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TRADE SECRETS, DISCLOSURE, AND DISSENT IN A FRACTURING ENERGY REVOLUTION

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INTRODUCTION

In the United States, Congress has traditionally relied, in part, upon citizen participation to control industrial activity and its effects on public welfare. It has also required industry to disclose certain information to the public in order to enable this participation. Early on in the movement toward expanded federal regulation of industry, Congress granted broad standing to individuals in generous “private attorney general” provisions in environmental and business-related statutes.¹ It also required agencies to follow strict notice-and-comment rulemaking procedures, which directed agencies to publicize proposed rules and receive citizen comments.² Through statutes such as the Emergency Planning and Community Right-to-Know Act (EPCRA) and the Safe Drinking Water Act (SDWA), Congress further mandated that industry publish information about releases of toxic materials³ and that public water providers disclose violations of water quality standards.⁴ These statutes all envisioned that informed citizens would influence industrial activity through open public venues. But a recent revolution in energy development—inspired by a new technique to extract natural gas from

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1. See, e.g., Clean Water Act of 1972 § 505, 33 U.S.C. § 1365 (2006) (providing that “any citizen” may bring an action for certain violations of the Act); Clean Air Act of 1970 § 304, 42 U.S.C. § 7604 (2006) (providing that “any person” may bring a citizen action for certain violations of the Act); see also Organized Crime Control Act of 1970 §901(a), 18 U.S.C. § 1964(c) (2006) (providing that “any person” injured due to a violation of the Act may sue).

2. Administrative Procedure Act of 1946 § 4, 5 U.S.C. § 553 (2006).

3. See Emergency Planning and Community Right-to-Know Act of 1986 § 313, 42 U.S.C. § 11023 (requiring annual preparation of “toxic chemical release forms”).

4. See Safe Drinking Water Act of 1974 §1414, 42 U.S.C. § 300g-3(c)(2)(C) (requiring notification of SDWA violations).

shale—called slickwater hydraulic fracturing (fracing)⁵—does not fall squarely within traditional venues for public disclosure and participation.⁶ In September 2010, the Environmental Protection Agency (EPA) took one step toward the “publicization” of fracing when it sent a letter to nine natural gas companies, requiring that they disclose to the agency the chemicals used in fracing in order to support a comprehensive EPA study of the potential drinking water quality and public health impacts of fracing.⁷ Although this administrative action appears to open a door to public access to information veiled by trade secrets, it is not currently clear that natural gas companies will promptly disclose the requested information—as shown by Halliburton’s refusal to disclose information in response to the letter and a subsequent subpoena issued by EPA⁸—or that the information will be publicly available. Unless Congress or state legislatures partially remove trade secret protections from fracing fluids, communities experiencing the brunt of the energy boom may have inadequate tools to evaluate and address the potential impacts of this development.

I. THE REGULATORY ENVIRONMENT AND ARGUMENTS FOR SECRECY

Fracing to extract natural gas from shales has rapidly expanded in recent years, raising questions of appropriate regulatory response and the extent to which the public should have a say in such a response. This Part explores this expansion and one of the central issues to emerge—some fracing companies’ resistance to disclosing the chemicals used in fracing.

5. There are several types of hydraulic fracturing (also known as “fracking” or “fracing”). Slickwater hydraulic fracturing—described simply as “fracing” in this Article—is distinguished by its use of large volumes of water and often by horizontal drilling. See Div. of Mineral Res., N.Y. State Dep’t of Envtl. Conservation, Draft Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Reform Program 3–5 (2009), available at <ftp://ftp.dec.state.ny.us/dmn/download/OGdSGEISFull.pdf> (on file with the *Columbia Law Review*) (defining slickwater fracing). Other types of fracing, as distinguished from slickwater fracing, have been common for more than fifty years. See *Crocker v. Humble Oil & Ref. Co.*, 419 P.2d 265, 271 (Okla. 1965) (describing first commercial fracing as occurring in 1949).

6. See Hannah Wiseman, *Regulatory Adaptation in Fractured Appalachia*, 21 *Vill. Envtl. L.J.* 229, 243–47 (2010) (describing exemptions).

7. Letter from the Envtl. Prot. Agency to BJ Services et al. (Sept. 9, 2010) [hereinafter EPA Letter], available at <http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/upload/HFvoluntaryinformationrequest.pdf> (on file with the *Columbia Law Review*); Press Release, Envtl. Prot. Agency, EPA Formally Requests Information from Companies About Chemicals Used in Natural Gas Extraction (Sept. 9, 2010), available at <http://Yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/ec57125b66353b7e85257799005c1d64!OpenDocument> (on file with the *Columbia Law Review*).

8. Subpoena from the Envtl. Prot. Agency to Halliburton (Nov. 9, 2010), available at http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/upload/hydrofract_halliburton_subpoena_11-9-2010.pdf (on file with the *Columbia Law Review*).

