

MENDING THE FRACTURE: BRINGING PARTIES TOGETHER ON HIGH VOLUME HYDRAULIC FRACTURING THROUGH ALTERNATIVE DISPUTE RESOLUTION

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I. INTRODUCTION

Natural gas is poised to make a significant impact on America's energy future.¹ According to the United States Energy Information Administration, natural gas supplied approximately 25 percent of the United States' energy demand in 2010.² The U.S. has abundant natural gas resources, and current estimates of the recoverable resource suggest that there is enough natural gas to supply the country for the next 90 years.³ Nevertheless, in recent years, conventional gas reserves, such as those found in the Gulf of Mexico, Kansas, and New Mexico,⁴ have been declining, while unconventional natural gas, found in shale formations, tight sands, and coal beds are anticipated to become an increasing portion of U.S. natural gas production.⁵

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¹ OFFICE OF FOSSIL ENERGY & NAT'L ENERGY TECH. LAB., U.S. DEP'T OF ENERGY, MODERN SHALE GAS DEVELOPMENT IN THE UNITED STATES: A PRIMER, ES-1 (2009) [hereinafter U.S. DEP'T OF ENERGY], *available at* http://www.netl.doe.gov/technologies/oil-gas/publications/epreports/shale_gas_primer_2009.pdf.

² U.S. ENERGY INFO. ADMIN., ANNUAL ENERGY OUTLOOK 2012 EARLY RELEASE OVERVIEW 12 (2012), *available at* <http://www.eia.gov/forecasts/aeo/er/pdf/0383er%282012%29.pdf> (indicating that 24.71 quadrillion BTUs of natural gas consumed is just over 25 percent of the 98.16 quadrillion BTUs consumed by the U.S. in 2010).

³ *See* U.S. DEP'T OF ENERGY, *supra* note 1, at 3 (providing an estimate of the recoverable resource at 2007 U.S. production rates).

⁴ ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, DOE/EIA-0216(2005), U.S. CRUDE OIL, NATURAL GAS AND NATURAL GAS LIQUIDS RESERVES: 2005 ANNUAL REPORT, 39 (2006), *available at* <ftp://ftp.eia.doe.gov/petroleum/021605.pdf>.

⁵ U.S. GEOLOGICAL SURVEY, FS-113-01, NATIONAL ASSESSMENT OF OIL AND GAS FACT SHEET: NATURAL GAS PRODUCTION IN THE UNITED STATES 2 (2002), *available at* <http://pubs.usgs.gov/fs/fs-0113-01/fs-0113-01.pdf>; *see also* DEPT. OF ENERGY, *supra* note 1 at 8; Terry W. Robertson, ENVIRONMENTAL CONCERNS OF HYDRAULICALLY FRACTURING NATURAL GAS WELLS, 32 Utah Envtl. L. Rev. 67, 69 (2012) (providing an explanation of conventional versus nonconventional gas reservoirs).

“The lower 48 states have a wide distribution of highly organic shales containing vast [reserves] of natural gas.”⁶ The Marcellus Shale is one of the most expansive shale gas plays in the U.S., spanning six states and extending northeast from Ohio and West Virginia, through Pennsylvania, and into the southern part of central New York.⁷ The U.S. Energy Information Administration estimates that the Marcellus formation contains 141 trillion cubic feet of natural gas, or a 6-year supply for the entire U.S. at current levels of usage.⁸ Additionally, the Utica Shale, which is deeper and larger than the Marcellus, covers a large portion of New York and the surrounding area.⁹ The Utica Shale is in the early stages of development and early testing indicates that it may hold even larger quantities of shale gas.¹⁰

Historically, the depth of these formations and the tightness of the shale made extraction difficult and expensive.¹¹ However, recent advances in horizontal drilling and hydraulic fracturing technologies, combined with increased natural gas prices that peaked in 2008,¹² have made the recovery of natural gas from shale formations economically viable.¹³ Through a process known variably as slickwater hydraulic fracturing, high volume hydraulic fracturing (“HVHF”) or, in more common parlance, hydraulic fracturing or “hydrofracking,” shale gas reserves are currently being accessed throughout the United States.¹⁴ Hydraulic fracturing dramatically increases the volume of natural gas produced from shale formations by breaking the rock to create an interconnected network of fractured pathways that allow the gas to escape from rock formations with low permeability.¹⁵ Interest in natural gas production through the use of HVHF has increased dramatically in recent years, particularly throughout the gas-rich Marcellus region.¹⁶

⁶ U.S. DEP’T OF ENERGY, *supra* note 1, at 8.

⁷ *See id.* at 21.

⁸ Ian Urbina, *New Report by Agency Lowers Estimates of Natural Gas in U.S.*, N.Y. TIMES (Jan. 28, 2012) <http://www.nytimes.com/2012/01/29/us/new-data-not-so-sunny-on-us-natural-gas-supply.html>.

⁹ *Utica Shale - The Natural Gas Giant Below the Marcellus?*, GEOLOGY.COM, <http://geology.com/articles/utica-shale/> (last visited Oct. 10, 2012).

¹⁰ *Id.*

¹¹ *See Marcellus Shale*, N.Y. STATE DEP’T OF ENVTL. CONSERVATION, <http://www.dec.ny.gov/energy/46288.html> (last visited Oct. 10, 2012).

¹² *See* Richard Finger, *We’re Headed to \$8 Natural Gas*, FORBES (July 22, 2012, 8:46 AM), <http://www.forbes.com/sites/richardfinger/2012/07/22/were-headed-to-8-00-natural-gas/>.

¹³ *See Natural Gas Extraction – Hydraulic Fracturing*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/hydraulicfracturing/> (last visited Nov. 8, 2012).

¹⁴ *See id.*

¹⁵ Terry W. Roberson, *Environmental Concerns of Hydraulically Fracturing Natural Gas Wells*, 32 UTAH ENVTL. L. REV. 67, 72, 74 (2012).

¹⁶ *Anschutz Exploration Corp. v. Town of Dryden*, 940 N.Y.S.2d 458, 464 (N.Y. Sup. Ct. 2012).

Despite its promise of inexpensive, clean, and domestically produced natural gas, hydraulic fracturing has been hotly debated in New York and the rest of the U.S.¹⁷ Popular documentaries such as *Gasland*¹⁸ have helped launch countless citizen action campaigns against HVHF,¹⁹ with concerns over environmental and health impacts at the heart of the debate.²⁰ Fanning the flames of controversy, hydraulic fracturing is relatively under-regulated at the federal level.²¹ In the absence of federal leadership, the responsibility of regulating HVHF has been left to the states.²² In New York, hydraulic fracturing has been contested, studied,²³ delayed,²⁴ and, most recently, litigated.²⁵

In February 2012, the New York Supreme Courts of Tompkins and Otsego Counties upheld local zoning ordinances banning hydraulic fracturing within the town's limits.²⁶ These rulings are currently on appeal;²⁷ if upheld, they could shape the future of HVHF in New York. These rulings affirm the power of local governments in the hydraulic fracturing decision-making process – a power previously believed to be reserved solely to the state by the Oil, Gas, and Solution Mining Law

¹⁷ See Mireya Navarro, *State Gets 20,000 Comments on Its Gas Drilling Rules by Deadline*, N.Y. TIMES (Jan. 12, 2012), <http://www.nytimes.com/2012/01/12/nyregion/new-york-rules-on-HVHF-get-20000-comments.html>.

¹⁸ GASLAND (International WOW Company 2010) (featuring the story of filmmaker and Pennsylvania landowner Josh Fox as he seeks to find answers about hydraulic fracturing and the recent gas drilling boom across the nation. The docudrama is an Oscar Nominated film and winner of multiple awards, including Special Jury Prize Documentary at the Sundance Film Festival, Best Documentary from the Environmental Media Association, and the Lennon Ono Grant for Peace).

¹⁹ See *Organizations*, GASLAND, <http://www.gaslandthemovie.com/take-action/organizations-fighting-fracking> (last visited Oct. 10, 2012) (providing a comprehensive listing of organizations “on the front lines, fighting the natural gas drilling from destroying our neighborhoods, our water and our health.”).

²⁰ See *New York Assembly Calls for Hydrofracking Health Impact Study*, SYRACUSE.COM (Mar. 12, 2012, 8:36 PM), http://www.syracuse.com/news/index.ssf/2012/03/new_york_assembly_calls_for_hy.html; see also *Natural Gas Hydro-fracking in Shale*, CITIZENS CAMPAIGN FOR THE ENV'T, <http://www.citizenscampaign.org/campaigns/hydro-fracking.asp> (last updated May 2, 2012).

²¹ Adam Orford, *Hydraulic Fracturing: Legislative and Regulatory Trends*, MARTEN L. (Oct. 4, 2011), <http://www.martenlaw.com/newsletter/20111004-fracking-roundup>.

²² *Id.*

²³ See *Marcellus Shale*, *supra* note 11.

²⁴ See N.Y. Comp. Codes R. & Regs. tit. 9, § 7.41 (2010) (imposing a temporary moratorium on the issuance of hydraulic fracturing permits in New York).

²⁵ See John Farley, *As Fracking Ban Holds Water, Other N.Y. Towns Jump on the ‘Ban Wagon,’* METROFOCUS (Feb. 29, 2012, 4:00 AM), <http://www.thirteen.org/metrofocus/2012/02/as-fracking-bans-hold-water-other-n-y-towns-jump-on-ban-wagon/>.

²⁶ *Anschutz Exploration Corp. v. Town of Dryden*, 940 N.Y.S.2d 458, 474 (N.Y. Sup. Ct. 2012); see also *Cooperstown Holstein Corp. v. Town of Middlefield*, 943 N.Y.S.2d 722, 730 (N.Y. Sup. Ct. 2012).

²⁷ Notice of Appeal at 1, *Anschutz Exploration Corp. v. Town of Dryden*, 940 N.Y.S.2d 458 (N.Y. Sup. Ct. 2012) (No. 2011-0902), available at <http://www.westfirmaw.com/flare/DrydenNoticeofAppeal.pdf>; Notice of Appeal at 1, *Cooperstown Holstein Corp. v. Town of Middlefield*, 943 N.Y.S.2d 722, (N.Y. Sup. Ct. 2012) (No. 2011-0930), available at <http://www.westfirmaw.com/flare/MiddlefieldNoticeofAppeal.pdf>.

("OGSML"), codified in Article 23 of the New York State Environmental Conservation Law ("ECL").²⁸ Following these precedents, some local communities have attempted to take similar action to ban HVHF altogether in their jurisdictions.²⁹ For those communities that remain open to HVHF, these court decisions may incentivize gas companies to negotiate, at the local level, the specific terms of Hydraulic Fracturing in the local communities, as well as provide significant leverage to the communities in these negotiations.

The use of principled negotiation, a component of Alternative Dispute Resolution ("ADR"), to address hydraulic fracturing issues in New York State holds great potential to yield more favorable outcomes than federal and state level regulation alone. Favorable outcomes will likely occur because ADR offers communities flexible options, such as requiring the implementation of specific best management practices ("BMPs"), to address site-specific concerns about natural gas drilling through HVHF. While the OGSML does not explicitly authorize municipalities to regulate the HVHF process per se,³⁰ through the aforementioned negotiations, developers may be willing to voluntarily agree to certain site-specific conditions in exchange for the opportunity to engage in hydraulic fracturing. Communities that do not ban HVHF outright should instead look to negotiate favorable terms and conditions for hydraulic fracturing to ensure sustainable, environmentally responsible development of their resources as they obtain the economic benefits of HVHF.

This Article provides a background on HVHF and explores the use of principled negotiation to address HVHF issues. Section II reviews the practice, risks, and rewards of HVHF. Section III reviews current federal, state, and local laws that may govern HVHF. Section IV considers the ways in which dispute resolution techniques and multi-stakeholder negotiations can yield favorable outcomes for communities seeking to develop their natural gas resources. Section V presents final conclusions and offers an alternative path forward on the hydraulic fracturing debate in New York.

