

Hydraulic Fracturing Regulation in the United States: The Laissez-Faire Approach of the Federal Government and Varying State Regulations

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AN INTRODUCTION TO HYDRAULIC FRACTURING IN THE U.S.

Hydraulic fracturing (or “fracking”) is a procedure used to increase the flow of oil or natural gas from a well drilled into a low permeability rock formation, like shale, and has been in use in the U.S. since the 1940s.¹ The procedure uses a mixture of water, proppants (e.g. sand or ceramic beads), and various chemicals, which are pumped into subsurface rock formations at high pressure.² The pressure creates fractures in the rock that extend outward from the well bore.³ The intent is to create a network of interconnected fractures, held open by the proppants, which allow oil and natural gas to flow from the pore spaces in the rock to the production well.⁴ This process, combined with horizontal drilling (to intersect natural vertical fractures in the shale), has turned otherwise unproductive shale formations into the largest oil and natural gas fields in the world.⁵ As of 2005, approximately 90 percent of all oil and natural gas wells drilled in the U.S. used hydraulic fracturing.⁶

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¹ *Hydraulic Fracturing of Oil & Gas Wells Drilled in Shale*, GEOLOGY.COM, <http://geology.com/articles/hydraulic-fracturing/> (last visited Oct. 26, 2011); *Hydraulic Fracturing 101*, EARTHWORKS, <http://www.earthworksaction.org/FracingDetails.cfm> (last visited Oct. 26, 2011).

² *Hydraulic Fracturing of Oil & Gas Wells Drilled in Shale*, *supra* note 1; *Hydraulic Fracturing 101*, *supra* note 1.

³ *Hydraulic Fracturing 101*, *supra* note 1.

⁴ *Id.*; *Hydraulic Fracturing of Oil & Gas Wells Drilled in Shale*, *supra* note 1.

⁵ *Hydraulic Fracturing of Oil & Gas Wells Drilled in Shale*, *supra* note 1.

⁶ ENVTL. WORKING GROUP, FREE PASS FOR OIL AND GAS: ENVIRONMENTAL PROTECTIONS ROLLED BACK AS WESTERN DRILLING SURGES (2009) available at <http://www.ewg.org/book/export/html/27154> (hereinafter FREE PASS FOR OIL AND GAS).

Several major “shale plays,” as the oil and gas industry calls them, exist in the U.S.⁷ The Marcellus Shale of the Appalachian Basin, located within parts of eight eastern U.S. states (New York, Pennsylvania, Ohio, West Virginia, Maryland, Kentucky, Tennessee, and Virginia)⁸ takes up a land area of about 54,000 square miles – an area larger than the state of Florida.⁹ In 2008, original estimates of its natural gas capacity ranged from 168 trillion cubic feet to 500 trillion cubic feet.¹⁰ Recently, however, the U.S. Geological Survey (USGS) estimated that the Marcellus Shale contains 84 trillion cubic feet of undiscovered, technically recoverable natural gas, and 3.4 billion barrels of undiscovered, technically recoverable natural gas liquids.¹¹ This estimate contrasts sharply with the U.S. Department of Energy’s (DOE) estimate of 410 trillion cubic feet of technically recoverable natural gas,¹² but still leaves the Marcellus as the largest reserve of shale gas in the U.S.¹³ The new findings by the USGS have, however, brought estimates of U.S. natural gas reserves under question and prompted the DOE to revise their previous figures on the Marcellus Shale.¹⁴

Aside from the Marcellus Shale, the largest U.S. shale gas formations being drilled today include the Barnett in Texas, the Fayetteville in Arkansas, and the Haynesville in Louisiana and eastern Texas.¹⁵ Significant commercial shale gas production also occurs in the Lewis Shale of northwestern Arizona and southwestern Colorado, the Antrim Shale in Michigan, and the New Albany Shale in southern Indiana and northern Kentucky.¹⁶

Significant U.S. shale oil formations include the Green River Formation in Western Colorado, southeastern Utah, and southern Wyoming, and the Devonian-Mississippian black shales of the eastern U.S.¹⁷ The Green River Formation, which includes the Green River and Washakie Basins of Wyoming, the Uinta Basin of Utah, and the Piceance Basin of Colorado, contains the richest, most concentrated deposits of shale oil in the U.S.¹⁸ The largest shale oil formation in the U.S., however, is the Bakken formation in the Williston basin of eastern North

⁷ See *Maps: Exploration, Resources, Reserves, and Production*, U.S. ENERGY INFO. ADMIN. http://205.254.135.24/pub/oil_gas/natural_gas/analysis_publications/maps/maps.htm (last visited Oct. 26, 2011) (click on the link for either the PDF or JPG of the map titled “Shale Gas and Oil Plays, Lower 48 States”).

⁸ *Marcellus Shale – Appalachian Basin Natural Gas Play*, Geology.com, <http://geology.com/articles/marcellus-shale.shtml> (last visited Oct. 26, 2011).

⁹ LISA SUMI, EARTHWORKS, *SHALE GAS: FOCUS ON THE MARCELLUS SHALE 2* (2008), available at <http://www.earthworksaction.org/publications.cfm?pubID=354>.

¹⁰ *Id.* at 4.

¹¹ U.S. Geological Survey, *USGS Releases New Assessment of Gas Resources in the Marcellus Shale, Appalachian Basin*, USGS.GOV (Aug. 23, 2011), http://www.usgs.gov/newsroom/article.asp?ID=2893&from=rss_home.

¹² Ian Urbina, *U.S. Geologists Sharply Cut Estimate of Shale Gas*, N.Y. TIMES, Aug. 24, 2011, http://www.nytimes.com/2011/08/25/us/25gas.html?_r=1&scp=1&sq=marcellus%20shale&st=cse.

¹³ U.S. ENERGY INFO. ADMIN., U.S. DEPT. OF ENERGY, *REVIEW OF EMERGING RESOURCES: U.S. SHALE GAS AND SHALE OIL PLAYS 5* (2011), available at <http://www.eia.gov/analysis/studies/usshalegas/> (compare the revised 84 trillion cubic feet figure for the Marcellus shale to the figures listed for other shale formations in the U.S.).

¹⁴ *Id.*

¹⁵ *Technically Recoverable Shale Gas Resources Jump 134 Percent*, INSTITUTEFORENERGYRESEARCH.ORG (May 16, 2011), <http://www.instituteforenergyresearch.org/2011/05/16/technically-recoverable-shale-gas-resources-jump-134-percent/>.

¹⁶ HALLIBURTON, *U.S. SHALE GAS: AN UNCONVENTIONAL RESOURCE. UNCONVENTIONAL CHALLENGES 1* (2008), available at <http://www.halliburton.com/halcomsearch.aspx?k=U.S.%20Shale%20Gas>.

¹⁷ John R. Dyni, *United States Oil-Shale Deposits*, Geology.com (2005), <http://geology.com/usgs/oil-shale/united-states-oil-shale.shtml>.

¹⁸ OFFICE OF PETROLEUM RESERVES, U.S. DEPT. OF ENERGY, *FACT SHEET: U.S. OIL SHALE RESOURCES* (Jun. 18, 2007), available at http://www.fossil.energy.gov/programs/reserves/npr/Oil_Shale_Resource_Fact_Sheet.pdf.

