Journal of Law and Policy

Volume 19 | Issue 2 Article 9

2011

Fracking and Federalism: Support for an Adaptive Approach That Avoids the Tragedy of the Regulatory Commons

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FRACKING AND FEDERALISM: SUPPORT FOR AN ADAPTIVE APPROACH THAT AVOIDS THE TRAGEDY OF THE REGULATORY COMMONS

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INTRODUCTION

New York State is currently engaged in the process of crafting a regime to regulate a controversial gas extraction technique called hydrofracking.[1] The breadth and scale of hydrofracking's potential impacts present state and local officials with novel and uncertain environmental and regulatory challenges. These challenges provide a unique opportunity to test some of the assumptions underlying academic discussions of environmental federalism.[2]

Congress exempted hydrofracking and its roughly thirty affiliated and component processes[3] from key portions of federal

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[1] *See infra* Part I.

[2] *See Marcellus Shale*, N.Y. ST. DEP'T OF ENVTL. CONSERVATION, http://www.dec.ny.gov/energy/46288.html (last visited Feb. 4, 2011) (providing overview of hydrofracking in New York and the State's regulatory strategy).

[3] *See 3D Rig Animation*, ENERGY IN DEPTH, http://www.energyindepth.

environmental laws,[4] leaving regulation largely to the States. As a result, policymakers in gas-rich states like New York are under unusually high pressure to make difficult trade-offs between significant economic benefits and uncertain harms to public health and the environment, some of them potentially catastrophic and long lasting.[5] The difficult choices hydrofracking poses and the nature of its potential harms illustrate the character of federalism concerns within the context of environmental problems.[6]

Although New York generally permits local governments to regulate local activities,[7] it is hardly surprising that in such a high-

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org/rig/index.html (last visited Feb. 4, 2011) (animated video provides three dimensional tour of a wellpad and hydrofracking operations).

[4] *See* Hannah Wiseman, *Regulatory Adaptation in Fractured Appalachia*, 21 VILL. ENVTL. L.J. 229, 251 n.125 (2010) (listing and explaining exceptions). *See also* Energy Policy Act of 2005, Pub. L. No. 109–58, 119 Stat. 594, 694 (2005) (codified as amended in scattered sections throughout the U.S. Code) (exempting hydraulic fracturing processes from the Safe Drinking Water Act, 42 U.S.C.A. § 300(h)(d) (West 2010)). The Energy Policy Act also altered how portions of the following Acts are applied to hydrofracking, resulting in *de facto* exemption: Comprehensive Environmental Response Compensation Liability Act (CERCLA), Pub. L. No. 96-510, 94 Stat. 2767 (1980) (codified at 42 U.S.C.A. §§ 9601–75 (West 2010)); Clean Water Act, ch. 758, 62 Stat. 1155 (1948) (codified in scattered sections throughout 33 U.S.C.); National Environmental Policy Act (NEPA), Pub. L. No. 91-190, 83 Stat. 852 (1969) (codified at 42 U.S.C.A. §§ 4321–4347 (West 2010)); Resource Conservation and Recovery Act (RCRA), Pub. L. No. 94-580, 90 Stat. 2795 (1976) (codified at 42 U.S.C.A. § 6901 *et. seq.* (West 2010)); Clean Air Act (CAA), ch. 360, 69 Stat. 322 (1955) (codified at 42 U.S.C.A. §§ 7401–7671 (West 2010)); Emergency Planning and Community Right-to-Know Act (EPCRA), Pub. L. No. 99-499, 100 Stat. 1728 (codified in scattered sections throughout 42 U.S.C.); 40 C.F.R. §§ 372.22(b), 373.23(b). *See* CITIZENS CAMPAIGN FOR THE ENVIRONMENT, PROTECTING NEW YORK'S AIR, LAND, WATER AND PEOPLE: WHAT'S THE HYDRO-FRACKING RUSH? 12 (last visited Feb. 4, 2010), *available at* http://www.citizenscampaign.org/PDFs/cce_hvhf_wp_final.pdf [hereinafter WHAT'S THE HYDRO-FRACKING RUSH?]. See Michael G. Gibson & David P. Young, *Oil and Gas Exemptions Under RCRA and CERCLA: Are They Still "Safe Harbors" Eleven Years Later?*, 32 S. TEX. L. REV. 361 (1991), for a dated but thorough analysis of oil and gas exemptions under RCRA and CERCLA.

[5] *See infra* Part I.C.

[6] *See infra* Part II.

[7] N.Y. MUN. HOME RULE LAW § 1 et. seq. (McKinney 2010).

stakes atmosphere the State has removed almost all regulatory authority from municipalities.[8] This contraction of regulatory authority may lead to suboptimal results. On the one hand, strict state primacy with diminished local input threatens to result in inadequate environmental protection.[9] On the other hand, concerns about the adequacy of New York's proposed regulatory regime have led to sharp and vocal criticism of hydrofracking in general, which has in turn generated intense public opposition to the practice.[10] This opposition itself threatens to curtail gas production.[11] New York's regulatory primacy could lead to both underprotection and underdevelopment of natural gas resources as public and political fears dominate regulators' decision making processes.[12]

The daunting task of addressing complex policy problems, like hydrofracking, has driven academic debate over how federal, state, and local governments can interact within our federalist system to most effectively protect environmental quality without unduly sacrificing economic growth.[13] Legal scholars drawing from economics and political science make efficiency-maximizing arguments based on assumptions about the way markets and

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[8] Note that this restriction of local authority is not unique to hydrofracking, and has long been applied to oil and gas extraction in the state. *See* N.Y. ENVTL. CONSERVATION LAW § 23-0303 (McKinney 2010).

[9] *See infra* Parts III–IV.

[10] *See, e.g.*, *Cuomo Gets an Earful About Hydrofracking*, CHANNEL 9 NEWS (Aug. 19, 2010, 6:13 PM), http://www.9wsyr.com/news/local/story/Cuomo-gets-an-earful-about-hydrofracking/5yuto95T5kuIfnUE0ejQHw.cspx; Mireya Navarro, *State Decision Blocks Drilling for Gas in Catskills*, N.Y. TIMES, April 23, 2010, at A15, *available at* http://www.nytimes.com/2010/04/24/science/earth/24drill.html?scp=3&sq=hydrofracking%20opponents%20city%20council%20meeting&st=cse; *Hydrofracking Opponent Disrupts Cuomo Speech*, CAPITAL TONIGHT (Feb. 3, 2011, 2:42 PM), http://www.capitaltonight.com/2011/02/hydrofracking-opponent-disrupts-cuomo-speech/; Josh Garrett, *Opponents Outnumber Supporters at NYC Hydrofracking Meeting*, HEATINGOIL.COM (Aug. 25, 2010, 2:19 PM), http://www.heatingoil.com/blog/opponents-outnumber-supporters-at-nyc-hydrofracking-meeting825/.

[11] *See supra* note 10; *infra* Part IV.

[12] *See infra* Parts III–IV.

[13] *See infra* Part II.B.1.

rational actors function.[14] However, recent theories take a cue from ecology and attempt to describe the dynamic interplay among the levels of government.[15] These theories apply observations about structural federalism in order to craft flexible frameworks for generating policy responses to environmental problems.

Two relatively new approaches, "adaptive federalism,"[16] and "the regulatory commons,"[17] counter the efficiency-focused approaches to environmental protection. Each approach highlights how a limited focus on matching environmental problems with the "right" tier of government is likely to lead to underprotection.[18] Adaptive federalism advocates for flexible roles for the three levels of government, based on the observation that overlapping jurisdiction provides a system of vertical checks and balances.[19] The regulatory commons analysis outlines how confusion over

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[14] *See infra* Part II.B.1.

[15] *See infra* Part II.B.2.

[16] *See generally* David E. Adelman & Kirsten H. Engel, *Adaptive Federalism: The Case Against Reallocating Environmental Regulatory Authority*, 92 MINN. L. REV. 1796 (2008) [hereinafter *Adaptive Federalism*]; *see also* William W. Buzbee, *Contextual Environmental Federalism*, 14 N.Y.U. ENVTL. L.J. 108 (2005) [hereinafter *Contextual Environmental Federalism*] (articulating a similar discussion about the salience of a robust federalism with overlapping regulatory roles).

[17] William W. Buzbee, *Recognizing the Regulatory Commons: A Theory of Regulatory Gaps*, 89 IOWA L. REV. 1 (2003) [hereinafter *Recognizing the Regulatory Commons*]. Buzbee has expounded upon the mechanisms at work in the regulatory commons in several articles since. *See, e.g.*, *Contextual Environmental Federalism*, *supra* note 16; William W. Buzbee, *Asymmetrical Regulation: Risk, Preemption, and the Floor/Ceiling Distinction*, 82 N.Y.U. L. REV. 1547 (2007) [hereinafter *Asymmetrical Regulation*].

[18] Henry N. Butler & Jonathan R. Macey, *Externalities and the Matching Principle: The Case for Reallocating Environmental Regulatory Authority*, 14 YALE L. & POL'Y REV. 23 (1996).

[19] *See generally Adaptive Federalism*, *supra* note 16. The "checks and balances" discussion was developed more fully by Engel in an earlier article. *See* Kirsten H. Engel, *Harnessing the Benefits of Dynamic Federalism in Environmental Law*, 56 EMORY L.J. 159, 179 (2006) [hereinafter *Harnessing the Benefits of Dynamic Federalism*]. Similarly, Buzbee's discussion of contextual environmental federalism challenges matching arguments that presume state primacy is preferable to a robust, three-tiered scheme. *See Contextual Environmental Federalism*, *supra* note 16.

jurisdictional boundaries can lead to gaps in protection even where an apparently vigorous overlapping regulatory scheme is in place.[20] Together, these approaches provide a hopeful perspective on the future of environmental federalism while remaining realistic about how protective goals can be frustrated.[21]

This Note asserts that the kinds of challenges hydrofracking presents, as well as its current regulatory status, lend support to theories that advocate for an adaptive approach to federalism. In forming its conclusions, this Note draws heavily on the experiences of some county-level officials in New York State,[22] which illustrate the kinds of pressures localities face and the compromises they are compelled to make in the high stakes atmosphere surrounding hydrofracking. These officials' accounts and New York's overall experience suggest that not only is underprotection likely when complex policy choices are left solely to the States, but that federal regulatory involvement can prevent the development of market inefficiencies that arise when massive uncertainty over environmental impacts stimulates popular opposition to a new technology.

In Part I, this Note describes what hydrofracking is, and lays out its harms and history. Part II introduces the relevant approaches to environmental federalism and some of their weaknesses. Part III explains the existing regulatory framework for hydrofracking, presents the approaches some officials in gas-rich Tioga County, NY[23] take as they prepare for the commencement of

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[20] *See Recognizing the Regulatory Commons*, *supra* note 17.

[21] *See infra* Part IV.

[22] County-level officials were selected for their capacity to communicate both detail and generality about how a number of towns and villages are dealing with the same or similar sets of issues.

[23] Tioga County was chosen as a focal point for this Note during discussions with David Kay at the Community and Regional Development Institute at Cornell University (CARDI), whom I contacted because CARDI has been actively involved in trying to help central New York communities prepare for hydrofracking. Tioga County's geologic features and proximity to the Millennium Pipeline make it particularly amenable to hydrofracking, thus a lot of activity is likely to occur there. In addition, as a primarily rural area, Tioga County shares landscape and political similarity with other counties likely to experience hydrofracking activity, thus is fairly representative of the kinds of

a high level of hydrofracking activity, and describes their perspectives on the sufficiency of the available regulatory tools. Part IV considers the policy implications of these officials' and New York State's experience with hydrofracking within the discussion of environmental federalism. Part IV also describes how the State's experience provides insight into incentive structures that result in regulatory commons problems. This Note concludes by asserting that a conception of federalism that includes all three levels of authority—local, state, and federal—is more likely to forestall commons problems than reliance on strict state primacy.

I. THE HIGH STAKES OF HYDRAULIC FRACTURING IN NEW YORK STATE

Recent interest in developing energy alternatives to oil, and advancements in natural gas extraction technologies, have led to controversy over the proper way to regulate a drilling and production process called hydrofracking.[24] The potential harms from hydrofracking are serious, and some would be irreversible.[25] At the same time, the economic benefits to be derived from hydrofracking are substantial.[26] Thus, public debate has focused on

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issues that will be faced throughout the state. After identifying Tioga County as a good subject area for study, I contacted Andrew Fagan at the Cornell Cooperative Extension for Tioga and Chemung Counties, also a member of Tioga County Investigates Natural Gas, a working group formed in order to anticipate hydrofracking issues, who helped me identify and select other officials whose duties are likely to be significantly implicated by hydrofracking. I visited Owego, NY, in October of 2010 in order to conduct interviews with Andrew Fagan and Elaine Jardine, Director of Planning for Tioga County. Jardine suggested I contact Dick Le Count, Director of Emergency Management, and Judith Quigley, County Attorney. Interviews with Wendy Walsh, Director of the Soil and Water Conservation District, Le Count, and Quigley were conducted by telephone. During the interviews, I asked the officials to describe their experiences with preparing for hydrofracking, the kinds of concerns they have, how they are addressing these concerns, and how they feel their responsibilities are impacted by the current and proposed regulatory scheme.

[24] *See infra* Part I.A.

[25] *See infra* Part I.C.

[26] *See infra* Part I.C.

the value, safety, and wisdom of allowing hydrofracking, and has divided many communities along economic lines.[27]

A. Hydraulic Fracturing: Description and Background

Hydrofracking is a term derived from the name of a gas drilling and extraction process called hydraulic fracturing. Hydraulic fracturing involves the injection of fluid into a well to cause subsurface formations to fracture and release natural gas.[28] First developed in the 1940s, hydraulic fracturing has been used throughout the country for about sixty years and in New York State since the 1950s.[29] Beginning in the 1990s, the oil and gas industry began to use hydraulic fracturing in horizontal wells—so called because they are drilled on an angle to run horizontally within target formations below the earth's surface.[30] The first horizontal well in the East was drilled in Pennsylvania in 2003 to reach the gas-rich Marcellus shale formation, which underlies much of the Appalachian region.[31] At present, "hydrofracking" is a term generically used to refer to a process that employs hydraulic fracturing, horizontal drilling, and high-volume fluid injection.[32]

Hydrofracking is an intensive industrial activity that involves significant environmental disturbance.[33] First, an access road is

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[27] *See infra* Part I.C.

[28] *Marcellus Shale*, *supra* note 2.

[29] N.Y. ST. DEP'T OF ENVTL. CONSERVATION, DRAFT SUPPLEMENTAL GENERIC ENVIRONMENTAL IMPACT STATEMENT ON THE OIL, GAS, AND SOLUTION MINING REGULATORY PROGRAM 5–32 (2009) [hereinafter SGEIS].

[30] Marianne Lavelle, *Forcing Gas Out of Rock With Water*, NAT'L GEOGRAPHIC DAILY NEWS (Oct. 17, 2010), http://news.nationalgeographic.com/news/2010/10/101022-energy-marcellus-shale-gas-science-technology-water/.

[31] John A. Harper, *The Marcellus Shale: A "New" Old Gas Reservoir in Pennsylvania*, 38 PENN. GEOLOGY, no. 1, 2008 at 9, *available at* http://www.dcnr.state.pa.us/topogeo/pub/pageolmag/pdfs/v38n1.pdf.

[32] *See, e.g.*, David W. Chen & Javier C. Hernandez, *Checking the Statements in the Debate*, N.Y. TIMES, Oct. 19, 2010, at 24, *available at* http://www.nytimes.com/2010/10/19/nyregion/19facts.html?_r=1&scp=1&sq=hydrofracking&st=cse (defining hydrofracking as "the process of using high-pressure water to extract natural gas from rock formations").