²⁸ See N.Y. ENVTL. CONSERV. LAW §23-0303 (McKinney 1981).

²⁹ Lissa Harriss, *Bethel Becomes Latest New York State Town to Ban Hydrofracking*, WATERSHED POST (Apr. 27, 2012, 11:39 AM), <http://www.watershedpost.com/2012/bethel-becomes-latest-new-york-state-town-ban-hydrofracking>.

³⁰ See N.Y. ENVTL. CONSERV. LAW §23-0303 (McKinney 1981).

II. HYDRAULIC FRACTURING: THE PRACTICE, THE COSTS, AND THE BENEFITS

A. The Practice of Hydraulic Fracturing

Wells drilled using the HVHF process account for a rapidly growing share of natural gas production in the U.S. today.³¹ In the HVHF process, a well is drilled and a mixture of water, chemicals, and a “proppant,” such as sand,³² is pumped into the well at extremely high pressures to fracture the rock and allow natural gas to escape and migrate to the surface.³³ Presently, most shale gas wells combine both vertical and horizontal drilling to maximize production from each well.³⁴ Shale deposits are typically wider than they are deep. Therefore, a vertical well is drilled to the target formation and a horizontal well is drilled through the formation to increase exposure to the shale, which maximizes gas production.³⁵

B. The Costs of Hydraulic Fracturing: Environmental and Public Health Risks

Hydraulic fracturing is an industrial activity that can cause significant environmental disturbance,³⁶ including potential impacts to surface and drinking water reserves, air quality, and habitat.³⁷ It may also have deleterious effects on human health, but these impacts are not yet well known or understood, and will require additional study and monitoring as hydraulic fracturing proceeds.³⁸ While these effects can be both significant and concerning, BMPs and mitigation techniques provide options for reducing the overall impacts and risks of HVHF.³⁹ To understand the

³¹ U.S. DEP’T OF ENERGY, *supra* note 1, at 8-9.

³² Oil and Natural Gas Sector: New Source Performance Standards and National Emissions Standards for Hazardous Air Pollutants Reviews, 76 Fed. Reg. 52738, 52757 (proposed Aug. 23, 2011) (defining proppant as a material that “props open” fractures in hydraulically fractured wells after fluid pressure is reduced).

³³ *Overview of Final Amendments to Air Regulations for the Oil and Natural Gas Industry: Fact Sheet*, U.S. ENVTL. PROT. AGENCY 3, <http://www.epa.gov/airquality/oilandgas/pdfs/20120417fs.pdf> (last visited Oct. 12, 2012) (estimating that 11,400 new wells are fractured each year and that another 1,400 existing wells are re-fractured to stimulate production or to produce natural gas from a different production zone).

³⁴ U.S. DEP’T OF ENERGY, *supra* note 1, at 46; see also Roberson, *supra* note 15, at 73-75 (describing the drilling and hydraulic fracturing process).

³⁵ See U.S. DEP’T OF ENERGY, *supra* note 1, at 46-47.

³⁶ N.Y. State Dep’t of Env’tl. Conservation, Revised Draft Supplemental Environmental Impact Statement on the Oil and Gas Solution Mining Regulatory Program 9 (Sept. 7, 2011), available at <http://www.dec.ny.gov/data/dmn/rdsgeisfull0911.pdf> [hereinafter NYS DEC].

³⁷ *Id.* at 9-16.

³⁸ See *id.* at 1.

³⁹ See GRAND VALLEY CITIZENS’ ALLIANCE, THE RIFLE, SLIT, NEW CASTLE COMMUNITY DEVELOPMENT PLAN (2006) available at <http://www.oilandgasbmps.org/docs/CO68-RSNCCommunityDevelopmentPlan.pdf> (defining Best Management Practices as a proven way of

importance of negotiating the use of BMPs to reduce environmental and public health risks, it is first necessary to consider the various types of impacts that can occur from HVHF.

1. *Water Impacts*

Two primary issues dominate the discussion about the water-related impacts of HVHF: water use and water contamination. HVHF requires large quantities of water, mixed with various fracturing fluids.⁴⁰ Millions of gallons of water may be used in each well.⁴¹ Surface water withdrawals supply the majority of the required water.⁴² These withdrawals can cause cumulative impacts such as “modifications to groundwater levels, surface water levels, and stream flow.”⁴³ Water withdrawals can result in significant adverse impacts to the aquatic ecosystem, downstream river channels, and riparian resources such as spawning streams for fish and other aquatic species.⁴⁴ The withdrawals can also negatively impact wetlands and aquifer supplies.⁴⁵

Moreover, fracturing fluids contain a complex cocktail of often proprietary chemicals⁴⁶ designed to maximize production in each well.⁴⁷ These chemical additives serve multiple purposes, such as reducing friction, preventing equipment corrosion, and “thickening” the water to better prop open fractures.⁴⁸ The specific compounds used in the fracturing fluid vary depending on company preference, source water quality, and site-specific characteristics of the target formation.⁴⁹ Less than two percent of the volume of a fracturing fluid is made up of chemical compounds.⁵⁰ However, all fracturing fluids contain a combination of chemicals. Some

conducting natural gas development operations, which eliminates or minimizes adverse impacts from natural gas development on public health and the environment, landowners, and the natural resources, enhances the value of natural and landowner resources, reduces conflict, and further listing a series of possible BMPs for natural gas development).

⁴⁰ *Hydraulic Fracturing 101*, EARTHWORKS, http://www.earthworksaction.org/issues/detail/hydraulic_fracturing_101 (last visited Oct. 12, 2012).

⁴¹ U.S. DEP’T OF ENERGY, *supra* note 1, at ES-4.

⁴² Jim Richenderfer, Director of Technical Programs, Susquehanna River Basin Comm’n, Address at the 2012 Goddard Forum: Marcellus Gas Water Quantity Issues (Mar. 28, 2012), *available at* <http://extension.psu.edu/private-forests/training-and-workshops/2012-goddard-forum-oil-and-gas-impacts-on-forest-ecosystems/marcellus-gas-water-quantity-issues/view> (indicating that 80% of water used for fracking in Marcellus Shale comes from surface withdrawals).

⁴³ NYS DEC, *supra* note 36, at 9.

⁴⁴ *See id.*

⁴⁵ *Id.*

⁴⁶ NYS DEC, *supra* note 36, at 5-55 to 5-63.

⁴⁷ *See* U.S. DEP’T OF ENERGY, *supra* note 1, at ES-4.

⁴⁸ Roberson, *supra* note 15, at 75-76.

⁴⁹ *See* Scott R. Kurkoski, *The Marcellus Shale: A Game Changer for the New York Economy?*, 84-JAN. N.Y. ST. B.J. 10, 11 (2012) (listing common types of fracturing fluids, their purpose in HVHF operations, and their more common and familiar applications).

⁵⁰ NYS DEC, *supra* note 36, at 8.

are benign while others can be hazardous, such as benzene, toluene, ethyl benzene, and xylene.⁵¹

Furthermore, approximately 10 to 20 percent of fracturing fluids “flowback” to the surface and must be contained, treated, or otherwise managed.⁵² Flowback fluids contain not only water and fracturing chemicals, but also salts and naturally occurring radioactive materials, which emerge out of each well bore from deep within a rock formation.⁵³ For these reasons, flowback fluids have prompted concerns over potential health and ecosystem impacts and have heightened awareness over the management of produced water at the surface.⁵⁴

Hydraulic fracturing may also increase the likelihood of methane migration into aquifers near drilling sites.⁵⁵ While methane often occurs naturally in aquifers, concerns have arisen regarding increased levels of dissolved methane in aquifers in close proximity to drilling sites.⁵⁶ “Although dissolved methane in drinking water is not currently classified as a health hazard for ingestion, it is an asphyxiant in enclosed spaces and an explosion and fire hazard.”⁵⁷

Consequently, the risk of exposure to fracturing fluids and methane that have migrated into aquifers has been hotly debated. The fluids or methane may be able to migrate because of faulty well casings or poor site-specific wastewater management and storage processes.⁵⁸ In addition to migration, people may also be exposed to the fluids or methane through surface spills, which can be caused by the improper handling of fracturing fluids.⁵⁹ Flowback fluids may also be illegally dumped.⁶⁰ One analysis of

⁵¹ MINORITY STAFF OF COMM. ON ENERGY & COMMERCE, 112TH CONG., CHEMICALS USED IN HYDRAULIC FRACTURING 1-2 (Comm. Print 2011) [hereinafter MINORITY STAFF REPORT], available at <http://democrats.energycommerce.house.gov/sites/default/files/documents/Hydraulic%20Fracturing%20Report%204.18.11.pdf>.

⁵² See Jerry V. Mead, Section Leader, Watersheds & Sys. Ecology, Drexel Univ., Address at the 2012 Goddard Forum: Potential Marcellus Impacts Ecosystem on Health and Water Quality (Apr. 9, 2012), available at <http://extension.psu.edu/private-forests/training-and-workshops/2012-goddard-forum-oil-and-gas-impacts-on-forest-ecosystems/potential-marcellus-impacts-ecosystem-on-health-and-water-quality/view>.

⁵³ See NYS DEC, *supra* note 36, at 13, 5-117 to 18.

⁵⁴ *Id.* at 13-14.

⁵⁵ See Steven G. Osborn et al., *Methane Contamination of Drinking Water Accompanying Gas-Well Drilling and Hydraulic Fracturing*, 108 PROCS. NAT'L ACAD. SCI. 8172, 8175 (2011), available at <http://www.pnas.org/content/108/20/8172.full.pdf+html>.

⁵⁶ See *id.* at 8172-73.

⁵⁷ *Id.* at 8173.

⁵⁸ See NYS DEC, *supra* note 36, at 6-14, 6-41 to -42; see also Rachel Nuwer, *Fracking Did Not Sully Aquifers, Limited Study Finds*, N.Y. TIMES GREEN BLOG (July 9, 2012, 3:14 PM), <http://green.blogs.nytimes.com/2012/07/09/fracking-did-not-sully-aquifers-limited-study-finds/?ref=energy-environment> (discussing a new study suggesting the existence of natural pathways between the Marcellus shale and drinking water aquifers, contradicting the idea that low permeability shale and thousands of feet of rock are capable of blocking potential contamination).

⁵⁹ See Mead, *supra* note 52.

⁶⁰ *PA Waste Hauler Charged for Illegal Dumping*, WHSV.COM (Mar. 18, 2011, 11:52 AM), http://www.whsv.com/home/headlines/PA_Waste_Hauler_Charged_for_Illegal_Dumping_118243504.html.

violations in Pennsylvania found that 20.6 percent of all wells in the state experienced some type of violation resulting in adverse environmental impacts, of which 7.7 percent were directly related to surface contamination from fracturing fluid.⁶¹

In addition to surface contamination, migration of flowback fluids and dissolved methane through rock layers is also a concern.⁶² Some geologists respond that since shale formations are deep, of low permeability, and are sufficiently capped by thousands of feet of rock between target formations for drilling and primary drinking aquifers, they prevent contamination by fracturing fluids.⁶³ For example, “between the Marcellus Shale and underground drinking water supplies [in New York] is 3,150 feet of impermeable Cotton Valley Hamilton Group Shale formation,”⁶⁴ which makes percolation of fracturing fluids to the surface unlikely. Despite this barrier, concerns over methane migration persist.⁶⁵

The concerns of many local communities that are uncertain about or opposed to HVHF are exacerbated by the reluctance of energy companies to disclose the contents of fracturing fluids.⁶⁶ In New York, the composition of fracturing fluids must be disclosed to the New York State Department of Environmental Conservation (“DEC”), but neither the companies nor the DEC are required to share the same information with the public at large.⁶⁷ Around the U.S., this shroud of secrecy has fanned the flames of an already hotly debated issue, leading to the introduction of the federal Fracturing Responsibility and Awareness of Chemicals Act (the “FRAC Act”), which if passed would require the disclosure of fracturing chemicals to the public. The FRAC Act would also repeal the fracturing exemption from the Safe Drinking Water Act.⁶⁸

2. Air Impacts

The air quality impacts of HVHF have also drawn scrutiny. Air emissions occur frequently during exploration, drilling, and operation of the wells.⁶⁹ Hydraulic fracturing-related emissions may stem from construction and related vehicle emissions, flaring, surface impoundments, venting,

⁶¹ See Mead, *supra* note 52.

