts for Pennsylvania. It can also have significant environmental impacts as well.

I. The Drilling Process

Recovering the gas in the Marcellus Shale Formation is a complicated process involving many steps. Here is a summary of what occurs during this process.

a. Exploration and Site Analysis

Once mineral rights are obtained through lease agreements or land purchases, the gas company begins a phase of development known as exploration. This phase allows the company to pinpoint the best location to begin drilling for natural gas deposits. Various techniques may be used and their environmental impacts vary greatly.

The first step in the exploration process usually involves some type of remote sensing technique, the most common of which is seismic exploration. Working on the theory that sound waves travel through different mediums in different ways, companies can identify the type of subsurface rock and its depth. Seismic testing can be performed by machines emitting high frequency waves that penetrate the ground, machines that shake the ground or drop heavy weights to create vibrations, or through explosive charge/dynamite blasting. All three have a potential to adversely affect the land and neighboring land. Obviously, the use of explosive charges is the most worrisome of these techniques because of the potential for the explosions to cause damage to structures and other features on the property.

While seismic testing reveals the potential for gas deposits in a given area, to verify the presence of natural gas, exploratory wells need to be drilled to determine the quantity and quality of gas available for recovery. Once identified, the drill site is selected and the well pad is prepared.

¹ Timothy Considine, Ph.D., M.B.A., Robert Watson, Ph.D., P.E., Rebecca Entler, Jeffrey Sparks, “An Emerging Giant: Prospects and Economic Impacts of Developing the Marcellus Shale Natural Gas Play” The Pennsylvania State University College of Earth & Mineral Sciences Department of Energy and Mineral Engineering, July 24, 2009.

b. Site Preparation and Drilling

Before drilling can begin, the well site must be prepared to allow room for the drilling rig and support vehicles to access the site. Steps may be taken to create holding tanks or pits for residual drilling fluid waste and to ensure that stormwater runoff is mitigated to the extent possible to prevent unnecessary erosion. This process is commonly known as ‘rigging up,’ and can potentially alter the land greatly.

During the site preparation, forest and vegetation is cleared and the land is leveled and access roads are created. Finally, the drilling rig is constructed. This area, known as the well pad, typically consumes 5 acres of land and includes more than just the drill. Once the well pad site is completed, there will be electrical support machinery, wastewater pits, storage containers, and other supply equipment on the well pad, and numerous heavy-diesel trucks.

Drilling on the Marcellus Shale uses a process known as hydraulic fracturing and horizontal drilling. The nature of the Marcellus Shale formation causes the gas to collect in vertical fractures in the rock. To access these gas reserves, a well must be drilled down to a depth of roughly 8-10,000 feet. From there, the well bore is drilled horizontally in many different lateral directions. The goal is to bisect as many of these vertical fractures as possible. Then, the well bore is pressurized with millions of gallons of water, sand and other chemicals to increase the underground pressure and break open the individual pores of gas pockets in the shale so that gas is released and flows up the well bore to be collected for later use. The amount of water typically required for hydraulic fracturing ranges from about one million gallons for a vertical well to approximately five million gallons for a vertical well with a horizontal lateral.² However, some vertical wells with multiple horizontal laterals can consume twenty million gallons or more per month.³

Once completed, the drilling rig is deconstructed and the well moves into its production phase.

c. Extraction and Transport of Natural Gas

Production involves the extraction of natural gas and can last decades. During this phase, pipelines and gas compressors may be constructed to ease the transport of natural gas from the well to a treatment plant. Depending on the makeup of the gas, it may be processed onsite to remove impurities.

² <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-77964/0100-FS-DEP4217.pdf>.

³ See Stone Energy DRBC Docket 2009-13-1, <http://www.state.nj.us/drbc/dockets/D-2009-13-1.pdf>.

d. Site Abandonment and Reclamation

When a well site no longer produces gas, it must be capped and plugged as required by State and Federal Law. Usually, companies place three cement plugs, between 100-200 feet in length, in the well hole. Then a steel plate is welded on top of the pipe.⁴ Pennsylvania law requires the gas company to return the well site to its previous conditions within 9 months.⁵ However, accelerated remediation and the method of remediation can be specified in a mineral rights lease.

II. Environmental Impacts

Natural gas drilling is a massive process and the property on which drilling occurs – as well as neighboring properties - can be affected. The following briefly describes some of the potential concerns affecting land use, air and noise pollution, and water quality. The extent of the environmental impact depends on many factors and every situation is unique.

a. Land

The land around the well site can be drastically altered. Crops, livestock, native flora and fauna may all be negatively impacted by drilling on the property. On the well pad itself, forested area must be cleared and land must be leveled. In addition, this well pad must be supported by lengthy access roads, pipelines and support facilities.

Because of the near-constant use of heavy machinery, the soil under the well pad and access roads can become heavily compacted and eroded. This leads to decreased soil percolation and increased water runoff.⁶ This causes less vegetative growth and in turn, more soil erosion. All of this affects water quality of streams and other water bodies into which stormwater carries such eroded soil.

When a large area of forest is removed, the ecosystem as a whole is affected. Native species of animals are uprooted, and non-native species are given an opportunity to invade the new land. These invasive species are aggressive and difficult to remove once they gain a foothold. Garlic mustard, stilt grass, autumn olive, and Japanese knotweed are all known to invade these types of areas in Pennsylvania forests.⁷

⁴ *Id.* at I-29.

⁵ 58 P.S. §601.

⁶ Mary Beth Sweeney et. al., “Study Guide II, Marcellus Shale Natural Gas: Environmental Impact,” The League of Women Voters of Pennsylvania, 2009-10, pp. 2.