Dakota and western Montana.¹⁹ The recently discovered Niobrara formation in the Denver Basin of southeastern Wyoming and northern Colorado has been getting a great deal of attention as well, as oil companies are rapidly leasing land in hopes of capitalizing on the Niobrara's oil producing potential.²⁰

The utilization of hydraulic fracturing to exploit these vast reserves of shale oil and gas in the U.S. raises significant concerns about its effect on human health and the environment. Specifically, there are concerns over four exposure pathways that could cause the pollution of drinking water. First, there is the concern that fracking chemicals might enter drinking water aquifers directly, due to improper well construction or an over-aggressive "frack." Second, there is the potential for pollution from the vast amounts of produced water and flowback, which the industry sends to a publicly owned treatment works (POTW), discharges into surface waters, or injects back into the ground. Third, surface drilling operations create the potential for spills and leaching of harmful waste products into the groundwater. Fourth, the fracturing of underground rock formations could potentially cause oil and gas reservoirs to communicate with groundwater aquifers. The first three exposure pathways are particularly important, because among the chemicals used in the hydraulic fracturing process are chemicals that are known to be toxic to humans and wildlife, in addition to known carcinogens.²¹

Other concerns relate to the emission of methane (which is a much more potent greenhouse gas than carbon dioxide) into the atmosphere from shale gas wells, intentional venting or flaring by workers, or from leaky pipes.²² Although natural gas is marketed as the "green" alternative to burning dirty oil and coal for heat and electricity, some argue that the greenhouse gas footprint of methane released from shale gas production is greater than that of conventional natural gas, oil, or coal.²³

FEDERAL REGULATION OF HYDRAULIC FRACTURING

Despite Congress's power to regulate hydraulic fracturing activities under the Commerce Clause of the U.S. Constitution, regulation of the technology and of the oil and gas industry in general is largely left to the states. In fact, the oil and gas industry, and in some cases hydraulic fracturing specifically, enjoys exemptions from several major federal environmental statutes, including: the Safe Drinking Water Act; the Resource Conservation and Recovery Act; the Emergency Planning and Community Right-To-Know Act; the Clean Water Act; the Clean Air Act; the Comprehensive Environmental Response, Compensation, and Liability Act; and the

¹⁹ *Bakken Formation Oil Assessment in North Dakota, Montana will be updated by U.S. Geological Survey*, U.S. DEPT. OF THE INTERIOR (May 19, 2011), <http://www.doi.gov/news/pressreleases/Bakken-Formation-Oil-Assessment-in-North-Dakota-Montana-will-be-updated-by-US-Geological-Survey.cfm>.

²⁰ Mark Jaffe, *Oil companies rushing to buy leases along Colorado's Front Range*, DENVER POST, Oct. 23, 2011, http://www.denverpost.com/search/ci_19169758.

²¹ *Hydraulic Fracturing 101*, *supra* note 1. For more information about the chemicals used in hydraulic fracturing, visit <http://fracfocus.org>. FracFocus is a national voluntary chemical disclosure website for the hydraulic fracturing industry. Some states are now requiring that well operators disclose chemical information for each individual well to FracFocus.

²² Tom Zeller, Jr., *Studies Say Natural Gas Has Its Own Environmental Problems*, N.Y. Times, Apr. 11, 2011, http://www.nytimes.com/2011/04/12/business/energy-environment/12gas.html?_r=1.

²³ See Robert W. Howarth et al., *Methane and the greenhouse-gas footprint of natural gas from shale formations*, CLIMATE CHANGE LETTERS (2011), available at www.acsf.cornell.edu/2011Howarth-Methane (finding that the greenhouse-gas footprint of shale gas is greater than conventional gas or oil, and 20% greater of a 20-year period than coal).

National Environmental Policy Act.²⁴ Many of the exemptions for the above listed statutes stem from or were strengthened by the Energy Policy Act of 2005.

The Safe Drinking Water Act

Congress enacted the Safe Drinking Water Act (SDWA) in 1974 to protect the quality of public drinking water in the U.S.²⁵ The law focuses on all waters, whether from above ground or underground sources, that are actually or potentially designed for human consumption.²⁶

Like most federal environmental laws in the U.S., the Environmental Protection Agency (EPA) is responsible for implementing the SDWA. Part C of the SDWA requires the EPA to establish minimum regulations for State Underground Injection Control (UIC) Programs.²⁷ These regulations must “contain minimum requirements for effective programs to prevent underground injection which endangers drinking water sources,” mandates that State programs require a permit for any underground injection, mandates inspection, monitoring, recordkeeping and reporting requirements, and specifically disallows the promulgation of any rule, “which authorizes any underground injection which endangers drinking water sources.”²⁸ A state must meet these minimum requirements in order to obtain primary enforcement and regulatory responsibility for underground injection activities within the state.²⁹

Originally, the SDWA defined “underground injection” as, “the subsurface emplacement of fluids by well injection,” without any exceptions.³⁰ Strangely, under this definition, the EPA considered hydraulic fracturing as exempt under the SDWA.³¹ In 1997, however, the U.S. Court of Appeals for the 11th Circuit ruled that “hydraulic fracturing activities constitute ‘underground injection’ under Part C of the SDWA.”³² Thus, the EPA and State UIC Programs were required to regulate hydraulic fracturing under the SDWA. In response, the EPA initiated a study of the potential for contamination of public water supplies from the hydraulic fracturing of coal seams for methane production,³³ and concluded in 2004 that hydraulic fracturing “poses little or no threat to [underground sources of drinking water].”³⁴ Environmental groups, federal legislators, and EPA employees questioned the accuracy of the 2004 report,³⁵ with one veteran scientist

²⁴ See RENEE L. KOSNIK, EARTHWORKS, THE OIL AND GAS INDUSTRY’S EXCLUSION AND EXEMPTIONS TO MAJOR ENVIRONMENTAL STATUTES (2007), available at <http://www.earthworksaction.org/pubs/PetroleumExemptions1c.pdf> (discussion oil and gas industry exemptions from major environmental statutes).

²⁵ *Summary of the Safe Drinking Water Act*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/lawsregs/laws/sdwa.html> (last updated Aug. 11, 2011).

²⁶ *Id.*

²⁷ Safe Drinking Water Act, 42 U.S.C. § 300h(a) (2011).

²⁸ *Id.* § 300h(b).

²⁹ *Id.* § 300h-1.

³⁰ Safe Drinking Water Act of 1974, Pub. L. No. 93-523, 88 Stat. 1660, § 1421(d)(1) (1974).

³¹ ENVTL. WORKING GROUP, *supra* note 6.

³² *Legal Envtl. Assistance Found. v. U.S. EPA*, 118 F.3d 1467, 1478 (11th Cir. 1997).

³³ *Inadequate Regulation of Hydraulic Fracturing*, EARTHWORKS, <http://www.earthworksaction.org/halliburton.cfm> (last visited Oct. 31, 2011).

³⁴ ENVTL. PROT. AGENCY, EVALUATION OF IMPACTS TO UNDERGROUND SOURCES OF DRINKING WATER BY HYDRAULIC FRACTURING OF COALBED METHANE RESERVOIRS 7-5 (2004), available at http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/wells_coalbedmethanestudy.cfm/

³⁵ KOSNIK, *supra* note 24 at 10.

alleging that EPA's findings were "unsupportable"³⁶ and that the report was "scientifically unsound."³⁷

Despite questions over the report's accuracy, Congress amended the SDWA in 2005 with the passage of the Energy Policy Act.³⁸ The amendments added two exclusions to the definition of underground injection: "(i) the underground injection of natural gas for purposes of storage; and (ii) the underground injection of fluids or propping agents (other than diesel fuels) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities."³⁹ Thus, regardless of whether the underground injection of water, proppants, and otherwise toxic chemicals associated with hydraulic fracturing actually endangers drinking water sources, the practice is exempt under the SDWA so long as diesel fuel is not used.