A. An Energy “Revolution” Through Natural Gas Production

Many policymakers and energy experts have assumed, since the 1970s, that America is rapidly running out of natural gas⁹—a crucial energy source that supplies nearly a quarter of this country’s energy.¹⁰ But in the 1990s in Texas, oil and gas companies perfected a method to extract gas trapped within shale formations.¹¹ Through fracing, gas operators drill wells thousands of feet into shale, punch holes in the sides of the wells, and inject millions of gallons of water¹² and potentially several thousand gallons of chemicals down the wells.¹³ This fractures the shale around the wells, exposing more surface area and releasing trillions of cubic feet of natural gas. Companies’ success with fracing in Texas was astounding. By the beginning of this decade, the Barnett Shale of north central Texas was a confirmed font of natural gas.¹⁴

Fracing has since expanded to other shale formations in the United States, such as the Fayetteville in Arkansas¹⁵ and the Marcellus in New York, Pennsylvania, Ohio, and West Virginia.¹⁶ Although domestic gas supplies remain limited and will only last for an estimated one hundred years,¹⁷ this extraction technique will bolster America’s energy

9. See Jacqueline Lang Weaver, *The Traditional Petroleum Fuel-Based Economy: An “Eventful” Future*, 36 *Cumb. L. Rev.* 505, 516 (2006) (explaining that in the late 1970s, “both industry and government experts estimated that the United States had . . . about a ten-year supply [of gas reserves] at then-current consumption rates”).

10. See Energy Info. Admin., U.S. Primary Energy Flow by Source and Sector, 2009 (2010), available at http://www.eia.doe.gov/aer/pecss_diagram.html (on file with the *Columbia Law Review*) (illustrating production of 23.4 quadrillion BTU’s of natural gas in 2009).

11. See John A. Harper, *The Marcellus Shale—An Old “New” Gas Reservoir in Pennsylvania*, Pa. *Geology*, Spring 2008, at 2, 10, available at <http://www.dcnr.state.pa.us/topogeo/pub/pageolmag/pdfs/v38n1.pdf> (on file with the *Columbia Law Review*) (describing use of “slick-water fracs” that allow for “more efficient recovery of a larger volume of [natural] gas”).

12. See R.R. Comm’n of Tex., *Water Use in the Barnett Shale* (Apr. 7, 2010), at http://www.rrc.state.tx.us/barnettshale/wateruse_barnettshale.php (on file with the *Columbia Law Review*) (describing hydraulic fracing procedure).

13. See Daniel J. Soeder & William M. Kappel, U.S. Geological Survey, *Water Resources and Natural Gas Production from the Marcellus Shale 4* (2009), available at <http://pubs.usgs.gov/fs/2009/3032/pdf/FS2009-3032.pdf> (on file with the *Columbia Law Review*) (“[A] three million gallon hydrofrac job . . . would result in about 15,000 gallons of chemicals in the waste [water].”).

14. See R.R. Comm’n of Tex., *Newark, East (Barnett Shale) Gas Well Gas Production 1993 Through 2009*, at http://www.rrc.state.tx.us/barnettshale/NewarkEastField_1993-2009.pdf (on file with the *Columbia Law Review*) (last visited Nov. 10, 2010) (showing rising production by 2000).

15. See J. Daniel Arthur et al., ALL Consulting, *Hydraulic Fracturing Considerations for Natural Gas Wells of the Fayetteville Shale 7* (2008), available at <http://www.aogc.state.ar.us/ALL%20FayettevilleFrac%20FINAL.pdf> (on file with the *Columbia Law Review*) (describing development of shale in Arkansas).

16. See Wiseman, *supra* note 6, at 240–41 & nn.65–73 (describing Marcellus expansion).

17. See Natural Gas Supply Ass’n, *How Much Natural Gas is There?*, at <http://www.naturalgas.org/overview/resources.asp> (on file with the *Columbia Law Review*) (last visited Nov. 10, 2010) (noting natural gas is nonrenewable resource).

independence for this period.

B. *Venues for Public Participation in Natural Gas Policymaking*

Energy booms are only beneficial to communities when all residents—not just those who wish to reap profits—can participate in decisions about energy development. But just as there is little available public information about the chemicals used in fracking, there are few venues for public participation in fracking decisions. Individuals can participate in state regulatory and legislative processes, encourage modified federal regulation, or bring tort actions in the courts. Indeed, citizens have already shown a strong commitment to participation: The EPA had to reschedule an August 2010 hearing in New York about an environmental study of fracking in order to accommodate the crowd.¹⁸ But local communities in some of the states with the most abundant shale gas cannot enact their own laws to address energy development. In New York and Pennsylvania, for example, local regulation of oil and gas development is strictly preempted,¹⁹ although towns may limit the location of fracking operations through zoning.²⁰ Because most specific controls of fracking occur only at the state regulatory and legislative levels (particularly in several of the states experiencing much of the fracking activity or proposed activity), high quality citizen participation within these forums is essential, and quality participation by individuals requires public access to information.