[33] SGEIS, *supra* note 29, at ch. 5.

built, after which a two- to five-acre site is cleared and prepared for drilling and pumping operations, and a drilling rig and other storage and processing structures are installed.[34] Next, a well is drilled deep into bedrock, and acid is injected to clean the resulting "wellbore."[35] The wellbore is then fitted with a steel and concrete casing, which is perforated within the profile of the target formation to allow fluid to enter and break it up.[36] Next, millions of gallons of water are trucked to the wellpad,[37] where it is then mixed with chemical agents with anti-corrosive and anti-bacterial functions, many of which are highly toxic.[38] In addition, materials like sand, which prop open fractures, and emulsifiers are added to the mix.[39] The resulting mixture, or fracking fluid, is pumped into the wellbore at high pressure.[40] The fluid fractures the target formation and escaping gas flows out of the wellbore to gathering lines, which carry it to larger pipelines. An estimated 9 to 35 percent of the fracking, or "flowback," fluid flows back up the wellbore over a period of about two weeks.[41] The rest remains below the earth's surface and has the potential to move through cracks in well casings or the target substrate into surrounding rock and eventually to migrate into and contaminate groundwater sources for waterways and drinking supplies.[42]

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[34] *Id.* at 5-5 to -12.

[35] *Id.* at 5-93. More than one well will often be drilled on a single wellpad. *Id.* at 5-20.

[36] *See 3D Rig Animation*, *supra* note 3. SGEIS, *supra* note 29, at 5-91, 5-93.

[37] The DEC has estimated that each frack job will require 400–600 tanker trucks of water. SGEIS, *supra* note 29, at 6-137.

[38] *See Hydraulic Fracturing 101*, EARTHWORKS ACTION, http://www.earthworksaction.org/FracingDetails.cfm (last visited Feb. 27, 2011); *see also* SGEIS, *supra* note 29, at 5-32.

[39] *See Marcellus Shale*, *supra* note 2.

[40] *See* SGEIS, *supra* note 29, at 5-92 to -94; *Oilfield Glossary: Hydraulic Fracturing*, SCHLUMBERGER OILFIELD GLOSSARY, http://www.glossary.oilfield.slb.com/Display.cfm?Term=hydraulic%20fracturing (last visited Feb. 27, 2011).

[41] *See also* SGEIS, *supra* note 29, at 5-97.

[42] *Id.* at 6-37. DEC considers this a low probability, considering that fluid will be injected into the dense shale layer thousands of feet below water supply aquifers, thus treats leaks that occur during drilling or from surface spills as

The combination of horizontal drilling and hydraulic fracturing presents concerns because it greatly increases the extent of drilling and the quantity of fracking fluid required.[43] Wellbores can extend as far down as 12,000 feet,[44] and can radiate as far as 4,500 feet from a wellsite.[45] Used together, these techniques have the potential to reduce surface disturbance, because horizontal drilling can access subsurface deposits of gas via fewer surface perforations that conventional drilling allows.[46] However, less surface disturbance comes at the expense of subsurface integrity, which can be cause for concern given the potential for both chemical-laced fracking fluid and natural gas to migrate into and contaminate aquifers and groundwater supplies.[47] In addition, the sudden increase in profitability due to new access to gas deposits has incentivized a rush to states with hydrocarbon-rich formations.[48] Many fear that the rapid onset of a high level of fracking will generate novel problems at a rate and scale that will make them difficult to detect or address adequately.[49]

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more probable than subsurface contamination. *See id.* at 6-15 to -17.

[43] *See Natural Gas Hydro-Fracking in Shale*, CITIZENS CAMPAIGN FOR THE ENV'T, http://www.citizenscampaign.org/campaigns/hydro-fracking.asp (last visited Feb. 16, 2011).

[44] Video recording: *Shale Gas Drilling: Pros and Cons*, 60 MINUTES (Nov. 14, 2010, 12:34 PM), *available at* http://www.cbsnews.com/video/watch/?id=7054210n (interview with Chesapeake Energy CEO Aubrey McClendon). Note that well depths in the Marcellus could extend down more than 5,000 feet below the earth's surface in some places. *See* SGEIS, *supra* note 29, at 4-15.

[45] SGEIS, *supra* note 29, at 5-22. However, even though there may be fewer wellsites, each wellpad disturbs more surface area than smaller wellpads for conventional gas production. *Id.* at 5-21.

[46] *Id.* at 5-20. *See also id.* at 6-153.

[47] *Id.* at 6-34 to -37; *see, e.g.*, Delen Goldberg, *Tioga County Man Blames Nearby Gas Drilling for Polluting His Well*, SYRACUSE.COM (Jan. 2, 2010, 6:00 AM), http://www.syracuse.com/news/index.ssf/2010/01/tioga_county_man_blames_natura.html.

[48] Harper, *supra* note 31, at 5.

[49] SUSAN RIHA, DIR., N.Y. WATER RESOURCES INST. & CHARLES L. PECK, PROF. DEP'T OF EARTH & ATMOSPHERIC SCI., CORNELL UNIV. ET AL., COMMENTS ON DRAFT SGEIS ON THE OIL, GAS AND SOLUTION MINING REGULATORY PROGRAM [hereinafter *Riha et al., Comments*], *available at* http://cce.cornell.edu/EnergyClimateChange/NaturalGasDev/Documents/PDFs/

B. Natural Gas in New York State

Due to the State's geologic and hydrologic features, natural gas has been mined in New York since the 1820s, long before the oil and gas industry pioneered methods to extract gas from hard shales like the Marcellus.[50] Prior to the development of hydrofracking and horizontal drilling methods, gas extraction in New York State was on the decline due to the inability of producers to access gas trapped in shale.[51] Growing energy demands over the past fifty years have focused industry and government attention on developing domestic shale gas resources.[52] In addition, the construction of a major natural gas pipeline through New York's Southern Tier[53] and the proximity of nearby gas markets in the rest of the state, as well as in New Jersey and Pennsylvania, have directed industry efforts towards New York and other Marcellus states.[54]

The Marcellus formation is attractive because it has an extensive range, covering nearly thirty-four million acres from New York to Tennessee.[55] A 2008 report estimates that there are as

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dSGEIS%20Comments%20_Riha_.pdf (last visited Nov. 30, 2010).

[50] Native Americans introduced early explorers of western New York to naturally occurring natural gas springs in Ontario County and near the present day town of Canandaigua, in Allegany County. The first gas well was drilled in Devonian shale near the town of Fredonia, Chataqua county, in 1821, and gas extraction has occurred in the state ever since. JOHN P. HERRICK, EMPIRE OIL: THE STORY OF OIL IN NEW YORK STATE 316–25 (1949); SGEIS, *supra* note 29, at 4-1.

[51] HERRICK, *supra* note 50, at 316–76; SGEIS, *supra* note 29, at 4-2 to -3; Harper, *supra* note 31, at 3–5.

[52] *Marcellus Shale*, *supra* note 2.

[53] The Millennium Pipeline is a natural gas pipeline that was completed in 2008 and extends across the southern tier of New York from Corning to Ramapo supplying customers including National Grid, Con Edison, Central Hudson Gas & Electric, and Orange & Rockland Utilities. *Millennium Pipeline*, NISOURCE GAS TRANSMISSION & STORAGE, http://www.ngts.com/about-ngts/millennium-pipeline/ (last visited Feb. 10, 2011).

[54] *Marcellus Shale*, *supra* note 2.

[55] Terry Engelder & Gary G. Lash, *Marcellus Shale Play's Vast Resource Potential Creating Stir in Appalachia*, AM. OIL & GAS REP., May 2008, at 7, *available at* http://www.geosc.psu.edu/~engelder/references/link150.pdf; *see*

many as five hundred trillion cubic feet of natural gas in place, with fifty trillion cubic feet recoverable.[56] The New York State Department of Environmental Conservation (DEC) estimates that roughly eight to ten trillion cubic feet of natural gas could be recovered over time from the Marcellus in New York,[57] where statewide annual consumption is over one trillion cubic yards.[58] Thus, the Marcellus presents New Yorkers with an intrastate source of energy, a valued prospect during a period when the nation seeks alternative bridge fuels.[59] In addition, below the Marcellus lie other shale formations that most likely will be subject to exploration and extraction in the future.[60]

C. Hydraulic Fracturing: Potential Harms and Benefits

The hydrofracking process[61] has already been used in other states, providing a sense of what New York faces in the near future. The technique was pioneered in the 1990s as a means to force the last remaining gas from old wells in the Barnett Shale in Texas.[62] Fracking has also been used to varying extents throughout the country, most extensively in the West.[63] In the East, the first

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also Marcellus Shale – Appalachian Basin Natural Gas Play, GEOLOGY.COM, http://geology.com/articles/marcellus-shale.shtml (last visited Feb. 27, 2011).

[56] A more recent estimate asserted that as much as 489 trillion cubic feet might be recoverable. Wiseman, *supra* note 4, at 240; *Marcellus 2008: Report Card on the Breakout Year for Gas Production in the Appalachian Basin*, BASIN OIL & GAS MAG., Aug. 2009, at 18, *available at* http://fwbog.com/index.php?page=article&article=144.

[57] SGEIS, *supra* note 29, at 4-24.

[58] *Marcellus Shale*, *supra* note 2.

[59] *See* SGEIS, *supra* note 29, at 2-2.

[60] *See id.* at 4-6, 4-9, 6-151; *see also Marcellus Shale – Appalachian Basin Natural Gas Play*, *supra* note 55 (discussing the potential for drilling in the Utica shale layer).

[61] I use the term "hydrofracking" to refer to a process that pairs horizontal drilling and high-volume hydraulic fracturing.

[62] Lavelle, *supra* note 30.

[63] *See* SGEIS, *supra* note 29, at 2-3. To access stories about hydraulic fracturing across the nation, see *Gas Drilling: The Story So Far*, PROPUBLICA (June 26, 2010, 9:42 AM), http://www.propublica.org/series/buried-secrets-gas-

high-volume fracking operations are in Pennsylvania and West Virginia.[64]

There are a number of documented or suspected harms from hydrofracking operations. These range from quality of life issues, such as persistent noise and vibrations from drilling and underground injection, to health impacts from exposure to air and water pollutants, to property value destruction, to social disruption.[65] Specific concerns include: the threat that gas or fracking fluid can pollute groundwater;[66] toxic air emissions from gas leaks, processing, gas "flaring" and truck exhaust;[67] erosion from construction and pipeline siting;[68] degradation of surface waterways from leaks, accidental chemical spills, and stormwater runoff;[69] noise and light pollution;[70] increased truck traffic and roadway deterioration;[71] and destruction of ecologically sensitive habitat and the landscape.[72] Other potential problems include

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drillings-environmental-threat (providing multiple sources and reports on hydrofracking activity throughout the United States).

[64] See *How Big Is the Gas Drilling Regulatory Staff in Your State?*, PROPUBLICA, http://projects.propublica.org/gas-drilling-regulatory-staffing/ (last visited Feb. 10, 2011), to compare drilling and regulatory oversight data between States.

[65] *See* SGEIS, *supra* note 29, at ch. 6.

[66] *Id.* at 6-3–6-41; *see* Michael Rubinkam, *Firm Finds Fracking Fluid in Dimock Well*, TIMES LEADER (Oct. 28, 2010), http://www.timesleader.com/news/hottopics/shale/Firm_finds_fracking_chemicals_in_Dimock_well_09-16-2010.html.

[67] SGEIS, *supra* note 29, at 6-109 to -123.

[68] *Id.* at 6-16; Telephone Interview with Wendy Walsh, Dir., Soil and Water Conservation District, Tioga County, NY (Oct. 4, 2010).

[69] SGEIS, *supra* note 29, at 6-15 to -16.

[70] Telephone Interview with Judith Quigley, County Att'y, Tioga County, NY (Oct. 20, 2010).

[71] SGEIS, *supra* note 29, at 6-138 to -139; Telephone Interview with Dick Le Count, Director, Emergency Management Office, Tioga County, NY (Oct. 19, 2010).

[72] SGEIS, *supra* note 29, at 6-44 to -47, 6-139 to -140 (discussing potential for invasive species introductions and increased access to remote areas and disturbance, which are the kinds of activities that pose threats to ecologically sensitive areas). Interview with Elaine Jardine, Dir. of Planning, Tioga County, NY in Owego, NY (Oct. 15, 2010); Telephone Interview with Judith Quigley,

chemical fires and gas explosions[73] and hydrofracking fluid and solid waste disposal,[74] including disposal of waste high in naturally occurring radioactive elements ("NORMS").[75] In addition, subsurface interference could cause seismic disturbance and trigger earthquakes.[76] More likely, seismic disruption could induce fractures in subsurface faults, causing gas to migrate into aquifers and thus contaminate creeks, wells, and other waterways.[77] Migration of gas into water sources and aquifers is of particular concern in a water-rich state like New York, where surface and groundwater connections are extensive.[78] Hydrofracking in the Catskills poses a potentially grave threat to New York City's water supply, which is fed by surface streams and groundwater. Furthermore, some are concerned that drillers and consumers will be forced to compete for water, especially during summer months when water sources are low.[79] A heavy burden on water bodies is also likely to result in diminished water quality and higher concentrations of pollutants.[80] Finally, the potential for social disruption is considerable as municipalities face new injections of

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supra note 70.

[73] Telephone Interview with Dick Le Count, *supra* note 71.

[74] SGEIS, *supra* note 29, at 6-40. *See also* Ian Urbina, *Drilling Down: Regulation Lax as Gas Wells' Tainted Water Hits Rivers*, N.Y. TIMES, Feb. 27, 2011, at A1, *available at* http://www.nytimes.com/2011/02/27/us/27gas.html?pagewanted=1&hp [hereinafter *Drilling Down*].

[75] SGEIS, *supra* note 29, at 6-40. *See also Drilling Down*, *supra* note 74.

[76] SGEIS, *supra* note 29, at 4-33, 4-35 (describing human-triggered seismic events, such as underground injection). *See, e.g.*, Campbell Robertson, *Arkansas Quake Is Its Most Powerful in 35 Years*, N.Y. TIMES, Feb. 28, 2011, at A14, *available at* http://www.nytimes.com/2011/03/01/us/01earthquakes.html?_r=1&hp; BJ Austin, *Another Earthquake Hits Cleburne*, KERA (July 10, 2009), http://www.publicbroadcasting.net/kera/news.newsmain/article/0/1/1528548/North.Texas/Another.Earthquake.Hits.Cleburne.

[77] N.Y. CITY DEP'T OF ENVTL. PROTECTION, FINAL IMPACT ASSESSMENT REPORT: IMPACT ASSESSMENT OF NATURAL GAS PRODUCTION IN THE NEW YORK CITY WATER SUPPLY WATERSHED 13 (2009), *available at* http://www.nyc.gov/html/dep/pdf/natural_gas_drilling/12_23_2009_final_assessment_report.pdf.

[78] *Id.* at 13–20.

[79] *Riha et al.*, *Comments*, *supra* note 49.

[80] SGEIS, *supra* note 29, at 6-3 to -14.

wealth, sudden land use changes, and large influxes of temporary workers.[81]

Hydrofracking primarily occurs on private or state-owned lands leased by extractors, also known as landmen, who compensate landowners with lease and royalty payments.[82] Conflicts between industry and landowners have arisen over leases in other parts of the country and often have been resolved to the disadvantage of landowners.[83] In addition, landowners who do not wish to enter lease agreements can see their interests compromised due to common law interpretations of rights to subsurface migratory resources, such as the Rule of Capture.[84] Drilling in New

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[81] Telephone Interview with Judith Quigley, *supra* note 70. *See also* SGEIS, *supra* note 29, at 6-139 to -140 (discussing some of the kinds of disruption that occur before and during drilling).

[82] N.Y. ST. OFFICE OF THE ATT'Y GEN., OIL AND GAS LEASES (2008), *available at* http://tiogagaslease.org/images/OAG_Gas_Lease_Brochure.pdf (last visited Nov. 25, 2010); *Prerequisites for Capturing the Benefits from New York's Natural Oil and Gas Resource Endowment*, NYSERDA 35–36, http://www.dec.ny.gov/docs/materials_minerals_pdf/nyserda6.pdf (last visited Feb. 27, 2011).