Many in the U.S refer to this exemption as the "Halliburton loophole," because of former Vice President Dick Cheney's ties to Halliburton (where he was formerly CEO) – the oil and gas giant who patented hydraulic fracturing in the 1940s.⁴⁰ Since 2005, two bills have been proposed in Congress that would have ended the SDWA exemption for hydraulic fracturing. The first was in the House of Representative in 2008, where Representatives DeGette, Salazar and Hinchey introduced a bill aimed at protecting drinking water from oil and gas development.⁴¹ The second came in 2009 when members of both houses of Congress introduced the Fracking Responsibility and Awareness of Chemicals Act (the aptly named "FRAC Act").⁴² Neither Bill made it through Congress.

The Resource Conservation and Recovery Act

Subtitle C of the Resource Conservation and Recovery Act (RCRA) of 1976 is a comprehensive environmental statute that gives EPA the authority to regulate the generation, transportation, treatment, storage, and disposal of hazardous waste – this is commonly referred to as a "cradle-to-grave" regulatory program.⁴³ Subtitle D provides a framework for regulating non-hazardous solid waste.⁴⁴

The definition of hazardous waste under RCRA is:

[A] solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may:

(A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; or

³⁶ *EPA Findings on Hydraulic Fracturing Deemed "Unsupportable,"* UNION OF CONCERNED SCIENTISTS (2010), http://www.ucsusa.org/scientific_integrity/abuses_of_science/oil-extraction.html

³⁷ *Inadequate Regulation of Hydraulic Fracturing,* *supra* note 33.

³⁸ KOSNIK, *supra* note 24 at 8.

³⁹ 42 U.S.C § 300h(d)(1)(B).

⁴⁰ *Inadequate Regulation of Hydraulic Fracturing,* *supra* note 33.

⁴¹ *Id.*

⁴² *Id.*

⁴³ *Summary of the Resource Conservation and Recovery Act,* U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/lawsregs/laws/rcra.html> (last updated Aug. 11, 2011); KOSNIK, *supra* note 24 at 6.

⁴⁴ KOSNIK, *supra* note 24 at 6.

(B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or other managed.”⁴⁵

RCRA required EPA to determine criteria for identifying and listing hazardous waste subject to regulation under Subtitle C.⁴⁶ Drilling fluids, produced waters, and other wastes associated with oil and natural gas exploration, development, or production (oil field wastes) were explicitly exempted from listing as hazardous waste until EPA conducted a Regulatory Determination as to whether such wastes warranted regulation under Subtitle C, but no sooner than October 21, 1982.⁴⁷

Before the EPA completed their Regulatory Determination, Congress enacted the Solid Waste Disposal Act (SWDA) in 1980.⁴⁸ The SWDA exempted oil field wastes from Subtitle C unless EPA could prove that the wastes posed a hazard to human health and the environment.⁴⁹ In 1988, the EPA completed their required Regulatory Determination of oil field wastes and determined that regulation under Subtitle C was not necessary because existing state and federal regulations were adequate and the economic impact to the petroleum industry would be great.⁵⁰ The result of this determination is that EPA regulations now exclude oil field wastes from the definition of hazardous wastes, meaning that these wastes are subject only to Subtitle D as a solid waste.⁵¹

Under Subtitle D, for example, solid wastes must be stored in a manner that does not constitute a fire, health, or safety hazard, and will not result in spillage.⁵² Generally, oil field wastes from hydraulic fracturing are stored on-site in tanks or surface pits.⁵³ If regulated under Subtitle C, the surface pits (or “surface impoundments”) would be required to have a liner “designed, constructed, and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil or ground water or surface water at any time during the active life . . . of the impoundment.”⁵⁴ This is just one example of the less protective requirements of Subtitle D as compared to Subtitle C. The oil and gas industry is also subject to less stringent requirements for the transportation, treatment, and disposal of oil field wastes under Subtitle D than they would be under Subtitle C.

The Emergency Planning and Community Right-To-Know Act

Enacted in 1986, the Emergency Planning and Community Right-To-Know Act (EPCRA) is the national legislation on community safety and is designed to help communities protect public health, safety, and the environment from chemical hazards.⁵⁵ Section 313 of

⁴⁵ Resource Conservation and Recovery Act, 42 U.S.C. § 6903(5) (2011)

⁴⁶ *Id.* § 6921(a).

⁴⁷ *Id.* § 6921(b)(2)

⁴⁸ KOSNIK, *supra* note 24 at 6.

⁴⁹ *Id.*

⁵⁰ *Id.* at 6-7.

⁵¹ 40 C.F.R. § 261.4(b)(5).

⁵² 40 C.F.R. § 243.200-1(a).

⁵³ *Hydraulic Fracturing 101*, *supra* note 1.

⁵⁴ 40 C.F.R. § 264.221(a).

⁵⁵ *Summary of the Community Planning and Community Right-to-Know Act*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/lawsregs/laws/epcra.html> (last updated Aug. 11, 2011).

EPCRA requires EPA and the States to collect data on releases and transfers of listed toxic chemicals that are manufactured, processed, or otherwise used above threshold quantities by certain industries.⁵⁶ This includes data related to point and fugitive on-site air releases, water releases, on and off-site land releases, underground injection, transfers to waste management facilities, and on-site waste treatment and management procedures.⁵⁷ The data are then made available to the public via EPA's Toxics Release Inventory.⁵⁸

Industrial facilities covered by the toxic chemical reporting requirements of EPCRA include those facilities with ten or more employees, a Standard Industrial Classification (SIC) Code of 20 through 39, and that manufacture, process, or otherwise use a threshold quantity of listed toxic chemicals.⁵⁹ The Administrator of the EPA may elect to add or delete SICs from the list of those industries subject to the reporting requirements of EPCRA, but has yet to include the oil and gas industry – SIC Code 13.⁶⁰

The Clean Water Act

Originally enacted as the Federal Water Pollution Control Act, the Clean Water Act (CWA) provides the basic structure for regulating discharges of pollutants into “waters of the United States” and regulating quality standards for surface waters.⁶¹ Under the CWA, it is unlawful to discharge any pollutant from a point source (a “discrete conveyance,” such as a ditch, pipe, tunnel, or conduit) into navigable waters without a permit.⁶²

The EPA administers the National Pollution Discharge Elimination System (NPDES) permit program to control discharges.⁶³ In 1987, Congress amended the CWA to require the EPA to develop a permitting program for stormwater runoff.⁶⁴ The amendments, however, exempted mining operations and “oil and gas exploration, production, processing, or treatment operations or transmission facilities” from the permitting requirement, provided the runoff consisted entirely of flows from conveyances, such as pipes or channels, which did not come in contact with on-site materials or waste products.⁶⁵

Interpreting this exemption, the EPA asserted authority to require stormwater permits for discharges from oil and gas construction facilities on the theory that sediment from the construction site constituted a pollutant.⁶⁶ In 2005, however, Congress amended the CWA through the Energy Policy Act, by defining the term “oil and gas exploration, production, process, or treatment operations and transmission facilities” to include construction activities.⁶⁷

⁵⁶ Emergency Planning and Community Right-To-Know Act, 42 U.S.C. § 11023 (2011).

⁵⁷ KOSNIK, *supra* note 24 at 16.