C. *Trade Secrets and Limited Public Information*

According to the vague information that is already publicly available, fracking companies, combined, use small quantities of more than 250 unique types of chemicals.²¹ These chemicals range from benign household substances to chemicals that, in large doses at high concentrations, can cause serious health effects.²² One fracking company typically uses just a handful of substances at one site,²³ but the public currently lacks the information necessary to determine which chemicals are present. Gas companies with 10,000 or more pounds of hazardous chemicals at a site must post material safety data sheets on their fracture sites and provide the sheets, which indicate the identity and

18. David Falcheck, EPA Postpones Gas Meeting, *Times-Trib.* (Scranton, Pa.), Aug. 11, 2010, at A5.

19. See N.Y. *Envtl. Conserv. Law* § 23-0303(2) (McKinney 2010); 58 Pa. *Cons. Stat. Ann.* § 601.602 (West 2010).

20. See *Huntley & Huntley, Inc. v. Borough Council of Oakmont*, 964 A.2d 855, 865–69 (Pa. 2009) (holding that town’s restriction of “extraction of minerals” to certain residential district was acceptable, but that the town too narrowly interpreted definition of “extraction of minerals” to exclude fracking).

21. See *Div. of Mineral Res., N.Y. State Dep’t of Env’tl. Conservation*, *supra* note 5, at 5-101 to 5-110 (describing chemicals and potential health effects).

22. *Id.*

23. *Id.* at 5-69.

characteristics of chemicals used, to local authorities.²⁴ But even a motivated citizen who requests a material safety data sheet from local authorities²⁵ and hypothetically manages to obtain the sheet without trade secret chemicals having been redacted²⁶ will not know—prior to a frac job—what chemicals will be present. And although several states require disclosure of chemicals to a state environmental agency or to health officials,²⁷ these laws do not typically grant public access to the chemical information.²⁸ Finally, beyond material safety data sheets, federal law provides no specific disclosure requirements²⁹ for the

24. See Emergency Planning and Community Right-to-Know Act of 1986 §§ 312–313, 42 U.S.C. §§ 11021–11022 (2006) (requiring material safety data sheets and hazardous chemical inventory forms when certain quantities of hazardous chemicals are present at facility); 40 C.F.R. § 355 App. A (2010) (setting quantities of different chemicals that trigger reporting requirements); Community Right-to-Know Reporting Requirements, 55 Fed. Reg. 30,632–37 (July 26, 1990) (explaining adoption of threshold of 10,000 pounds of hazardous chemicals and lower quantities for “extremely hazardous substances”).

25. See Emergency Planning and Community Right-to-Know Act of 1986 § 311(c)(2), 42 U.S.C. § 11021(c)(2) (allowing person to request material safety data sheet).

26. The Occupational Safety and Health Administration’s hazardous communications regulations—referenced in EPCRA—allow entities to “withhold the specific chemical identity, including the chemical name and other specific identification of a hazardous chemical, from the material safety data sheet.” 29 C.F.R. § 1910.1200(i) (2010). These regulations apply to “all employers with employees exposed to hazardous chemicals in their workplaces.” Hazard Communication, 52 Fed. Reg. 31,852 (Aug. 24, 1987); see 29 C.F.R. § 1910.1200(b) (2010) (“This section requires . . . all employers to provide information to their employees about the hazardous chemicals to which they are exposed.”).

27. See 25 Pa. Code § 78.55 (2009) (requiring plan for “control and disposal of fluids”); Pa. Dep’t of Env’tl. Prot., Oil and Gas Management Practices, *in* Oil and Gas Operators Manual 4-i, 4-2 (2001), available at <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-48243/chap4.pdf> (on file with the *Columbia Law Review*) (requiring disclosure to Pennsylvania Department of Environmental Protection as part of § 78.44 plan); see also Md. Dep’t of the Env’t, Application for Gas Exploration and Production § 4, Marcellus Shale Wells/Hydro Fracturing Addendum (2008), available at <http://www.mde.state.md.us/assets/document/permit/MDE-LMA-PER045.pdf> (on file with the *Columbia Law Review*) (requiring disclosure to Maryland Department of the Environment on application form no. MDE/LMA/PER.045); Div. of Mineral Res., N.Y. State Dep’t of Env’tl. Conservation, *supra* note 5, at 5-149 (describing Colorado’s, West Virginia’s, Wyoming’s, and Louisiana’s disclosure requirements); *id.* at app. 6 (proposing New York form that would require disclosure of chemicals to Department); Wyo. Oil & Gas Conservation Comm’n, Operational Rules, Drilling Rules, *in* General Agency, Board or Commission Rules 3-1, 3-18 (2010), available at http://wogcc.state.wy.us/downloads/proposed_rules_2010/Post8jun10/CH3_8jun10.pdf (on file with the *Columbia Law Review*) (requiring disclosure to Wyoming Oil and Gas Conservation Commission).