⁶² NYS DEC, *supra* note 36, at 7-46.

⁶³ See U.S. DEP'T OF ENERGY, *supra* note 1, at 14.

⁶⁴ Roberson, *supra* note 15, at 71.

⁶⁵ See NYS DEC, *supra* note 36, at 3.

⁶⁶ See MINORITY STAFF REPORT, *supra* note 51, at 1.

⁶⁷ NYS DEC, *supra* note 36, at 22.

⁶⁸ See Fracturing Responsibility and Awareness of Chemicals Act, S. 587, 112th Cong. (2011).

⁶⁹ Oil and Natural Gas Sector: New Source Performance Standards and National Emissions Standards for Hazardous Air Pollutants Reviews, 76 Fed. Reg. at 52744-45 (proposed Aug. 23, 2011) (to be codified at 40 C.F.R. pts. 60, 63) (explaining where emissions occur throughout the production, transmission, processing and distribution of natural gas).

dehydrators, condensate tanks,⁷⁰ and compressor stations.⁷¹ Emissions also occur throughout the natural gas infrastructure either from equipment design or inadvertently as fugitive emissions.⁷² These emissions contain combustible and poisonous gasses, as well as other hazardous materials that pose known public health concerns.⁷³ For example, materials such as nitrogen oxide (“NO_x”), volatile organic compounds (“VOCs”), particulate matter, sulfur dioxide (“SO₂”), and methane⁷⁴ are emitted during the drilling or operation of a HVHF well. High concentrations of NO_x, SO₂, and particulate matter have been linked to significant health problems such as increased risk for heart attack, asthma, and other respiratory illnesses.⁷⁵ VOCs can cause “[e]ye, nose, and throat irritation[,] headaches, loss of coordination, nausea[,] and damage to [the] liver, kidney[s], and central nervous system.”⁷⁶

A study conducted by the University of Colorado suggests that air emissions from HVHF “may contribute to acute and chronic health problems for those living near natural gas drilling sites.”⁷⁷ This report, “based on three years of monitoring, found a number of potentially toxic petroleum hydrocarbons in the air near the wells, including benzene, ethylbenzene, toluene and xylene.”⁷⁸ These chemicals were linked to an increase in non-cancer related health impacts that was greater for residents living closer to the wells.⁷⁹ Nonetheless, the specific impacts of air emissions from hydraulic fracturing on human health are not yet well known and should be the focus of future research.

⁷⁰ See *Sources of Oil and Gas Air Pollution*, EARTHWORKS, http://www.earthworkSACTION.org/issues/detail/sources_of_oil_and_gas_air_pollution (last visited Oct. 12, 2012).

⁷¹ Natalie Pekney, Researcher, Nat’l. Energy Tech. Lab., Address at the 2012 Goddard Forum: Oil and Gas Impacts on Atmospheric Emissions in the Allegheny National Forest (Apr. 9, 2012), available at <http://extension.psu.edu/private-forests/training-and-workshops/2012-goddard-forum-oil-and-gas-impacts-on-forest-ecosystems/oil-and-gas-impacts-on-atmospheric-emissions/view>.

⁷² See John P. Martin, Air Emissions from Wellhead Operations: A Regulatory and Field Practice Review 4 (Sept. 5, 2011) (unpublished manuscript) (on file with author).

⁷³ See Oil and Natural Gas Sector: New Source Performance Standards and National Emissions Standards for Hazardous Air Pollutants Reviews, 76 Fed. Reg. at 52745. (proposed Aug. 23, 2011) (to be codified at 40 C.F.R. pts. 60, 63).

⁷⁴ U.S. DEP’T OF ENERGY, *supra* note 1, at ES-5.

⁷⁵ See *Coal-Fired Power Plants: Understanding the Health Costs of a Dirty Energy Source*, Physicians for Soc. Responsibility, <http://www.psr.org/assets/pdfs/coal-fired-power-plants.pdf> (last visited Sept. 26, 2012).

⁷⁶ See, *An Introduction to Indoor Air Quality (IAQ): Volatile Organic Compounds (VOCs)*, U.S. ENVTL. PROT. AGENCY, http://www.epa.gov/iaq/voc.html#Health_Effects (last visited Oct. 12, 2012).

⁷⁷ David Kelly, *Study Shows Air Emissions Near Fracking Sites May Pose Health Risk*, NEWSROOM: U. COLO. DENVER (Mar. 19, 2012), <http://www.ucdenver.edu/about/newsroom/newsreleases/Pages/health-impacts-of-fracking-emissions.aspx>.

⁷⁸ *Id.*

⁷⁹ *Id.*

3. Impacts to Habitat

Hydraulic fracturing can also significantly impact wildlife habitat.⁸⁰ While multiple hydraulically fractured wells are often clustered together on a single well pad, surface impacts resulting from the development of these types of natural gas wells remain significant, and can disturb wildlife habitat.⁸¹ Estimates vary on the amount of surface land that is disturbed by each well pad. One analysis of Pennsylvania well sites suggests that for each well pad, up to 30 acres are disturbed by a combination of direct and indirect impacts.⁸² Others estimates, including one by the DEC, indicate that after reclamation, the average amount of land disturbed by a multi-well pad during the drilling and fracturing phase of operations is only 7.4 acres.⁸³ Regardless of the true size of the impacted area, surface impacts can result in habitat fragmentation, increased edge effects, the provision of inroads for invasive species, and effects to area-sensitive species dependent on interior forest or other undisturbed habitat.⁸⁴

Additionally, while one well might have minimal impacts, the cumulative effects of many wells has not been adequately studied or quantified, but is likely significant.⁸⁵ The theory of island biogeography can give some insight into how the effects might cumulate. This theory was originally focused on studying species richness on islands and has been extended to explain the loss of species richness in fragmented habitats.⁸⁶ As access roads and well pads carve up previously contiguous habitats, fragmentation can lead to a loss in species richness in a given area, causing ecosystem-wide impacts.⁸⁷ Furthermore, surface impacts from well pads, roads, and other associated construction and storage related activities might result in a reduction of natural services the ecosystem provides, such as erosion control, water filtration, nutrient removal, and carbon storage.⁸⁸

C. The Benefits of Hydraulic Fracturing: Energy and Economic Benefits

Hydraulic fracturing offers some significant benefits to property owners, the economy, the environment, and to the United State's energy reliability and security. Natural gas drilling can generate economic benefits

⁸⁰ NYS DEC, *supra* note 36, at 13-14.

⁸¹ *See id.* at 6-67.

⁸² *See* Mead, *supra* note 52.

⁸³ NYS DEC, *supra* note 36, at 6.

⁸⁴ *See* Mead, *supra* note 52.

⁸⁵ *See generally* NYS DEC, *supra* note 36.

⁸⁶ *See* R.H. MACARTHUR & E.O. WILSON, THE THEORY OF ISLAND BIOGEOGRAPHY 159 (1967).

⁸⁷ *See id.*

⁸⁸ *See* Mead, *supra* note 52.

from leases and royalties, increased tax revenue, and jobs.⁸⁹ With respect to the environment, natural gas offers a cleaner burning fuel alternative to coal and petroleum.⁹⁰ Furthermore, from a national policy perspective, natural gas offers versatility of applications, reliability of supply, and the energy security benefits associated with the domestic production of fuel.⁹¹

1. Value of Mineral Rights

The exploitation of mineral rights can bring significant benefits to property owners across New York. For owners who choose to lease their property for exploration and extraction of natural gas, project development can provide lucrative payouts. For example, in the Marcellus Shale region of Pennsylvania, landowner leases provide upfront payments of up to \$5,750 per acre with the promise of a production-based payment of 20 percent of the royalties.⁹² It is likely that New York landowners would realize similar benefits from development of the Marcellus Shale underlying New York.

2. Jobs, Taxes, and Economic Benefits

Natural gas exploration and production also hold the promise of new, high paying jobs and can add to local tax revenues for economically depressed regions in New York.⁹³ The New York DEC's revised draft Supplemental Generic Environmental Impact Statement ("rdSGEIS") estimates that more than 54,000 jobs and over \$2.5 billion in economic activity could be derived from natural gas development in the state.⁹⁴ A comparison may better illustrate the potential benefits; Williamsport, Pennsylvania has realized significant economic growth directly related to natural gas development⁹⁵ while the economy of Ithaca, New York, which is comparable in size and natural gas reserves but has not yet developed its natural gas resources, has stagnated.⁹⁶

⁸⁹ See N.Y. STATE DEP'T OF ENVTL. CONSERVATION, FACT SHEET: ECONOMIC IMPACTS OF HIGH-VOLUME HYDRAULIC FRACTURING IN NEW YORK STATE (2011) [hereinafter ECONOMIC IMPACTS FACT SHEET], available at http://www.dec.ny.gov/docs/materials_minerals_pdf/econimpact092011.pdf.

⁹⁰ See *Natural Gas*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/cleanenergy/energy-and-you/affect/natural-gas.html> (last visited Nov. 9, 2007).

⁹¹ See Robert Lenzner, *Natural Gas Equals Energy Independence and Economic Rejuvenation*, FORBES (July 20, 2012, 11:48 AM), <http://www.forbes.com/sites/robertlenzner/2012/07/20/natural-gasenergy-independence-and-economic-rejuvenation/>.

⁹² Kurkoski, *supra* note 49, at 17.

⁹³ See ECONOMIC IMPACTS FACT SHEET, *supra* note 89.

⁹⁴ Kurkoski, *supra* note 49, at 18.

⁹⁵ *Id.* at 17 (describing how the town of Williamsport grew by 7.8% in 2010, raking 7th in the nation for GDP growth in that year, growing its economy by \$247 million).

⁹⁶ See *id.*

The benefits also extend to the state level. Pennsylvania has added over 214,000 well-paying jobs and generally increased in-state economic development as a result of the exploration and production of natural gas from the Marcellus Shale.⁹⁷ According to the Pennsylvania Department of Revenue, companies involved in natural gas development in Pennsylvania have paid more than \$1.1 billion in taxes since 2006.⁹⁸ Similar benefits could be realized in New York as an *ad valorem* tax ensures tax revenues from the production of oil and gas will go to local communities shouldering the burden of development.⁹⁹

3. Cleaner Burning Fuel

Natural gas provides more than just economic benefits; using natural gas instead of coal or petroleum has environmental benefits, as natural gas is a cleaner burning fuel than either coal or petroleum.¹⁰⁰ Climate scientists have indicated that it is essential to transition away from carbon intensive fuel consumption toward cleaner, more renewable energy sources over the course of the next century to curb the effects of climate change.¹⁰¹ Additionally, federal environmental laws, such as the Clean Air Act, have favored cleaner, lower emission sources of fuel to protect air quality and public health.¹⁰² Natural gas is, by far, the cleanest burning fuel because combustion of natural gas, instead of other fossil fuels, results in lower greenhouse gas emissions and lower quantities of other air pollutants such as NO_x, SO₂, particulate matter, and VOCs.¹⁰³ In fact, natural gas combustion emits approximately half the carbon dioxide of coal and approximately 30 percent less carbon dioxide than fuel oil.¹⁰⁴ Thus, natural gas has become a central theme in the national discussion concerning reductions in greenhouse gas emissions and improvements in air quality.¹⁰⁵

The United States could realize significant environmental benefits from shifting to a proportionately greater reliance on natural gas until

⁹⁷ See *id.* at 17-18 (citing a report by the Pennsylvania Department of Labor statistics).

⁹⁸ *Id.* at 18.

⁹⁹ *Id.* (discussing one analysis of tax revenues generated in the Town of Windsor, NY, finding that five well pads over five years producing a regionally average quantity of gas could generate more than \$20 million in local tax revenue and more than \$13 million in school tax revenue).