⁵⁸ See *Toxics Release Inventory*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/tri/> (last updated Oct. 27, 2011).

⁵⁹ *Id.* § 11023(b)(1)(A).

⁶⁰ *Id.* § 11023(b)(1)(B); *Chemicals and Public Disclosure*, FRAC FOCUS, <http://fracfocus.org/chemical-use/chemicals-public-disclosure> (last visited Nov. 1, 2011).

⁶¹ *Summary of the Clean Water Act*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/lawsregs/laws/cwa.html> (last updated Aug. 11, 2011).

⁶² *Id.*; see also *The Clean Water Act*, 33 U.S.C. §§ 1311(a), 1362(12), (14) (2011).

⁶³ *Summary of the Clean Water Act*, *supra* note 61.

⁶⁴ FREE PASS FOR OIL AND GAS, *supra* note 6.

⁶⁵ 33 U.S.C. § 1342(l)(2).

⁶⁶ KOSNIK, *supra* note 24 at 11.

⁶⁷ 33 U.S.C. § 1362(24).

Thus, this amendment extended the stormwater permit exemption to all oil and gas field operation activities, which includes those activities associated with hydraulic fracturing.

Following the 2005 amendment, the EPA issued a final rule exempting stormwater discharges of sediment from oil and gas construction facilities.⁶⁸ The Natural Resources Defense Council challenged this rule, and the Ninth Circuit Court of Appeals held that the EPA's promulgated rule was "arbitrary and capricious and constitutes an impermissible construction . . . of the CWA."⁶⁹ The court vacated the rule and subsequently denied the EPA's request for a rehearing.⁷⁰

The result is that oil and gas construction facilities remain subject to the stormwater permitting requirements of the CWA and associated EPA regulations. Additionally, the oil and gas industry is subject to the permitting requirements associated with discharging a pollutant into navigable waters, when applicable. These requirements limit the concentration and quantity of a pollutant that can be discharged under the terms of a NPDES permit, and establish monitoring and recording requirements, among other permit conditions.⁷¹

Additionally, the EPA requires certain oil drilling facilities to prepare and implement Spill Prevention, Control and Countermeasure (SPCC) plans to prevent the discharge of oil into navigable waters or adjoining shorelines.⁷² The regulations for the SPCC plans were promulgated under section 311(j)(1)(C) of the Clean Water Act in 1973, and were amended by the Oil Pollution Act of 1990.⁷³ Facilities that must prepare and implement SPCC plans include those that are non-transportation related; have an aggregate aboveground storage capacity over 1,320 gallons or a buried storage capacity over 42,000 gallons; and have a reasonable expectation of discharging into or upon navigable waters or adjoining shorelines.⁷⁴ Furthermore, the SPCC plan must be prepared in accordance with good engineering practices; provide for inspections, tests, and recordkeeping procedures; and include training of personnel to prevent discharges.⁷⁵

The Clean Air Act

The Clean Air Act (CAA) is a comprehensive federal statute that regulates air emissions from stationary and mobile sources.⁷⁶ The act authorizes the EPA to regulate hazardous air pollutant emissions and to protect public health and welfare by establishing National Ambient

⁶⁸ *Regulation of Oil and Gas Construction Activities*, U.S. ENVTL. PROT. AGENCY, <http://cfpub.epa.gov/npdes/stormwater/oilgas.cfm> (last updated Mar. 9, 2009).

⁶⁹ *NRDC v. U.S. EPA*, 526 F.3d 591, 608 (9th Cir. 2008).

⁷⁰ *Regulation of Oil and Gas Construction Activities*, *supra* note 68.

⁷¹ See 40 C.F.R. 122.41-122.50.

⁷² *Spill Prevention, Control and Countermeasure Plans (SPCC)*, ENVTL. PROT. AGENCY, <http://www.epa.gov/region5oil/plan/spcc.html> (last updated Oct. 2, 2011).

⁷³ *Id.*, n.1.

⁷⁴ 40 C.F.R. § 112.1.

⁷⁵ *Id.* § 112.7.

⁷⁶ *Summary of the Clean Air Act*, ENVTL. PROT. AGENCY, <http://www.epa.gov/lawsregs/laws/caa.html> (last updated Aug. 11, 2011).

Air Quality Standards (NAAQS).⁷⁷ States are required to meet the NAAQS by developing state implementation plans (SIPs) to regulate industrial sources of air pollution in the state.⁷⁸

Section 112 of the CAA requires the EPA to establish emission standards for hazardous air pollutants (HAPs) from “major source” and “area source” categories that require the maximum degree of reduction in emissions that the EPA determines to be achievable – commonly referred to as maximum achievable control technology (MACT).⁷⁹ Major sources are defined as “any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit . . . in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants.”⁸⁰ An area source is “any stationary source of hazardous air pollution that is not a major source.”⁸¹

The regulations applicable to the oil and gas industry under the CAA impose more stringent requirements on major sources of HAP emissions than on area sources.⁸² Additionally, major sources are required to obtain a Title V permit (as specified in subchapter V of the CAA and 40 CFR parts 70 and 71), while area sources are not.⁸³ Under EPA regulations, however, HAP emission from oil and gas exploration or production wells are exempt from the aggregation rule within the statutory definition of “major source.”⁸⁴ Since most oil and gas wells, on their own, do not emit the threshold limit of HAPs under the statutory definition, they are not required to obtain a Title V permit. This leaves HAP emissions from oil and gas wells essentially unregulated under the CAA.⁸⁵

The Comprehensive Environmental Response, Compensation, and Liability Act

In 1980, Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and amended the act in 1986 with the Superfund Amendments and Reauthorization Act (SARA).⁸⁶ CERCLA establishes a federal “Superfund” to pay for the clean up of abandoned or uncontrolled hazardous waste sites.⁸⁷ Additionally, the fund pays for the clean up of accidents, spills, and other emergency releases of hazardous substances to the environment.⁸⁸ The EPA has the power, under CERCLA, to hold potentially responsible parties (PRPs) financially liable for the costs of cleaning up a hazardous waste site, or to direct private party cleanup when the responsible party is known.⁸⁹

⁷⁷ *Id.*

⁷⁸ *Id.*

⁷⁹ The Clean Air Act, 42 U.S.C. § 7412 (2011);

⁸⁰ *Id.* § 7412(a)(1).

⁸¹ *Id.* § 7412(a)(2).

⁸² Compare 40 C.F.R. § 63.764(c), with 40 C.F.R. § 63.764(d).

⁸³ 40 C.F.R. § 63.764(f).

⁸⁴ *Id.* § 63.761.

⁸⁵ KOSNIK, *supra* note 24 at 13.

⁸⁶ *Summary of the Comprehensive Environmental Response, Compensation, and Liability Act*, ENVTL. PROT. AGENCY, <http://www.epa.gov/lawsregs/laws/cercla.html> (last updated Aug 11, 2011).