⁷ Sweeney et. al., “Study Guide II,” at 3.

b. Air

While natural gas is considered a clean fossil fuel, its extraction can release a great deal of air pollution. Estimates vary depending on specific wells, but there will be a massive increase in heavy-truck traffic. One study of a Denton, Texas natural gas drill site found that 592 one-way truck trips were required per well.⁸ Diesel and heavy-duty trucks can emit air toxins such as carbon dioxide, particulate matter, and known carcinogens.⁹ And these are the just the emissions from the trucks. The wells themselves are another source of air pollution from supply equipment or gas leaks. The United States Department of Energy estimates that 50 billion cubic feet of methane escapes from leaking valves during natural gas drilling. This is the single largest source of methane emissions in the nation.¹⁰

In addition to methane, other pollutants are released into the air by the drilling process. Along with this principal component of natural gas, one can expect increased emissions of the following: nitrogen oxides; volatile organic compounds; benzene; toluene; ethyl benzene; xylene; carbon monoxide; sulfur dioxide; particulate matter; ozone; and hydrogen sulfide.¹¹ Each of these pollutants causes known health risks.

c. Noise

While not as serious a health risk as air or water pollution, noise can be a near-constant annoyance. During heavy exploration phases, trucks may travel across the land 24-hours a day. If used, gas compressors run at high decibels around the clock. And the various seismic testing techniques previously discussed are by their nature loud and obtrusive.

⁸ “Hancock & The Marcellus Shale: Visioning the Impacts of Natural Gas Extraction Along the Upper Delaware,” Columbia University Urban Design Research Seminar, 2009, pp. 11. (citing, “Preparing for Natural Gas Development: Understanding Impacts and Protecting Public Assets,” A Gas Drilling Research Task Force Report for Sullivan County,” February 13, 2009.

⁹ U.S. Environmental Protection Agency (EPA). (2002) *Health assessment document for diesel engine exhaust*. Prepared by the National Center for Environmental Assessment, Washington, DC, for the Office of Transportation and Air Quality; EPA/600/8-90/057F. Available from: National Technical Information Service, Springfield, VA; PB2002-107661, and <http://www.epa.gov/ncea>; *Status Report on Clean Mobile Source Diesel Initiatives in the Northeast States and Eastern Canadian Provinces*. (Sept. 2003). Prepared by Northeast States for Coordinated Air Use Management for the Conference of New England Governors and Eastern Canadian Premiers (NEG/ECP). Available from www.nescaum.org/documents.

¹⁰ United States Department of Energy, Office of Fossil Energy, “Environmental Benefits of Advanced Oil and Gas Exploration and Production Technology.” http://fossil.energy.gov/programs/oilgas/publications/environ_benefits/env_benefits.pdf.

¹¹ Sweeney et. al. “Study Guide II,” at 9. (citing, “Modern Shale Gas, Development in the United States: A Primer,” Ground Water Protection Council & ALL Consulting, 2009, Prepared for the U.S. Department of Energy, Office of Fossil Energy and National Energy Technology Laboratory.)

d. Water

Water pollution is the single largest environmental concern associated with natural gas drilling. As noted before, wells—whether vertical or horizontal—use significant amounts of water during the drilling process. As more and more wells are drilled in Pennsylvania, the demand for water will be significant. In the Susquehanna and Delaware River basins, the cheapest and most common source of water is a nearby stream, river or lake in the basin watershed. Thus, proper water quality management is critically important for landowners and policymakers alike.

In addition to quantity, water quality issues can arise. When water is used in the drilling process, it is combined with numerous chemicals to create what is known as “slickwater” or “frac water”. All of the chemicals used are designed to perform a specific function to increase gas flow efficiency. There are acids to dissolve minerals and prevent oxidation. Biocides are used to eliminate bacteria in the water and corrosion inhibitors used to prevent corrosion of the pipe. Friction reducers and gels increase flow efficiency of the slickwater. And this is just the start. Other ingredients include oxygen scavengers, pH adjusters, proppants, scale inhibitors, and surfactants. A detailed list of these additives and their function can be found in the U.S. Department of Energy’s “Modern Shale Gas” Primer.¹²

Anywhere from 30-70% of the slickwater returns to the surface.¹³ Along with the chemicals detailed above, this water contains a mix of rock, minerals, and in some case, radioactive material.¹⁴ Companies often construct onsite storage pits to house the vast quantities of this wastewater—which can pose risks if the waters leak, overflow, or otherwise escape from the pits—something that has already occurred at some Pennsylvania well sites.

At least one analysis of Marcellus Shale drilling activities in Pennsylvania has found significant numbers of accidents, spills, and regulatory violations having environmental impacts. The Pennsylvania Land Trust Association found 1,435 violations of Pennsylvania Oil and Gas Laws between January 2008 and June 25, 2010, with 952 of those violations having or likely to have an impact on the environment.¹⁵ Thus, the claim that gas drilling will have no environmental impacts in Pennsylvania is not supported by the facts.

¹² Ground Water Protection Council, “Modern Shale Gas, Development in the United States: A Primer,” U.S. Department of Energy, Office of Fossil Energy and National Energy Technology Laboratory, April 2009, pp. 63. It should be noted that only 15,000 gallons of these chemicals are used for every 1 million gallons of water. Industry is quick to note that amounts to only 0.5% by volume.¹² However, this should not downplay the concern of contamination. These chemicals are chosen because the increase gas production – not for minimizing environmental impacts. In the drilling process, these chemicals are combined in a slurry and because much of this frac water gets reused, chemicals can build up over time, as does their potential for adverse environmental impact. It only takes only one leak to contaminate an entire community’s water supply.

¹³ Sweeney et. al., at 4.

¹⁴ “Oil and Gas at Your Door,” Chapter I, pp. I-27.

¹⁵ See www.conserveland.org/violationsrpt.

LEGAL ASPECTS OF ENVIRONMENTAL CONCERNS

Given the potential environmental impacts of gas drilling, it is important to understand the various legal regulations that may play a role in regulating drilling. There are federal, state, and local sources of regulation to consider.

There are two ways to think about the applicable law. One is to focus on the sources of the law (i.e., federal, state, local). The second is to think about the law in terms of the drilling process. Let's start with sources.

Federal Regulation

Gas Exploration is regulated in the United States mostly under the Department of the Interior and the Environmental Protection Agency through various federal acts such as National Environmental Policy Act, Clean Water Act, Clean Air Act and the Safe Drinking Water Act / Energy Policy Act of 2005.

National Environmental Policy Act

The Department of the Interior (DOI) regulates and approves exploration and extraction of natural resources on federally-owned lands throughout the United States. If the drilling involves such federal lands, DOI must follow a decision-making process mandated by the National Environmental Policy Act (NEPA)¹⁶ to conduct a thorough analysis of environmental impacts before they give final approval. The NEPA process requires citizen review and potential to comment. However, unless federal lands or funds are involved, NEPA will not be implicated.