¹⁰⁰ U.S. DEP'T OF ENERGY, *supra* note 1, at 5-6.

¹⁰¹ Cf. Press Release, Intergovernmental Panel on Climate Change, Potential of Renewable Energy Outlined in Report by the Intergovernmental Panel on Climate Change (May 9, 2011), available at http://www.ipcc.ch/news_and_events/docs/ipcc33/PRESS%20RELEASE%20Updated%20version%20-%20Potential%20of%20Renewable%20Energy%20Outline.pdf (presenting analyses of how moving away from carbon intensive fossil fuels to cleaner energy sources, specifically renewables, will contribute to reaching greenhouse gas emissions targets).

¹⁰² See James M. Inhofe & Frank Fannon, *Energy and the Environment: The Future of Natural Gas in America*, 26 ENERGY L.J. 349, 360 (2005).

¹⁰³ See U.S. DEP'T OF ENERGY, *supra* note 1, at 5.

¹⁰⁴ *Id.*

¹⁰⁵ See *id.*

renewable energy sources become more efficient, economical, and widely available.¹⁰⁶ Natural gas has been referred to as a “bridge fuel” to a cleaner, less carbon intensive energy future for the U.S.¹⁰⁷ In other words, natural gas could reduce the country’s greenhouse gas emissions and buy time for renewable energy generation sources to mature before the full force of climate change is felt. This bridge may have to extend for a considerable distance; a recent plunge in natural gas prices has made renewable energy generation sources less economically competitive and slowed investment in the sector.¹⁰⁸ In order to truly act as a bridge fuel, advocacy for natural gas must not halt the steady march forward in the development of renewable energy through federal and state renewable energy incentives. In fact, research, development, and deployment of renewable energy generation sources should continue in order to ensure this bridge reaches to a clean energy future.

On the other hand, critics of natural gas argue that shifting domestic energy consumption from coal and oil to cleaner burning natural gas will not be enough to meet the critical greenhouse gas reduction targets necessary to reverse the warming trend associated with global warming.¹⁰⁹ Moreover, opponents contend that emissions from natural gas exploration and production will offset any benefit realized by switching to cleaner natural gas from more carbon intensive fossil fuels.¹¹⁰ Certain gasses, such as methane, are commonly emitted during natural gas exploration and production, and these gasses are far more potent greenhouse gases than carbon dioxide, the most prominent of the greenhouse gasses.¹¹¹ In the extreme, some opponents argue that greenhouse gas emissions could actually rise as a result of increased production and consumption of natural gas.¹¹²

¹⁰⁶ Beren Argetsinger, Comment, *The Marcellus Shale: Bridge to a Clean Energy Future or Bridge to Nowhere?* *Environmental, Energy and Climate Policy Considerations for Shale Gas Development in New York State*, 29 PACE ENVTL. L. REV. 321, 328 (2011).

¹⁰⁷ *Id.* at 323.

¹⁰⁸ See Jeremy Hobson, *T. Boone Pickens: ‘Natural Gas Has Been a Disaster,’* MARKETPLACE.ORG (May 21, 2012), <http://www.marketplace.org/topics/sustainability/t-boone-pickens-natural-gas-has-been-disaster> (providing a transcript as well as video recording of Jeremy Hobson’s interview with T. Boone Pickens, Chairman, BP Capital Management).

¹⁰⁹ Robert Kropp, *Switching to Natural Gas Won’t Halt Climate Change*, GREENBIZ.COM (Mar. 7, 2012, 7:56 AM), <http://www.greenbiz.com/news/2012/03/07/even-rapid-shift-low-carbon-economy-will-offer-slow-benefits>.

¹¹⁰ See Robert W. Howarth et al., *Methane and the Greenhouse Gas Footprint of Natural Gas from Shale Formations*, 106 *Climatic Change* 679 (2011) (Climatic Change Letters, DOI: 10.1007/s10584-011-0061-5), available at <http://link.springer.com/article/10.1007%2Fs10584-011-0061-5>.

¹¹¹ See Martin, *supra* note 72, at 7.

¹¹² See Howarth et al., *supra* note 110.

4. Versatility – Fuel Switching

The versatility of natural gas further suggests that an easy transition to a cleaner, domestic source of fuel is possible in the near term.¹¹³ Natural gas can be used across several sectors of the economy, such as in electricity generation and transportation, as well as in industrial, commercial, and residential applications.¹¹⁴ Many of the fuel sources used in the electricity generation and transportation consist of carbon intensive, domestically produced coal or carbon intensive foreign oil.¹¹⁵ In fact, these two sectors make up 61 percent of all greenhouse gas emissions in the U.S.¹¹⁶ However, both sectors could quickly and easily transition to operate using natural gas.¹¹⁷ In 2009, rapid fuel switching from coal to natural gas in the electricity generation sector in some states contributed to a marked decrease in carbon dioxide emissions.¹¹⁸

5. Energy Security and Independence

The U.S. consumes 20 percent of the world's energy but accounts for only 5 percent of the world's population.¹¹⁹ Increased reliance on foreign sources of energy to satiate our increasingly large energy demand could further decrease U.S. energy security and create a multi-billion dollar outflow of capital, often to unstable regions across the globe.¹²⁰ According to T. Boone Pickens, Chairman of BP Capital Management and author of a clean energy policy proposal, the U.S. spent over \$453 billion on oil imported from OPEC and other nations around the world in 2011.¹²¹ Moreover, in October of that year "the U.S. imported 57 percent of its oil, or 333 million barrels...sending approximately \$36.4 billion, or \$816,086.64 per minute," to foreign countries rather than keeping those dollars in the U.S.¹²² Every president since Nixon has implicitly acknowledged this outflow of capital and risk to energy security by

¹¹³ See U.S. DEP'T OF ENERGY, *supra* note 1, at 5.

¹¹⁴ *Id.* at 3.

¹¹⁵ Argetsinger, *supra* note 106, at 321-22.

¹¹⁶ *Total US GHG Emissions by Economic Sector in 2010*, U.S. Env'tl. Prot. Agency <http://www.epa.gov/climatechange/ghgemissions/sources.html> (last visited Oct. 13, 2012).

¹¹⁷ See Argetsinger, *supra* note 106, at 328-29.

¹¹⁸ N.Y. STATE ENERGY RESEARCH & DEV. AUTH., *RELATIVE EFFECTS OF VARIOUS FACTORS ON RGGI ELECTRICITY SECTOR CO2 EMISSIONS: 2009 COMPARED TO 2005 AT 4* (2010), available at http://www.rggi.org/docs/Retropective_Analysis_Draft_White_Paper.pdf.

¹¹⁹ *Population and Energy Consumption*, WORLD POPULATION BALANCE, http://www.worldpopulationbalance.org/population_energy (last visited Oct. 13, 2012).

¹²⁰ U.S. DEP'T OF ENERGY, *supra* note 1, at 4.

¹²¹ *Natural Gas and the Pickens Plan: Reducing our Reliance on OPEC Oil*, PICKENS PLAN, http://www.pickensplan.com/energy_independence/ (last visited Oct. 13, 2012).

¹²² *October Oil Imports: 333 Million Barrels; \$36.4 Billion*, PICKENS PLAN (Nov. 9, 2011, 1:30 PM), <http://www.pickensplan.com/news/2011/11/09/october-oil-imports-333-million-barrels-364-billion/>.

stressing “the importance of reducing our dependence on foreign oil.”¹²³ Natural gas promises to bring the U.S. closer to achieving this goal. Natural gas has the potential to be an economic and geopolitical game changer because “[84] percent of the natural gas consumed in the U.S. is produced in the U.S., and [97] percent of natural gas used in [the U.S.] is produced in North America.”¹²⁴ Thus, natural gas is an attractive energy source not only because of its economic and environmental benefits, its versatility, and its reliability, but also because it is domestically produced and can provide energy security and independence.

Notwithstanding the benefits, HVHF poses significant risks, as previously described. The environmental and public health consequences of large-scale shale gas development raise important policy questions that will shape the role natural gas will play in the United States’ energy future.¹²⁵ Following a steady drumbeat of criticism raised by citizen action campaigns and a series of articles by the New York Times in February 2011, the EPA launched an investigation examining the relationship between hydraulic fracturing and drinking water.¹²⁶ The EPA has vowed to consider the best available science from independent sources and to conduct the study using a transparent, peer-reviewed process to resolve scientific uncertainties about HVHF.¹²⁷ This study may provide a better understanding of the risks inherent in HVHF. Whatever the outcome, the risks must be weighed against the benefits of natural gas development. If natural gas drilling is to occur, these risks must be addressed at the local, state, and federal levels to ensure minimal impact to public health and the environment.

III. REGULATION OF HYDRAULIC FRACTURING: FEDERAL, STATE, AND LOCAL AUTHORITY

Oil and gas development in the U.S. is regulated by a complex and fractured set of federal laws, some of which allow for states to implement the federal programs. These laws include the Clean Air Act, the Clean Water Act, and the Safe Drinking Water Act.¹²⁸ This federalist approach has left states with the challenging role of making difficult trade-offs

¹²³ Kurkoski, *supra* note 49, at 17.

¹²⁴ U.S. DEP’T OF ENERGY, *supra* note 1, at 5.

¹²⁵ Argetsinger, *supra* note 106, at 323.

¹²⁶ See Memorandum from: Arun Majumdar, Acting under Sec’y of Energy, Dep’t of Energy; David J. Hayes, Deputy Sec’y, Dep’t of Interior; and Bob Perciasepe, Deputy Adm’r, Env’tl. Prot. Agency, to: Assistant Sec’y’s, Nat’l Labs., Dep’t of Energy; Assistant Sec’y’s, Bureau Dirs., Dep’t of the Interior; and Assistant Adm’rs, Reg’l Adm’rs, Env’tl. Prot. Agency, on Multi-Agency Collaboration on Unconventional Oil and Gas Research (Apr. 13, 2012), available at http://www.epa.gov/hydraulicfracture/oil_and_gas_research_mou.pdf.

¹²⁷ See *Questions and Answers About the EPA’s Hydraulic Fracturing Study*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/hfstudy/questions.html#1> (last visited Oct. 5, 2012).

¹²⁸ Emily C. Powers, Note, *Fracking and Federalism: Support for an Adaptive Approach that Avoids the Tragedy of the Regulatory Commons*, 19 J.L. & POL’Y 913, 930-31 (2011).

between significant economic benefits and uncertain impacts to public health and the environment.¹²⁹ This approach has also led to pronounced inconsistency among state regulatory programs that oversee natural gas drilling.¹³⁰ Concerns over the environmental and public health impact of HVHF are compounded by this patchwork of laws and regulations, which critics argue is insufficient to guard against potential harmful effects, especially to air and water.¹³¹

In New York, the regulation of hydraulically fractured wells is largely a matter of state authority and is regulated by New York State Environmental Conservation Law 23. This law authorizes the DEC's Oil, Gas and Solution Mining Regulatory Program,¹³² and the New York State Environmental Quality Review Act ("SEQRA").¹³³ The federal government plays a minimal role in New York.¹³⁴ Nevertheless, this Section will explore a few areas where the federal government has left oil and gas regulation to the states, or has exempted the oil and gas industry from federal regulation. The purpose of this explanation is to highlight that hydraulic fracturing is poorly regulated at the federal level, which leaves the regulatory burden to the states.

A. Hydraulic Fracturing Regulations and Exemptions in Major Federal Environmental Laws

1. The Safe Drinking Water Act

"Congress [enacted] the Safe Drinking Water Act . . . to protect public health by regulating the nation's public drinking water supply."¹³⁵ The Safe Drinking Water Act ("SDWA") authorizes the Environmental Protection Agency ("EPA") "to set national health-based standards for drinking water" and create a framework for underground injection control.¹³⁶ Under the SDWA, states are given primacy to either enforce minimum EPA-based standards or set their own higher standards.¹³⁷

Since the SDWA's enactment, the EPA had not regulated hydraulic fracturing under the Act, and declined to do so until recently because the EPA believed the SDWA was not meant to regulate HVHF.¹³⁸ The debate

¹²⁹ *Id.* at 914.