⁸⁷ *Id.*

⁸⁸ *Id.*

⁸⁹ *Id.*

CERCLA defines a hazardous substance as those substances designated or listed under various statutes, including hazardous wastes listed pursuant to RCRA, as amended by the SWDA, but excludes petroleum, including crude oil, natural gas, natural gas liquids, liquefied natural gas, and mixtures of natural gas and synthetic gas.⁹⁰ This exclusion means that spills and releases of petroleum, crude oil, and natural gas, which contain chemicals otherwise covered under the definition of hazardous substance, are immune to federal regulation under CERCLA.⁹¹ Environmental groups argue that this exclusion gives oil companies little incentive to prevent and clean up spills.⁹²

The National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 established a framework for protecting the environment by requiring all branches of government to properly consider the environmental impacts of any major federal action that significantly affects the environment.⁹³ NEPA requires federal agencies to take a hard look at the environmental impacts of a proposed action and possible alternatives.⁹⁴ Federal agencies do this by preparing Environmental Assessments (EAs) to determine if the proposed action will result in significant environmental impacts, and, if the EA reveals a significant environmental impact, subsequent Environmental Impact Statements (EISs), which assess possible alternatives and require an opportunity for public involvement.⁹⁵

The Energy Policy Act of 2005 created a rebuttable presumption that certain oil and gas related activities authorized by the U.S. Department of the Interior in managing public lands, and the U.S. Department of Agriculture in managing National Forest System Lands, are subject to a “categorical exclusion” under NEPA.⁹⁶ The activities presumed to qualify for a categorical exclusion include activities conducted pursuant to the Mineral Leasing Act for the purpose of exploration or development of natural gas if the activity falls under one of five categories.⁹⁷ The excluded activities are presumed to have no significant environmental impact, unless the public can prove “extraordinary circumstances in which a normally excluded action may have a significant environmental effect.”⁹⁸ Essentially, oil and gas activities are no longer subject to NEPA’s procedural requirements.

STATE REGULATION OF HYDRAULIC FRACTURING

States are free to regulate hydraulic fracturing as they see fit, with the exception that state regulations must meet the minimum requirements of any applicable federal regulations. This approach to oil and gas industry regulation has led to varying levels of complexity in the regulatory process encountered by companies in different states. Some states have specific rules

⁹⁰ Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9601(14) (2011).

⁹¹ KOSNIK, *supra* note 24 at 5.

⁹² FREE PASS FOR OIL AND GAS, *supra* note 6.

⁹³ *Summary of the National Environmental Policy Act*, ENVTL. PROT. AGENCY, <http://www.epa.gov/lawsregs/laws/nepa.html> (last updated Aug. 11, 2011).

⁹⁴ KOSNIK, *supra* note 24 at 15.

⁹⁵ *Id.*

⁹⁶ *Id.*; 42 U.S.C. § 15942(a).

⁹⁷ 42 U.S.C. § 15942(b).

⁹⁸ 40 C.F.R. § 1508.4.

related to hydraulic fracturing, while others regulate the process solely under their general oil and gas permitting requirements.

Colorado

The Oil and Gas Conservation Act (OGCA) is the primary statute governing oil and gas development in Colorado.⁹⁹ As part of the legislative declaration, the OGCA states that it is in the public interest to “[f]oster the responsible, balanced development, production, and utilization of the natural resources of oil and gas in the state of Colorado in a manner consistent with the protection of public health, safety, and welfare, including protection of the environment and wildlife resources.”¹⁰⁰ The Act gives the Colorado Oil and Gas Conservation Commission (COGCC) the authority to regulate “[o]il and gas operation so as to prevent and mitigate significant adverse environmental impacts on any air, water, soil, or biological resource resulting from oil and gas operations to the extent necessary to protect public health, safety, and welfare, including protection of the environment and wildlife resources, taking into consideration cost-effectiveness and technical feasibility.”¹⁰¹

Under regulations promulgated by the COGCC, an operator must apply for a permit-to-drill that indicates the proposed well location, the location of water wells, and the location of other water sources within 400 feet of the wellhead.¹⁰² The Director of the COGCC may withhold approval if they have “reasonable cause to believe the proposed well or oil and gas location . . . presents an imminent threat to public health, safety and welfare, including the environment, or a material threat to wildlife resources.”¹⁰³

Operators wishing to perform “enhanced recovery operations,” must apply for additional authorization from COGCC and cannot commence construction until receiving said authorization.¹⁰⁴ Where the injection of fluids for enhanced recovery operations is proposed, like fracking, the application must describe the proposed casing for the well, provide a statement of the type of fluid to be injected, provide a chemical analysis of the fluid to be injected, and describe the proposed “stimulation program.”¹⁰⁵ Well casings must be designed to prevent migration of oil, gas, or water that “may result in the degradation of ground water.”¹⁰⁶

Operators of fracking wells must also maintain Material Safety Data Sheets (MSDSs) for any hazardous chemicals brought to the well site for underground injection, and must keep a Chemical inventory for each chemical product used or stored in an amount over 500 pounds in any quarterly period.¹⁰⁷ When the composition of a chemical product is considered a trade secret by the vender or service provider, like fracking fluid, the operator must only maintain a record of its identity.¹⁰⁸ If the Director of the COGCC determines that information concerning the chemical constituents of the chemical product is necessary to respond to a spill, or because of

⁹⁹ Oil and Gas Conservation Act, COLO. REV. STAT. ANN. § 30-60-101 – 30-60-129 (West 2011).

¹⁰⁰ *Id.* § 34-60-1021(1)(A)(I).

¹⁰¹ *Id.* § 34-60-106(2)(d).

¹⁰² 2 Colo. Code Regs. § 404-1:303

¹⁰³ *Id.* § 404-1:303(m).

¹⁰⁴ *Id.* § 404-1:401(a).

¹⁰⁵ *Id.* § 404-1:404(b)(4)(C)–(E)

¹⁰⁶ *Id.* § 404-1:317(d).

¹⁰⁷ *Id.* § 404-1:205(b), (c).

¹⁰⁸ *Id.* § 404-1:205(d).

complaints regarding adverse impacts to public health, safety, welfare, or the environment, the venter must disclose that information.¹⁰⁹ Recently, the COGCC issued proposed rules that would require public disclosure to the “FracFocus” website of all chemicals used the hydraulic fracturing process.¹¹⁰

Pits used during oil and gas exploration and production “shall be constructed and operated to protect public health, safety, and welfare and the environment . . . from significant adverse environmental, public health, or welfare impacts from [exploration and production] waste,” unless permitted by law.¹¹¹ Operators must apply for an Earthen Pit Permit to construct and utilize all production pits.¹¹² Pits constructed after April 1, 2009, with some exceptions, must be lined.¹¹³

Spills of exploration and production waste must be “controlled and contained immediately upon discovery to protect the environment, public health, safety, and welfare, and wildlife resources.”¹¹⁴ Spills or releases of certain sizes must be reported to the COGCC within different time frames, but spills of any size must be reported within twenty-four hours that “impact or threaten to impact any waters of the state, residence or occupied structure, livestock, or public byway.”¹¹⁵ Most wastes from drilling operations may be injected back in to the ground, with a permit, or disposed of at a commercial solid waste facility.¹¹⁶

New York

Currently, New York State does not allow hydraulic fracturing in its portion of the highly sought after Marcellus Shale. In December of 2010, then New York State Governor David Patterson issued an executive order banning the practice of “high-volume, horizontal hydraulic fracturing” in the Marcellus Shale region until the Department of Environmental Conservation (DEC) completed a review to certify that the practice was safe.¹¹⁷ At the time of the executive order, the DEC had already stopped issuing drilling permits in the Marcellus Shale until it completed its review of the practice.¹¹⁸ The “moratorium” enacted by the executive order is still under effect, as the DEC continues its review process.¹¹⁹

In 2009, the DEC issued a Draft Supplemental Generic Environmental Impact Statement (SGEIS) to provide a comprehensive review of issues unique to horizontal drilling and high-volume hydraulic fracturing.¹²⁰ After a great deal of public comment, the DEC revised the Draft

¹⁰⁹ *Id.*

¹¹⁰ COLO. OIL AND GAS CONSERVATION COMM’N, DRAFT STATEMENT OF BASIS AND PURPOSE 3, *available at* <http://cogcc.state.co.us/>

¹¹¹ *Id.* § 404-1:902(a).