[83] Courts have interpreted royalty and compensation disputes in favor of oil and gas industry interests even though the industry enjoys informational and strategic advantages such as greater familiarity with contracts. *See* Thomas A. Mitchell, *The Future of Oil and Gas Jurisprudence: Past as Prologue*, 49 WASHBURN L.J. 379, 406 (2010). In some instance, gas companies have seemed to take advantage of informational disparities. Telephone Interview with Judith Quigley, *supra* note 70. As an example, some gas companies have been pursuing leases in New York since the early 1980s, and some residents have been displeased to see their neighbors, who have held out longer or begun to organize, achieve significantly better lease terms and higher compensation arrangements. *Id.* In some cases, compensation has increased from $20/acre up to $3000/acre over period of a few years. *Id.*; Telephone Interview with Wendy Walsh, *supra* note 68. *See also Marcellus Shale – Appalachian Basin Gas Play*, *supra* note 55; Michael Rubinkam, *The Marcellus Dilemma: One Family's Struggle with a Giant Natural Gas Company*, ITHACA J. (Nov. 25, 2010, 6:05 PM), http://www.theithacajournal.com/article/20101125/NEWS01/11250342/The+Marcellus+dilemma++One+family+s+struggle+with+a+giant+natural+gas+company.

[84] *See* Mitchell, *supra* note 83, at 406 (noting that natural gas from the Marcellus "will be leased, developed, and produced . . . solely under the 'pure' rule of capture as articulated at the end of the nineteenth century.").

York State is also permitted on public lands, although with limitation; drilling is not allowed within the Adirondack State Park or in parts of the Catskills.[85]

Despite the myriad potential harms from hydrofracking, many New York politicians and residents wish to encourage it and support permissive regulation.[86] Gas production is enormously profitable and brings hard-to-resist economic benefits to landowners and depressed areas of the state.[87] At the time of writing, royalties from just one acre of leased land can total about $180,000 a year, in addition to a signing bonus of several hundred to several thousand dollars.[88] Multiply that amount by the many acres that a lessor might own and it becomes clear why, for many individual landowners, the incentives to permit drilling outweigh the costs.[89] Relatedly, increased gas production brings job opportunities to economically depressed areas of the state, so landowners are not the only ones who benefit from hydrofracking.[90] In addition, natural gas is characterized by many as a fuel critical to bridge the transition from oil to renewable and

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[85] Telephone Interview with Judith Quigley, *supra* note 70. *See also* SGEIS, *supra* note 29, at 1-2 to -3.

[86] *See, e.g.*, Delen Goldberg, *Many Central New York Lawmakers Undecided on Hydrofracking*, SYRACUSE.COM (Jan. 17, 2010, 5:00 AM), http://www.syracuse.com/news/index.ssf/2010/01/central_new_york_lawmakers_str.html.

[87] *See* Clifford Krauss & Tom Zeller, Jr., *When a Rig Moves in Next Door*, N.Y. TIMES, Nov. 6, 2010, at B1, *available at* http://www.nytimes.com/2010/11/07/business/energy-environment/07frack.html?pagewanted=1&_r=1&sq=hydraulic%20fracturing%20farmers&st=cse&scp=2.

[88] This is based on a typical royalty rate of 12.5%, a production average of one million cubic feet per day, and the last available published natural gas rate per cubic foot, $3.96 (rate in December, 2010), for a one acre unit. See *Natural Gas Royalty Estimate*, GEOLOGY.COM, http://geology.com/royalty/ (last visited Mar. 18, 2011), for a "royalty calculator." Note that production averages range from .2 to 2 million cubic feet per day. *Id.* Last available gas rate was taken from *Natural Gas Navigator, U.S. Natural Gas Wellhead Price*, U.S. ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY (last updated Feb. 28, 2011), http://tonto.eia.doe.gov/dnav/ng/hist/n9190us3M.htm.

[89] *See* Krauss & Zeller, *supra* note 87.

[90] *Id.*

other domestic energy sources.[91]

Yet, despite the potential economic benefits, the sudden influx of enormous profits to previously depressed areas of New York State may create another series of long-lasting and destructive effects. Existing socioeconomic divisions are likely to be exacerbated, creating environmental justice concerns.[92] Those who benefit financially from leasing their land will be able to afford to relocate away from any environmental or public health hazards caused by hydrofracking, with their departures diminishing the local tax base. Meanwhile neighbors without financial resources may have no choice but to remain.[93] Moreover, some who lease their land may find it difficult or impossible to sell once hydrofracking has begun, or realize that their property has significantly diminished in value.[94] Hydrofracking operations and impacts may also make land undesirable for other uses—especially if contamination has occurred. In addition, some farmers may cease operations in light of fracking windfalls, which could alter the landscape significantly.[95] However, despite its risks, the

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[91] *See* SGEIS, *supra* note 29, at 2-2.

[92] Telephone Interview with Judith Quigley, *supra* note 70.

[93] *Id.*

[94] *See* BBC Research and Consulting, *Measuring the Impact of Coalbed Methane Wells on Property Values* (Greystone Environmental Consultants, Inc., La Plata County, CO & Durango, CO, Working Paper 2001), *available at* https://docs.google.com/fileview?id=0Bwsxa7SpCLLDZTllNWUzMzItMTM4NS00ZDliLTgwODktMzgxM2RjMjg5OGQ1&hl=en (demonstrating diminished property values of land near comparable coalbed methane mining operations in Colorado); Jad Mouawad & Clifford Krauss, *Dark Side of a Natural Gas Boom*, N.Y. TIMES, Dec. 7, 2009, at B1, *available at* http://www.nytimes.com/2009/12/08/business/energy-environment/08fracking.html?_r=1 (describing Pennsylvania woman's fears that water contamination from hydrofracking have made her newly built home unsaleable).

[95] This is already happening, as some farmers who formerly struggled have ceased farming due to windfalls. However, it is important to note that "gas drilling is allowing farmers to stay on their land, which is environmentally superior to selling it off piecemeal for suburbanization." Peter Applebome, *Will New York Rebel Against Fracking?*, GREEN BLOG, N.Y. TIMES (June 10, 2010, 2:17 PM), http://green.blogs.nytimes.com/2010/06/10/will-new-york-rebel-against-fracking/?scp=2&sq=hydraulic+fracturing+farmers&st=nyt; *see also* Krauss & Zeller, *supra* note 87.

immediate and short-term benefits make hydrofracking difficult for many in the state to reject and make its regulation a subject of considerable controversy.[96]

II. THE DEBATE OVER ENVIRONMENTAL FEDERALISM

Congress has enacted a number of environmental laws with the broadly ambitious goals of protecting human health and the environment.[97] These statutes have engendered considerable discussion and disagreement over how to balance federal, state, and local roles in the execution of the laws while achieving protection adequate to satisfy congressional mandates.[98] The debate over environmental federalism concerns how best to conceive of environmental problems, how to characterize the achievement of statutory goals, and how to distribute regulatory authority among the three levels of government.[99] Analysis of the various perspectives on environmental federalism reveals the difficulties inherent in solving complex environmental problems.[100] However, it is the complex nature of these problems that suggests that adaptive regulatory approaches may be more suitable than matching approaches at meeting these challenges.[101]

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[96] *See supra* note 10; Krauss & Zeller, *supra* note 87; *infra* Parts III.C.1–2.

[97] *See* ROBERT L. GLICKSMAN ET AL., ENVIRONMENTAL PROTECTION: LAW AND POLICY 73–74 (2007). *See, e.g.*, CAA (with the purpose "to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population." 42 U.S.C.A. § 7401(b)(1) (West 2010)); CWA (with objective to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C.A. § 1251(a) (West 2010)); and NEPA (with purposes "to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation." 42 U.S.C.A. § 4321 (West (2010)).

[98] *See infra* Part II.B.

[99] *See infra* Part II.B.

[100] *See infra* Part II.B.

[101] *See infra* Part II.B, Parts IV.B–C.

A. Federal Environmental Law

Beginning in 1969, and throughout the 1980s, Congress enacted a host of federal environmental statutes that together articulate a broad goal to protect public resources, including air, water, human health, and ecological integrity.[102] These statutes enjoyed wide political support, which is frequently attributed to a popular recognition of threats to the environment after several highly publicized disasters.[103] Some of these new laws expanded existing schemes, but as a whole they embody an unprecedented and comprehensive approach to protection that acknowledges the irreplaceable value of our environment.[104]

Federal environmental laws use a variety of means to achieve their ends, but one hallmark is their reliance on federal and state implementation and enforcement roles.[105] In the more "cooperative" schemes, the federal government, generally through the U.S. Environmental Protection Agency (EPA), sets minimum standards that industry or states must meet before being subject to sanctions.[106] Laws like the Clean Air Act (CAA), Clean Water Act (CWA), Safe Drinking Water Act (SDWA), and the Emergency Planning and Community Right to Know Act (EPCRA) require states to devise and implement comprehensive plans to meet

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[102] Including regulation under: NEPA (review of federal actions for environmental impacts), CAA (clean air), CWA (clean water), OSHA (workplace safety), FIFRA (pesticide regulation), SDWA (safe drinking water), RCRA (disposal of hazardous materials), TSCA (toxic substances), and CERCLA (hazardous and polluted sites).

[103] Motivating events include a chemical leak at a Union Carbide plant in Bhopal, India, that immediately killed over 3,000 people, contamination of a middle-class housing development at Love Canal in upstate New York, high levels of pollution in the Cuyahoga River that caused it to catch fire, and the popularity of Rachel Carson's *Silent Spring*. *See* RICHARD J. LAZARUS, THE MAKING OF ENVIRONMENTAL LAW 59–60, 110–11 (2004); Robert V. Percival, *Environmental Federalism: Historical Roots and Contemporary Models*, 54 MD. L. REV. 1141, 1158–59 (1995).

[104] Lazarus, *supra* note 103, at 59–60; 110–11.

[105] Percival, *supra* note 103, at 1171–78.

[106] *Id.* at 1141, 1171–78.

federal goals.[107] Depending on the set of issues at hand, the federal government sets a regulatory floor, which empowers states to formulate regulations for activities within their borders that are more stringent than the federal standards but prevents any state from allowing suboptimal standards.[108] These schemes also have permitting or enforcement components, where actors engaging in certain kinds of activity are required to comply with federal standards directly.[109] Other schemes, like the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), and EPCRA's Toxics Release Inventory, are directly administered by federal authorities, while still providing some roles for the states.[110] State law and police powers are included in these schemes via savings clauses or where state law does not conflict with, or prevent implementation or enforcement of, federal law—except to the extent that state law has been expressly or impliedly preempted.[111]

Several models are used to explain the need for federal regulation in the face of issues that concern resources held in common.[112] These concepts not only describe the kinds of comprehensive schemes that can be desirable, but also try to predict human behavior by focusing on the logic and incentives that lead to collective action problems. One such explanation is the "tragedy of the commons," which describes how individual actors are driven by short-term self-interest to pollute a commonly held resource even where each individual knows the group's collective actions will eventually destroy or seriously damage it.[113] The tragedy is that even where the specter of damage is apparent to all, the lack of capacity to overcome coordination barriers leads to an

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[107] *Id.*

[108] *Id.*

[109] *Id.*

[110] *Id.*

[111] *Id.*; *see Asymmetrical Regulation*, *supra* note 17, at 1554 (noting role of state standards where a federal floor has been set).

[112] GLICKSMAN ET AL., *supra* note 97, at 4–11, 86–91.

[113] *See* Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243, 1243–48 (1968).

ostensibly inevitable and disastrous outcome.[114] The federal government can be seen as capable or necessary to overcome collective action problems with the resources and information to identify the nation's needs and the authority to force compliance with standards designed to protect both present and future interests.[115]

The tragedy of the commons can be pervasive even after regulation is implemented; short-term interests often continue to weigh more heavily in decision making than long term or future interests, and additional incentives and political motivations come to bear.[116] As is highlighted in the hydrofracking context, one of the drivers of commons problems even after extensive regulation is the fact that the benefits and costs of regulation are often conceived of as reciprocal.[117] Benefits to industry in the form of less regulation can be correlated with costs of protecting public health and the environment from harm or increased risk of harm.[118] Thus, the operative inquiry for policymakers concerns who should bear the cost of regulation, which can be discussed in terms of efficiency or may require reaching normative conclusions about who ought to bear the burdens environmental harms present. The idea that harms are reciprocal is the building block of arguments that posit that regulation becomes inefficient when it is overly cautious and leads to unnecessary costs, as in the form of lost jobs.[119]

The "race-to-the-bottom" paradigm has also been used to

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[114] *Id.*

[115] *Id.*; GLICKSMAN ET AL., *supra* note 97, at 8–11 (discussing the role of the influence of the "tragedy of the commons" on environmental federalism scholarship).

[116] *See generally Recognizing the Regulatory Commons*, *supra* note 17 (introducing discussion of "regulatory commons" problems that persist after a regulatory regime is instituted).

[117] *See generally* Ronald Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960) (introducing discussion of reciprocal harms); *see also* GLICKSMAN ET AL., *supra* note 97, at 13–15 (2007) (discussing the role of the Coase Theorem on environmental law structures and the "polluter pays" principle).

[118] *Id.*

[119] *See* GLICKSMAN ET AL., *supra* note 97, at 16–17.

defend federal intervention in environmental issues.[120] Proponents of this argument allege that absent federal involvement, state competition for mobile industry resources will lead state regulators to lower environmental standards to suboptimal levels.[121] The race-to-the-bottom has been the subject of much discussion within the field of environmental law and although contested, there is at least some empirical evidence to suggest that it does occur.[122] More consequentially, study of whether or not states engage in a race-to-the-bottom has revealed that state regulators may feel compelled to lower standards to attract industry even where there is no actual need to do so.[123] Thus, as a threshold matter, state regulators appear to tend towards making underprotective policy choices.

B. The Debate About Environmental Federalism

Disagreement over how best to implement the existing federal environmental laws has given rise to debate about environmental

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[120] Richard B. Stewart, *Pyramids of Sacrifice? Problems of Federalism in Mandating State Implementation of National Environmental Policy*, 86 YALE L.J. 1196, 1213 (1977); *see also* GLICKSMAN ET AL., *supra* note 97, at 15–27.

[121] The "race to the bottom" has its origins in labor law and policy. *See, e.g.*, Liggett v. Lee, 288 U.S. 517, 558–60 (1933) (Brandeis, J., dissenting).

[122] *Compare* Richard L. Revesz, *Rehabilitating Interstate Competition: Rethinking the "Race-To-The-Bottom" Rationale for Federal Environmental Regulation*, 67 N.Y.U. L. REV. 1210 (1992), *with* Kirsten H. Engel, *State Environmental Standard-Setting: Is There a "Race" and Is It "To the Bottom"?*, 48 HASTINGS L.J. 271 (1997) [hereinafter *State Environmental Standard-Setting*], *and* Scott R. Saleska & Kirsten H. Engel, *"Facts Are Stubborn Things:" An Empirical Reality Check in the Theoretical Debate Over the Race-To-The-Bottom in Federal Standard-Setting*, 8 CORNELL J.L. & PUB. POL'Y 55 (1998) [hereinafter *Facts Are Stubborn Things*].