Clean Water Act

The Clean Water Act of 1972 (CWA)¹⁷ establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating water quality standards for surface waters. By authority of the CWA, the EPA has implemented pollution control programs such as setting wastewater standards for industry. They have also set water quality standards for all contaminants in surface waters. Under the CWA it is unlawful to discharge any pollutant from a point source into navigable waters, unless a permit is obtained by the EPA or a qualifying state agency. EPA's National Pollutant Discharge Elimination System (NPDES) permit program controls discharges.¹⁸ Point sources are discrete conveyances such as pipes or man-made ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities

¹⁶ Section 102 of the National Environmental Policy Act of 1969, 42 U.S.C. §4332; CEQ NEPA Regulations 40 C.F.R. §1508.12.

¹⁷ Clean Water Act (33 U.S.C. §1251 *et seq.* (1972)).

¹⁸ 40 C.F.R. § 122.1.

must obtain permits if their discharges go directly to surface waters. This typically includes stormwater runoff as well from associated industrial activity and discharges from municipal storm water systems.¹⁹

However, companies drilling wells for natural gas operate under an exemption from the CWA which excludes materials that are injected in to a well for production of gas and water derived from the production of gas as not being a pollutant.²⁰ Congress extended the exemption to all gas construction facilities in the 2005 Energy Bill.²¹ In addition, the CWA does not required drilling companies to obtain a permit for discharges of stormwater runoff from the exploration, production, treatment, or transmission of natural gas.²²

Clean Air Act

The Clean Air Act (CAA), 42 U.S.C. § 7401 et seq., allows EPA to set limits on certain air pollutants in order to ensure basic health and environmental protection from air pollution for all Americans. The CAA also gives EPA the authority to limit emissions of air pollutants coming from sources like chemical plants, utilities, and steel mills through the National Ambient Air Quality Standards (NAAQS). Individual states may have stronger air pollution laws, but they may not have weaker pollution limits than those set by EPA. Additionally, EPA must approve state and local agency plans for reducing air pollution. If a plan does not meet the necessary requirements, EPA can issue sanctions against the state and, if necessary, take over enforcing the CAA in that area.

The purpose of NAAQS is to limit the emission of substances that contribute to air pollution and endanger public health.²³ The CAA does not enumerate the substances to be regulated by NAAQS, but rather gives the EPA the authority to determine which substances should be governed by NAAQS.²⁴ Each state must, in turn, adopt and submit to the EPA for approval a State Implementation Plan (SIP) for each primary and secondary standard that provides for the implementation, maintenance, and enforcement of such standards.²⁵ The EPA established which substances are regulated by NAAQS in the promulgated EPA regulations 40 CFR pt. 50. The regulations set standards for Sulfur Dioxides, Particulate Matter, Carbon Monoxide, Ozone, and Nitrogen Oxide.²⁶

The CAA also requires the EPA to establish and enforce National Emission Standards for Hazardous Air Pollutants (NESHAPS).²⁷ These standards regulate 188 different hazardous air pollutants (HAP).²⁸ The CAA further directs the EPA to name major and area

¹⁹ 40 C.F.R. § 122.28.

²⁰ *Id.*

²¹ <http://www.ewg.org/reports/Free-Pass-for-Oil-and-Gas/Oil-and-Gas-Industry-Exemptions>.

²² §1251.

²³ 42 U.S.C. § 7409(a)-(b) (2006) – National Primary and Secondary Ambient Air Quality Standards.

²⁴ §7408(a)(1).

²⁵ §7410(a)(1).

²⁶ 40 CFR pt. 50 *et seq.*

²⁷ 42 U.S.C. § 7412 (2006) - Hazardous Air Pollutants.

²⁸ See §7412(b).

sources that emit these HAPs, and develop regulations for these sources based on maximum achievable control technology (MACT).²⁹

Section 7412(n)(4)(A) of the CAA provides that emissions from oil and gas wells, pipeline compressors, and pump stations cannot be aggregated with emissions from other similar units to determine whether such units or stations are major sources of air pollution³⁰ or any other purpose under Section 7412. Section 7412(n)(4)(B) provides that the EPA may only establish an "area source" category for oil and gas production wells if they are located in a metropolitan statistical area or consolidated metropolitan statistical area with over a million people if such wells present "more than a negligible risk of adverse effects to public health."³¹ Under authority of the CAA, the EPA has issued several regulations that pertain to Oil and Gas exploration and production.

The EPA has established National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks.³² These provisions apply to certain pumps, compressors, agitators, pressure relief devices, and other pieces of equipment that are intended to operate in organic hazardous air pollutant service 300 hours or more per year.³³

The EPA has also established National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities.³⁴ These provisions apply to emission points of hazardous air pollutants located at oil and natural gas production facilities that are major or area sources of hazardous air pollutants (i.e., all sources of hazardous air pollutants), as well as "[f]acilities that process, upgrade, or store hydrocarbon liquids prior to the point of custody transfer," and "[f]acilities that process, upgrade, or store natural gas prior to the point at which natural gas enters the natural gas transmission and storage source category or is delivered to a final end user."³⁵

Safe Drinking Water Act and the Energy Policy Act of 2005

The Safe Drinking Water Act (SDWA), 42 U.S.C. § 300f et seq., is the principal federal law in the United States that ensures safe drinking water for the public.³⁶ Pursuant to the act, the EPA is required to set standards for drinking water quality and oversee all states, localities, and water suppliers who implement these standards. The SDWA applies to every public water system in the United States but privately drilled and owned wells are excluded from EPA review.

²⁹ §§ 7412(a), (c), (g).

³⁰ 42 U.S.C. § 7412(n)(4) (2006) .

³¹ 42 U.S.C. § 7412(c)(3) (2006).

³² 40 C.F.R. pts. 63.160-.183 (Subpart H) – National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks.

³³ *Id.*

³⁴ 40 C.F.R. pts. 63.760-.777 (Subpart HH) – National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities.

³⁵ 40 C.F.R. pt. 63.760(a)(1)-(3).

³⁶ 42 U.S.C. § 300f et seq. (1974).