28. See Wyo. Oil & Gas Conservation Comm’n, *supra* note 27, at 3-18 (requiring disclosure to Commission). But see Rebecca Torrellas, Wyoming Forces Frac Fluid Disclosure, *E&P*, Sept. 2, 2010, at <http://www.epmag.com/2010/September/item66859.php> (on file with the *Columbia Law Review*) (describing how Wyoming anticipates that citizens will have access to chemical information).

29. A bill requiring disclosure of fracking chemicals (the FRAC Act) was introduced in the House and Senate but remains in Committee. See Fracturing Responsibility and Awareness of Chemicals (FRAC) Act of 2009, H.R. 2766, 111th Cong. (2009); FRAC Act, S.

chemicals used in fracking and does not require oil and gas producers to report annual releases of toxic substances under the EPCRA, although it does require emergency reporting if sufficient quantities of a hazardous substance are released.³⁰

Natural gas companies have typically resisted disclosure of the chemicals used in fracking by arguing that the information is a trade secret.³¹ Although no legal decisions have yet established whether the composition of a company's fracking fluid is a trade secret,³² it likely is. In most states,³³ a trade secret consists of information, "including a

1215, 111th Cong. (2009); The Library of Congress, Thomas, Bill Summary & Status: H.R. 2766, at <http://thomas.loc.gov/cgi-bin/bdquery/z?d111:HR02766:@@K> (on file with the *Columbia Law Review*) (last visited Nov. 10, 2010) (showing referral); The Library of Congress, Thomas, Bill Summary & Status: S. 1215, at <http://thomas.loc.gov/cgi-bin/bdquery/z?d111:SN01215>: (on file with the *Columbia Law Review*) (last visited Nov. 10, 2010) (also showing referral).

30. Emergency Planning and Community Right-to-Know Act of 1986 § 313(b), 42 U.S.C. § 11023(b); 40 C.F.R. § 372.23 (2010) (excluding Standard Industrial Classification Major Group 13: Oil and Gas Extraction in facilities that must prepare toxic chemical release forms under EPCRA); see also Emergency Planning and Community Right-to-Know Act of 1986 § 304, 42 U.S.C. § 11004 (requiring reporting of release of "extremely hazardous substance" listed in section 103(a) of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)); Comprehensive Environmental Response, Compensation, and Liability Act § 103(a), 42 U.S.C. § 9603(a) (requiring notification to National Response Center of release of "hazardous substance . . . in quantities equal to or greater than those determined pursuant to" section 102 of CERCLA); Comprehensive Environmental Response, Compensation, and Liability Act § 102(a), 42 U.S.C. § 9602(a) (directing EPA to identify hazardous substances for which notification will be required and allowing EPA to determine reportable quantities for substances); 40 C.F.R. § 302.4, Table 302.4 (2010) (listing hazardous substances to which emergency release notification requirements apply, including some substances that New York and Pennsylvania have indicated may be present at some frac sites, and listing minimum quantities that must be released to trigger reporting).

31. See Katie Howell, *More Oversight Sought for Hydraulic Fracturing*, N.Y. Times, Nov. 4, 2009, at <http://www.nytimes.com/gwire/2009/11/04/04greenwire-more-oversight-sought-for-hydraulic-fracturing-35961.html> (on file with the *Columbia Law Review*) (describing some companies' resistance to disclosure). But see Katie Howell, *Spills, Looming Regulations Spur Natural Gas Industry Toward Disclosure*, N.Y. Times, Oct. 1, 2009 [hereinafter Howell, *Toward Disclosure*], at <http://www.nytimes.com/gwire/2009/10/01/01greenwire-spills-looming-regulations-spur-natural-gas-ind-5759.html?pagewanted=all> (on file with the *Columbia Law Review*) (reporting some companies' expressed willingness to disclose).

32. Interestingly, an old case addressing antitrust concerns when one oil producer and refiner proposed to acquire another suggests, in dicta, that hydraulic fracturing may not be a trade secret. The case discusses how the company proposing to acquire another was one of the largest producers of Penn Crude (a particular type of oil), and how secondary recovery techniques for Penn Crude included "hydraulic fracturing." But the question of whether this technique in particular was a trade secret was not at issue in the case. See *United States v. Pennzoil Co.*, 252 F. Supp. 962, 967–69, 987 (D. Pa. 1965) (describing oil production process and, in addressing divestiture, mentioning "[t]here has been little, if any, evidence of trade secrets which would pass on the permissible acquisition at the present time").

33. See Unif. Trade Secrets Act § 1, 14 U.L.A. 529–30 (2005) (listing forty-four states and District of Columbia as adopting the Act); *id.* at 539–44 (listing no states that have modified definition of "trade secret" to exclude "formulas").

formula,” which has “independent economic value”³⁴ due to the private nature of the information and “is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.”³⁵ Fracing fluids appear to meet each of these criteria.