[123] Engel and Saleska & Engel presented empirical evidence to show that even if state policymakers do not actually "need" to lower standards to attract industry, they continue to believe that standard-lowering is necessary. *See State Environmental Standard-Setting*, *supra* note 122; *Facts Are Stubborn Things*, *supra* note 122. In fact, the race to the bottom might be a misnomer if applied in the context of natural gas extraction. With gas, the concern is not with mobile industry in the typical sense. Rather, gas companies will likely seek to access the extent of gas wherever it is available, limited only by technological feasibility, so interstate competition is less operative.

federalism. Discussion revolves around how to balance federal, state, and local interests.[124] Some scholars argue for economics-based approaches to determine what level of government should have regulatory primacy,[125] while others attempt to respond to the complex systems that environmental laws govern and the behavioral forces that appear to motivate regulators.[126] However, given the complexity of environmental problems and federal laws that, in many cases, require regulation regardless of cost, adaptive approaches that seek to respond to the dynamic nature of environmental issues are more likely than market based approaches to result in effective policy.[127]

1. Economics and The "Matching Principle"

For the past three decades, academics have debated how to apportion authority over environmental problems most effectively, without encouraging overregulation.[128] A large part of the discussion has turned to economics arguments, which seek efficiency-based means of determining whether the federal government or the states should have primacy.[129] One argument posits that, contrary to conventional wisdom concerning the race-to-the-bottom, states are more likely to maximize all social goods because federal intervention impedes accurate expression of state preferences through state policy choices and market mechanisms.[130] Building on this idea, and the related assumption that inducing internalization of costs leads industry and regulators alike to make more efficient choices, some academics have

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[124] *See infra* Parts II.B.1–2.

[125] *See infra* Part II.B.1.

[126] *See infra* Part II.B.2.

[127] *See infra* Parts II.B.2 & IV.

[128] *See, e.g.*, Revesz, *supra* note 122; Jonathan H. Adler, *Jurisdictional Mismatch in Environmental Federalism*, 14 N.Y.U. ENVTL. L.J. 130, 131–33 (2005); Stewart, *supra* note 120, at 1210; Butler & Macey, *supra* note 18, at 25.

[129] *See Adaptive Federalism*, *supra* note 16, at 1802–07 (describing and criticizing prevailing economics-based theories).

[130] *Compare* Revesz, *supra* note 122, *with State Environmental Standard-Setting*, *supra* note 122, *and Facts Are Stubborn Things*, *supra* note 122.

espoused the "matching principle," which involves identifying the best match between a level of government and the geography of an environmental problem.[131] Under matching theories, the federal government may be the most efficient regulator in some instances, but state or local regulation is most appropriate much of the time.[132] Thus, geographic correlation between problems and regulatory authorities should guide any attempts to regulate.[133] A corollary of this argument is that one-size-fits-all federal regulations are ineffective due to highly disparate ecological and social conditions across the states.[134]

Despite their elegance, economics-based or efficiency-focused models may not be well suited to addressing environmental issues. Environmental laws confront problems that can appear to have clear geographic boundaries but in fact defy clear delineation.[135] Theories that rely on market or regulatory preferences to measure social goods also run the risk of under-representing non-economic or hard-to-price values, pervasive in environmental issues,[136] given widespread reliance on cost-benefit analysis in orienting such preferences. Moreover, these theories fail to appreciate fully that social goods and ills, even if reciprocal, are rarely cleanly symmetrical. These theories may also ignore the role uncertainty plays in policymaking or the wide variety of interests and "hidden" considerations that can skew regulatory incentives.[137] Furthermore,

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[131] *See* Adler, *supra* note 128; Butler & Macey, *supra* note 18, at 25.

[132] *See* Adler, *supra* note 128; Butler & Macey, *supra* note 18, at 25.

[133] *See, e.g.*, Adler, *supra* note 128, at 137–39 (discussing the need for decentralization and the variable needs of different regions).

[134] Stewart, *supra* note 120, at 1210; *see generally* Colloquium, *State Roles in U.S. Environmental Law and Policy*, 14 N.Y.U. ENVTL. L.J. (2005); Dan Esty, *Revitalizing Environmental Federalism*, 95 MICH. L. REV. 570 (1996).

[135] See, for example, the difficulty the Supreme Court has had in trying to reconcile agency interpretation manifesting a "scientific" understanding of what delineates a wetland with the statutory meaning of "waters of the United States" in United States v. Riverside Bayview Homes, Inc., 474 U.S. 121 (1985); Solid Waste Agency of Northern Cook County v. Army Corps of Engineers, 531 U.S. 159 (2001); and Rapanos v. United States, 547 U.S. 715 (2006).

[136] *See, e.g.*, GLICKSMAN ET AL., *supra* note 97, at 15–27.

[137] *See Facts Are Stubborn Things*, *supra* note 122, at 74–84 (discussing political, behavioral, and risk-based incentive structures that may come to bear

tautological approaches that rely on preferences to arrange themselves into a balance between goods and ills and then define that equilibrium as achievement of maximum efficiency lack normative direction.[138] Finally, efficiency-focused arguments do not fully address the iterative possibilities[139] created by a three-tiered system or the potential for exploitation of institutional differences across levels of government to increase efficiency of the existing environmental law framework.[140] The weaknesses in efficiency arguments are particularly relevant where information about systems and risk is both largely incomplete and contested and where economic pressures distort public choice.[141]

2. Adaptive Federalism and the Regulatory Commons

One theory has recently emerged that describes an "ecological" approach to environmental federalism.[142] Critiquing economics-based theories as ill equipped to address the complexity of environmental issues, not to mention the environmental law framework, Kirsten H. Engel and David E. Adelman describe "adaptive federalism" as a form of federalism that embraces flexibility and overlap, features that make ecological systems more durable.[143] According to Engel and Adelman, adaptive federalism is likely to be more responsive to the complexities and variation inherent in environmental problems and to result in higher levels of protection than the "classical" or "static" conceptions, like the matching principle, which they argue assume away critical

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on regulatory decision making). *See also* Gregg P. Macey, *Coasean Blind Spots: Charting the New Institutionalism*, 98 GEO. L. J. 863 (2010) (discussing complex nature of transaction costs and how these create "Coasean blind spots" that complicate decision making in environmental disputes).

[138] *See* DOUGLAS A. KYSAR, REGULATING FROM NOWHERE: ENVIRONMENTAL LAW AND THE SEARCH FOR OBJECTIVITY 14–16 (2010).

[139] *See* Ann E. Carlson, *Iterative Federalism and Climate Change*, 103 NW. U. L. REV. 1097, 1099–1103 (2009).

[140] *See generally Contextual Environmental Federalism*, *supra* note 16.

[141] *See* KYSAR, *supra* note 138, at 71–75.

[142] *Adaptive Federalism*, *supra* note 16, at 1817–20.

[143] *Id.* at 1832; *see also Harnessing the Benefits of Dynamic Federalism*, *supra* note 19, at 179.

variables.[144] By contrast, adaptive federalism relies on the institutional stability of our existing environmental law while encouraging flexibility that allows regulators to react to an ever-evolving body of information.[145]

William Buzbee's discussion of the regulatory commons supplements adaptive federalism by focusing on the operative concerns about overregulation that motivate proponents of matching approaches.[146] Buzbee points out that matching jurisdiction to environmental problems can be difficult because many issues are cross-jurisdictional.[147] Buzbee argues that even where there appears to be too much regulation, as in apparently robust regulatory frameworks, gaps develop due to perceptions of jurisdictional inadequacy, paucity of incentives, and political machinations.[148] Regulators become inattentive to regulatory opportunities because, for instance, multiple regulators share jurisdiction, or causes and effects of an activity make it difficult to identify the regulatory body with controlling jurisdiction.[149] Buzbee's discussion suggests that the etiology of commons problems is structural and behavioral, and may be pervasive even where a state has sole regulatory authority. Moreover, despite the potential for jurisdictional confusion that overlapping vertical jurisdiction presents,[150] one can conclude that regulatory commons problems are more likely to be prevented by clarifying roles and granting a variety of regulators increased responsibility for problems than by contracting jurisdiction and reducing available resources.[151]

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[144] *Adaptive Federalism*, *supra* note 16, at 1799.

[145] *See generally id.*

[146] *See generally Recognizing the Regulatory Commons*, *supra* note 17.

[147] *Id.* at 22–28.

[148] *See id.*

[149] *See id.*

[150] *See id.*; *Contextual Environmental Federalism*, *supra* note 16, at 126; *Asymmetrical Regulation*, *supra* note 17.

[151] *See Recognizing the Regulatory Commons*, *supra* note 17.

III. HYDROFRACKING: THE REGULATORY FRAMEWORK

Several holes in federal environmental laws allow hydrofracking to escape federal oversight.[152] Some exemptions have been explicitly placed in statutes.[153] Other aspects of hydrofracking slip through loopholes in the laws or simply do not trigger the existing scheme.[154] Therefore, regulatory authority has been handed to state governments. New York's proposed regime may not provide adequate protection from hydrofracking's harms.[155] In addition, New York prevents local governments from exercising direct regulatory authority over hydrofracking processes, leaving localities vulnerable to potential environmental and public health harms.[156]

A. Federal Regulation

Like any activity with an impact on the environment, federal environmental laws touch upon aspects of hydrofracking.[157] However, the oil and gas industry successfully lobbied for exemptions for hydrofracking[158] from several major federal environmental laws, many of which went into effect with the enactment of the Energy Policy Act of 2005 ("the Act").[159] Apparently, the view that exemption from federal statutes and

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[152] *See infra* Part III.A.; *see also* note 4.

[153] *See infra* Part III.A.; *see also* note 4.

[154] *See infra* Part III.A.

[155] *See infra* Parts III.B–C.

[156] *See infra* Parts III.B–C.

[157] *See infra* notes 168–69 and accompanying text.

[158] *See, e.g.*, Dennis Lathem, LEAF v. EPA: *A Challenge to Hydraulic Fracturing of Coalbed Methane Wells in Alabama*, COALBED METHANE ASSOCIATION OF ALABAMA (July 1, 2001), http://www.energyindepth.org/PDF/LEAF_v_EPA.pdf.

[159] Energy Policy Act of 2005, Pub. L. No. 109–58, 119 Stat. 594, 694 (2005) (codified as amended in scattered sections throughout the U.S. Code); *See also* NAT'L ENERGY POL'Y DEVEL. GRP., NATIONAL ENERGY POLICY: RELIABLE, AFFORDABLE, AND ENVIRONMENTALLY SOUND ENERGY FOR AMERICA'S FUTURE viii–xv (2001), *available at* http://www.wtrg.com/EnergyReport/National-Energy-Policy.pdf [hereinafter NAT'L ENERGY POL'Y].

reduced federal oversight of oil and gas development would lead to increased energy independence and development of so-called bridge fuels, like natural gas, prevailed in Congress.[160] However, some critics are suspicious of the motives behind what skeptics have termed the "Halliburton loophole."[161] Whatever its intent, Congress removed federal oversight of most aspects of hydrofracking and its component practices.

Section 322 of the Act exempts hydraulic fracturing from the SDWA, which protects public and municipal water supplies from underground injection and disposal of hazardous substances through imposition of water quality standards.[162] Further, the Act effectively exempted wellpad construction activities associated with hydrofracking from the National Pollutant Discharge Elimination System (NPDES) under the CWA.[163] In addition, because Congress rolled hydrofracking-related practices into its

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[160] Congress' characterization of the Act is aligned with the views of the Energy Policy Development Group, as expressed in NAT'L ENERGY POL'Y, *supra* note 159, at viii-xv; the conference report states that the Act is meant "to ensure jobs for our future with secure, affordable, and reliable energy." H.R. REP. NO. 109–190, at 1 (2005), *reprinted in* 2005 U.S.C.C.A.N. 448, 448. *See also infra* notes 159–67 and accompanying text.

[161] The exemptions have been termed the "Halliburton Loophole" because Halliburton pioneered much of the hydrofracking technology, and Vice President Cheney, formerly a Chief Executive Officer of Halliburton, has been widely criticized for permitting industry representatives and lobbyists to participate in a secret task force to create energy policy early in the tenure of the Bush Administration. Some believe the Energy Policy Act of 2005 is a legislative expression of many of the policies hashed out by that task force. *See* Editorial, *The Halliburton Loophole*, N.Y. TIMES, Nov. 2, 2009, at A28, *available at* http://www.nytimes.com/2009/11/03/opinion/03tue3.html?scp=1&sq=halliburton+loophole&st=nyt.

[162] See Energy Policy Act, §§ 322–23, 119 Stat. 594, 694, amending the SDWA, 42 U.S.C. § 300h(d), to exclude underground injection from hydraulic fracturing. Previously, in 1997, the 11th Circuit had ruled that that, under the SDWA, the EPA had to regulate "underground injection." Legal Environmental Assistance Foundation v. EPA, 118 F.3d 1467 (11th Cir. 1997).

[163] *Effect of Federal Safe Drinking Water Act, Clean Water Act, and Emergency Planning and Community Right to Know Act*, N.Y. ST. DEP'T OF ENVTL. CONSERVATION, http://www.dec.ny.gov/energy/46445.html (last visited Apr. 7, 2011) [hereinafter *Effect of Federal Safe Drinking Water Act*].

exemption language, it potentially expanded existing oil and gas exemptions in CERCLA to aspects of site construction, drilling, and postfracking production.[164] The Act also weakened review under the National Environmental Policy Act (NEPA) by presuming that certain categorical exclusions apply for oil and gas extraction.[165] Hydrofracking is also exempt from RCRA, which provides for federal oversight of storage and disposal of hazardous materials,[166] and from toxic substance reporting requirements under EPCRA.[167]

Hydrofracking is not entirely beyond the scope of federal oversight, yet significant federal involvement is unlikely given the structure of potentially applicable laws. States must still meet water quality standards under the CWA and the CAA's national ambient air quality standards via existing state-formulated plans. However, current interpretations of "navigable waterways" make it unlikely that the federal government has jurisdiction under the CWA to regulate emissions unless a "significant nexus" exists between an impacted groundwater connection and navigable waters.[168] Establishing a "significant nexus" is likely a difficult showing in the hydrofracking context, as most impacts will be on groundwater sources that are hard if not impossible to trace to navigable waters.[169] In addition, the EPA will not aggregate air

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[164] WHAT'S THE HYDRO-FRACKING RUSH, *supra* note 4, at 12.

[165] *Id.*

[166] *See* Wiseman, *supra* note 4, at 251 n.125.

[167] *Effect of Federal Safe Drinking Water Act*, *supra* note 163; *see also* CERCLA, Pub. L. No. 99-499, 100 Stat. 1728 (1986) (codified in scattered sections throughout the U.S. Code).

[168] Rapanos v. United States, 547 U.S. 715, 787 (2006). Justice Kennedy articulated the "significant nexus" test in his concurrence; although not commanding a majority, his position essentially embodies the nexus between the majority and the dissent in *Rapanos*, suggesting to lower courts that his formulation should govern their decisions. *See id.*

[169] Proving hydrologic connections is likely to be difficult because it may be impossible to determine where and how much fracking fluid will travel subsurface after injection. Furthermore, *Rapanos* has proven difficult for lower courts to apply and has led to erratic results. *See* Gregory H. Morrison, Note, *A Nexus of Confusion: Why the Agencies Responsible for Clean Water Act Enforcement Should Promulgate a New Set of Rules Governing the Act's*

emissions from the various operations that occur on a wellpad, and the agency has exempted pollutants emitted by surface waste, like fracking fluid, from stationary source regulation under the CAA.[170] Courts are also unlikely to hold that the CAA applies to increased emissions from truck traffic.[171] Finally, although savings clauses in federal laws preserve state police powers and common law authority,[172] including tort liability for harm after the fact, standing and evidentiary hurdles typically prevent recovery in suits brought over environmental harms.[173] Thus, the federal government has effectively vacated the field, and regulation of hydrofracking is achieved via a patchwork of state policies.[174] Although industry often welcomes federal standard setting when faced with the burden of meeting a proliferation of state schemes,[175] it is apparent that in the hydrofracking context, industry supporters have preferred a state-led approach.[176]

B. State Regulatory Scheme

State police power includes the authority to regulate activity that impacts natural resources and human health, and New York State has exercised this power to propose comparatively stringent

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Jurisdiction, 42 MCGEORGE L. REV. 397 (2011); Stephen P. Louthan, *Environmental Law: Post-Rapanos Rulings*, NAT'L L.J., Sept. 25, 2006, *available at* http://www.cobar.org/docs/PostRapanosRulings.pdf?ID=2947.