The Energy Policy Act of 2005 provides for minimal requirements to obtain a permit for underground injection wells but specifically excludes the regulation of the underground injection of brine or other fluids which are brought to the surface in connection with oil or natural gas production or natural gas storage operations, or any underground injection for the secondary or tertiary recovery of oil or natural gas, unless such requirements are essential to assure that underground sources of drinking water will not be endangered by such injection.³⁷ In effect, SDWA cannot regulate gas drilling operations.

Underground Injection Control Program

The Underground Injection Control Program (UIC Program) regulates certain aspects of hydraulic fracturing. Injection wells are categorized into five classes. The categories are defined based on similarities such as the fluids injected, techniques utilized, and injection depth. The UIC Program primarily regulates activities in Class II and Class V injection wells. Class II wells inject fluids commonly used for natural gas production. The majority of the injected fluid is brine that comes to the surface during the extraction of gas. There are approximately 144,000 Class II wells in operation in the United States, injecting more than two billion gallons of brine every day. Fracturing that uses Class II and V injection wells to open space in a formation are also regulated by the UIC Program.³⁸

River Basin Commission Regulations

Another quasi-federal regulatory control on drilling can be found in the regulations of the two main River Basin commissions in Pennsylvania: the Delaware River Basin Commission (DRBC) and the Susquehanna River Basin Commission (SRBC). The DRBC and SRBC exist as a result of several states forming an interstate compact to govern issues on the respective rivers. The primary focus of this regulatory regime is withdrawals of water from the river watersheds to meet the large demand for water during the drilling and fracking processes. Generally, the SRBC has granted water withdrawal permits, while the DRBC has issued draft regulations that, as of July 2011, had not yet been finalized and promulgated.

State Regulation

Gas exploration is regulated in Pennsylvania under the state's oil and gas laws (Oil and Gas Act, Coal and Gas Resource Coordination Act, and Oil and Gas Conservation Law), and the environmental protection laws that include the Clean Streams Law, the Dam Safety and Encroachments Act, the Solid Waste Management Act, and the Water Resources Planning Act.³⁹ DEP's Bureau of Oil and Gas Management regulates the exploration,

³⁷ 42 U.S.C.A. § 300h (b)(2).

³⁸ http://www.epa.gov/safewater/uic/wells_hydrofrac.html.

³⁹ <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-77964/0100-FS-DEP4217.pdf>.

development and recovery of Marcellus Shale natural gas reservoirs in a manner that will protect the commonwealth's natural resources and the environment.⁴⁰

Pennsylvania law requires drillers to case and cement Marcellus Shale natural gas wells through all fresh water aquifers before drilling through deeper zones known to contain oil or gas. This casing and cement protects groundwater from the fluids and natural gas that will be contained inside the well, and keeps water from the surface and other geologic strata from mixing with and contaminating groundwater.

If drilling causes disruption of water quality or flow in water wells, state law requires drilling operators to replace or restore water supplies affected by drilling. If you are not satisfied with the drilling company's response, a complaint can be filed with the nearest DEP regional office. DEP will investigate complaints within 10 days and issue orders as necessary to replace or restore the water supply. Once a well is no longer producing, the operator must plug the well and restore the site within nine months of plugging the well.

Many landowners and municipalities are interested in receiving notice of well permit applications. DEP has a no-cost subscription service called eNotice that notifies land owners and municipalities with an email when a well permit application is received. This system enables land owners and municipalities to receive notice of a permit application at the same time that DEP receives the application. eNotice can be accessed through DEP's website at www.depweb.state.pa.us.

Oil and Gas Act

On February 14, 2012, Governor Tom Corbett signed into law a significant change to the Commonwealth's environmental law regime governing oil and gas operations in Pennsylvania.⁴¹ The new Act ("Act 13" or "the Act"), updated and recodified the Commonwealth's Oil and Gas Act. The old Act, 58 P.S. §§ 601.101-601.605, is recodified as Chapter 32, 58 Pa.C.S. §§ 3201-3274. The main addition in Act 13 are new zoning requirements and fee impositions. Further, Act 13 updates environmental regulations to coincide with the booming Marcellus Shale development, coined as "unconventional wells" in the Act. We highlight here some of the important legal limits and provisions impacting Marcellus Shale gas drilling after the changes imposed by Act 13.

1. Environmental Regulation

a. Permits

To drill a well, a drilling operator must obtain a permit from DEP.⁴² A surface landowner or coal operator, lessee, or owner of any coal underlying a proposed well

⁴⁰ *Id.*

⁴¹ See 58 Pa. C.S. §§ 2301-3504.

⁴² 58 Pa. C.S. § 3211(a).

location may object to the initiation of drilling activities to the DEP.⁴³ The DEP may deny a permit if there are unresolved objections to the well location by a coal mine owner or operator.⁴⁴ The surface landowner shall be notified of the intent to drill within 15 days of the receipt of a plat under section 3211(b).⁴⁵ The surface landowner may request a conference pursuant to section 3251 and is limited to asserting that the location violates well location restrictions found in section 3215 (relating to well location restrictions).⁴⁶

The municipality where the tract of land upon which the well is proposed to be drilled may submit written comments to DEP describing local conditions or circumstances which the municipality has determined should be considered by the department in rendering its determination on the permit.⁴⁷ The DEP may consider these comments in deciding whether to grant or deny the permit.⁴⁸

b. Water Use

A company may not withdraw or use water within the Commonwealth for drilling or hydraulic fracturing without first receiving approval of a water management plan by DEP.⁴⁹ Criteria is set forth in subsection (m)(2)(i)-(iv) to guide the DEP in approving the water management plan. Well operators are also required to abide by the Clean Streams Law, act of June 22, 1937 (P.L. 1987, No. 394), in the disposal of brines produced from the drilling, alteration, or operation of a well.⁵⁰ Casing requirements are to be promulgated by regulation through the DEP.⁵¹

In addition to those water requirements, a well operator who affects a public or private water supply by pollution or diminution shall restore or replace the affected supply with an alternate source of water adequate in quantity or quality for the purposes served by the supply.⁵² A person thought to be aggrieved by the pollution or diminution of water supply may notify DEP, which must investigate within 10 days, and make a determination within 45 days following notification.⁵³ Unless rebutted by defenses enumerated in subsection (d), it shall be presumed that a well operator is responsible for pollution of a water supply if the water supply is within 2,500 feet of the unconventional vertical well bore and the pollution occurred within 12 months of completion, drilling, stimulation, or alteration, whichever is later in time.⁵⁴

⁴³ 58 Pa. C.S. § 3211(b.2).