¹¹² *Id.* § 404-1:903(a).

¹¹³ *Id.* § 404-1:904.

¹¹⁴ *Id.* § 404-1:906(a).

¹¹⁵ *Id.* § 404-1:906(b).

¹¹⁶ *Id.* § 404-1:907.

¹¹⁷ Sasha Chavkin, *Executive Order Suspending Fracking Brings Little Change*, ProPublica (Dec. 17, 2010), <http://www.propublica.org/article/executive-order-suspending-fracking-brings-little-change>.

¹¹⁸ *Id.*

¹¹⁹ Jay F. Marks, *Business Q&A with LeAnne Burnett*, NewsOK (Nov. 3, 2011), http://newsok.com/business-qa-with-leanne-burnett/article/3619398?custom_click=pod_headline_daily-qa.

¹²⁰ *Marcellus Shale*, N.Y. DEPT. OF ENVTL. CONSERVATION, <http://www.dec.ny.gov/energy/46288.html> (last visited Nov. 3, 2011).

SGEIS and released a Revised Draft SGEIS in September 2011.¹²¹ The SGEIS recommends prohibiting high-volume hydraulic fracturing in the New York City and Syracuse watersheds, and on state-owned land including parks, forest areas and wildlife management areas.¹²² Under regulations that the DEC will issue in accordance with these recommendations, hydraulic fracturing would only be allowed on privately owned lands, but under “rigorous and effective controls.”¹²³

The DEC recently proposed such regulations, which are available for public comment until December 12, 2011.¹²⁴ The proposed regulations would, among other things: prohibit the drilling of wells within 500 feet of a private water well or within 2,000 feet of a public drinking water supply well or reservoir for at least three years; require three well casings to prevent gas migration; impose strict stormwater control measures; and require full disclosure to the DEC of all products utilized in the fracturing process.¹²⁵ Additionally, the proposed regulations would require a DEC-approved plan for disposing of flowback water, and would institute a process to monitor the disposal of waste streams from the drilling process.¹²⁶

Originally, it was expected that hydraulic fracturing permits would begin being issued sometime in 2012, but the DEC Commissioner recently stated that the review process will likely take longer than originally expected.¹²⁷ For New York, this means that permits for hydraulic fracturing are unlikely to be issued until at least 2013.¹²⁸ Multiple towns across New York State, however, are taking the matter into their own hands by using zoning laws to ban hydraulic fracturing.¹²⁹ At least twelve towns in New York State have already banned hydraulic fracturing through zoning ordinances, and more plan to follow their lead.¹³⁰

Whether towns have the authority to do this is the issue in a lawsuit brought by Anschutz Exploration Corporation against the town of Dryden, NY.¹³¹ Anschutz argues that state conservation law gives the state, not towns, the sole authority to regulate the gas industry.¹³² The town argues that banning is not “regulation,” and that the home rule provision of the New York State Constitution gives towns the authority, through zoning, to decide where they want industry.¹³³ The outcome of this case, and another similar case against the town of Middlefield, NY, could have huge implications for New York State, the oil and gas industry, and rural towns across America.

Pennsylvania

¹²¹ *Id.*

¹²² *New Recommendations Issued in Hydraulic Fracturing Review*, N.Y. DEPT. ENVTL. CONSERVATION (Jun. 30, 2011), <http://www.dec.ny.gov/press/75403.html> (hereinafter *New Recommendations*).

¹²³ *Id.*

¹²⁴ *High Volume Hydraulic Fracturing Proposed Regulations*, N.Y. DEPT. ENVTL. CONSERVATION, <http://www.dec.ny.gov/regulations/77353.html> (last visited Nov. 3, 2011).

¹²⁵ *New Recommendations*, *supra* note 122.

¹²⁶ *Id.*

¹²⁷ Karen Dewitt, *Gov. Cuomo willing to wait on hydrofracking*, WRVO Public Media (Oct. 31, 2011), <http://www.wrvo.org/post/gov-cuomo-willing-wait-hydrofracking>.

¹²⁸ *Id.*

¹²⁹ Maria Scarvalone, *In Upstate NY, Gas Drilling Debate Gets Local*, WNYC News (Nov. 3, 2011).

¹³⁰ *Id.*

¹³¹ *Id.*

¹³² *Id.*

¹³³ *Id.*

The Pennsylvania Department of Environmental Protection (DEP) administers regulations applicable to oil and gas drilling in the state. No person is allowed to drill a well unless they obtain a permit from the DEP.¹³⁴ The DEP may deny a permit application if “the issuance of such permit would result in a violation of [the Pennsylvania Oil and Gas Act] or any other applicable environmental statute, rule, or regulation.”¹³⁵

A landowner who experiences a diminution in water quality as a result of drilling may request an investigation by the DEP.¹³⁶ The DEP must perform an investigation within ten days and make a determination within forty-five days.¹³⁷ If the DEP finds that the drilling operations caused the diminution in water quality, then the well operator must “restore or replace the affected supply with an alternate source of water adequate in quantity or quality for the purposes served by the supply.”¹³⁸ If the pollution occurs within six months of drilling, the DEP presumes that the well operator is responsible for water pollution within 1,000 feet of the well, unless the well operator provides an affirmative defense.¹³⁹ In order to prevent pollution or diminution of fresh groundwater, wells must have a permanent casing that runs through the fresh water strata.¹⁴⁰

When it comes to the disposal of drilling wastes, DEP regulations require the well operator to prepare a control and disposal plan for the disposal of wastes, including “stimulation fluids” (or fracking fluids).¹⁴¹ The plan must identify waste control and disposal methods consistent with the Pennsylvania Clean Streams Law and the Solid Waste Management Act.¹⁴² The well operator must control and dispose of wastes in a manner that prevents the pollution of waters of Pennsylvania.¹⁴³ Before disposal, well operators may store fracking fluid and certain other wastes from the drilling process in open pits, provided the pits are lined and designed to contain all polluttional substances and wastes.¹⁴⁴

In the Marcellus Shale, specifically, the DEP requires applications for drilling permits to include a mandatory water plan that will govern water withdrawal and disposal issues.¹⁴⁵ Additionally, the DEP keeps a list of chemicals used in the fracking process, and requires well operators to keep a list of all chemicals used at each well site available.¹⁴⁶

Texas

¹³⁴ 25 PA. CODE § 78.11(a) (2011).

¹³⁵ 58 PA. CONS. STAT. § 601.201(e)(1) (2011).

¹³⁶ *Id.* § 601.208(b).

¹³⁷ *Id.*

¹³⁸ *Id.* § 601.208(a), (b).

¹³⁹ *Id.* § 601.208(b).

¹⁴⁰ *Id.* §601.207(b).

¹⁴¹ 25 Pa. Code § 78.55(a).

¹⁴² *Id.* § 78.55(b).

¹⁴³ *Id.* § 78.54.

¹⁴⁴ *Id.* 78.56(1)

¹⁴⁵ PA. DEPT. OF ENVTL. PROT., *Marcellus Shale: Tough Regulations, Greater Enforcement 1*, available at <http://www.dep.state.pa.us/dep/deputate/minres/oilgas/factsheets.htm> (last visited Nov. 4, 2011).