[170] *See* Wiseman, *supra* note 4, at 251 n.125.

[171] *See* Village of Oconomowoc Lake v. Dayton Hudson Corp., 24 F.3d 962, 963 (7th Cir. 1994) (holding that the CAA does not apply to emissions from increased truck traffic).

[172] *Asymmetrical Regulation*, *supra* note 17, at 1550 (discussing savings clauses in the context of preemption doctrine).

[173] *See* ROBERT V. PERCIVAL ET AL. ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 70–75 (5th ed. 2006).

[174] See Wiseman, *supra* note 4, for a comprehensive comparison of state policies.

[175] *Asymmetrical Regulation*, *supra* note 17, at 1569–70.

[176] *See* Letter from John Hoeven, Gov. of N.D., Chairman of Interstate Gas and Oil Compact Commission, to U.S. Reps. Tauzin and Dingell (Mar. 18, 2003), *available at* http://www.energyindepth.org/PDF/Tauzin-Dingell.pdf.

environmental regulations on hydrofracking.[177] Article 23 of the New York Environmental Conservation Law[178] ("Article 23") establishes the DEC's broad jurisdiction to regulate oil and gas extraction via its Division of Mineral Resources,[179] with dual regulatory goals of encouragement of natural gas development and protection of correlative ownership.[180] In addition, the Department of Transportation has jurisdiction over transportation of hazardous materials,[181] and the Public Service Commission regulates siting of gas gathering lines, which is not subject to public review under the State Environmental Quality Review Act (SEQRA), New York's NEPA corollary.[182]

Pursuant to SEQRA, the DEC has devised a land use focused regulatory strategy over hydrofracking implemented largely via permitting and reporting requirements.[183] The DEC prepared its draft supplemental Generic Environmental Impact Statement (SGEIS), released in 2009, after receiving applications for permits to drill using high-volume hydrofracking methods.[184] The SGEIS supplements the DEC's Generic Environmental Impact Statement,[185] which outlines the agency's approach to conventional

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[177] *See generally* Wiseman, *supra* note 4.

[178] N.Y. ENVTL. CONSERVATION LAW § 23-0301 (McKinney 2010).

[179] *See Environmental Enforcement Law*, N.Y. ST. DEP'T OF ENVTL. CONSERVATION, http://www.dec.ny.gov/regulations/40195.html (last visited Apr. 7, 2011); *Well Owner and Applicants Information Center*, N.Y. ST. DEP'T OF ENVTL. CONSERVATION, http://www.dec.ny.gov/energy/1522.html (last visited Apr. 7, 2011).

[180] N.Y. COMP. CODES R. & REGS. tit. 6 § 550.1 (2010).

[181] *See* SGEIS, *supra* note 29, at 5-5 to -6. DOT regulations specify that fracking fluid components should be separately trucked and mixed only onsite. *Id.*

[182] N.Y. COMP. CODES R. & REGS. tit. 6 § 617.5(c)(35) (2010); s*ee also* SGEIS, *supra* note 29, at 5-129.

[183] SGEIS, *supra* note 29, at §§ 7.1.1, 7.1.1.1, 7.1.1.3–7.4. The DEC Plan relies on the Susquehanna River Basin Commission and the Delaware River Basin Commission to regulate water withdrawals from those bodies of water.

[184] *Id.* at 1-1.

[185] *See generally* GENERIC ENVIRONMENTAL IMPACT STATEMENT ON THE OIL, GAS, AND SOLUTION MINING REGULATORY PROGRAM, DIVISION OF MIN. RESOURCES, N.Y. ST. DEP'T OF ENVTL. CONSERVATION (1992), *available at*

extraction methods and which proved inadequate to address the significantly greater environmental impacts from high volume hydrofracking.[186]

The regulatory strategy the DEC has presented in the SGEIS concerns many New Yorkers. The most significant concern that critics share is that the agency is inadequately funded or staffed to ensure compliance with state regulations and policies.[187] For instance, as of 2009, the Division of Mineral Resources had only sixteen enforcement staff members to oversee more than thirteen thousand conventional wells.[188] Even drillers are concerned that their permits will be held up by administrative delays because DEC's staff is inadequate to process the large number of forthcoming requests.[189]

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http://www.dec.ny.gov/energy/45912.html.

[186] *Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program: Well Permit Issuance for Horizontal Drilling and High Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low-Permeability Gas Reservoirs, Executive Summary*, DEC, http://dec.ny.gov/energy/47554.html (last visited Feb. 12, 2011).

[187] *See* RIVERKEEPER, COMMENTS ON THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DRAFT SUPPLEMENTAL GENERIC ENVIRONMENTAL IMPACT STATEMENT ON THE OIL, GAS AND SOLUTION MINING REGULATORY PROGRAM 1–3 (Dec. 28, 2009), *available at* http://www.riverkeeper.org/wp-content/uploads/2010/01/Riverkeeper-DSGEIS-Comments-12-28-09.pdf [hereinafter *Riverkeeper Comments*]; *Riha et al., Comments, supra* note 49; *Specific Comments on the Draft Scope for the GEIS*, N.Y. CITY DEP'T OF ENVTL. PROTECTION 1–2, 6 (Dec. 12, 2008), http://www.nyc.gov/html/dep/pdf/natural_gas_drilling/nycdep_comments_final_12-22-09.pdf [hereinafter *DEP Comments*].

[188] *Buried Secrets: Gas Drilling's Environmental Impacts: New York*, PROPUBLICA, http://projects.propublica.org/gas-drilling-regulatory-staffing/states/NY (last visited Feb. 27, 2011).

[189] Mireya Navarro, *Cuts in State Agency Are Troubling, Environmentalists and Gas Drillers Agree*, N.Y. TIMES, Oct. 22, 2010, at A17, *available at* http://www.nytimes.com/2010/10/23/nyregion/23grannis.html?partner=rss&emc=rss; *IOGA of NY Supports Restoration of DEC Staff for Natural Gas Operations*, INDEP. OIL & GAS ASS'N, http://iogany.org/news.php3 (last visited Apr. 7, 2011); Telephone Interview with Judith Quigley, *supra* note 70. Recently, former DEC Commissioner Grannis expressed concern that DEC staff was not even sufficiently equipped to handle the over 14,000 comments filed in response to the SGEIS. Allison Sickle, *New York DEC Shorthanded to Reply to*

Critics are also concerned that the DEC's plan does not address the cumulative impacts of even routine aspects of hydrofracking.[190] The SGEIS deals with these effects in a cursory fashion and asserts that too much uncertainty exists to be able to assess them with accuracy.[191] Many critics feel the DEC's failure to address these impacts is unsatisfactory, for it is the uncertainty of these effects that frustrates attempts to prepare for them and compounds the risk of harm.[192] For example, small-scale chemical spills, accidents, and incremental burdens on surface waters and infrastructure are difficult for localities to anticipate without more information about how extensive drilling will be.[193] Some also suggest that the state has not recognized the extent of hidden economic costs associated with environmental contamination and the potential loss of ecosystem services.[194] Similarly, there are concerns that emergency management plans are lacking and that worst case scenarios have not been sufficiently elaborated, in light of federal exemptions.[195] Moreover, many hold that the DEC inadequately considered the findings and conclusions of regulators from other states that have experienced harms from horizontal drilling and high-volume hydraulic fracturing.[196] There is widespread concern that the DEC has not ensured there will be full, public disclosure of chemical components in fracking fluid, and some urge public reporting requirements for frack fluid components, all locations of

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14,000 Marcellus Shale Comments – Environmental Inspectors Down to 16, D.C. BUREAU (Apr. 29, 2010), http://dcbureau.org/20100429367/Natural-Resources-News-Service/new-york-dec-staff-shorthanded-to-reply-to-13500-marcellus-shale-comments-environmental-inspectors-down-to-16.html.

[190] *See Riverkeeper Comments*, *supra* note 187; *Riha et al., Comments*, *supra* note 49; *DEP Comments*, *supra* note 187.

[191] SGEIS, *supra* note 29, at 6-141 to -143.

[192] *Riha et al., supra* note 49. *See also DEP Comments*, *supra* note 187, at 7; *Riverkeeper Comments*, *supra* note 187.

[193] *See Riverkeeper Comments*, *supra* note 187; *Riha et al., Comments*, *supra* note 49; *DEP Comments*, *supra* note 187, at 9.

[194] *See Riverkeeper Comments*, *supra* note 187; *Riha et al., Comments*, *supra* note 49; *DEP Comments*, *supra* note 187, at 39.

[195] *DEP Comments*, *supra* note 187, at 48.

[196] *Id.* at 1; *see also Riverkeeper Comments*, *supra* note 187.

drilling operations, and any spills or contamination.[197] Overall, the SGEIS leaves concern that once hydrofracking kicks into high gear, the State will not be poised to address problems that arise. Addressing emergencies and incidental effects will be largely left to localities, which bear the most risk of immediate harms from hydrofracking.

C. Local Roles

As a home rule state, New York typically allows municipalities a degree of latitude to govern local activities.[198] However, Article 23 stipulates that the State's regulatory program "supersede[s] all local laws or ordinances relating to the regulation of the oil, gas and solution mining industries" although local primacy over road use and property taxes are retained.[199] For instance, the State will not require local approval of permits under its State Pollution Discharge Elimination System (SPDES) and corollary Stormwater Pollution Prevention Plan (SWPPP) program.[200] Thus, localities will not have control over such critical decisions as wellpad siting, stormwater planning, erosion control, or pipeline placement.[201] The State has issued nonbinding directives to industry to consult with local planning documents and procedures in siting decisions, and operators are expected to comply with local floodplain permitting

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[197] *Riha et al., Comments*, *supra* note 49; *see also About the DEC Supplemental Generic Environmental Impact Statement (SGEIS)*, N.Y. CITY DEP'T OF ENVTL. PROT., http://www.nyc.gov/html/dep/html/news/natural_gas_drilling_SGEIS.shtml (last visited Feb. 27, 2011) ("[T]he City urged DEC to rescind the draft SGEIS given the serious omissions and the grave consequences of the proposed action.").

[198] N.Y. MUN. HOME RULE LAW § 1 et. seq. (McKinney 2010).

[199] N.Y. ENVTL. CONSERVATION LAW § 23-0303(2) (McKinney 2010); Michael E. Kenneally & Todd M. Mathes, *Natural Gas Production and Municipal Home Rule in New York*, 10 N.Y. ZONING L. & PRACTICE REP., no. 4, 2010 at 2, *available at* http://counties.cce.cornell.edu/yates/documents/NaturalGasProduction.pdf.

[200] Telephone Interview with Wendy Walsh, *supra* note 68.

[201] *See generally Stormwater*, N.Y. ST. DEP'T OF ENVTL. CONSERVATION, http://www.dec.ny.gov/chemical/8468.html (last visited Apr. 7, 2011); SGEIS, *supra* note 29, at 1-2; Telephone Interview with Wendy Walsh, *supra* note 68.

requirements that establish broadly applicable siting and setback guidelines.[202] However, localities cannot set any laws or regulations that specifically refer to or are clearly directed at hydrofracking activities.[203] Thus, hydrofracking is not subject to zoning restrictions, although zoning has long been considered a valid exercise of local authority.[204] Localities are nonetheless expected to investigate water quality complaints[205] and provide emergency response services.[206] Waste disposal and sanitation are also typically local responsibilities, which will be dramatically impacted by the high volume of flowback water, waste, and drill

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[202] *See* SGEIS, *supra* note 29, at 8-5; Interview with Elaine Jardine, *supra* note 72. Some county officials are lobbying the state to allow local influence, if not control, over issues such as gathering and pipeline siting and stormwater plans. Telephone Interview with Wendy Walsh, *supra* note 68.

[203] *See* SGEIS, *supra* note 29, at 1-2; Keneally & Mathes, *supra* note 199 (explaining that New York case law suggests municipalities may not explicitly target natural gas production with zoning, but also arguing that it is possible that a carefully enacted ordinance could meet court approval).

[204] *See* Hadacheck v. Sebastian, 239 U.S. 394 (1915). Interview with Elaine Jardine, *supra* note 72. A court might uphold a zoning ordinance limiting hydrofracking if an area has a comprehensive plan in place, and has specifically and historically rejected similar activities on grounds a court would find reasonable. The town of Ulysses in Tompkins County is attempting this approach. *See* Liz Lawyer, *Ulysses Explores Gas-Drilling Ban*, PRESSCONNECTS.COM (Oct. 28, 2010, 8:10 PM), http://www.pressconnects.com/article/20101028/NEWS01/10280445/Ulysses+explores+gas-drilling+ban. However, a regional or municipal plan targeted towards a specific industrial use might be rejected as impermissible NIMBYism. *See* Michael Burger, *"It's Not Easy Being Green": Local Initiatives, Preemption Problems, and the Market Participant Exception*, 78 U. CIN. L. REV. 835, 886–89 (discussing NIMBYism, LULUs, and "spot zoning" in light of municipal attempts to zone out liquefied natural gas storage facilities). In addition, in this context zoning provides a limited tool, as most fracking will occur in rural, rather than municipal areas. Finally, if zoning restrictions are not enacted before hydrofracking begins, the activity could constitute a preexisting nonconforming use.

[205] SGEIS, *supra* note 29, at 8-4 to -5.

[206] *See* EDWARD VANDEMARK, TIOGA COUNTY COUNCIL OF GOVERNMENTS, OVERVIEW OF TIOGA COUNTY LOCAL GOVERNMENTS 12–14 (2009), *available at* http://www.tiogacountyny.com/pdfs/government/govtoverview.pdf (setting forth and describing the basic services provided at the county level); Telephone Interview with Dick Le Count, *supra* note 71.

cuttings from hydrofracking operations.[207] Despite the significant emergency responsibilities and infrastructural demands hydrofracking poses, localities have few authoritative tools to help them prepare.[208]

1. Local Responses

Many local officials in communities where hydrofracking activity is likely to occur have been attempting to prepare for its probable impacts.[209] Several officials in gas-rich Tioga County, an area likely to see extensive hydrofracking activity, have expressed frustration with their limited ability to influence the course of drilling or its effects.[210] In particular, some are frustrated by the fact that local discretion has been removed from activities typically subject to local input, such as permitting for construction and industrial activities.[211] Others are less concerned about the State's primacy, do not feel lack of federal oversight is an issue of concern, and downplay fears over some of hydrofracking's risks.[212] While some are concerned to an extent about threats to the environment and public health, few feel it is within his or her authority to take a position on whether hydrofracking should be encouraged or prevented.[213] Most see the value in compromise,

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[207] *See* VANDEMARK, *supra* note 206, at 41 (setting forth and describing basic services provided at the county level); Interview with Elaine Jardine, *supra* note 72; Telephone Interview with Judith Quigley, *supra* note 70.

[208] *See infra* Part III.C.1–2.

[209] *See infra* Part III.C.1–2.

[210] Telephone Interview with Wendy Walsh, *supra* note 68.

[211] Interview with Elaine Jardine, *supra* note 72; Telephone Interview with Judith Quigley, *supra* note 70. In particular, Wendy Walsh is concerned about the potential for erosion from wellpad activities and gathering line siting and notes that although she typically has input in the permitting process for construction activities, she does not in the hydrofracking context. She hopes that gas companies will be responsive to local requests about siting. Telephone Interview with Wendy Walsh, *supra* note 68.

[212] Telephone Interview with Dick Le Count, *supra* note 71 (stating his "biggest worry is that we'll run out of freshwater" and opining that truck traffic will be the most formidable problem localities will face).