⁴⁴ *Id.* at 3211(e.1).

⁴⁵ *Id.* at 3212(b)(2).

⁴⁶ *Id.*

⁴⁷ *Id.* at 3212.1.

⁴⁸ *Id.* at 3215(d).

⁴⁹ *Id.* at 3211(m).

⁵⁰ *Id.* at 3217(a).

⁵¹ *Id.* at 3217(c).

⁵² *Id.* at 3218(a).

⁵³ *Id.* at 3218(b).

⁵⁴ *Id.* at 3218(c). It must be noted that one of the “defenses” which gets the well operator out of the presumption is if “the landowner or water purveyor refused to allow the operator access to conduct a predrilling or prealteration survey” of the water supply. *Id.* at § 3218(d)(1)(ii) and (2)(ii). Thus, a landowner who does not allow the well

c. Chemical Disclosures

Along with reporting requirements for each specific well to be reported to DEP under section 3222(a.1), operators must complete a chemical disclosure registry form within 60 days following the conclusion of hydraulic fracturing of a new well.⁵⁵ Furthermore, a vendor or service provider who provides hydraulic fracturing chemicals must furnish the information the operator requires in submitting the chemical disclosure registry form.⁵⁶ But, a vendor or service provider may sign a written statement indicating a chemical or additive is proprietary or a trade secret and therefore may not be printed or disclosed in the public record.⁵⁷

d. Air Emissions

From development and production of wells, as well as, transmission and processing of gas, owner or operators must submit to DEP a source report identifying and quantifying actual air containment emissions from any air containment source.⁵⁸ Nitrogen oxide and volatile organic compounds are singled out as a quantity of compounds that should be submitted in a separate report to DEP pursuant to 25 Pa. Code Ch. 135.⁵⁹

e. Eminent Domain

Eminent domain powers are expressly given to companies engaged in selling, transporting, storing, or manufacturing natural gas in section 3241, 58 Pa. C.S. § 3241. Those companies may appropriate an interest in real property for the purpose of engaging in storing gas in underground geologic formations. Before appropriating, a representative must attempt to agree with the owners involved as to damages payable for rights acquired. If an agreement is not reached, the representative must submit a bond to the court of common pleas of the county in which the tract of land is situated for approval.⁶⁰

II. Zoning/Preemption

Pursuant to Pennsylvania's prior Oil and Gas Act, 58 P.S. § 601.101 *et. al*, all ordinances "purporting to regulate oil and gas well operations regulated by this act" were superseded.⁶¹ Further, no ordinances enacted under the MPC or the Flood Plain Management Act "shall contain provisions which impose conditions, requirements or

operator to test the water quality in the well before drilling risks losing out on this powerful presumption of pollution.

⁵⁵ *Id.* at 3222.1(b)(2).

⁵⁶ *Id.* at 3222.1(1).

⁵⁷ *Id.* at 3222.1(3).

⁵⁸ *Id.* at 3227(a).

⁵⁹ *Id.* at 3227(c).

⁶⁰ *Id.* at 3241(d).

⁶¹ 58 P.S. § 601.602.

limitations on the same features of oil and gas well operations ... or accomplish the same purposes.”⁶² Act 13 therefore seeks to expand the preemptive effect of the Oil and Gas Act.

Pursuant to new section 3302, “except with respect to local ordinances adopted pursuant to the MPC and ... the Flood Plain Management Act, all local ordinances purporting to regulate oil and gas operations regulated by Chapter 32 (relating to development) are hereby superseded.”⁶³ This language mirrors the prior language in section 601.602 of the Oil and Gas Act. Act 13 furthers the preemptive scope of state statutes on local ordinances by the addition of section 3303.⁶⁴ Under that section, “the Commonwealth ... preempts and supersedes the local regulation of oil and gas operations regulated by the environmental acts, as provided in this chapter.”⁶⁵ Therefore, any local ordinance that “regulate[s] oil and gas operations” may be preempted and superseded by the state statute provision that deals with the same subject.

In addition to sections 3302 and 3303, Act 13 includes provisions that attempt to guide a local municipality in the development of uniform local ordinances in line with the provisions of the state statute and further adds restrictions to local ordinances.⁶⁶ Section 3304 includes the general rule that “all local ordinances regulating oil and gas operations shall allow for the reasonable development of oil and gas resources.”⁶⁷ Furthermore, this section goes on to include provisions explicitly requiring local governments to allow within its geographical area well and pipeline location assessment operations, construction of oil and gas operations without conditions that are more stringent than those imposed on other industrial uses, development of sites without more stringent requirements than other industrial uses, and allow oil and gas operations as a permitted use in all zoning districts.⁶⁸

Act 13 does place a limitation on the development of well sites in residential districts though, essentially placing a limitation on the section 3304(b)(5) requirement to allow oil and gas operations as a permitted use in all zoning districts.⁶⁹ If a well site is placed within a residential district, a local municipality may prohibit or permit as a conditional use those wells that are within 500 feet of an existing building, the wellpad being farther than 300 feet from an existing building, with water pipelines, access roads, and security facilities all being outside that 300 foot buffer.⁷⁰ Furthermore, impoundment areas “shall not be located closer than 300 feet from an existing building.”⁷¹

Regarding industrial and agricultural zones, Act 13 requires a municipality to authorize natural gas compressor stations as a permitted use in both districts, and as a

⁶² *Id.*

⁶³ 58 Pa. C.S. § 3302.

⁶⁴ *See* 58 Pa. C.S. § 3303.

⁶⁵ *Id.*

⁶⁶ *See* 58 Pa. C.S. § 3304.

⁶⁷ 58 Pa. C.S. § 3304(a).

⁶⁸ *See* 58 Pa. C.S. § 3304(b)(1)-(5).

⁶⁹ *See* 58 Pa. C.S. § 3304(b)(5.1).