¹³⁰ See generally Martin, *supra* note 72, at Appendix (comprehensively listing state based regulations pertaining to flaring and venting of natural gas from wellhead emissions).

¹³¹ See Argetsinger, *supra* note 106, at 323.

¹³² N.Y. Envtl. Conserv. Law § 23-0305(8)-(9) (McKinney 2012).

¹³³ N.Y. Comp. Codes R. & Regs. tit. 6, § 617.1 (1996).

¹³⁴ See Powers, *supra* note 128, at 913-14.

¹³⁵ U.S. DEP'T OF ENERGY, *supra* note 1, at 32.

¹³⁶ *Id.*

¹³⁷ See Roberson, *supra* note 15, at 77; see also 42 U.S.C. § 300g-2(a) (1996).

¹³⁸ Roberson, *supra* note 15, at 78.

over federal regulation under the SDWA came to a head in 1997 during *LEAF v. EPA*, when the Legal Environmental Assistance Foundation (“LEAF”) challenged this premise.¹³⁹ Specifically, LEAF challenged the EPA’s approval of Alabama’s underground injection control program to regulate hydraulic fracturing activities related to the production of coal bed methane gas.¹⁴⁰ Conversely, LEAF claimed that federal regulation was required under the underground injection control provisions of the SDWA.¹⁴¹ “At the time of the case, state Underground Injection Control programs were to prohibit unauthorized ‘underground injection,’ defined as ‘the subsurface emplacement of fluids by well injections.’”¹⁴² Upon the plain language of the statute, the Eleventh Circuit Court of Appeals held that hydraulic fracturing activities fell within the definition of underground injection under the SDWA and thus required regulation by the EPA.¹⁴³ Moreover, in a subsequent case, *LEAF II*, the Court determined that operators of natural gas wells that disposed of fracturing fluid via underground injection were subject to the SDWA, which specifically required an Underground Injection Permit for a Class II well.¹⁴⁴

The *LEAF* litigation raised the profile of hydraulic fracturing by highlighting the environmental and public health concerns associated with the practice. For example,

[d]uring the *LEAF* litigation, environmental groups, regulators, and the public became aware that some companies were using diesel fuel as an additive in their hydraulic fracturing fluids. Diesel fuel contains benzene which is a known carcinogen. Following the *LEAF* litigations and the disclosure of diesel fuel being used in hydraulic fracturing fluids, the industry agreed to give up diesel fuel [as an additive] and understood that the federal government could regulate [injection of fluids used for hydraulic fracturing].¹⁴⁵

¹³⁹ Legal Envtl. Assistance Found., Inc. v. U.S. Envtl. Prot. Agency (*LEAF I*), 118 F.3d 1467, 1471 (11th Cir. 1997).

¹⁴⁰ *Id.*

¹⁴¹ *Id.*

¹⁴² Hanna 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, 143 (2009).

¹⁴³ *LEAF I*, 118 F.3d at 1478.

¹⁴⁴ Legal Envtl. Assistance Found., Inc. v. U.S. Envtl. Prot. Agency (*LEAF II*), 276 F.3d 1253, 1261-64 (11th Cir. 2001) (deciding a case subsequent to *Leaf I*, in *LEAF II*, LEAF petitioned the Eleventh Circuit to require the EPA enforce the Part I ruling, and challenged the EPA’s classification of hydraulically fractured wells. Again the Court found with LEAF, that hydraulic fracturing wells fell within the definition of Class II wells under the SDWA).

¹⁴⁵ Roberson, *supra* note 15, at 81.

In the end, while the *LEAF* litigation successfully raised the profile of hydraulic fracturing, it ultimately failed to force long-term, meaningful federal regulation of the practice under the SDWA.

Instead, in response to the *LEAF* litigation, Congress amended the SDWA through the comprehensive Energy Policy Act of 2005.¹⁴⁶ The amendment explicitly exempts hydraulic fracturing from the SDWA unless diesel fuel additives, which contain carcinogens, are used in the fracturing fluids.¹⁴⁷ By exempting HVHF from SDWA regulation and failing to ban the use of diesel fuel in HVHF, Congress failed to adequately regulate hydraulic fracturing under the SDWA. Some claim this amendment was intended to respond to *LEAF* and merely clarified Congress' original intent *not* to regulate HVHF under the SDWA.¹⁴⁸ Others have remained skeptical that Congress acted in the best interest of the American people in creating this exemption and argue that it simply serves special interests, dubbing it the "Halliburton Loophole."¹⁴⁹

2. The Clean Water Act

The Clean Water Act ("CWA") was "established to protect water quality" and "is the primary federal law governing pollution of surface waters."¹⁵⁰ The CWA authorizes the EPA to regulate the discharge of pollutants and to set water quality standards for all surface waters.¹⁵¹ Like the SDWA, the CWA establishes minimum federal standards and allows for state primacy to enforce those standards or impose more stringent standards.¹⁵²

Under the Clean Water Act, operators of natural gas wells may dispose of fracturing fluid by surface discharge.¹⁵³ The CWA empowers the EPA to regulate pollution limits on the discharge of oil and gas related produced water through the National Pollution Discharge and Elimination System ("NPDES") permitting process.¹⁵⁴ State authorities issue most NPDES permits, provided that the State Implementation Plans have been

¹⁴⁶ RENEE LEWIS KOSNIK, EARTHWORKS, THE OIL AND GAS INDUSTRY'S EXCLUSIONS AND EXEMPTIONS TO MAJOR ENVIRONMENTAL STATUTES 8 (2007), *available at* <http://www.earthworksaaction.org/files/publications/PetroleumExemptions1c.pdf?pubs/PetroleumExemptions1c.pdf>.

¹⁴⁷ *Id.*

¹⁴⁸ Kurkoski, *supra* note 49, at 13.

¹⁴⁹ *Id.* (describing and responding to criticism of the 2005 Act that is claimed to create a "Halliburton Loophole" for energy companies); *see also* Roberson, *supra* note 15, at 82 (pointing out that environmental groups interpreted Congress's action in enacting this exemption to be "another example of litigation victory being undone by a Congress that favors the industry with little regard to environmental costs").

¹⁵⁰ U.S. DEP'T OF ENERGY, *supra* note 1, at 29.

¹⁵¹ Roberson, *supra* note 15, at 83.

¹⁵² U.S. DEP'T OF ENERGY, *supra* note 1, at 29-30.

¹⁵³ Roberson, *supra* note 15, at 76.

¹⁵⁴ U.S. DEP'T OF ENERGY, *supra* note 1, at 29.

approved by the EPA.¹⁵⁵ Under federal regulations, shale gas produced water requires a permit only where discharges directly into surface waters are planned.

“In 1987, Congress amended the CWA to require the EPA to establish a storm water discharge program” to address sediment loading resulting from manmade surface disturbances.¹⁵⁶ However, the amendment exempted gas exploration from the NPDES permit program “for discharges of storm water runoff from...gas exploration, production, processing, or treatment operation or transmission facilities.”¹⁵⁷ “The Energy Policy Act of 2005 expanded [this oil and gas exclusion by exempting] ‘all field activities or operations associated with exploration, production, processing, or treatment operations, or transmission facilities, including activities necessary to prepare a site for drilling and for the movement and placement of drilling equipment, whether or not such field activities or operations may be considered to be construction activities’” from NPDES permitting requirements.¹⁵⁸

Despite these exemptions, nothing prevents states from implementing stricter standards under state designed, federally approved permitting programs. In fact, New York plans to address this under the State Pollution Discharge Elimination System.¹⁵⁹

3. *The Clean Air Act*

The Clean Air Act (“CAA”) is the primary law regulating emissions affecting air quality and establishes the National Ambient Air Quality Standards (“NAAQS”),¹⁶⁰ State Implementation Plans (“SIPs”),¹⁶¹ and New Source Performance Standards (“NSPS”).¹⁶² To control the major sources of emissions, the CAA also establishes the National Emission Standards for Hazardous Air Pollutants (“NESHAPs”), which requires the use of Maximum Achievable Control Technology standards for major sources of emissions located near population centers.¹⁶³ Fracturing products have been found to contain 29 chemicals that are: “(1) known or possible human carcinogens, (2) regulated under the SDWA for their risks to human health, or (3) listed as hazardous air pollutants under the Clean Air Act.”¹⁶⁴

¹⁵⁵ See 33 U.S.C. § 1342(b) (2011).

¹⁵⁶ See Robertson, *supra* note 15, at 84.

¹⁵⁷ *Id.*

¹⁵⁸ *Id.*

¹⁵⁹ See *State Pollutant Discharge Elimination System (SPDES)*, N.Y. STATE DEP’T OF ENVTL. CONSERVATION, <http://www.dec.ny.gov/permits/6054.html> (last visited Oct. 14, 2012).

¹⁶⁰ See 42 U.S.C. § 7409 (1977).

¹⁶¹ See 42 U.S.C. § 7410 (1990).

¹⁶² See 42 U.S.C. § 7411 (1990).

¹⁶³ U.S. DEP’T OF ENERGY, *supra* note 1, at 36.

¹⁶⁴ MINORITY STAFF REPORT, *supra* note 51, at 8.

Despite this, historically the CAA has provided that oil and gas wells could not be aggregated for the purpose of subjecting them to NESHAPs.¹⁶⁵

Nevertheless, the EPA in 2011 issued a final rule intending to regulate the oil and gas sector under revised NSPS and NESHAPs.¹⁶⁶ While this may be a significant step forward in federal regulation of hydraulic fracturing, this rule does not take immediate effect. Instead, this rule will be phased in through 2015, leaving new wells potentially under regulated, at least until that date.¹⁶⁷ Again, despite these arguably lax regulations, nothing prevents states from enacting standards that are more stringent than those provided by federal law. For example, New York has proposed a comprehensive strategy to regulate emission at the wellhead in the rdSGEIS.¹⁶⁸

4. *The Resource Conservation and Recovery Act*

The Resource Conservation and Recovery Act ("RCRA") seeks to protect human health and the environment from the multitude of problems associated with increasing volumes of municipal and industrial waste.¹⁶⁹ RCRA "gives the EPA authority to control hazardous waste from 'cradle-to-grave.'"¹⁷⁰ Under the Act, Congress exempted certain types of waste from regulation pending EPA review, and the EPA subsequently issued a final rule stating that control of natural gas exploration and production wastes was not required under Section C of RCRA.¹⁷¹ The Solid Waste Disposal Act of 1980 further amended RCRA to "exempt drilling fluids, produced waters, and other wastes associated with exploration, development, and production of crude oil, natural gas and geothermal energy" from regulation under RCRA.¹⁷² Thus, fracturing wastes are not regulated as hazardous waste under RCRA. Still, nothing precludes states from controlling these wastes through their own laws and regulations.¹⁷³

¹⁶⁵ See KOSNIK, *supra* note 146, at 13.

¹⁶⁶ Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews, 77 Fed. Reg. 49490 (proposed Aug. 16, 2012) (to be codified at 40 C.F.R. pt. 63).

¹⁶⁷ See *Overview of Final Amendments to Air Regulations for the Oil and Natural Gas Industry*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/airquality/oilandgas/pdfs/20120417fs.pdf> (last visited Oct. 14, 2012).

¹⁶⁸ See NYS DEC, *supra* note 36, at 6-96 to -99.

¹⁶⁹ U.S. DEP'T OF ENERGY, *supra* note 1, at 37.

¹⁷⁰ Roberson, *supra* note 15, at 87.

¹⁷¹ U.S. ENVTL. PROT. AGENCY, EXEMPTION OF OIL AND GAS EXPLORATION AND PRODUCTION WASTES FROM FEDERAL HAZARDOUS WASTE REGULATIONS 5 (2002), available at <http://www.epa.gov/epawaste/nonhaz/industrial/special/oil/oil-gas.pdf>.

¹⁷² U.S. DEP'T OF ENERGY, *supra* note 1, at 37.