First, fracing fluids are mixed according to unique formulas, which dictate the chemicals to be used in the fluid and their proportions.³⁶ It appears that fracing companies cannot easily divine—without some research and investment—a “magic combination” that will work perfectly in every shale formation; the exact contents of these mixtures, therefore, are not likely common knowledge within the industry.³⁷ The formulas also provide unique economic advantages to a fracing company. Some help to reduce the friction of water as it flows through the wellbore and fractures,³⁸ while others control clay that forms in the shale and prevent it from plugging the fractures,³⁹ among other functions. A company that uses a superior proportion of chemicals within its fracing fluid to control clay formation in the shale, for example, will likely have lower costs and higher rates of gas production than a company with a less effective fluid. And even if fracing companies unknowingly use nearly identical formulas in their fracing fluids, trade secrets—unlike patents—need not be novel and thus may be maintained by multiple entities.⁴⁰ Although courts have not yet addressed whether fracing fluid formulas are trade secrets, at least one court has treated other formulas used to improve processes in the petroleum industry as unique products with potential trade secret qualities or even patentable status.⁴¹

Finally, it also appears that fracing companies have made reasonable efforts to maintain the secrecy of their formulas; many of them have avoided disclosure, as shown by the EPA’s letter to fracing companies.⁴²

34. Unif. Trade Secrets Act § 1(4), 14 U.L.A. 538.

35. *Id.*

36. Ground Water Prot. Council, U.S. Dep’t of Energy, Modern Shale Gas Development in the United States: A Primer 62 (2009), available at http://www.netl.doe.gov/technologies/oil-gas/publications/EPreports/Shale_Gas_Primer_2009.pdf (on file with the *Columbia Law Review*) (explaining that formulas vary).

37. This is in contrast to “[a] method of casting, for example,” that is “unknown to the general public but readily known within the founding industry”—a method that would not count as a trade secret. Unif. Trade Secrets Act § 1(4), 14 U.L.A. 538.

38. See Div. of Mineral Res., N.Y. State Dep’t of Envtl. Conservation, *supra* note 5, at 5-42 (describing chemicals’ purposes).

39. *Id.*

40. See, e.g., *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 476 (1974) (explaining “[n]ovelty, in the patent law sense, is not required for a trade secret”).

41. See *Gipson v. Mattox*, No. 05-0601-WS-C, 2006 WL 3421244, at *1 (S.D. Ala. Nov. 27, 2006) (discussing inventorship dispute over patent for chemical formula used to treat “dry gas pipe or processed fluid pipe lines that are susceptible to the build up of iron sulfide deposits, by complexing iron sulfide found in these pipe lines” and not disputing patentable nature of such formula).

42. See EPA Letter, *supra* note 7, at 3 (requesting information on hydraulic fracturing and ensuring that any information provided will be confidential if so requested). But see Howell, *Toward Disclosure*, *supra* note 31 (describing voluntary disclosure of fracing fluid chemicals).

This is all that is likely required, as companies need not take extraordinary measures against spying competitors' or the public's attempts to obtain information.⁴³

II. ARGUMENTS FOR PUBLIC DISCLOSURE

Although fracking formulas likely are trade secrets under most state laws, this Part argues that public policy concerns outweigh the benefits of maintaining the formulas' full trade secret status.

A. *Public Demands for Information*

As fracking in shale formations has expanded, public attention to fracking and requests for information—and particularly information about the chemicals in fracking fluids—have grown. Communities have often welcomed the fracking development as mineral leases, employee housing demand, and taxes have bolstered local economies.⁴⁴ But at the same time, growing concerns have led citizens to demand more information and expanded means to influence energy development. First and foremost, they are concerned about the quality of their water.⁴⁵ At the EPA's public hearings this past summer, citizens arrived with containers of dirtied well water and argued that fracking had contaminated the water.⁴⁶ New York City has also vehemently opposed fracking in the watershed of its unfiltered drinking water supply for fear of contamination.⁴⁷ Natural gas companies argue that there has never

43. See, e.g., *Colo. Supply Co. v. Stewart*, 797 P.2d 1303, 1306 (Colo. App. 1990) (“Extreme and unduly expensive procedures need not be taken.”).

44. See Timothy Considine et al., *An Emerging Giant: Prospects and Economic Impacts of Developing the Marcellus Shale Natural Gas Play 16–19* (2009), available at <http://www.allegHENYconference.org/PDFs/PELMisc/PSUStudyMarcellusShale072409.pdf> (on file with the *Columbia Law Review*) (describing economic benefits of natural gas development); Mary Esch, *EPA Hears “Fracking” Views*, *Tulsa World*, Sept. 14, 2010, at E1 (describing low-income communities' support for fracking in New York).