⁷⁰ *Id.*

⁷¹ 58 Pa. C.S. § 3304(6).

conditional use in all other zoning districts if; (i) it is located 750 feet or more from the nearest existing building or 200 feet from the nearest lot line; and (ii) the noise level does not exceed 60dba at the nearest property line.⁷² Furthermore, natural gas processing plants are authorized as a permitted use in an industrial zoning district and as a conditional use in agricultural zoning districts if the same requirements are met.⁷³

Other explicit limitations on a municipality's power to enact an ordinance is set forth in section 3304 which include limits on restrictions placed by the municipality on vehicular access roads, subterranean operations or hours of operation of compressor stations and processing plants, and setback distances.⁷⁴

The restrictions in § 3304 were struck down and declared "null and void" by the Commonwealth Court in *Robinson Township v. Commonwealth*, 2012 WL 3030277 (Pa. Cmwlth Ct. July 26, 2012). The Robinson Township majority found that the restriction of a municipality's power to zone on the basis of the state's interest in development of oil and gas resources violated substantive due process. The court therefore enjoined the application of § 3304 and any provisions designed to enforce that section.⁷⁵

In addition, prior case law interpreting the Oil and Gas Act provisions is likely still relevant in interpreting Act 13 because "any difference between 58 Pa. C.S. § 3302 and § 602 is not intended to change or affect legislative intent, judicial construction, or administration and implementation of § 602."⁷⁶ Therefore, the substantive provisions of § 602 which were incorporated into Act 13 through § 3302 (relating to development) retain their prior interpretation and precedential quality. The addition of expanded preemption language in Act 13 likely will alter prior case law, although.

The two leading cases regarding the prior Pennsylvania Oil and Gas Act preemption provisions are *Huntley & Huntley, Inc. v. Borough of Oakmont*, 964 A.2d 855 (Pa. 2009) and *Range Resources-Appalachia, LLC v. Salem Township*, 964 A.2d 869 (Pa. 2009). These two cases analyzed separated municipal zoning ordinances, the later was found to be preempted by the prior act's language, the later survived preemption.

In *Huntley*, the township successfully attempted to restrict oil and gas wells in R-1 residential districts through an ordinance adopted pursuant to the MPC.⁷⁷ The court noted the broad preemptive language in MPC enacted ordinances and quoted the act's language in stating "such ordinances are preempted to the extent they either 'contain provisions which impose conditions, requirements or limitations on the same *features* of oil and gas well operations regulated' by the Act, or 'accomplish the same purposes as set forth in' the

⁷² 58 Pa. C.S. § 3304(b)(7)(i)-(ii).

⁷³ 58 Pa. C.S. § 3304(b)(8)(i)-(ii).

⁷⁴ See 58 Pa. C.S. § 3304(b)(8)-(11).

⁷⁵ For a more detailed review of the *Robinson Township* decision, see the 3-part blog post about it on the Widener Environmental Law Center's blog, at <http://blogs.law.widener.edu/envirolawblog/>.

⁷⁶ House Bill 1950, § 3504(4), pg. 172.

⁷⁷ *Huntley*, 964 A.2d at 866.

Act.⁷⁸ (*italics added*). In its rationale, the court stated that placement of a well in a residential zone is not a “feature” preempted by the state statute because “features of oil and gas well operations” pertains to technical aspects of well functioning and matters ancillary thereto.⁷⁹ Therefore, the ordinance restricting well placement in R-1 residential zones was not preempted because it was not a “feature”.

Next in *Huntley*, the court analyzed the purposes of the municipal ordinance and the Oil and Gas Act to determine whether the ordinance accomplished “the same purposes as set forth” in the act.⁸⁰ In determining the two laws had different purposes, the court reasoned that the “Borough’s ordinance in the present case includes service police power objectives relating to the safety and welfare of its citizens, encouraging the most appropriate use of land throughout the borough, conserving the value of property, minimizing overcrowding and traffic congestion, and providing adequate open spaces.”⁸¹ Comparing that purpose to the express purpose of the act, the court found overlap but held that the state and county had sufficiently distinct interests that allowed the borough to restrict land use as it determined was in the best interest of its citizens.⁸² Therefore, according to analysis using the prior Oil and Gas Act preemption language, if an ordinance did not regulate a “feature” of oil and gas operations and its purpose was distinct from the Oil and Gas Act’s purpose, the ordinance was not preempted.

In *Range Resources*, Salem Township enacted a general ordinance directed at regulating surface and land development associated with oil and gas drilling operations.⁸³ The ordinance established a fee for permit applications, required a permit for all drilling-related activities, regulated the location, design and construction of access roads and provided for criminal penalties upon failure to comply with its terms, among various other provisions.⁸⁴ The court held that the ordinance reflected an attempt by the township to enact a comprehensive regulatory scheme relative to oil and gas development within the municipality.⁸⁵ Further, the court reasoned “there are numerous aspects of the Ordinance’s regulations pertaining to features of well operations that substantively overlap with similar regulations set forth in the Act, falling under the express preemptive language of Section 602.”⁸⁶

The court further stated “hence, we find that the Ordinance is qualitatively different from the zoning enactment at issue in *Huntley* that sought only to control the location of wells consistent with established zoning principles.”⁸⁷ In this case, the court found that

⁷⁸ *Id.* at 863.

⁷⁹ *Id.* at 864.

⁸⁰ *Id.*

⁸¹ *Id.* at 865.

⁸² *Id.*

⁸³ *Range Resources*, 964 A.2d at 870.

⁸⁴ *Id.* at 870-71.

⁸⁵ *Id.* at 875.

⁸⁶ *Id.*

⁸⁷ *Id.* at 876.

Salem Township’s ordinance had the sole purpose of regulating oil and gas development, not on zoning or the regulation of commercial or industrial development generally.”

The new language in section 3304(b) may have an effect on the applicability of the *Huntley* decision because the legislature attempts to require a municipality to allow the development of oil and gas wells at least as a conditional use in all zoning districts, subject to a few requirements.⁸⁸ Furthermore, with the addition of section 3304(a), the intent of the legislature seems to promote development of oil and gas in all zoning districts.⁸⁹ Read as a whole, Act 13’s language is much more restrictive than the prior preemptive language in the Oil and Gas Act. A municipality still has its power to create zoning ordinances under the MPC, but need to be cognizant in the new restrictions placed on the development of ordinances through Act 13.