¹⁴⁶ *Id.*

The Oil and Gas Division of the Texas Railroad Commission is the main regulatory agency that administers regulations related to oil and gas drilling. Any operator wishing to drill an oil and gas well must apply for a permit to drill, deepen, reenter, or plug back.¹⁴⁷ All well casings should isolate and seal off all “usable-quality water zones” to “prevent contamination or harm.”¹⁴⁸ Additionally, operators may not “cause or allow pollution of surface or subsurface water in the state.”¹⁴⁹

Regulations related to drilling wastes provide for the use of pits, provided the operator obtains a permit from the Commission.¹⁵⁰ The Commission may only issue a permit if they determine that “the maintenance or use of such pit will not result in the . . . pollution of surface or sub-surface waters.”¹⁵¹ Operators may dispose of certain low chloride fluids and other wastes without a permit by spreading them over the land on which they were generated, or by burial.¹⁵² Otherwise, a permit is required for any other disposal method.¹⁵³ All oil and gas wastes may be injected underground into “nonproducing zones of oil, gas, or geothermal resources bearing formations,” provided that “the formations are separated from freshwater formation by impervious beds which will give adequate protection to such freshwater formations.”¹⁵⁴

In June 2011, Texas passed a law requiring the Railroad Commission to promulgate rules for the disclosure of chemicals used in hydraulic fracturing.¹⁵⁵ The Commission approved a proposed rule in August that would apply to hydraulic fracturing treatments on wells drilled after the effective date of the rule.¹⁵⁶ This proposed rule would require disclosure to the well operator of each chemical ingredient added to the hydraulic fracturing fluid.¹⁵⁷ The well operator would then be required to submit this information, as is currently proposed in Colorado, to the “FracFocus” website.¹⁵⁸

Louisiana

The Louisiana Department of Natural Resources (DNR) Office of Conservation is responsible for regulating the exploration and production of oil and gas. An operator of a hydraulic fracturing well must obtain a work permit before commencing well construction operations.¹⁵⁹ The work permit application must include a plan for the construction and stimulation of the fracking well.¹⁶⁰ Before drilling can begin, the operator also needs to obtain a

¹⁴⁷ TEX. ADIN. CODE tit. 16 § 3.5(a) (2011).

¹⁴⁸ *Id.* § 3.13(a).

¹⁴⁹ *Id.* § 3.8(b).

¹⁵⁰ *Id.* § 3.8(d)(2).

¹⁵¹ *Id.* § 3.8(d)(6).

¹⁵² *Id.* § 3.8(d)(3).

¹⁵³ *Id.* § 3.8(d)(1).

¹⁵⁴ *Id.* § 3.9(1), (2).

¹⁵⁵ Kristi M. Tice, *United States: Railroad Commission of Texa Issues Proposed Hydraulic Fracturing Chemical Disclosure Rule* (Oct. 10, 2011),

<http://www.mondaq.com/unitedstates/x/147544/Environmental+Law/Railroad+Commission+Of+Texas+Issues+Proposed+Hydraulic+Fracturing+Chemical+Disclosure+Rule>.

¹⁵⁶ *Id.*

¹⁵⁷ *Id.*

¹⁵⁸ *Id.*

¹⁵⁹ STRONGER, INC., Louisiana Hydraulic Fracturing State Review 10 (2011), available at

<http://www.dep.state.pa.us/dep/deputate/minres/oilgas/factsheets.htm>.

¹⁶⁰ *Id.*

permit to drill.¹⁶¹ To protect fresh water sources, the DNR requires well casings of varying depths dependent on the depth of the well itself.¹⁶²

Flowback from hydraulic fracturing activities must be stored in tanks or lined pits,¹⁶³ but are exempt from Louisiana Hazardous Waste Regulations.¹⁶⁴ Pits must be constructed above the 100-year floodplain, and temporary containment pits must be closed within six months of well completion.¹⁶⁵ Pits must be closed in a manner that protects the soil, surface water, ground water, and underground sources of drinking water.¹⁶⁶ Before closing a pit, the pit contents are tested for multiple parameters, including pH, heavy metals, and oil and grease content.¹⁶⁷

The well operator is responsible for the proper handling and transportation of exploration and production waste taken offsite for storage, treatment, or disposal.¹⁶⁸ Offsite disposal must be at an approved commercial facility.¹⁶⁹ The operator may elect to dispose of such wastes at a DNR or Department of Environmental Quality (DEQ) permitted facility.¹⁷⁰ Wastes received at a DEQ permitted facility becomes the sole responsibility of the DEQ.¹⁷¹ Furthermore, DEQ regulations require well operators to develop and implement a Spill Prevention and Control Plan.¹⁷²

Recently, the Louisiana DNR adopted a new rule requiring oil and gas well operators to disclose the composition and volume of the fracking fluids they use, after completing the well.¹⁷³ The rule requires disclosure to the Office of Conservation or a public registry, such as “FracFocus.”¹⁷⁴

Wyoming

The Wyoming Oil and Gas Conservation Commission (WOGCC) has the authority to regulate oil and gas development in the state, handles the permitting process, and enforces Wyoming’s oil and gas statutes and regulations. Before drilling activity can commence, the well operator must apply for and obtain a permit to drill or deepen a well.¹⁷⁵ The permit application must include a description of the casing and cementing programs, in addition to a completion and

¹⁶¹ LA. ADMIN. CODE. tit. 43, pt. XIX § 103.

¹⁶² *Id.* § 109.

¹⁶³ *Id.*

¹⁶⁴ *Id.* § 501.

¹⁶⁵ STRONGER, INC., *supra* note 159.

¹⁶⁶ La. Admin. Code tit 43, pt. XIX § 311(A).

¹⁶⁷ *Id.* § 311(C).

¹⁶⁸ *Id.* § 503(D).

¹⁶⁹ *Id.*

¹⁷⁰ *Id.* § 503(E).

¹⁷¹ *Id.*

¹⁷² STRONGER, INC., *supra* note 159, at 11.

¹⁷³ *New hydraulic fracturing regulation requires work permit, disclosure of fluids in Louisiana*, PennEnergy (Oct. 21, 2011),

http://www.pennenergy.com/index/petroleum/display/5558175063/articles/pennenergy/petroleum/exploration/2011/10/new-hydraulic_fracturing.html.

¹⁷⁴ *Id.*

¹⁷⁵ WY. ADMIN. CODE. OIL. GEN. chp. 3 § 8 (2011).

stimulation (hydraulic fracturing) program, which includes the stimulation fluid and proposed chemical additives and their concentrations.¹⁷⁶

For onsite storage of waste associated with the drilling process in pits, the operator must obtain a permit from the WOGCC,¹⁷⁷ and approval from the State Oil and Gas Supervisor.¹⁷⁸ Applications for pit construction shall be approved only if “the pit will not cause the contamination of surface or groundwater, and endanger human health or wildlife.”¹⁷⁹ Under certain circumstances, such as when pits are proposed in areas with shallow groundwater or immediately adjacent to the Green or Colorado River drainage basin, the Supervisor shall require pits to be lined.¹⁸⁰ Additionally, the operator must not “pollute streams, underground water, or unreasonably damage or occupy the surface of the leased premises or other lands,” and is not allowed to discharge any fluid contents of any pit without a permit issued by the Wyoming Department of Environmental Quality.¹⁸¹ Drilling fluids may not be discharged into “live water or into drainages that lead to live waters of the state.”¹⁸²

RECENT DEVELOPMENTS IN HYDRAULIC FRACTURING REGULATION

In April 2011, the Department of the Interior, Bureau of Land Management (BLM) announced that they would be updating their Programmatic Environmental Impact Statement (EIS) for the Allocation of Oil Shale and Tar Sands Resources on Lands Administered by the BLM in Colorado, Utah, and Wyoming.¹⁸³ In 2008, the BLM amended land use plans in Colorado, Utah, and Wyoming to open up approximately two million acres of land to the possible development of oil shale.¹⁸⁴ These amendments were supported by the preparation of a Programmatic EIS and Record of Decision (ROD) as required under the Energy Policy Act of 2005.¹⁸⁵ The BLM will now take a “fresh look” at the 2008 Programmatic EIS and ROD, to determine if it is appropriate for the two million acres to remain available for potential development of oil shale.¹⁸⁶ This process is still ongoing.