45. See Mike Soraghan, *Obscure Regulator Hits Brakes on Northeast Shale Drilling*, *N.Y. Times*, Sept. 13, 2010, at <http://www.nytimes.com/gwire/2010/09/13/13greenwire-obs-cure-regulator-hits-brakes-on-northeast-sha-11558.html?scp=3&sq=fracturing&st=cse> (on file with the *Columbia Law Review*) (describing citizens' concerns). It appears that activities at the surface, including the storage of flowback water on site and its eventual disposal, as well as chemical spills, may be more important than concerns surrounding the potential for fracking to contaminate groundwater. This Article does not suggest that groundwater quality should be the central focus of study and regulation but rather observes that it has been the public's central concern, rightly or wrongly.

46. See Esch, *supra* note 44 (showing man holding jug of water); Randy Woock, *EPA Gathers Input on Hydraulic Fracturing*, *Trinidad Times Indep.* (Colorado), July 16, 2010, at 1 (showing man holding jar of water).

47. See N.Y. City Dep't of Env't'l Prot., *New York City Comments on: Draft Supplemental Generic Environmental Impact Statement (dSGEIS) on the Oil, Gas and Solution Mining Regulatory Program* (2009), available at <http://www.tcgasmap.org/media/NYC%20DEP%20Draft%20SGEIS%20Comments.pdf> (on file with the *Columbia Law Review*) (expressing strong reservations about fracking in the watershed); Edith Honan, *NYC's Bloomberg Opposes Gas Drilling in Watershed*, *Reuters*,

been a proven incident of contamination of underground water supplies from fracking and that it is not a concern.⁴⁸ In Pennsylvania, however, families have sued fracking companies, alleging that the companies contaminated their water supplies with methane following drilling and fracking.⁴⁹ The contamination issue remains murky and hotly disputed.

Citizens are also worried about potential exposure to chemicals at the surface, where fracturing chemicals are transferred and wastewater from fracking is temporarily stored.⁵⁰ In Pennsylvania, for example, natural gas companies have mistakenly spilled fracking chemicals at well sites, sometimes forcing removal of the soil.⁵¹ And in the wake of a fracking fluid spill in Colorado, an emergency room nurse alleged that she experienced serious problems with her stomach, liver, and lungs after treating a worker who had been involved in the spill.⁵² Due to most fracking companies' consistent claims that fracking fluid formulas are trade secrets, however, these public concerns cannot be adequately addressed with the information currently available. To predict the potential effects of fracking—particularly on the surface, where there is a limited record of incidents such as spills—the chemicals within the fluids must be known.

B. *Improving Public Disclosure*

Despite fracking companies' legitimate arguments for keeping fracking fluid formulas confidential, the strong benefits of public disclosure of fracking chemicals suggest that Congress or state legislatures⁵³ should partially remove trade secret protections for fracking

Jan. 25, 2010, at <http://www.reuters.com/article/idUSN2519291120100125> (on file with the *Columbia Law Review*) (reporting Mayor Bloomberg's strong statements against fracking in the watershed).

48. Esch, *supra* note 44.

49. Fred Bosselman & Joel B. Eisen et al., *Energy, Economics, and the Environment* 284–85 (3d ed. 2010). See also Laura Legere, *Cabot Facing Legal Action*, *Times-Trib.* (Scranton, Pa.), Nov. 20, 2009, at A1 (describing federal lawsuit filed by families claiming drilling damaged their health and property); Press Release, Parker Waichman Alonso LLP, *Pennsylvania Fracking Lawsuit Claims Natural Gas Drilling Fouled Water Wells*, Sept. 14, 2010, at <http://www.yourlawyer.com/articles/title/pennsylvania-fracking-lawsuit-claims-natural-gas-drilling-fouled-water-wells> (on file with the *Columbia Law Review*) (describing lawsuit filed against Southwest Energy Company).

50. See, e.g., *Natural Gas Drilling in the New York City Watershed: Oversight Hearing Before the Comm. on Envtl. Prot. of the N.Y.C. Council*, 2008 Leg., 2008 Session, 115–120 (N.Y. 2008) (testimony of Dusty Horwitt, Senior Analyst for Public Lands, Environmental Working Group), available at <http://legistar.council.nyc.gov/View.ashx?M=F&ID=677318&GUID=D5F19027-F7DD-4468-96C5-A5AF27FB955C> (on file with the *Columbia Law Review*) (discussing concerns about chemicals at surface).

51. See Laura Legere, *State Shuts Down Cabot*, *Times-Trib.* (Scranton, Pa.), Sept. 26, 2009, at A1 (describing 8,400-gallon spills of gel and water); James Loewenstein, *DEP Fines Chesapeake, Schlumberger for Acid Spill in Asylum Twp.*, *Times-Trib.* (Scranton, Pa.), Dec. 8, 2009, at A1 (describing hydrochloric acid spill).

52. Jim Moscou, *A Toxic Spew?: Officials Worry About Impact of 'Fracking' of Oil and Gas*, *Newsweek*, Aug. 20, 2008, at <http://www.newsweek.com/2008/08/19/a-toxic-spew.html> (on file with the *Columbia Law Review*).