III. Impact Fee

The general rule is that a governing body of a county that has “spud” unconventional gas well located within its borders may elect whether to impose a fee on those wells.⁹⁰ “Spud” is defined as “the actual start of drilling of an unconventional gas well.”⁹¹ If the county does not adopt an ordinance within 60 days of the effective date of Act 13, it is prohibited from receiving funds until one year after the adoption of an ordinance imposing a fee.⁹² Further, the county ordinance must start with “the county of (insert name) hereby imposes an unconventional gas well fee on each unconventional gas well spud in this county” so as to be clear and readily understandable to a layperson that this is an impact fee on drilling operations.⁹³

If the county does not impose a fee, the municipalities in the county may compel the imposition of a fee by adopting resolutions under section 2302(a.4). Following 60 days but not more than 120 day after the effective date of Act 13, half of the municipalities representing 50% of the population must adopt a resolution to impose a fee. If that is accomplished, a fee is considered enacted in that county.⁹⁴

Nuisance Claims

a. Public Nuisance

In Pennsylvania, parties may be enjoined from activity which obstructs or causes inconvenience or damage to the public in the exercise of rights common to all.⁹⁵

⁸⁸ See 58 Pa. C.S. § 3304(b).

⁸⁹ 58 Pa. C.S. § 3304(a).

⁹⁰ *Id.* at 2302(a).

⁹¹ *Id.* at 2301.

⁹² *Id.* at 2302(a.3)(2). This and other deadlines on municipalities appears to have been enjoined from going into effect for 120 days from April 11, 2012 by the Commonwealth Court in *Robinson Township v. Commonwealth*, No. 284 M.D. 2012 (Cmwlth. Ct. April 11, 2012).

⁹³ *Id.* at 2302(a.2).

⁹⁴ *Id.* at 2302(a.4).

⁹⁵ *Commonwealth ex rel. Lewis v. Allowill Realty Corp.*, 478 A.2d 1334, 1337 (Pa. Super. 1984).

Unreasonable interferences with a public right include: whether the conduct involves a significant interference with the public health, the public safety, the public peace, the public comfort or the public convenience; whether the conduct is proscribed by a statute, ordinance or administrative regulation; or whether the conduct is of a continuing nature or has produced a permanent or long-lasting effect, and, as the actor knows or has reason to know, has a significant effect upon the public right. ⁹⁶

For a private citizen to file a lawsuit under a public nuisance, the private citizen must be specifically injured by the public nuisance over and above the injury suffered by the public generally.⁹⁷

b. Private Nuisance

In Pennsylvania, a private nuisance is a nontrespassory invasion of another's interest in the private use and enjoyment of land.⁹⁸ For liability, a nuisance must cause significant harm that would be suffered by a normal person in the community or by property in normal condition and used for a normal purpose. A significant harm is more than slight inconvenience or petty annoyance. ⁹⁹

In addition, a private nuisance may be found where there is an unreasonable, unwarrantable, or unlawful use by a person of his own property which causes injury, damage, hurt, inconvenience, annoyance or discomfort to one in the legitimate enjoyment of his reasonable rights of person or property. ¹⁰⁰

c. Nuisance Per Se

A nuisance per se is a use of land that is generally recognized as injurious to health or to the welfare of the community, so that proof of the nuisance may be made simply by proof of the act. Some businesses are, under certain conditions, nuisances per se, where there is an act or use of property of a continuing nature offensive to, and legally injurious to, health or property. Most businesses, however, are not classified as nuisances per se but can be enjoined as a nuisance if the record establishes that the particular business establishment is not being conducted properly and has become a nuisance in fact. In Pennsylvania, drilling is not nuisance per se, and will never become so if done in a reasonable manner.¹⁰¹

Nuisance in Fact

An individual is liable for a nuisance in fact if the individual's conduct is a legal cause of an invasion of another's interest in the private use and enjoyment of land, and the

⁹⁶ *Diess v. Pa. Dep't of Transp.*, 935 A.2d 895 (Pa. Cmwlth. 2007).

⁹⁷ *Pennsylvania SPCA v. Bravo Enterprises*, 237 A.2d 342, 348 (Pa. 1968).

⁹⁸ *Golen v. Union Corp.*, 718 A.2d 298 (Pa. Super. 1998)

⁹⁹ *Id.*

¹⁰⁰ *Kemmel v. Schelegel*, 478 A.2d 11 (Pa. Super. 1984)

¹⁰¹ *Smith v. Bellows et. al.*, 20 Pa. D. 383 (1910)

invasion is either: intentional and unreasonable; or unintentional and otherwise actionable under the rules controlling liability for negligent or reckless conduct, or for abnormally dangerous conditions or activities. ¹⁰² Courts look at the circumstances surrounding a particular activity in question to determine if there is a nuisance in fact.¹⁰³

Anticipatory Nuisance

To prove an anticipatory nuisance, an individual must show that the proposed use of the property will be a nuisance per se. If the use is not a nuisance per se, a nuisance must result from the contemplated act or thing under the circumstances. The injury must be actually threatened, not merely anticipated; it must be practically certain, not merely probable.¹⁰⁴

¹⁰² *Diess*, 935 A.2d at 905.

¹⁰³ *Kembel*, 478 A.2d at 16.

¹⁰⁴ *City of Erie v. Gulf Oil Corp.*, 150 A.2d 351 (Pa. Sup. Ct. 1959)

LEGAL ASPECTS OF LANDOWNER LEASING

Drilling on the Marcellus Shale natural gas reserves presents a great financial opportunity to landowners in Pennsylvania. However, this opportunity carries with it the potential for great risk. Before delving into specific issues, it is important to remember that knowledge and information are absolutely critical to protecting your land, your health, and your rights. Fortunately, there is a wealth of information available through the internet, state agencies, and various organizations devoted to Marcellus Shale development in Pennsylvania. Consult your neighbors. Attend community meetings. And before you sign a mineral lease or a surface use agreement, please consult an attorney experienced in the oil and gas industry.