¹⁷³ *Id.* at 38.

5. Other Federal Laws

Exemption of hydraulic fracturing extends to other federal environmental laws as well. For example, while the Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”) regulates hazardous chemicals, including some chemicals used in the HVHF process,¹⁷⁴ the Act essentially excludes regulation of these chemicals when they are used for the purpose of oil and gas extraction.¹⁷⁵

A notable difference from the aforementioned legislation is that natural gas drilling and exploration may require federal review under the National Environmental Policy Act (“NEPA”).¹⁷⁶ However, the NEPA is merely a procedural statute and is primarily used to determine if there has been a procedural violation or whether an agency action was arbitrary and capricious.¹⁷⁷ In other words, the NEPA does little to increase the substantive regulation of natural gas drilling under federal environmental laws.

Further analysis of these and other federal environmental laws is beyond the scope of this article. It is sufficient to note that natural gas drilling is under-regulated by federal environmental law, leaving the states to promulgate their own safeguards against the risks of natural gas development. If state regulation is found to be insufficient to adequately address site-specific community concerns in New York, then local communities have the opportunity to step in, leverage their bargaining power, and engage in negotiation with energy companies.

B. State Jurisdiction

In general, the Department of Environmental Conservation (DEC) has the primary authority for siting of hydraulically fractured gas wells in New York.¹⁷⁸ The “DEC’s Division of Mineral Resources administers regulations and a permitting program to mitigate to the greatest extent possible any potential environmental impact of drilling and well operation.”¹⁷⁹ Additionally, in New York, energy companies may also be required to work with the Delaware River Basin Commission (“DRBC”) or the Susquehanna River Basin Commission. These are regional water authorities which issue permits to withdraw water for consumptive use in

¹⁷⁴ *Id.* at 40.

¹⁷⁵ See *id.* (noting that hazardous chemicals other than crude oil are seldom present at shale gas drilling sites in sufficient quantities to trigger CERCLA regulation).

¹⁷⁶ Roberson, *supra* note 15, at 86 (indicating that an environmental impact statement is required for natural gas drilling on federal land).

¹⁷⁷ See 39A C.J.S. *Health & Environment* § 106 (2012).

¹⁷⁸ See *Marcellus Shale*, *supra* note 11.

¹⁷⁹ *Oil and Gas: Oil, Gas and Solution Salt Mining in New York State*, N.Y. STATE DEP’T OF ENVTL. CONSERVATION, <http://www.dec.ny.gov/energy/205.html> (last visited Oct. 14, 2012).

the basins, and these commissions have jurisdiction that cross state lines, extending to parts of both New York and Pennsylvania.¹⁸⁰ A permit is required from the DRBC prior to any water withdrawal.¹⁸¹

New York's Oil, Gas, and Solution Mining Law ("OGSML") gives the DEC the authority to regulate oil and gas exploration and production.¹⁸² In 1988 a Generic Environmental Impact Statement ("GEIS") on the Oil, Gas, and Solution Mining Regulatory Program was prepared to comprehensively review the DEC's program for regulating oil and gas wells, along with several other underground storage operations deeper than 500 feet.¹⁸³ The GEIS analyzed the environmental, social, and economic impacts of the DEC's regulatory program for oil and gas development in New York.¹⁸⁴

Recently, the DEC has undertaken an initiative to update the GEIS for oil and gas in New York. The DEC found that the development of a potentially significant gas resource in the Marcellus and Utica shales using HVHF would require large volumes of water, so the DEC declared that further review of hydraulic fracturing under SEQRA would be necessary before the state would issue a permit.¹⁸⁵ In 2008, the DEC began developing a Supplemental Generic Environmental Impact Statement ("SGEIS") amid public concern and increased interest in the issuance of permits for HVHF wells to develop the Marcellus Shale and other low-permeability gas reservoirs in New York.¹⁸⁶ In September 2009, an initial draft SGEIS ("dSGEIS") was released for public comment.¹⁸⁷ Subsequent to the completion of the dSGEIS, the New York State Senate and Assembly passed a bill placing a moratorium on all oil and gas well drilling in the

¹⁸⁰ Michelle L. Kennedy, *The Exercise of Local Control Over Gas Extraction*, 22 *Fordham Envtl. L. Rev.* 375, 378 (2011) (indicating that DRBC's jurisdiction extends into eastern Pennsylvania and southern New York); see also SUSQUEHANNA RIVER BASIN COMM'N STAFF, *THE SUSQUEHANNA RIVER BASIN'S COMMISSION ROLE IN NATURAL GAS DEVELOPMENT* (2010), available at <http://www.srbcs.net/stateofsusq/documents/NaturalGasDevelopmentFeatureArticle.PDF>.

¹⁸¹ See *Project Review/Permitting*, DEL. RIVER BASIN COMM'N, <http://www.state.nj.us/drbc/programs/project/> (last modified Oct. 24, 2012).

¹⁸² See N.Y. ENVTL. CONSERV. LAW § 23-0305 (8)-(9) (McKinney 2005).

¹⁸³ *Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program*, N.Y. STATE DEP'T OF ENVTL. CONSERVATION, <http://www.dec.ny.gov/energy/45912.html> (last visited Oct. 14, 2012); see also N.Y. STATE DEP'T OF ENVTL. CONSERVATION, *FINAL GENERIC ENVIRONMENTAL IMPACT STATEMENT: EXECUTIVE SUMMARY* (1992), available at http://www.dec.ny.gov/docs/materials_minerals_pdf/fgeisexecsum.pdf.

¹⁸⁴ *Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program*, *supra* note 183.

¹⁸⁵ *SGEIS on the Oil, Gas and Solution Mining Regulatory Programs: Well Permit Issuance for Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low-Permeability Gas Reservoirs*, N.Y. STATE DEP'T OF ENVTL. CONSERVATION, <http://www.dec.ny.gov/energy/47554.html> (last visited Oct. 14, 2012) [hereinafter *SGEIS*].

¹⁸⁶ NYS DEC, *supra* note 36, at 2-3.

¹⁸⁷ *SGEIS*, *supra* note 185.

state until the final SGEIS was complete.¹⁸⁸ Governor Paterson vetoed this bill.¹⁸⁹ Instead, he issued an Executive Order placing a moratorium on all hydraulic fracturing permits and ordering the DEC to conduct further environmental review to ensure that all environmental and public health impacts were mitigated or avoided and to present the additional information to the public for further review.¹⁹⁰

In September 2011, the DEC issued the revised dSGEIS ("rdSGEIS"), with the public comment period concluding in January 2012.¹⁹¹ A final SGEIS will be issued after consideration of the comments. "The Final SGEIS will set additional parameters for SEQRA review. [Once issued, the DEC] will then process and, as appropriate, issue well permits for gas well development using high-volume hydraulic fracturing."¹⁹² The agency was expected to complete their review and issue new regulations by the end of the summer of 2012, but as of the date of this article the new regulations have yet to be released.¹⁹³

While the final SGEIS has not been released, certain deficiencies regarding the regulation of HVHF still exist within the proposal. Critics of hydraulic fracturing in New York have voiced many concerns about the proposed regulatory changes in the rdSGEIS.¹⁹⁴ In light of a recent state budget crisis and dwindling staff numbers, an overarching concern is that the DEC will be ill-equipped to ensure compliance and enforcement at the many well sites which are likely to be distributed widely throughout the state.¹⁹⁵ The rdSGEIS has also been criticized for not adequately considering cumulative impacts, health impacts, wastewater treatment, and prohibition of the use of toxic chemicals.¹⁹⁶ The rdSGEIS was further

¹⁸⁸ Robert Harding, *Gov. Paterson Vetoes Hydrofracking Moratorium, Issues Executive Order not Allowing Permits Until July 2011*, AUBURNPUB.COM (Dec. 11, 2010, 11:08 PM), http://auburnpub.com/news/opinion/blogs/eye_on_albany/article_b2d21714-05ae-11e0-846d-001cc4c03286.html.

¹⁸⁹ *Id.*

¹⁹⁰ See N.Y. Comp. Codes R. & Regs. tit. 9, § 7.41 (2010).

¹⁹¹ *SGEIS*, *supra* note 185.

¹⁹² *Id.*

¹⁹³ Mary Esch, *Local Moratorium Prompts Gas Company to Shut Wells*, SEATTLEPI (July 9, 2012 1:49 PM), <http://www.seattlepi.com/news/article/Local-moratorium-prompts-gas-company-to-shut-wells-3693371.php>.

¹⁹⁴ E.g., Letter from Sarah Eckel, Legislative & Policy Director, Citizen's Campaign for the Environment, to Eugene Leff, N.Y. State Dep't of Env'tl. Conservation (Jan. 1, 2012), *available at* http://www.citizenscampaign.org/PDFs/fracking-comments/SGEISComments_0112.pdf (providing comments regarding the Revised Draft Supplemental Generic Environmental Impact Statement On the Oil, Gas, and Solution Mining Regulatory Program).

¹⁹⁵ See Hinchey *Urges Withdrawal of dSGEIS: Congressman Lists 10 Problems with Regulations*, MAURICE HINCHEY (Jan. 9, 2012, 11:34 AM), http://hinchey.house.gov/index.php?option=com_content&view=article&id=1808:hinchey-urges-withdrawal-of-dsgeis-&catid=71:2011-press-releases (presenting the Congressman's objections to the new regulations which do not "require a dramatic increase in DEC resources and staffing devoted to the permitting and oversight activities related to high-volume hydraulic fracturing").

¹⁹⁶ E.g., *id.*

criticized for failing to perform the necessary analysis, such as a cumulative impact analysis and a public health analysis, and for failing to consider or regulate the significant health and environmental effects of hydraulic fracturing.¹⁹⁷ The regulatory language regarding the disclosure of fracturing fluids has also caused some consternation.¹⁹⁸ While the rdSGEIS considers many factors, it is clear that some areas have not been considered at all and others remain vague. Indeed, with many thousands of comments received on the rdSGEIS,¹⁹⁹ ample opportunities for improvement have been offered.

Due to the many and varied concerns voiced by citizen opponents to state regulation of HVHF, one could argue that state-level regulation alone will be insufficient to address all community concerns. Thus it will be necessary to include a local component to the siting of hydraulically fractured wells to adequately protect the interests of local communities. Since “[a]gencies, by design, move the nexus of decision-making further away from citizens...[having]...the effect of making decisions both more remote and more corruptible. To counter this trend, the U.S. has seen an increase in judicial and legislative intervention into the regulatory process in an effort to increase accountability and transparency.”²⁰⁰ As seen in two recent court cases, this is exactly what is happening with respect to the hydraulic fracturing debate in New York.

C. Town & Municipal Jurisdiction

Two recent New York trial-level court decisions have vastly expanded the role of local government in hydraulic fracturing decision-making.²⁰¹ Although both decisions are on appeal,²⁰² if they are upheld they have the potential to empower communities to engage in negotiation with energy companies interested in using HVHF in their jurisdiction. Municipalities should leverage this increased bargaining power and engage in discussions with energy companies interested in drilling in their towns. Although some towns will likely opt to ban HVHF altogether, given the potential economic benefits, others will undoubtedly remain open to

¹⁹⁷ See Letter from Sarah Eckel, Legislative & Policy Director, Citizen’s Campaign for the Environment, to Eugene Leff, N.Y. State Dep’t of Env’tl. Conservation, *supra* note 194, at 1-2; see also *Hinchey Urges Withdrawal of dSGEIS: Congressman Lists 10 Problems with Regulations*, *supra* note 195.

¹⁹⁸ See, e.g., *Hinchey Urges Withdrawal of dSGEIS: Congressman Lists 10 Problems with Regulations*, *supra* note 195.

¹⁹⁹ *SGEIS*, *supra* note 185 (indicating that more than 13,000 comments were received on the dSGEIS).

²⁰⁰ Sean F. Nolon, *Negotiating the Wind: A Framework to Engage Citizens in Siting Wind Turbines*, 12 Cardozo J. Conflict Resol. 327, 356 (2011).