[213] *Id.*; Interview with Andrew Fagan, Dir., Cornell Cooperative Extension

given the contentious nature of hydrofracking and its perceived inevitability.[214] Understandably, local officials are interested in achieving pragmatic solutions with what little regulatory authority they have.[215] Several seem persuaded that, as heavy users of natural gas, New Yorkers have an obligation to permit drilling.[216] Furthermore, local officials recognize the State's interest in encouraging gas production and understand the rationale behind cutting off local input and control.[217] Opposition at the local level could allow a few individuals to stall or prevent fracking, which would be undesirable and unacceptable[218] given the many interests in favor of drilling and the benefits that would come from gas production—even if local opposition could provide a bulwark against hydrofracking's harms.

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for Chemung and Tioga Counties, NY (Oct. 15, 2010); Interview with Elaine Jardine, *supra* note 72; Telephone Interview with Judith Quigley, *supra* note 70; Telephone Interview with Wendy Walsh, *supra* note 68.

[214] Telephone Interview with Dick Le Count, *supra* note 71; Interview with Andrew Fagan, *supra* note 213; Interview with Elaine Jardine, *supra* note 72 (stating "I can't say whether it's good or bad. That's not my role. My role is to prepare the municipalities for the impact that it will have with the constraints they're given by New York State government."); Telephone Interview with Judith Quigley, *supra* note 70 (expressing the common sentiment that people in Tioga County "don't want to scare companies away" and that "the DEC is already perceived as "overregulating"); Telephone Interview with Wendy Walsh, *supra* note 68.

[215] Telephone Interview with Dick Le Count, *supra* note 71; Interview with Andrew Fagan, *supra* note 213; Interview with Elaine Jardine, *supra* note 72; Telephone Interview with Judith Quigley, *supra* note 70; Telephone Interview with Wendy Walsh, *supra* note 68.

[216] Interview with Andrew Fagan, *supra* note 213; Interview with Elaine Jardine, *supra* note 72; Telephone Interview with Wendy Walsh, *supra* note 68.

[217] Interview with Elaine Jardine, *supra* note 72; Telephone Interview with Wendy Walsh, *supra* note 68.

[218] Interview with Elaine Jardine, *supra* note 72 (explaining "[i]n defense of the state, they don't want every gas drill to have to go through local permitting. They know that local permitting is a difficult process here if it's a controversial use. It's really hard to get anything through."); Telephone Interview with Wendy Walsh, *supra* note 68.

2. Mitigating Impacts from Hydrofracking

Some officials in Tioga County seek to mitigate impacts from hydrofracking through traditional means of municipal control.[219] While a few towns and villages in New York State are testing their zoning discretion,[220] this power is less relevant in Tioga County, where most towns and villages do not have comprehensive zoning plans in place.[221] Therefore, concerned county officials have focused instead on tweaking traffic rules and on implementing light, noise, and wellhead protection ordinances, which restrict uses and set water quality standards within municipal borders.[222] Localities may also require ancillary service providers or businesses, such as pipe yards and chemical storage facilities, to comply with standards for lighting, traffic flow, and signage under site plan review ordinances—although site plan review does not apply to drilling or hydraulic fracturing processes themselves.[223]

It is important to note the limitations of these regulatory tools. In Tioga County, for example, while twelve of the fifteen towns and villages do now have site plan review ordinances in place, only four have enacted zoning regulations.[224] The majority of towns have not enacted new ordinances in anticipation of hydrofracking besides site plan review, and enacting these measures would not ultimately be feasible.[225] Zoning plans require staff and expertise to formulate, while noise and light ordinances and traffic plans require prohibitively expensive environmental testing and

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[219] Telephone Interview with Dick Le Count, *supra* note 71; Interview with Andrew Fagan, *supra* note 213; Interview with Elaine Jardine, *supra* note 72; Telephone Interview with Judith Quigley, *supra* note 70; Telephone Interview with Wendy Walsh, *supra* note 68.

[220] *See* Lawyer, *supra* note 204.

[221] Interview with Elaine Jardine, *supra* note 72.

[222] Wellhead protection ordinances set forth general land-use guidelines and setbacks that are intended to protect a municipal water supply from contamination. *Id.*; Telephone Interview with Judith Quigley, *supra* note 70.

[223] Interview with Elaine Jardine, *supra* note 72.

[224] *Id.*

[225] *Id.*

engineering consultants.[226] In addition, wellhead protection plans do not apply where a town lacks a public water supply and are not applicable to wellpad activity.[227]

There are also political obstacles to implementing new measures.[228] Many towns and villages have only part-time or volunteer officials without the institutional capacity or political will to enact new ordinances.[229] Furthermore, there is frequently opposition to measures that appear to increase governmental interference with private property rights, even in protective ways.[230] In addition, county legislators have proven to be unwilling to address fears about hydrofracking given uncertainty over practical issues,[231] such as whether groundwater contamination is a serious concern. The county is also suffering from "personnel drain," as some of the best-trained and most knowledgeable workers are hired by industry in anticipation of drilling.[232] Furthermore, the State has not provided supplemental resources to help localities prepare, nor has it indicated it will do so once fracking begins in earnest.[233]

Perhaps the most crucial tool localities lack is adequate

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[226] Telephone Interview with Judith Quigley, *supra* note 70. One local engineering firm has put together a package that would help municipalities get reimbursed for wear and tear on roads. Interview with Elaine Jardine, *supra* note 72.

[227] *Id.*

[228] *Id.*; Telephone Interview with Judith Quigley, *supra* note 70.

[229] Interview with Elaine Jardine, *supra* note 72; Telephone Interview with Judith Quigley, *supra* note 70.

[230] Interview with Elaine Jardine, *supra* note 72; Telephone Interview with Judith Quigley, *supra* note 70.

[231] For instance, one looming issue concerns how long it will take the State to finalize its regulatory scheme. Interview with Elaine Jardine, *supra* note 72. Note too that many politicians, as landowners, do or will have personal economic interest in encouraging hydrofracking. Telephone Interview with Judith Quigley, *supra* note 70.

[232] Interview with Andrew Fagan, *supra* note 213; Interview with Elaine Jardine, *supra* note 72; Telephone Interview with Wendy Walsh, *supra* note 68.

[233] Interview with Elaine Jardine, *supra* note 72; Telephone Interview with Wendy Walsh, *supra* note 68.

enforcement ability.[234] Towns and villages do not have the necessary financial resources to conduct adequate oversight or ensure that violations of local laws are addressed.[235] By contrast, energy companies generally have more than sufficient resources to pay small fines, which are therefore not likely to deter behavior that results in harm.[236] Energy companies also tend to have significant legal resources readily available to challenge town enforcement attempts or to counter opposition.[237]

Aware of their disproportionate resources, localities have facilitated relationships with industry and sought voluntary agreements in which they seek commitments for infrastructure investments.[238] For instance, officials seek promises that industry will purchase firefighting equipment;[239] build, repave, and

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[234] Telephone Interview with Judith Quigley, *supra* note 70.

[235] *Id.*

[236] *See, e.g.*, Christopher Helman, *Range Resources is King of the Marcellus Shale*, FORBES.COM (July 22, 2010, 7:00 PM), http://www.forbes.com/forbes/2010/0809/companies-energy-range-resources-bp-gas-blowout-beneficiary.html (describing the $500 million dollar operating income of just one "small" gas company active in the East, Range Resources); *see also* Donald Gilliland, *Marcellus Shale Gas Drillers Committed 1,435 Violations in 2.5 Years, Report Says*, PENNLIVE.COM (Aug. 2, 2010, 5:37 PM), http://www.pennlive.com/midstate/index.ssf/2010/08/marcellus_shale_gas_drillers_c.html (reporting that gas industry averaged one and a half regulatory violations a day over two and a half year period); *Drilling Down*, *supra* note 74 (describing how energy companies in Pennsylvania have engaged in illegal dumping of fracking wastes because it is cheaper than proper disposal where resulting fines are dwarfed by the daily profits reaped from gas production).

[237] *See* Helman, *supra* note 236; Gilliland, *supra* note 236; *Welcome to the Marcellus Drilling Resource Page*, PENN. SIERRA CLUB, http://pennsylvania.sierraclub.org/PA_Chapter_2008/Conservation/Energy/MarcellusDrillingResourcePage.htm (last visited Feb. 18, 2011) (noting that Pennsylvania towns have been tied up in legal battles in attempts to get gas companies to comply with local laws).

[238] Telephone Interview with Dick Le Count, *supra* note 71; Interview with Elaine Jardine, *supra* note 72; Telephone Interview with Judith Quigley, *supra* note 70; Telephone Interview with Wendy Walsh, *supra* note 68.

[239] Telephone Interview with Dick Le Count, *supra* note 71; Interview with Elaine Jardine, *supra* note 72.

maintain roads;[240] use closed systems to store fracking fluid;[241] and disclose the chemicals used in fracking mixtures.[242] In one striking example, the Tioga County Emergency Management Office will rely solely on industry to extinguish any wellpad fires.[243] In addition to realizing that basic needs will be better met if they work with private industry, local officials are interested in fostering positive and cooperative relationships with firms operating in and among their communities.[244]

IV. HYDROFRACKING AND ENVIRONMENTAL FEDERALISM

New York's experience with hydrofracking illustrates how an adaptive approach to regulation is more likely to result in sufficient environmental protection than an approach that attempts to match potential problems with a level of authority based on geography. While an essentially localized activity, hydrofracking nonetheless presents a regulatory challenge to state and local governments.[245] Deciding whether to encourage or limit hydrofracking requires a highly subjective analysis that relies on uncertain and incomplete

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[240] Interview with Elaine Jardine, *supra* note 72; Telephone Interview with Judith Quigley, *supra* note 70; Telephone Interview with Wendy Walsh, *supra* note 68.

[241] Interview with Elaine Jardine, *supra* note 72; Telephone Interview with Judith Quigley, *supra* note 70; Telephone Interview with Wendy Walsh, *supra* note 68.

[242] Telephone Interview with Dick Le Count, *supra* note 71; Telephone Interview with Wendy Walsh, *supra* note 68.

[243] Telephone Interview with Dick Le Count, *supra* note 71.

[244] *Id.*; Interview with Andrew Fagan, *supra* note 213; Interview with Elaine Jardine, *supra* note 72; Telephone Interview with Judith Quigley, *supra* note 70; Telephone Interview with Wendy Walsh, *supra* note 68. Of course, there are concerns about whether these agreements will satisfactorily address localities' needs in actuality, and these agreements can give rise to disagreements between energy companies and localities over how best to implement them. For example, although energy companies and towns share an interest in having roads maintained in good quality, thus operators may agree to provide resources to accomplish this task, they may resist doing so in a manner that meets local desires or conventions—or even labor laws. Telephone Interview with Judith Quigley, *supra* note 70.

[245] *See supra* Part III.

information about risk.[246] Meanwhile, state and local decisionmakers are incentivized to accept risk of harms they lack resources to prevent or mitigate.[247] Applying federal laws to hydrofracking would help relieve some of the pressures on state and local authorities by placing the burden of precaution onto energy companies.[248] Moreover, there may be appreciable benefits to fostering a flexible regime that includes responsive interaction among all three levels of government.[249] Finally, an active federal role in regulating new technologies like hydrofracking can give states and localities a better chance to formulate policies aligned with their resources and expertise, leading to increased political accountability, jurisdictional confidence, and fewer regulatory commons problems.[250]

A. Strict State Primacy: A Poor Match for Hydrofracking

In many respects, the existing federal approach to regulation of hydrofracking would likely meet the approval of matching principal proponents. A land-based activity without any obvious interstate impacts, hydrofracking seems a good candidate for a state-led approach, and the federal government essentially has mandated state primacy.[251] Federal regulation would increase costs and slow fracking efforts.[252] If federal laws were operative,

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[246] *See supra* Part I.C.

[247] An example is contamination of an entire county's drinking water source, as in Tioga County, where the Clinton Street Ballpark Aquifer supplies both Tioga and neighboring Broome County. *See* Clinton Street-Ballpark Valley Aquifer System Broome and Tioga County Areas, NY, 50 Fed. Reg. 2025 (Envtl. Prot. Agency Jan. 14, 1985) (final determination). *See also infra* Part III.C.

[248] *See infra* Part IV.B–C.

[249] *See infra* Part IV.B–C.

[250] *See infra* Part IV.C.

[251] *See supra* Part III.C; *see also* Wiseman, *supra* note 4, at 251 n.125.

[252] Adler, *supra* note 128, at 157–60 (arguing that SDWA is an example of inefficient regulation because it makes a poor jurisdictional match); *see also* Butler & Macey, *supra* note 18, at 62 (arguing that "[b]ecause land pollution and the potential for groundwater contamination are very localized phenomena, our federalism model leads to the argument that these externalities should be

industry, states, and localities would bear additional SDWA compliance burdens.[253] Energy companies would have to comply with and obtain permits under the CWA, which are costly and delay development. Aggregation of emissions from wellpad activity or truck traffic under the CAA would increase permitting and cause companies to incur pollution control costs. Removal of exemption from CERCLA would increase risk of liability that would create disincentives to drill, and strengthened NEPA review would also add time and cost to preproduction planning. Regulation under RCRA would also add time and expense to disposal of fracking byproducts. Moreover, and especially given the extensive private property interests involved in hydrofracking, local geographic, socioeconomic, geological, and hydrological differences make state regulation arguably more appropriate than federal regulation to meet unique state preferences.[254]

However, an analysis of New York's experience with hydrofracking to date suggests that state primacy may well result in underprotection and even hamper production activity.[255] Notably, New York's proposed regulations are more protective than those in many other states,[256] yet its plan nonetheless has demonstrated weaknesses.[257] New York's inadequate enforcement and oversight capacity and its failure to anticipate cumulative impacts may mean that state primacy will result in unintended and undesirable outcomes.[258]

First, it is important to note that New York's regulations may not result in protection of some baseline standards that EPA has established.[259] For instance, concentrations of toxic pollutants in flowback hydrofracking fluids have measured in excess of amounts

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regulated exclusively by state and local jurisdictions").

[253] Adler, *supra* note 128, at 157–60.

[254] *See supra* Part I.C.

[255] *See infra* note 285 and accompanying text.

[256] *See generally* Wiseman, *supra* note 4 (comparing multiple state regimes and describing New York's proposed regulation as comparatively more protective than other states).

[257] *See supra* Part III.B.

[258] *See supra* Part III.B.

[259] Wiseman, *supra* note 4, at 277.

that would be permissible under the SDWA, and flowback fluids can be high in pollutants ruled hazardous under RCRA.[260] Because New York State has not updated its wetland map after pivotal Supreme Court decisions that altered federal jurisdiction over wetlands,[261] there may be pollutant releases onto what should be federally regulated land.[262] New York's ability to achieve water quality standards under the CWA may be seriously overestimated in light of criticism that the State has not accurately estimated the extent of cumulative impacts on water quality.[263] Air emissions from wellpad activities, if aggregated, might far exceed the minimum requirements that trigger the CAA.[264] These examples demonstrate that New York's scheme might result in failure to meet federal standards that would apply absent exemptions or do apply to the same or similar harms caused by other industries and suggest that as a threshold matter, state primacy over hydrofracking will create results inconsistent with existing law.

Furthermore, the New York scheme's reliance on local implementation of emergency planning, public health, waste disposal, and road regulation enhances the probability that unintended harms may occur. The level of risk that localities are expected to bear is disproportionate to the resources they have to handle that risk.[265] As a result, the State's regulatory regime is

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[260] *See id* at 277–78.

[261] *See* Solid Waste Agency of Northern Cook County v. Army Corps of Engineers, 531 U.S. 159 (2001) (invalidating the "migratory bird rule" and holding that the Army Corps does not have jurisdiction over wetlands not directly adjacent to navigable waters); Rapanos v. United States, 547 U.S. 715 (2006) (plurality holding that federal jurisdiction extends only to navigable waterways and water bodies with continuous surface connection with navigable waterways, as well as to wetlands adjacent to these waters). *See also supra* note 168 and accompanying text.

[262] *See Riha et al., Comments*, *supra* note 49.

[263] *See Drilling Down*, *supra* note 74 (examining how processed wastewater from hydrofracking may result in water body quality below that required by federal standards).