Separation of Surface Rights and Mineral Rights

The rights to minerals, such as natural gas, ordinarily belong to the owner of the land. However, a particular parcel of land may be severed into separate interests, creating a “surface estate” and a “mineral estate.” These interests can be created by an instrument that transfers—by grant, assignment, reservation, or otherwise—an interest of any kind in coal, oil and gas, and other minerals.¹⁰⁵

When a separate mineral estate is created, a surface estate owner retains the buildings and rights to the surface, but no longer owns any of the minerals beneath the land. As with the surface estate, the mineral estate is considered a real property interest and can be recorded in the lands record against the surface property.¹⁰⁶ In addition a mineral interest allows the owner: the right to develop (the right to ingress and egress); the right to lease (executive right); the right to receive bonus payments; the right to receive daily rentals; and the right to receive royalty payments. When an undivided mineral interest is conveyed, reserved, or excepted, it is presumed that all of these attributes remain with the mineral interest unless a contrary intent is expressed.¹⁰⁷

In Pennsylvania, the mineral estate is “dominant” to the surface estate—which means that the owner or lessee of a mineral estate has the right to make reasonable use of the surface estate to access the subsurface. If the surface owner believes that such surface usage is unreasonable, the surface owner bears the burden to initiate a legal challenge. Surface and mineral estate owners may negotiate an agreement that defines the extent of the surface usage, but the owner or lessee of the mineral estate owner is under no obligation to make such an agreement.¹⁰⁸ Thus, unless the surface and mineral rights

¹⁰⁵ NANCY SAINT-PAUL, PROPERTY INTERESTS IN OIL AND GAS § 7:4 (Summers Oil and Gas, 3d ed. 2011).

¹⁰⁶ Elisabeth N. Radow, *Homeowners and Gas Drilling Leases: Boon or Bust?*, NYSBA Journal, Nov./Dec. 2011, at 15.

¹⁰⁷ Saint-Paul, *supra* note 104.

¹⁰⁸ Ross H. Pifer, *What a Short, Strange Trip It's Been: Moving Forward After Five Years of Marcellus Shale Development*, 72 U. Pitt. L. Rev. 615, 633 (2011).

owners reach an agreement about how the mineral rights owner will use the surface, the surface owner must allow the mineral rights owner any reasonable use of the surface to access the minerals. In the context of natural gas drilling, that likely includes allowing the mineral rights owner (or his lessee like a gas company) to use the surface and drill for the gas.

However, landowners can control surface activities through natural gas lease agreements that define what the mineral owner or drilling/energy company can do to extract natural gas. Although there is some state oversight of the leasing process, most of the terms of the leasing transaction are the product of negotiation on the open market.¹⁰⁹ When entering into a lease agreement, the landowner must anticipate any activities that the mining company might do while exploring the property. This exploration may include: setup and storage of drilling equipment; creation of access roads; construction of power and telephone facilities; and production and storage facilities.¹¹⁰

Additionally, Pennsylvania law requires that the surface estate be restored from disturbances caused by drilling activities. A well operator must at all times follow an erosion and sediment control plan in accordance with Pennsylvania's Clean Streams Law. Further, equipment must be removed and well site restored within 9 months of completion of the activity.¹¹¹ The lease can be a way for a landowner to allocate responsibility for these required restoration activities.

Because of the complexity of the issues involved, it is a good idea to consult an attorney who is well-versed in gas and mineral leases before entering into any such lease.

Space Lease vs. Gas Lease

a. The Space

In a standard space lease, the landlord retains all rights of ownership, except for the specific space leased to the tenant. However, a standard gas lease typically includes physical leased space that consists of the subsurface area within the property boundaries and undesignated portions of the surface land to set up the necessary drilling infrastructure. These undesignated, expansive, reserved surface rights can result in acres going to support the operation that the lessor had not contemplated.¹¹²

b. The Rent

The standard space lease typically contains an agreed upon rent payable in regular installments. In a gas lease, landowners often receive a signing bonus of dollars per acre of

¹⁰⁹ *Id.* at 627.

¹¹⁰ Saint-Paul, *supra* note 104.

¹¹¹ 58 PA.STAT. ANN. § 601.206 (West 2012).

¹¹² Elisabeth N. Radow, *Homeowners and Gas Drilling Leases: Boon or Bust?*, NYSBA Journal, Nov./Dec. 2011, at 15.

leased land. Rental payments, including the bonus and annual rental amounts, are normally made in one payment for the stated term of the lease and referred to as a “paid-up” lease.¹¹³

In addition to the signing bonus, Pennsylvania law requires that landowners receive a minimum one-eighth (12.5%) royalty on all oil or gas removed from their property; however, a landowner may negotiate with the energy company for a royalty payment that exceeds the state minimum. Pennsylvania applies the “net-back” method of royalty calculation, which calculates royalties as one-eighth of the sale price of the gas minus one-eighth of the post-production costs of bringing the gas to market. Post-production costs refer to expenditures the gas company from when the gas exits the ground until it is sold. Essentially, the gas is valued when it leaves the ground at the wellhead by deducting from the sales price the costs of getting the natural gas from the wellhead to the market.¹¹⁴

c. The Term

The standard space lease, between a landlord and a tenant, grants the tenant the right to occupy a specified space for a fixed timeframe. A standard gas lease typically runs for a five-year term. However, a lease may include provisions which could tie up the landowner’s property well beyond the primary period without receiving any royalty payments. As long as certain events occur or are ongoing, including drilling, production, staging, infrastructure maintenance, or storage, the gas lease may remain in effect.¹¹⁵ It is important for the landowner to understand what events will end the lease arrangement, and this should be clearly spelled out in the lease. Where specific conditions of this second term have not been met, the lease terminates at the conclusion of the primary term, at which point the landowners can renegotiate or enter into a lease with another company.¹¹⁶

d. Assignment

Space leases typically require a tenant to obtain landlord consent for third-party lease assignment. However, a typical gas lease allows a lessee to sell or assign the interest to a third party without providing notice to the landowner, limiting the landowner’s ability to control who is allowed on the landowner’s property.¹¹⁷

¹¹³ *Id.* at 16.

¹¹⁴ *Kilmer v. Elexco Land Servs., Inc.*, 990 A.2d 1147 (Pa. 2010).

¹¹⁵ Radow, *supra* note 111, at 16.

¹¹⁶ KRISTA WEIDNER, *Natural Gas Exploration: A Landowner’s Guide to Leasing Land in Pennsylvania* 6 (Penn State Extension 2008).

¹¹⁷ Radow, *supra* note 111, at 16.