53. The EPA believes that it has the authority to obtain fracking chemical information,

fluids. In addition to improving the quality of citizen participation in fracking policy, better information about fracking chemicals could allow the public to monitor agencies, ensuring that they are adequately regulating the practice. Better information could help to verify or negate claims of contamination and could assist medical professionals—who might not have access to the fracking site—to locate the causes of symptoms if a worker or other individual were mistakenly exposed to chemicals at the surface. Further, better information could support cleanup efforts where fracking fluid spills occur. Although spill response teams test materials at the site to identify the chemicals spilled,⁵⁴ ex ante information about the chemicals likely present could allow for a more rapid and effective response. Public knowledge of information also could, in general, “promot[e] individual autonomy by facilitating the ability of individuals to make choices about the risks to which they are exposed.”⁵⁵ And finally, the publicization of information could spur fracturing companies to seek out safer chemicals if any raised red flags.⁵⁶

The challenge of removing trade secret protection for fracking fluids, however, is to identify the ideal level of disclosure, as there are several types of chemical information associated with fracking fluids. At the most general level, there are “classes” of fracking fluid additives, such as “acid[s],” “clay stabilizer[s],” or “friction reducer[s].”⁵⁷ Knowledge of

as evidenced by its letter and its indication that it will explore legal alternatives to “compel submission” if companies do not comply. See EPA Letter, *supra* note 7, at 3. Indeed, the EPA may have the authority to obtain information under the Toxic Substances Control Act (TSCA), which allows the agency to require companies to produce data on a “chemical substance or mixture” where such mixture may “present an unreasonable risk of injury to health or the environment” or such risk is unknown. See 15 U.S.C. § 2603 (2006) (authorizing EPA to require testing on health and environmental effects of chemical substances). But companies will still be able to submit confidential data under this requirement. See U.S. Gov’t Accountability Office, GAO 05-458, *Chemical Regulation: Options Exist to Improve EPA’s Ability to Assess Health Risks and Manage Its Chemical Review Program* 31–34 (2005), available at <http://www.gao.gov/new.items/d05458.pdf> (on file with the *Columbia Law Review*) (describing how TSCA allows submission of confidential information and how companies frequently use this provision). Courts could override trade secret claims on a case-by-case basis where the public interest overrides the need for secrecy, but the widespread public benefits of disclosure suggest that case-by-case analysis would be inefficient and unduly burdensome. Congress, on the other hand, could likely remove states’ common law trade secret protections for fracking fluids, as could state legislatures. Indeed, Congress’s proposed “FRAC Act” would require state agencies to make “the disclosure of chemical constituents” in fracking fluids publicly available. H.R. 2766, 111th Cong. § 2(b) (2009).

54. See, e.g., Laura Legere, *An Ocean of Trouble: Chemicals Used Can Be Mystery*, *Times-Trib.* (Scranton, Pa.), June 22, 2010, at A1 [hereinafter Legere, *Chemicals Used*] (explaining how Pennsylvania’s Department of Environmental Protection takes samples at spill sites).

55. Albert C. Lin, *Deciphering the Chemical Soup: Using Public Nuisance to Compel Chemical Testing*, 85 *Notre Dame L. Rev.* 955, 989 (2010).

56. Bradley C. Karkkainen, *Information as Environmental Regulation: TRI and Performance Benchmarking, Precursor to a New Paradigm?*, 89 *Geo. L.J.* 257, 295–309 (2001) (describing how required disclosure can improve environmental performance and encourage self-regulation).

57. Div. of Mineral Res., N.Y. State Dep’t of Envtl. Conservation, *supra* note 5, at 5-44.

the class of a fluid will have limited use, as one type of friction reducer could have very different properties from the next. Within these classes of fluids are the “products,” which are mixtures of chemicals that achieve the function of each class—a cocktail of chemical constituents that reduces friction, for example.⁵⁸ Finally, there are the chemical constituents of products—the specific chemicals that are mixed together to create a fracking product.⁵⁹

New York’s Department of Environmental Conservation has already published a report with general information about the chemical constituents potentially found in fracking solutions,⁶⁰ and Pennsylvania’s Department of Environmental Protection has released similar information.⁶¹ The public needs more detailed information, however, in order to have an accurate understanding of each chemical’s use; different shale formations, and even different well sites within one formation, may require different chemicals.⁶² After a fracking fluid spill at a farm in Pennsylvania, for example, the chemicals identified by the state’s environmental agency at the site did not, according to a local newspaper, match the chemicals on the agency’s public list of potential fracking chemicals used.⁶³ The public needs to know the chemical constituents of each fracking company’s fracking fluids used in each shale formation and the identification numbers associated with each constituent.⁶⁴

Full loss of trade secret protection for fracking fluids is not necessary. Some protection of product identity—including the exact proportions of various chemical constituents within a product—could remain to ensure that companies continue to gain independent economic benefits from their formulas and have incentives to innovate. Information about concentrations and proportions might be better sought through

58. *Id.* These products have traditionally received trade secret protection, thus necessitating hypotheticals; their names and contents are not publicly available. See *id.* at 5-51 (refusing to link chemical constituents to product names and citing trade secrets).