[264] *See* Ian Urbina, *Pressure Limits Efforts to Police Drilling for Gas*, N.Y. TIMES, March 3, 2011, at A1, *available at* http://www.nytimes.com/2011/03/04/us/04gas.html?_r=1&ref=science.

[265] *See supra* Part III.C.

effectively dependent on voluntary industry action.[266] Local officials hope energy companies will agree to provide necessary infrastructure—like roads—and emergency response support—like basic firefighting equipment—even though the industry has incentives to downplay and minimize concerns to the detriment of preparedness.[267] Moreover, experiences of local officials show that localities do not feel well equipped to handle even routine incidental, let alone catastrophic, impacts from fracking and that they lack reliable information to help them bargain with energy companies optimally.[268]

Lack of oversight and enforcement powers at state and local levels may lead to lax, inconsistent, or insufficient compliance with existing state and local regulations.[269] Even where officials are dedicated to proactive prevention and oversight efforts, local

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[266] *See supra* Part III.C; *see infra* note 267.

[267] As Elaine Jardine explained:

> I'd really like to get into meeting with more [gas companies]. Because they don't necessarily have to comply with [wellhead protection ordinances] . . . . We really want to establish some kind of relationship with the gas companies so they may decide to comply with a municipal wellhead protection ordinance [and] we would like to see some of these critical things that are needed in the community followed, too—like if a fire station needs to have a ladder truck, none of our fire stations have ladder trucks—so you know have the gas company pay for that, and community benefit type things.

Interview with Elaine Jardine, *supra* note 72.

[268] According to Elaine Jardine:

> I don't get much support from the legislature. It's a combination of funding, it's not believing in planning—and they just don't want to tackle the issue of natural gas right now . . . . [And the planning department] will be the main point of contact for gas industries' dealing with the municipalities and we're trying to set that up now . . . The associate planner I used to have went to Chesapeake [Energy] to be a municipal relations person.

Id. As Andrew Fagan put it: "[n]ational and international companies–they're so excited about this play and they're saying it's the second largest in the world, but are we ready for it? Are we ready for these companies to descend upon us, and can we trust them?" Interview with Andrew Fagan, *supra* note 213. *See supra* Parts III.C–D.

[269] *See supra* Part III.C.

staffs are inadequate to conduct inspections that would ensure that companies—who may be unfamiliar with desired or mandated local practices, given variation from town to town—are heeding regulations and ordinances.[270] If noncompliance is detected, local enforcement power does not appear sufficient to induce adherence to laws.[271] Furthermore, at the state level, an insufficient number of wellpad inspectors can lead to severely reduced checks on drilling and production activities, which may make it more likely that harm-generating errors will occur.[272] If harm does occur, lack of oversight may make identification of the responsible party difficult, given the number of component processes that make up hydrofracking.[273]

New York's experience also illustrates some of the difficulty of drawing jurisdictional lines around complicated environmental problems that have corollary economic benefits. New York is proceeding to set its jurisdictional lines by declaring what hydrofracking's impacts are likely to be, by establishing permitting and policy standards in its SGEIS to respond to these impacts, and by restricting local authority.[274] Yet the defects in New York's

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[270] Telephone Interview with Wendy Walsh, *supra* note 68.

[271] As Judith Quigley explained, "if there is a disagreement over something, gas companies are the ones with deep pockets . . . and of course companies will battle if [an issue] goes to court," while towns and villages simply do not have money in the coffers or legal staff to fight any opposition. Telephone Interview with Judith Quigley, *supra* note 70. Furthermore, as Andrew Fagan explained, "[i]f it is just a gentlemen's agreement, where [companies] just agree to a checklist, and there's no punitive actions that will happen, then we have to be ready for the consequences." Interview with Andrew Fagan, *supra* note 213.

[272] *See* Marie C. Baca, *Interview: Former Environmental Commissioner Pete Grannis on Gas Drilling*, PROPUBLICA (Nov. 12, 2010, 7:55 AM), http://www.propublica.org/article/interview-former-ny-environmental-commissioner-pete-grannis-on-gas-drilling.

[273] The presence of a series of subcontractor relationships can complicate the process of identifying the responsible party in a spill or disaster. See, e.g., the controversy over whether British Petroleum, TransOcean, or Halliburton could be held accountable for the oil leak in the Gulf of Mexico of the spring and summer of 2010. *See* Erika Boldstad, *BP, Transocean, Halliburton Will Blame One Another for Spill*, MCCLATCHY (May 10, 2010), http://www.mcclatchydc.com/2010/05/10/93868/bp-transocean-halliburton-will.html.

[274] *See supra* Parts III.B–C.

proposed scheme suggest that state regulators have downplayed or failed to anticipate fully the gravity of uncertain impacts, which has led to inaccurate characterization of problems and poor allocation of authority.[275] Furthermore, because DEC regulators are not responsible for the kinds of issues that first responders at the local level face, such as waste disposal, road degradation, emergency response, or even local air quality, problems within the jurisdiction of localities are likely to prove beyond any local regulator's control or resources to address.[276] Moreover, the uncertainty over whether hydrofracking should be viewed as presenting problems rather than opportunities has fostered ambivalence that colors local elected officials' willingness to cast hydrofracking as a policy priority.[277] Thus, many of the attempts to address potential harms have been initiated by unelected officials who are concerned about harm and feel they should prepare now in order to help forestall foreseeable problems.[278] Unelected local officials effectively are left with a Hobson's choice—they can either curry favor with energy companies and establish voluntary agreements and risk considerable harm, or push the boundaries of what might be permitted by law, such as attempting to zone out hydrofracking, only to find they have overstepped their power and in the process have alienated and lost the ability to work with and extract concessions from gas producers.[279] In addition, confusion about jurisdiction with regard to foreseeable harms may lead local decisionmakers to be even more reluctant to grapple with

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[275] *See supra* Part III.B.

[276] *See supra* Part III.C; *Drilling Down*, *supra* note 74.

[277] *See supra* Part III.C. Local legislators have not been focused on devising plans to prepare for fracking "saying it's not here yet and we don't know how long it's going to take." Interview with Elaine Jardine, *supra* note 72.

[278] *See supra* Part III.C.

[279] As Andrew Fagan explained:

> I think the tricky part, for anyone looking at [hydrofracking], is - okay who has jurisdiction over what piece of this [issue], and what is this piece anyway? How are [we] supposed to stay on top of this? What's the responsibility of towns? What's the responsibility of counties? What's the responsibility of individuals?

Interview with Andrew Fagan, *supra* note 213.

unforeseeable and novel problems that arise.[280] Drawing strict jurisdictional boundaries around an environmental issue without fully addressing the scope of possible problems or recognizing the asymmetry between local and industry resources creates a danger that the drawn boundaries will prove arbitrary or fail to account for the broad scope of consequent harms. Thus, setting strict jurisdictional lines—especially where, as here, there is pressure to underregulate[281]—might leave designated regulators unprepared, while responsibility for handling many intractable problems will be pushed off onto those who are not politically accountable.[282]

Besides the potential for environmental and public health harms, New York's experience with hydrofracking suggests that even apparently well-matched jurisdiction can hamper economic growth. Fear that New York's regulations are inadequate in light of federal exemptions, combined with widely publicized accounts of hydrofracking's harms, has led to a high level of opposition from some groups.[283] Vocal opposition has delayed the release of final

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[280] *Id.*

[281] Both from the energy industry and interested property owners. *See supra* Part II.C. In addition, we might presume the pressures that typically have been seen to drive state regulators are operative here. For discussion of these forces, see *Contextual Environmental Federalism*, *supra* note 16, at 120–22; *Facts Are Stubborn Things*, *supra* note 122; *State Environmental Standard-Setting*, *supra* note 122.

[282] Elaine Jardine expressed this point:

> We need that natural gas as a nation and as consumers, so I can see both sides. It's a two-edged sword. The impact is [going to be major] because of all of the incidental impacts [but if] farmers get good payment so the farm will most likely stay in farming . . . I see it from both sides of the coin. It's just a wait and see game I guess. We can't do much about it.

Interview with Elaine Jardine, *supra* note 72; *see also* Baca, *supra* note 272 (quoting former DEC Commissioner Grannis as understanding "both sides" of the issue and discussing the DEC's dual mandate of environmental protection and promoting gas and oil exploitation).

[283] Some of the most vocal opposition to hydrofracking has coalesced around the documentary *Gasland*, which won an award for best documentary at the Sundance Film Festival and was nominated for an Academy Award, and chronicles the experience of landowners and neighbors of hydrofracking activity. *See About the Film*, GASLAND: A FILM BY JOSH FOX, http://gasland

regulations in New York[284] and may result in an outright ban if sufficient public opposition is sustained or continues to grow.[285] Even if New York proceeds to set regulations and allows hydrofracking to commence, its insufficient oversight capacity is likely to limit the extent of production, as DEC's current strategy is to issue permits only in proportion to oversight capacity.[286] Thus, hydrofracking shows that the matching principle can lead to

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themovie.com/about-the-film/ (last visited Feb. 10, 2011); *see also* Charles Riley, '*Gasland' Oscar Nod Draws Industry Ire*, CNNMONEY.COM (Jan. 26, 2011, 5:21 PM), http://money.cnn.com/2011/01/26/news/companies/gasland_movie/index.htm.

[284] *See* Sickle, *supra* note 189.

[285] *See Comments by N.Y. Gov. David Paterson* (WAMC radio broadcast Nov. 24, 2010) ("At this point, I would say that the hydrofracking opponents have raised enough of an argument to thwart us going forward at this time."). Former Gov. Paterson also issued an executive order suspending the approval of some permits until after July 2011, although the efficacy of this order is doubtful given that permits will not be issued before DEC completes its review of hydrofracking, not expected to occur before the order ceases to have effect. Sasha Chavkin, *Executive Order Suspending Fracking Brings Little Change*, PROPUBLICA (Dec. 17, 2010, 1:23 PM), http://www.propublica.org/article/executive-order-suspending-fracking-brings-little-change. Of course, New York's experience may not be representative of how the hydrofracking debate will play out in the rest of the country. Downstate residents are concerned primarily with protecting their water supply and can be out of touch with the kinds of problems communities upstate face that make them amenable to hydrofracking. *See, e.g.*, Eric Engquist, *The New Gold Rush*, CRAIN'S, (Nov. 9, 2009, 5:59 PM), http://www.crainsnewyork.com/article/20091101/SMALLBIZ/311019959# (contrasting opposition to hydrofracking by Mayor Bloomberg and organized NYC residents with benefits from hydrofracking accrued to upstate residents). It may be unlikely that public opposition will grow significant enough to stanch hydrofracking activity in other states that do not have such a polarized makeup.

[286] In an interview, former Commissioner of the DEC, Pete Grannis explained:

> The human resources have to be scaled based on [] drilling activity. The plan [when we were drafting the SGEIS] was to have on-site monitors . . . . The DEC will make sure [there are staff] on hand to make sure that the process is functioning properly. It's no good to [just] give a permit . . . [y]ou need people on site who are not answerable to the driller.

Baca, *supra* note 272.

apparent inefficiency, by its own terms.

B. An Adaptive Approach to Environmental Federalism

Hydrofracking demonstrates the desirability of an adaptive approach to environmental federalism that includes an active role for the federal government and regulatory flexibility both within applicable federal agencies and between state and local actors to respond to changing information and circumstances. The network of federal environmental laws is critical to prevent and check harms from environmental problems that might immediately seem to have only localized effects.[287] Each environmental law is designed to allocate burdens of risk and precaution differently and to place those burdens onto industry, localities, states, and the federal government in nuanced ways.[288] Layers of accountability, liability, and penalty institute procedural nodes that incentivize industry actors to act with greater precaution where they propose to engage in risky activity. Greater precaution would undoubtedly lead to a reduced risk of harm, and could mollify opposition that stands as an obstacle to production in the face of uncertainty. Thus, while federal laws might impose upfront and ongoing compliance costs for energy companies seeking to exploit the Marcellus Shale in New York, their application would likely lead to more satisfactory outcomes for a larger number of stakeholders.

One criticism of federal environmental laws that adaptive federalism addresses is that federal regulation suffers from path dependence and poor responsiveness to local concerns and conditions.[289] To some extent, hydrofracking proves these criticisms have merit. For example, the way the EPA currently

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[287] *See supra* Part III.A.

[288] *See* GLICKSMAN ET AL., *supra* note 97, at 72–78 (describing the design of environmental laws and how functions, enforcement, and risk and burden allocation vary); *Harnessing the Benefits of Dynamic Federalism*, *supra* note 19, at 178–83 (arguing that federal regulation provides valuable checks that provide a better safety net within the context of environmental problems).

[289] *Asymmetrical Regulation*, *supra* note 17, at 1595 (noting that "the first significant regulatory action on an issue may sit unrevised for years, long after the state of the art has changed").

defines a "stationary source" under the CAA leaves hydrofracking operations just out of regulatory range.[290] Of course, the EPA has been vested with the discretion to exercise considerable regulatory flexibility to change how it defines terms, such as what constitutes a "stationary source,"[291] in order to respond to evolving problems. However, under an adaptive approach to federalism, some path dependence is not detrimental to the objective of environmental protection; rather, a degree of overarching rigidity can provide structure.[292] Applying federal laws in a consistent manner across industries—rather than based on arbitrary exemptions—would provide the regulatory system with greater stability, even as regulators strive to increase their capacity to respond to evolving circumstances.

Hydrofracking illustrates how regulators may use information to increase their responsiveness to local conditions and improve the adaptability of the federal environmental law framework. Because the EPA has been essentially directed to leave the field,[293] community groups, localities, and states have been compelled to gather and generate information about harm and problem-solving strategies and to disseminate this information across state lines.[294]

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[290] *See supra* Part III.A.

[291] Chevron U.S.A. Inc. v. Natural Res. Def. Council, Inc., 467 U.S. 837 (1984) (setting forth what has become the Chevron test, highly deferential to agency interpretations of ambiguous terms in enabling statutes).

[292] *Adaptive Federalism*, *supra* note 16.

[293] Note, however, that Congress has directed EPA to study hydrofracking more closely, which the agency has begun to do, releasing a draft study plan on February 8, 2011. *See Hydraulic Fracturing*, U.S. EPA, http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/index.cfm (last visited Feb. 12, 2011).

[294] *See, e.g.*, *Lastest News*, CATSKILL MOUNTAINKEEPER.ORG, http://www.catskillmountainkeeper.org/ (last visited Mar. 14, 2011) (listing stories of interest about impacts from hydrofracking nationwide); *Natural Gas Hydrofracking in Shale*, CITIZENS CAMPAIGN FOR THE ENVIRONMENT, http://www.citizenscampaign.org/campaigns/hydro-fracking.asp (last visited Mar. 14, 2011) (providing access to stories and information about hydrofracking nationwide); *Landman Report Card*, LANDMANREPORTCARD.ORG (last visited Mar. 14, 2011) (providing a place for landowners approached by landmen to report their experiences); *Marcellus Drilling News*, MARCELLUSDRILLING.COM, http://marcellusdrilling.com/ (last visited Mar. 14, 2011) (a pro-drilling website

For instance, much of the information that the Tioga County Attorney has been using to develop a model voluntary road use agreement was obtained by the attorney from neighboring Broome County, who, faced with a local information deficit, traveled to Texas to obtain information about the kinds of issues that have arisen there due to gas production.[295] However, information applicable to one state or region does not always translate well to another.[296] Furthermore, information that has been publicly compiled in an ad hoc manner might not be reliable, with a good proportion subject to interest-group and media distortions.[297]

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posting positive articles about hydrofracking and alerts about efforts to limit or ban the practice). There are many more such community-operated websites and blogs, as well as more journalistic efforts, like ProPublica's investigative reports on hydrofracking trends nationwide. *See supra* notes 63 & 64. In terms of the kind of general information generation that has occurred, and how unruly it can be, note that as of February 27, 2011, an Internet search for "hydraulic fracturing" and "New York" turned up 155,000 search results. *Hydraulic Fracturing New York*, GOOGLE, http://google.com (search "hydraulic fracturing new york") (last visited Feb. 27, 2011). To see how EPA is likely better situated to aggregate and analyze information about hydrofracking, see *Drilling Down*, *supra* note 74 (comparing state information and data on water contamination with internal EPA documents that provide a fuller picture of hydrofracking's harms to water bodies).