²⁰¹ Esch, *supra* note 193.

²⁰² *Id.*

HVHF. For the latter communities, negotiation should be used to advance the interests of community members, protect the environment, and safeguard public health in their towns.

Both of the New York cases hinge on the local zoning authority and the extent to which Article 23 of the ECL, the OGSML, prevents local zoning ordinances from limiting or banning HVHF.²⁰³ It has long been held that local governments have the authority to enact zoning ordinances to protect the health, safety, and welfare of their communities.²⁰⁴ Furthermore, “[t]he New York State Legislature, under the Statute of Local Governments, specifically conferred to cities, towns and villages the power to adopt, amend and repeal zoning ordinances.”²⁰⁵ Nevertheless, the OGSML mandates that “[t]he provisions of this article shall supersede all local laws and ordinances relating to the regulation of the oil, gas and solution mining industries; but shall not supersede local government jurisdiction over local roads or the rights of local governments under the real property tax law.”²⁰⁶ Therefore, the question facing the courts is whether the supersedure clause of the OGSML preempts the statutory right of local authorities to regulate local land use with respect to HVHF.

1. Anschutz Exploration Corporation v. Town of Dryden

In *Anschutz Exploration Corporation v. Town of Dryden*, the New York Supreme Court of Tompkins County considered a zoning ordinance issued by the Town of Dryden stating, in part, that:

[n]o land in the Town shall be used: to conduct any exploration for natural gas and/or petroleum; to drill any well for natural gas and/or petroleum; to transfer, store, process or treat natural gas and/or petroleum; or to dispose of natural gas and/or petroleum exploration or production wastes; or to erect any derrick, building or other structure; or to place any machinery or equipment for any such purposes.²⁰⁷

²⁰³ *Anschutz Exploration Corp. v. Town of Dryden*, 940 N.Y.S.2d 458, 461 (N.Y. Sup. Ct. 2012); *see also* *Cooperstown Holstein Corp. v. Town of Middlefield*, 943 N.Y.S.2d. 722, 723-24 (N.Y. Sup. Ct. 2012).

²⁰⁴ *Vill. of Euclid v. Amber Realty Co.*, 272 U.S. 365, 395 (1926) (stating that a local ordinance must be arbitrary and unreasonable and have “no substantial relation to the public health, safety, morals, or general welfare” to be declared unconstitutional).

²⁰⁵ Kennedy, *supra* note 180, at 391.

²⁰⁶ *Anschutz Exploration Corp.*, 940 N.Y.S.2d at 466.

²⁰⁷ *Id.* at 465.

The Anschutz Exploration Corporation argued that the OGSML preempted the town's zoning law, thus invalidating it.²⁰⁸ The court held that the OGSML did not preempt local zoning power to regulate land use held in connection with oil and gas production, but rather preempted only local laws regulating operation of oil and gas production.²⁰⁹ Further, the court found that the town's zoning ordinance did not directly conflict with the OGSML's substantive provisions regulating well location.²¹⁰ The court examined the force of the OGSML by measuring the effect of the local ordinance against the purpose of the state statute, finding that the OGSML's supersedure clause did not conflict with the local zoning law; the court therefore upheld the ban.²¹¹

2. *Cooperstown Holstein Corporation v. Town of Middlefield*

In *Cooperstown Holstein Corporation v. Town of Middlefield*, the court considered the Town of Middlefield's amendment to its zoning law, which added that "[h]eavy industry and all oil, gas or solution mining and drilling are prohibited uses..."²¹² The plaintiff, a local property owner who had already executed two oil and gas leases pertaining to his property, argued that the town's zoning law would frustrate his ability to obtain the benefits associated with the leases.²¹³ The New York Supreme Court of Otsego County considered the legislative intent and the legislative history of the OGSML and found no clear legislative intent to supersede local control of land use.²¹⁴ The court held that the OGSML did not preempt the local zoning law because the legislature did not intend the statute to "impact,...diminish or eliminate" a local government's right to regulate land use.²¹⁵

3. *The OGSML's Supersedure Clause*

Each court analogized the OGSML's supersedure clause to a similarly worded clause contained in the Mined Land Reclamation Law ("MLRL") of the ECL and relied on the interpretation of this law by the New York Court of Appeals (New York's highest court).²¹⁶ The Court of Appeals stated that a zoning ordinance did not relate to the extractive

²⁰⁸ *Id.*

²⁰⁹ *Id.* at 468-69.

²¹⁰ *Id.* at 470.

²¹¹ *Id.* at 470 n.13.

²¹² *Cooperstown Holstein Corp. v. Town of Middlefield*, 943 N.Y.S.2d. 722, 723 (N.Y. Sup.

Ct. 2012).

²¹³ *See id.*

²¹⁴ *Id.* at 724-28.

²¹⁵ *Id.* at 728.

²¹⁶ *See id.* at 730; *see also Anschutz Exploration Corp.*, 940 N.Y.S.2d at 460.

mining industry but to an entirely different subject of land use, and that in the absence of a clear expression of legislative intent to preempt local control over land use, the statute could not be read as preempting local zoning authority.²¹⁷ Both trial courts also looked to the legislative history of the 1981 amendment to the OGSML and determined that the legislature did not intend for the law to preempt zoning ordinances.²¹⁸ This analogy to the MLRL provided the legal reasoning for the courts to find that the OGSML did not supersede local laws governing land use. Given that the primary language of the two supersedure clauses is nearly identical, both courts found in favor of the towns.²¹⁹

4. Opportunities for Local Regulatory Authority

The reception these decisions have received has varied. Governor Cuomo supports allowing local communities to make zoning decisions about HVHF, including implementing an outright ban.²²⁰ Others are fearful of where this level of town regulation might lead.²²¹ As these cases make their way to the New York State Appellate Division, it is possible that the rulings from the Otsego and Tompkins courts could be overturned. However, this seems unlikely because the courts' interpretation of the statute appears sound and their analogy to the MLRL is persuasive.

While it is true that the issue of supersedure by the OGSML is not yet settled in New York, these two court decisions have nevertheless opened the door for local community participation in hydraulic fracturing decision-making. Specifically, these cases illustrate how opposition to hydraulic fracturing has played an effective and critical civic function and has set the stage for more civic involvement in oil and gas development in towns across New York. This type of citizen opposition must be harnessed to help lead the way to a wise and environmentally responsible use of community resources. Energy companies seeking to actively pursue hydraulic fracturing in New York should take careful note and engage citizen opposition and use it to strive to develop BMPs in New York that go above and beyond what will be required for DEC permits. Furthermore, towns should look to leverage these court rulings to actively pursue

²¹⁷ *Frew Run Gravel Prods. v. Town of Carroll*, 518 N.E.2d 920, 923-24 (N.Y. 1987).

²¹⁸ *Anschutz Exploration Corp.*, 940 N.Y.S.2d at 467; *Cooperstown Holstein Corp.*, 943 N.Y.S.2d at 724.

²¹⁹ *Anschutz Exploration Corp.*, 940 N.Y.S.2d at 474; *Cooperstown Holstein Corp.*, 943 N.Y.S.2d at 730.

²²⁰ Esch, *supra* note 193.

²²¹ See Joseph De Avila, *Cuomo Weighs Letting Towns Decide Fracking*, WALL ST. J. (June 13, 2012, 10:28 PM), <http://online.wsj.com/article/SB10001424052702303822204577464993711407470.html> ("I think it's going to be a real war," said Binghamton Mayor Matthew Ryan, who opposes fracking. "Nobody ever thought an important decision like this would be passed down to local governments.").

negotiation of environmentally and socially responsible HVHF within their towns, should they choose to allow HVHF at all.

IV. ALTERNATIVE DISPUTE RESOLUTION AS A MODEL IF TOWNS' POWER TO BAN HYDRAULIC FRACTURING IS UPHELD

Alternative Dispute Resolution ("ADR") could be used as a model if towns' power to ban hydraulic fracturing is upheld. ADR consists of a broad spectrum of mostly consensual approaches to resolve disputes in which the parties seek to achieve a settlement of the issues.²²² Approaches range from direct communication between the parties in negotiation, to facilitation and mediation with a neutral third party aiding the dialogue, to binding or non-binding arbitration where a neutral third party hears facts and renders an opinion.²²³ Four key aspects of ADR help shape a successful outcome: (1) the voluntary nature of the process, (2) direct communication among stakeholders, (3) flexible design options, and (4) neutrality or a level playing field.²²⁴

Environmental Dispute Resolution ("EDR") is the application of ADR to environmental disputes.²²⁵ Environmental disputes tend to share a number of characteristics. "[They] tend to be complex and expensive, and include controversies and concerns that typically involve the allocation and protection of public goods, such as air, water, and biodiversity."²²⁶ Many diverse stakeholders are often involved in environmental disputes.²²⁷ These stakeholders may include members of the public, various levels of government, private industry, environmental and advocacy organizations, and nearby property owners.²²⁸ Resource and power disparities may arise between and among the stakeholders.²²⁹ "Environmental disputes also tend to involve complex technical issues and scientific uncertainty" creating a need for technical working groups or other joint fact-finding processes.²³⁰ Lastly, "environmental disputes...often involve actions that have irreversible impacts on the...environment."²³¹

Negotiation is the form of ADR that is best suited to address the issue of hydraulic fracturing at the local community level in New York.

²²² Gail Bingham & Lee M. Langstaff, *Alternative Dispute Resolution in the NEPA Process*, RESOLVE 1 (2011), <http://www.resolve.org/wp-content/uploads/2011/02/nepa.pdf>.

²²³ *Id.*

²²⁴ *Id.*

²²⁵ Gail Bingham et al., *Effective Representation of Clients in Environmental Dispute Resolution*, 27 PACE ENVTL. L. REV. 61, 61 (2009).

²²⁶ *Id.* at 62.

²²⁷ *Id.*

²²⁸ *Id.*

²²⁹ *See id.*

²³⁰ *Id.* at 63.

²³¹ Bingham & Langstaff, *supra* note 222, at 63.

“Negotiations are a vehicle of communication and stakeholder management...[that] can play a vital role in assisting policy-makers to obtain a better grasp of the complex issues, factors and human dynamics behind important policy issues,” such as those associated with HVHF.²³² Principled negotiation, based on multiple factors including interests, people, options, alternatives, criteria/legitimacy, commitments, and communication,²³³ is best suited for this environmental dispute in New York. Furthermore, in a democratic society, a negotiated outcome lends legitimacy to decision-making, resulting in more amiable conclusions and durable solutions.²³⁴

A. Benefits of ADR

For parties considering alternatives to a negotiated agreement in the context of HVHF, often their only other choice will be litigation. However, litigation is time consuming, costly, and rarely leaves both parties satisfied.²³⁵ On the other hand, ADR seeks to create durable and rational solutions crafted around mutually acceptable principles, creating a win-win for all parties involved.²³⁶ Some benefits of ADR include: emphasizing an increased focus on relevant information; improving communication among interested and affected stakeholders; providing a decreased likelihood of costly and lengthy litigation; improving prospects for future relationships among parties; and providing more informed decision-making.²³⁷

B. Why ADR and Why Now?

Timing is an important factor in negotiations. It has been argued that “parties are unlikely to enter talks before a situation is ‘ripe for a solution’, [*sic*] a condition that occurs when the parties realize that the status quo is ‘a lose-lose situation, not a win-lose situation.’”²³⁸ The parties must continually reevaluate their alternatives to negotiation in both beginning ADR and throughout the dispute resolution process.²³⁹ Alternatives to negotiation can be an important source of power or strength

²³² Food & Agric. Org. of the U.N., *Negotiation Theory and Practice: A Review of the Literature*, 2 (Jan. 2008) http://www.fao.org/docs/up/easypol/550/4-5_Negotiation_background_paper_179EN.pdf [hereinafter Food & Agric. Org.]

²³³ See generally ROGER FISHER & WILLIAM URY, *GETTING TO YES: NEGOTIATING AGREEMENT WITHOUT GIVING IN* (Bruce Patton ed., 1981).