59. *Id.* at 5-45 to 5-51.

60. *Id.* at 5-45 to 5-61.

61. Bureau of Oil & Gas Mgmt., Pa. Dep’t of Envtl. Prot., *Chemicals Used by Hydraulic Fracturing Companies in Pennsylvania for Surface and Hydraulic Fracturing Activities* (2010), available at http://www.dep.state.pa.us/dep/deputate/minres/oilgas/new_forms/marcellus/Reports/Frac%20list%206-30-2010.pdf (on file with the *Columbia Law Review*).

62. See U.S. Dep’t of Energy, *supra* note 36, at 62 (noting different fracturing jobs require distinct additive mixtures serving different functions).

63. Legere, *Chemicals Used*, *supra* note 54.

64. The American Chemical Society maintains a database of Chemical Abstracts Service (CAS) numbers, which identify millions of unique chemical substances. See Am. Chem. Soc’y, CAS, at <http://www.cas.org/expertise/cascontent/registry/regsys.html#q1> (on file with the *Columbia Law Review*) (last visited Nov. 10, 2010) (stating CAS database contains more than 56 million organic and inorganic substances and 62 million sequences); see also Div. of Mineral Res., N.Y. State Dep’t of Envtl. Conservation, *supra* note 5, at 5-52 to 5-61 (providing CAS numbers of most fracking fluids, extracted from “Material Safety Data Sheets” submitted to New York’s environmental agency).

discovery in tort suits (under protective orders⁶⁵) and analyzed by experts where damages from chemicals are alleged. Alternatively, policymakers could remove trade secret protections altogether and require companies to patent their formulas if they wished to protect their commercial value. This would be costly and time consuming, but it would allow for public disclosure while preserving the economic benefits of unique formulas.

Unfortunately, the EPA's letter to fracking companies comes nowhere close to requiring the sort of disclosure that will inform public discourse. First, the letter anticipates that the companies might not disclose at all, requiring the companies to inform the EPA within seven days of receiving the letter "as to whether or not you will submit all of the information requested."⁶⁶ Further, the letter allows all information disclosed to the EPA to remain a trade secret; it reassures companies that "[d]ata provided in response" to the EPA's request "may be claimed as Confidential Business Information . . . and will be handled" confidentially.⁶⁷ The EPA will eventually compile this information, along with other data, in its own report that assesses the potential environmental and health effects of the process,⁶⁸ but citizens need the information as well.

CONCLUSION

The EPA's disclosure requirement and its planned report, in addition to state regulations mandating disclosure, are important first steps toward informing the public about an element of the twenty-first century's energy boom. But they should not be viewed as full solutions. As more than 2,060 Marcellus drilling permits were issued in Pennsylvania from January through August 2010,⁶⁹ as New York's Senate voted for a moratorium on fracking,⁷⁰ and as the Mayor of Fort Worth, Texas commissioned a study of the air quality effects from drilling rigs,⁷¹

65. See Unif. Trade Secrets Act § 5, 14 U.L.A. 647-49 (2005) (requiring courts to preserve secrecy).

66. EPA Letter, *supra* note 7, at 3. The letter contains vague threats that the agency will compel disclosure, but it is not clear whether the agency will follow through on these threats. *Id.*

67. *Id.*

68. Press Release, Env'tl. Prot. Agency, EPA Initiates Hydraulic Fracturing Study: Agency Seeks Input from Science Advisory Board (Mar. 18, 2010), at <http://yosemite.epa.gov/opa/admpress.nsf/e77fdd4f5afd88a3852576b3005a604f/ba591e790c58d30852576ea004ee3ad!opendocument> (on file with the *Columbia Law Review*).

69. Bureau of Oil and Gas Mgmt., Pa. Dep't of Env'tl. Prot., Marcellus Shale Permits Issued and Wells Drilled (2010), available at <http://www.dep.state.pa.us/dep/deputate/minres/oilgas/photogallery/photo13295/Marcellus%20Wells%20permitted-drilled%20January-August%202010.gif> (on file with the *Columbia Law Review*).

70. Edith Honan, New York Senate Passes Gas Drilling Moratorium, Reuters, Aug. 4, 2010, at <http://www.reuters.com/article/idUSTRE67358R20100804> (on file with the *Columbia Law Review*).

71. City of Fort Worth, Air Quality Committee, at

it has become clear that the public demands information. The EPA's request for chemical information is a good start, but it is insufficient. As thousands of new gas wells are drilled and fractured each year, citizens need effective means of participating in the policy dialogue and contributing to new regulations of fracing, where needed. Without better information, this effort will be futile.

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