[295] Telephone Interview with Judith Quigley, *supra* note 70.

[296] Hydrofracking effects are likely to differ across states depending on hydrology and geology (i.e. aquifer depth versus depth of drilling), as well as political and economic variation. *See* LISA SUMI, SHALE GAS: FOCUS ON THE MARCELLUS SHALE (2008), http://www.earthworksaction.org/pubs/OGAP MarcellusShaleReport-6-12-08.pdf (discussing drilling or potential for drilling in several different shale formations across the country and suggesting how differences might lead to different impacts).

[297] Accuracy or validity of either position aside, compare *Hydraulic Fracturing Facts*, HYDRAULIC FRACTURING.COM, http://www.hydraulic fracturing.com/Pages/information.aspx (last visited Mar. 14, 2011) (website that appears to be operated by Chesapeake Energy asserting that "[p]roperly conducted modern hydraulic fracturing is a safe, sophisticated, highly engineered and controlled procedure") with John Zeiger, *No Fracking Way: Ban Hydrofracking in New York*, ONEARTH.ORG, http://www.onearth.org/node/1865 (last visited Mar. 14, 2011) (NRDC-published community blog post describing SGEIS as "possibly the worst document [the DEC] has ever written" and positing that "one could make the argument that it was practically written by gas

Indeed, public concern about whether anecdotal harms can be traced to hydrofracking has already led the EPA to commence a new study of the practice.[298] The agency now has the opportunity to develop and respond to emerging information in a comprehensive fashion, creating a reliable record that addresses public fears, as this Note and other authors recommend.[299] With more reliable information, regulators at all levels of government would be better situated to make decisions about whether or how to regulate hydrofracking.[300] Regulatory flexibility to respond to

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company lobbyists"). Note that uncertainty about what harms are likely to occur that results from concern over accuracy of publicly available information has placed local officials who seek to cultivate objectivity in an awkward position, exacerbating their difficulties in preparing for incidental impacts; as Andrew Fagan explains:

> When you see movies like *Gasland* and other things, you need some way to view those things through the lens of objectivity if you don't have all the knowledge then you get caught up in the emotional . . . . So that's been a real challenge, and the media doesn't help . . . . And right now we are in a position that we can learn from mistakes that are happening in Pennsylvania, [but] in Pennsylvania the companies are showing all of these regulations they already have to follow, and DEP is happy about how they are monitoring things, and how things are going, but yet you hear about these number of concerns or issues and you keep trying to weigh that out in your mind, and saying "who do you believe?"

Interview with Andrew Fagan, *supra* note 213.

[298] The EPA is engaged in producing a report on hydrofracking, to be released in 2012. *See Hydraulic Fracturing*, *supra* note 293. An EPA report released in 2004, which concluded that hydrofracking could not be conclusively linked to purported harms, has been widely criticized. *See generally* LISA SUMI, OIL AND GAS ACCOUNTABILITY PROJECT, OUR DRINKING WATER AT RISK: WHAT EPA AND THE OIL AND GAS INDUSTRY DON'T WANT US TO KNOW ABOUT HYDRAULIC FRACTURING (2005), *available at* http://www.earthworksaction.org/pubs/DrinkingWaterAtRisk.pdf.

[299] *See* Hannah Wiseman, *Untested Waters: The Rise of Hydraulic Fracturing in Oil and Gas Production and the Need to Revisit Regulation*, 20 FORDHAM ENVTL. L. REV. 115, 182–83 (2009).

[300] Allowing the EPA to play a pivotal role in providing and ensuring reliability of information about possible environmental harm can result in improved policy choices about new technologies, like hydrofracking, over time. Applying existing federal laws would help prevent some of hydrofracking's

unique problems would increase as uncertainty that hinders decisionmaking or incentivizes regulators to discount harm is lessened.

Although matching principle proponents would likely argue that wholly intrastate municipal drinking water supplies can be more appropriately and efficiently regulated at the state or local level,[301] an adaptive approach to federalism supports the idea that a federal environmental law like the SDWA is equally justified as those that target clearly interstate resources like air and navigable waterways. Analysis of the SDWA shows that applying the matching principle and fixing a static regulatory position that drinking water is always better left to localities or states can result in underprotection. Water resources that states and localities can protect most efficiently under "normal" conditions may be left vulnerable when a new kind of industry, such as hydrofracking, arises that has unprecedented and formerly unforeseeable impacts.[302] Towns can only use devices like weak wellhead protection ordinances to prevent pollution of communal water supplies.[303] And as in Tioga County, where one aquifer supplies a whole county,[304] a wellhead protection plan will not forestall contamination that occurs outside the borders of the municipality that has enacted the plan.[305] If the SDWA were to apply to hydrofracking, federal enforcement and oversight resources would

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most dramatic harms but would not remove jurisdiction from state and local regulators. *See supra* Part III.A. Thus, federal regulators would still be able to learn from innovations at lower levels of government and from industry responses to different policies. The federal government could consciously devise and adopt iterative strategies, finding ways to moderate what industry perceives as draconian state postures in some instances, while inhibiting overly permissive schemes in other states. See Carlson, *supra* note 139 (presenting a discussion of iterative opportunities created when federal and state regulatory differences are played off of one another in the context of vehicle emissions standards).

[301] *See* Adler, *supra* note 128, at 157–60.

[302] *See Drilling Down*, *supra* note 74.

[303] Interview with Elaine Jardine, *supra* note 72.

[304] *Id. See also* Clinton Street-Ballpark Valley Aquifer System Broome and Tioga County Areas, NY, 50 Fed. Reg. 2025 (Envtl. Prot. Agency Jan. 14, 1985) (final determination).

[305] Interview with Elaine Jardine, *supra* note 72.

offer a higher level of assured protection. Not only would the federal government carry a bigger stick to ensure compliance, but federal intervention would cut out the formidable costs of establishing and revisiting baseline standards where the nature of novel harms is not well understood.[306] Furthermore, forcing energy companies to implement technologies that will prevent harm to municipal water supplies could have the beneficial impact of preventing harm to unregulated water sources, like private wells, as industry operating standards improve in order to achieve compliance with federal regulations. Hydrofracking shows that even federal laws that seem intrusive at the local or state level may be necessary to ensure proper protection of critical commonly held resources. Thus, allowing federal laws to provide a stable framework while increasing responsiveness within that framework will lead to better protection.

C. Avoiding Regulatory Commons Problems

In addition to demonstrating that an adaptive approach is preferable to a matching approach, New York's experience with hydrofracking sheds light on some aspects of operative incentives within the regulatory commons. As in New York, states may have conflicting regulatory mandates, which result in incentive confusion and distortion. For example, the DEC's goal is to promote the maximum extent of exploitation of gas resources while protecting correlative rights and the environment—goals that are in conflict.[307] Giving the states primacy over environmental problems while tasking them with striking a balance between economic growth and environmental protection may make it less likely they will have incentives to include localities in permitting and land-use decisions.[308] In an atmosphere where there is pressure

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[306] *See e.g.*, Part III.C.

[307] N.Y. COMP. CODES R. & REGS. tit. 6 § 550.1 (2010); *About DEC*, N.Y. ST. DEP'T OF ENVTL. CONSERVATION, http://www.dec.ny.gov/24.html (last visited Apr. 7, 2011). For Commissioner Grannis' perspective on these conflicting directives, see Baca, *supra* note 272.

[308] Especially where there is evidence that state regulators are already more growth-oriented than federal regulators to begin with. *See Contextual*

to compromise, states have incentives to stifle legitimate opposition; they can easily characterize such opposition as "NIMBYism" and dismiss it. For example, in New York, meaningful opportunity to express local opposition and participate in critical decisions over how hydrofracking will occur is foreclosed by the State's usurpation of traditional zoning power and local SPDES and SWPPP permitting processes.[309] Contracted authority leads to jurisdictional insecurity at the local level; meanwhile, the State has not provided adequate mechanisms for protection.[310] However, if federal law were to apply, the push to begin hydrofracking would be slowed dramatically as energy companies would be forced to comply with federal permitting processes. State and local regulators would have more time and more resources to focus on and refine strategies best suited to their historic expertise, such as cooperative compliance with the federal environmental laws, land use and natural resources planning, and municipal zoning.[311] Shared regulatory responsibility and a slowed pace could help diminish the high stakes atmosphere that currently drives New York to stifle meaningful local input, and would lead to enhanced deliberation and increased jurisdictional confidence overall.

Finally, the pervasive role of compromise in preference setting at the local level suggests that avoiding regulatory commons problems involves awareness of differences in risk tolerances across the three tiers of government. As is occurring in New York, states and localities may be bound to accept higher levels of risk than many citizens prefer because the combination of profits and harm-prevention strategies that rely on industry skew incentive structures and align risk tolerances with industry preferences.[312] In

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Environmental Federalism, *supra* note 16, at 120–22.

[309] Interview with Elaine Jardine, *supra* note 72; Telephone Interview with Judith Quigley, *supra* note 70; Telephone Interview with Wendy Walsh, *supra* note 68.

[310] *See supra* Part III.B.

[311] *See, e.g.*, *supra* Part III.A (describing state roles in cooperative federalism), and Part III.C (discussing the traditional municipal power to enact municipal zoning plans).

[312] As Dick Le Count explained, "we have to come up with solutions; being

addition, local actors have little choice but to accept an activity, even if they would prefer to keep it out of their environs.[313] By contrast, regulators at the federal level are more insulated from immediate risks of harm, direct benefits, and complicated mixtures of the two.[314] Thus, federal regulators may be better poised to set and enforce baseline standards that can prevent any group or community from accepting unacceptably high levels of risk. In addition, varying the level of federal oversight according to type of activity rather than the type of harms an activity causes—as is occurring with hydrofracking—results in inconsistent application of laws that adds to jurisdictional confusion.[315]

While adding another layer of regulatory authority will introduce a new group of actors, with their own incentive structures that could arguably add to jurisdictional confusion,[316] a federal role seems nonetheless necessary to ensure adequate protection. Where state and local oversight and enforcement resources are not adequate to meet an environmental law challenge, a federal role would assure that energy companies exercise a minimum level of environmental precaution. Local governments would then not be compelled to enter unenforceable agreements that result in the same, or likely far less, protection.[317] Local governments could spend their scarce resources on initiatives that contribute to the long-term stability of their communities rather than on scrambling to prepare or on negotiations with energy companies with short-term and myopic

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negative and anti-fracking doesn't help because then we won't get the help of the energy companies." Telephone Interview with Dick Le Count, *supra* note 71. For analysis of dynamics of risk allocation and economies of scale, see *Contextual Environmental Federalism*, *supra* note 16, at 121–22.

[313] *See Contextual Environmental Federalism*, *supra* note 16, at 111–12 (advancing an "economy of scale" argument for federal jurisdiction on the basis it is better poised to balance risk tolerances).

[314] *See id.*

[315] *E.g.*, the exemption of hydrofracking, a construction activity that creates a high level of disturbance, from the state SWPPP program seems arbitrary, given that local regulators generally have input into permitting of local construction activities.

[316] *See Contextual Environmental Federalism*, *supra* note 16, at 126.

[317] *See supra* Part III.C.

interests.[318] This outcome seems entirely consistent with the purposes of federalism—that responsibilities at each level of government are correlated to resources and expectations about accountability.[319]

Application of federal laws along with state and local regulations can also play an important signaling role by setting normative priorities.[320] These priorities serve to reinforce clarity over, and confidence in, regulatory authority to meet novel challenges. As in the hydrofracking example, failure to apply environmental laws in a consistent fashion decreases regulator assurance in jurisdictional authority.[321] Because it seems clear that the federal government is steadfastly interested in developing natural gas resources,[322] an increased federal role in the regulation of hydrofracking is not likely to result in insurmountable barriers to production and may provide legal, conceptual, and normative stability that is key to avoiding regulatory commons problems.[323]

CONCLUSION

New York's attempt to regulate hydrofracking has provided an opportunity to scrutinize the appropriateness of various approaches to environmental federalism. At first glance, hydrofracking seems like an activity that could be best regulated at the state and local

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[318] Elaine Jardine explained "[Hydrofracking] takes up a good chunk of my time." Interview with Elaine Jardine, *supra* note 72.

[319] *See Contextual Environmental Federalism*, *supra* note 16, at 128.

[320] *See* Stewart, *supra* note 120, at 1210–11.

[321] *See supra* note 279.

[322] *See supra* Part III.A (describing extent of Congressional support for exemptions for hydraulic fracturing).

[323] *See supra* Part III.A. The most aggressive Congressional attempt to address hydrofracking to date has sought to remove the exemption for hydraulic fracturing under the SDWA. Fracturing Responsibility and Awareness of Chemicals Act of 2009, H.R. 2766, 111th Cong. (2009); Fracturing Responsibility and Awareness of Chemicals Act of 2009, S. 1215, 111th Cong. (2009). However, neither the House nor the Senate bill made it out of committee. *See Bill Summary and Status*, THOMAS (LIBRARY OF CONGRESS), http://thomas.loc.gov/cgi-bin/bdquery/z?d111:h.r.02766: (last visited Apr. 12, 2011).

level, given that its most immediate effects are localized and intrastate.[324] Therefore, hydrofracking and New York State ostensibly make a good regulatory match, as Congress has mandated.[325]

However, as analysis of New York's experience shows, matching approaches rely on what are perhaps overly simplistic assumptions about the roles that risk and uncertainty play in setting and satisfying preferences.[326] In New York, regulators have been required to balance interests that are easy to price and relatively certain against those that are difficult to quantify and uncertain; further, they have been under pressure to make sensitive decisions about important trade-offs quickly.[327] With little regulatory control, localities have been forced to align their interests with industry interests in attempts to assure safety and maximize benefits, and then hope for the best.[328] Existing state and local laws are likely to prove inadequate to prevent or redress harms from hydrofracking, should they occur, because oversight and enforcement resources are limited.[329] In turn, concern over state and local capabilities to address harms itself threatens to inhibit gas production.[330] Thus, hydrofracking in New York suggests that state primacy—and thus the matching principle—may not result in adequate public and environmental protection or optimal economic efficiency.[331]

New York's experience with hydrofracking underscores the need for an adaptive framework even with regulatory commons risks.[332] A federal role will lead to some costs, which include initial delays in fracking activity and increased spending to achieve compliance with federal laws.[333] However, underregulation can

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[324] *See supra* Part IV.A.
[325] *See supra* Part III.A.
[326] *See supra* Part IV.
[327] *See supra* Parts II–III.
[328] *See supra* Part III.C.
[329] *See supra* Part III.C.
[330] *See supra* Part IV.A.
[331] *See supra* Part IV.
[332] *See supra* Parts IV.B–C.
[333] *See supra* Part IV.A.

lead to unnecessary, tragic, and irreversible costs borne by those populations least equipped to bear them.[334] A vigorous and responsive framework of laws with roles for each level of government would increase jurisdictional confidence and eliminate or mitigate uncertainty about risk.[335] Federal regulation would also prevent hindrance of beneficial economic activity by ensuring that regulators and the public have access to accurate and adequate information and by providing necessary oversight and enforcement resources.[336] Thus, allowing an active, yet adaptive, federal role in the regulation of activities that threaten to cause substantial harms will better protect public health and the environment as well as the virtues and values of federalism.[337]

[334] *See supra* Parts II.C & III.B.

[335] *See supra* Parts IV.B–C.

[336] *See supra* Parts IV.B–C.

[337] *See supra* Parts IV.B–C.