On July 28, 2011, the EPA announced a proposal to promulgate a New Source Performance Standard (NSPS), under the Clean Air Act (CAA), that would apply to oil and natural gas exploration and production operations.¹⁸⁷ The NSPS would mandate the use of “reduced emissions completion” technology or pit flaring for all new hydraulically fractured natural gas wells.¹⁸⁸ EPA is proposing the new NSPS in response to a consent decree between

¹⁷⁶ *Id.*; see also *Id.* § 45.

¹⁷⁷ *Id.* chp. 4 § 1(a).

¹⁷⁸ *Id.* § 1(h).

¹⁷⁹ *Id.* § 1(a).

¹⁸⁰ *Id.* § 1(w).

¹⁸¹ *Id.* § 1(ee).

¹⁸² *Id.*

¹⁸³ 76 Fed. Reg. 21003 (Apr. 14, 2011).

¹⁸⁴ *Id.*

¹⁸⁵ *Id.*

¹⁸⁶ *Id.*

¹⁸⁷ *EPA Proposes New Rules to Regulate Air Emissions from Oil and Natural Gas Exploration, Production, Transmission, and Storage Facilities, Including Hydraulic Fracturing Operations*, VINSON & ELKINS, LLP (Jun. 19, 2011)

<http://www.velaw.com/resources/EPAProposesNewRulesRegulateAirEmissionsOilNaturalGasHydraulicFracturingOperations.aspx>.

¹⁸⁸ *Id.*

the EPA and two environmental groups resulting from a lawsuit filed against the EPA under the CAA.¹⁸⁹ The consent decree requires the EPA to promulgate a final rule by February 28, 2012.¹⁹⁰

On October 20, 2011, the EPA announced that it will begin the process of developing standards for wastewater discharges produced by natural gas extraction from underground coalbed and shale formations.¹⁹¹ The announcement acknowledges that the federal government lacks a comprehensive set of regulations for the disposal of wastewater from natural gas extraction activities, and intends to develop a comprehensive set of regulations with the input of industry and public health groups.¹⁹²

More recently, on November 3, 2011, the EPA announced final plans to perform a comprehensive study of water in hydraulic fracturing.¹⁹³ The study will look at the full cycle of water in fracking, from its acquisition before use to its ultimate treatment and disposal.¹⁹⁴ EPA plans to release initial research findings in 2012, and a final report in 2014.¹⁹⁵ Sites to be examined by the EPA in the study include drilling sites in Colorado, Pennsylvania, Louisiana, North Dakota, and Texas.¹⁹⁶ The study's findings will undoubtedly influence the course of future federal regulation of hydraulic fracturing.

CONCLUSION

The United States, as does Europe, contain vast amounts of oil and natural gas in shale formations. For decades, the US oil and gas industry has employed the process of hydraulic fracturing to exploit these natural resources. The process raises significant concerns about air and groundwater pollution, which has led to a polarizing, often heated public debate that continues to this day, and will likely continue for the foreseeable future.

Current US federal regulation of hydraulic fracturing, and oil and gas industry extraction operations, largely consists of a string of *ad hoc* exemptions and little oversight. The bulk of the regulatory responsibility is given to the several states, and these regulations vary widely in their complexity and level of protection of human health and the environment. New Jersey, for example, has banned hydraulic fracking.

New research findings, proposed regulations, and allegations of groundwater contamination are released on an almost daily basis. With newly proposed federal regulations, studies being conducted by the states, the federal government, public interest NGOs and mounting pressure from environmental groups, the state of hydraulic fracturing regulation in the U.S. is, quite literally, up in the air.

¹⁸⁹ *Id.*

¹⁹⁰ *Id.*

¹⁹¹ *EPA Announces Schedule to Develop Natural Gas Wastewater Standards*, ENVTL. PROT. AGENCY. (Oct. 20, 2011), <http://yosemite.epa.gov/opa/admpress.nsf/0/91E7FADB4B114C4A8525792F00542001>.

¹⁹² *Id.*

¹⁹³ Nick Snow, *EPA announces final hydraulic fracturing research plan*, OIL & GAS J. (Nov. 4, 2011), <http://www.ogj.com/articles/2011/11/epa-announces-final-hydraulic-fracturing-research-plan.html>.

¹⁹⁴ *Id.*

¹⁹⁵ *Id.*

¹⁹⁶ Michael Rubinkam, *EPA to probe gas drilling's toll on drinking water*, ASSOCIATED PRESS (Nov. 4, 2011), <http://www.chron.com/news/article/EPA-to-probe-gas-drilling-s-toll-on-drinking-water-2250420.php>.

In Europe, moratoria and outright prohibitions have been imposed on certain types of hydraulic fracturing. In early March, 2011, French Prime Minister Francois Fillon announced that "unconventional" oil shale exploration and extraction activities would not be authorized in the French territory.¹⁹⁷ More recently, in October the French government canceled all three exploration permits on shale-gas fields after Total SA and U.S.-based Schuepbach Energy, LLC—which hold the rights—maintained their intention to drill using hydraulic fracturing. In a joint statement, France's Minister of Energy, Eric Besson, and Minister of the Environment, Nathalie Kosciusko-Morizet, said that the three permits, which represent all of the country's potential shale-gas fields, had been cancelled after the companies submitted a mandatory report about their drilling techniques in which they maintained plans to use hydraulic fracturing.¹⁹⁸

Shale gas now accounts for one quarter of all U.S. gas production, and the Energy Information Administration (EIA) forecasts that this proportion will double by 2035. According to a study by IHS Cambridge Energy Research Associates, European production levels from unconventional gas sources, including shale, could range from 60 billion cubic metres (bcm), less than half of current shale gas production in North America, to 200 bcm by 2025.¹⁹⁹ With such overwhelming natural resources, which could relieve EU gas energy dependence on Russia and Eastern Europe, can development of these vast reserves be in Europe's not too distant future?

¹⁹⁷ Letter of March 11, 2011 from Prime Minister Francois Fillon to the Ministers of the Environment, Interior and the Economy (Commerce).

¹⁹⁸ Geraldine Amiel, *France Cancels Shale-Gas Permits Over Fracking Impasse*, THE WALL STREET JOURNAL (Oct. 4, 2011), <http://online.wsj.com/article/SB10001424052970204612504576608983814069012.html>.

¹⁹⁹ Reuters, *Hydraulic fracturing to revolutionize world energy markets*, THE VANCOUVER SUN (Oct. 31, 2011), <http://www.vancouversun.com/business/resources/Hydraulic+fracturing+revolutionize+world+energy+markets/5632987/story.html?id=5632987#ixzz1e6QZBGRI>