²³⁴ Food & Agric. Org., *supra* note 232, at 4, 22.

²³⁵ See Bingham & Langstaff, *supra* note 222, at 1.

²³⁶ Food & Agric. Org., *supra* note 232, at 22.

²³⁷ Bingham & Langstaff, *supra* note 222, at 3.

²³⁸ Food & Agric. Org., *supra* note 232, at 16 (citing W.I. ZARTMAN & M.R. BERMAN, *THE PRACTICAL NEGOTIATOR* (Yale Univ. Press 1982)).

²³⁹ Food & Agric. Org., *supra* note 232, at 20-21.

in a negotiation. "A more 'powerful' party with a weaker [alternative to negotiating] will need to come to a negotiated agreement more than its rival."²⁴⁰

Often in environmental disputes there will be little interest on the part of, for example, a developer, to negotiate with communities where local permits are not required to develop, construct, or operate a facility. However, in the HVHF context, combined with the aforementioned recent New York Supreme Court decisions, the power dynamic between local communities and energy companies has shifted. In New York, assuming the two court cases are not reversed on appeal, energy companies must contemplate being completely shut out of New York shale gas plays by way of town zoning ordinances banning HVHF. In this context, the ADR option is a powerful motivating force that can be used to start community-level talks and to help keep energy companies at the table when discussing local concerns about HVHF. ADR can be used to encourage companies to take steps to mitigate the potential impacts of HVHF, above and beyond state regulatory requirements. Similarly, ADR may be attractive from the community's perspective, as the imbalance of financial power between wealthy energy companies and local community actors makes litigation a risky and costly strategy. However, local parties stand to lose their bargaining power if future litigation reverses the recent court findings.

The aforementioned court decisions give local communities leverage to shape HVHF development. Some energy companies may even be genuinely interested in socially and environmentally responsible development of gas resources.²⁴¹ While there may be many communities that will continue the trend of banning HVHF in their jurisdictions, some may be inclined to permit it or to restrict it to certain areas. For such communities, their recently confirmed power to impose a ban provides them leverage to negotiate the terms under which energy companies may be permitted to operate in their towns. While regulating HVHF remains the exclusive power of the state,²⁴² energy companies are free to enter into voluntary agreements with communities regarding all aspects of hydraulic fracturing operations. Therefore, it is in the best interest of energy companies to recognize local communities' ability to shape the future of gas drilling in their locales.

²⁴⁰ *Id.* at 21.

²⁴¹ *E.g.*, Elizabeth Cheney, *Public-Private Understanding Creates a Strong Foundation for a Sustainable Energy Future*, WORLD RESOURCES REP., <http://www.worldresourcesreport.org/responses/public-private-understanding-creates-strong-foundation-sustainable-energy-future> (last visited Nov. 10, 2012).

²⁴² N.Y. ENVTL. CONSERV. LAW § 23-0303(2) (McKinney 1981); *see* *Anschutz Exploration Corp. v. Town of Dryden*, 940 N.Y.S.2d 458, 473-74 (N.Y. Sup. Ct. 2012); *see also* *Cooperstown Holstein Corp. v. Town of Middlefield*, 953 N.Y.S.2d 722, 730 (N.Y. Sup. Ct. 2012).

C. Starting the Discussion - Who Goes First?

While local communities may begin community-wide discussions on the costs and benefits of HVHF, it will be helpful for energy companies to engage communities directly, early in the process of investigating the feasibility of drilling in the community. Naturally, how a company prepares and approaches a community about the prospect of drilling will shape the community's response.²⁴³ As with the siting of wind farms in New York, project developers who approach local boards early and often are likely to be more successful.²⁴⁴ To be sure, "[b]y involving citizens in the process authentically, they will trust it more. The more parties trust in the process, the more likely they are to accept the outcome."²⁴⁵

D. Principled Negotiation - Steps in the Process

"At its most fundamental level, multi-stakeholder environmental partnerships 'offer the chance for actors of diverse histories, interests, and perspectives to come together and cooperate.'"²⁴⁶ Once local communities and energy companies have indicated their mutual willingness to explore the possibility of hydraulic fracturing, managing an effective multi-stakeholder negotiation is a delicate balancing act. Specifically, four conditions must be met for there to be successful voluntary exchanges in siting negotiation: "(1) each party must possess something to trade; (2) 'deals' must be possible that are better than 'no deal'; (3) each party must trust that the other will honor its promises; and (4) each party must believe the above is true."²⁴⁷

Negotiations begin to take shape by setting an agenda to address an issue and choosing which items will be discussed. The form of an agenda "can set the tone and framework for the outcomes that are reached."²⁴⁸ In order to set an agenda, local boards must navigate through a complex array of issues and engage interested stakeholders, who are often comprised of a diverse mix of influential parties.²⁴⁹ Effective "negotiat[i]ons" will identify and draw together parties essential to an issue area, create a forum for

²⁴³ Nolon, *supra* note 200, at 346.

²⁴⁴ See BBC RESEARCH & CONSULTING WIND POWER FACILITY SITING CASE STUDIES: COMMUNITY RESPONSE 13-16 (2005), available at http://www.nationalwind.org/assets/publications/NWCC_Siting_Case_Studies_Final.pdf (providing a collection of case studies prepared by BBC Research & Consulting for the National Wind Coordinating Committee).

²⁴⁵ Nolon, *supra* note 200, at 353.

²⁴⁶ Elisabeth N. Radow, *Citizen David Tames Gas Goliaths on the Marcellus Shale Stage: Citizen Action as a Form of Dispute Prevention in the Internet Age*, 12 CARDOZO J. CONFLICT RESOL. 373, 394 (2011) (quoting Eric C. Poncelet, *Personal Transformation in Multistakeholder Environmental Partnerships*, 34 POL'Y SCI. 273 (2001)).

²⁴⁷ Nolan, *supra* note 200, at 369.

²⁴⁸ Food & Agric. Org., *supra* note 232, at 4.

²⁴⁹ *Id.* at 5.

sharing information, uncover[] interests, and defin[e]...options. Once...options have been identified negotiation again plays an important role as stakeholders and policy makers go about the business of selecting between available options and debating the merits of competing solutions.”²⁵⁰

Negotiations can take many forms. There are at least five different core types of negotiation theory. These types are structural, processual, strategic, behavioral, and integrative.²⁵¹ While discussion of all of these is beyond the scope of this article, the integrative approach, also known as principled negotiation, is likely the best model for local level negotiations of hydraulic fracturing. This approach focuses on “uncovering *interests*, generating *options* and searching for commonalities between parties.”²⁵² “[I]ntegrative theories and strategies look for ways of creating value, or ‘expanding the pie,’...so that there is more to share between parties as a result of negotiation.”²⁵³ Specifically, “[i]ntegrative approaches use objective criteria, look to create conditions of mutual gain, and emphasize the importance of exchanging information between parties and group problem-solving.”²⁵⁴ “Because integrative approaches emphasize problem solving, cooperation, joint decision-making and mutual gains, integrative strategies call for participants to work jointly to create win-win solutions.”²⁵⁵

There are four standard steps in principled negotiation.²⁵⁶ The first step is to separate the people from the problem.²⁵⁷ People often get emotional, especially over highly controversial topics like HVHF.²⁵⁸ These emotions can influence people’s perceptions about those with whom they are negotiating.²⁵⁹ “Emotions typically become entangled with the objective merits of the problem.”²⁶⁰ “This means finding a way [to] solve a problem without getting distracted by personal elements, [with the ultimate goal of] coming to an agreement in a manner that will preserve the relationship” among the parties.²⁶¹ Advocates of principled negotiation argue that it is important for stakeholders to express whatever emotions they are feeling.²⁶² “Allowing the other negotiator to release his or her feelings is an effective tactic for improving communication because it helps to clear the air of

²⁵⁰ *Id.*

²⁵¹ *Id.* at 9.

²⁵² *Id.* at 15.

²⁵³ *Id.*

²⁵⁴ *Id.* at 15.

²⁵⁵ *Id.*

²⁵⁶ FISHER & URY, *supra* note 233, at 11.

²⁵⁷ *Id.*

²⁵⁸ *See id.*

²⁵⁹ *See id.*

²⁶⁰ *Id.*

²⁶¹ Food & Agric. Org., *supra* note 232, at 19.

²⁶² FISHER & URY, *supra* note 233, at 31.

unwanted emotions and get talks back on track rather than let them be hung up on bad feelings.”²⁶³

Second, it is necessary “to identify the interests involved in an issue area as opposed to dealing with positions of the negotiating parties.”²⁶⁴ In New York, this means addressing environmental, economic, and social issues associated with HVHF and identifying each stakeholder’s perspective. Identification of parties’ interests will help elucidate each party’s position on hydraulic fracturing. By identifying such interests, “negotiators can approach issues of mutual concern with greater creativity, understanding and flexibility.”²⁶⁵

Third, negotiations must engage in fact finding and then generate options for mutual gain to address the interests of each party.²⁶⁶ After the parties to the negotiation begin building relationships and exchanging information “to gain a clearer understanding of the interests at stake, the parties should...generat[e] options”²⁶⁷ by thinking creatively and brainstorming potential solutions that address the underlying interests of all parties. Creative thinking “increases the chances that the parties involved will formulate a ‘win-win’ solution.”²⁶⁸ One goal of negotiation is to expand settlement options by discovering each party’s interests instead of focusing on positions; this allows the parties to identify areas of potential agreement.²⁶⁹ The space between each party’s Best Alternative to a Negotiated Agreement (“BATNA”) is the Zone of Potential Agreement (“ZOPA”). Currently, a New York town’s BATNA is banning HVHF or state regulation while an energy company’s BATNA is drilling elsewhere. In the middle lies the potential for socially and environmentally responsible HVHF, which can deliver real benefits to the state and local economies.

Finally, parties must insist that any final agreement is based upon some objective criteria.²⁷⁰ These criteria should include standards of fairness, efficiency, or scientific merit.²⁷¹ The issues raised by HVHF are complex and divisive, and the science surrounding its impacts is contested. In an environmental dispute involving HVHF, objective criteria in the form of science may be difficult to agree upon. Nevertheless, relying on the best available and most trustworthy sources of scientific and technical

²⁶³ Food & Agric. Org., *supra* note 232, at 25.

²⁶⁴ *Id.* at 19.

²⁶⁵ *Id.*

²⁶⁶ See FISHER & URY, *supra* note 233, at 12.

²⁶⁷ Food & Agric. Org., *supra* note 232, at 21.

²⁶⁸ *Id.*

²⁶⁹ See FISHER & URY, *supra* note 233, at 43.

²⁷⁰ *Id.* at 85.

²⁷¹ See *id.* at 86.

information when addressing HVHF will be essential to the creation of lasting solutions that are supported by all parties.²⁷²

In defining objective criteria, leaders in local communities will have to consider complex scientific issues. Given HVHF's complicated relationship with water, air, and public health, it may be necessary to have all sides agree on the science to rely upon or the scientific experts needed to complete reports or studies for stakeholders. There may be limited or regionally specific science to support decisions in a given locale. Moreover, the parties will have to deal with the advocacy inherent in the science presented by the various sides in the hydraulic fracturing debate. Anti-fracturing groups will present one side, while energy companies will advance the other. Decision makers should move away from this advocacy science and instead focus on research as a potential area for opportunities within the negotiation. For example, negotiations could focus on supporting localized efforts to understand the impacts of HVHF, with an emphasis on research leadership by local universities or other local partners deemed credible by all sides.²⁷³ Nevertheless, scientific uncertainty should not stall the process of negotiation.²⁷⁴ It will be necessary for all the parties to work across interest groups, conduct joint fact-finding, and ultimately agree on organizations viewed as credible by all sides.²⁷⁵

In sum, local communities will need to clearly articulate the problem and the improvements expected from engaging in the negotiation process. Communities must evaluate the alternatives, such as litigation, to engaging in negotiation. Communities must also communicate the value of entering into negotiation in lieu of banning HVHF. Local officials must inform and encourage two-way communication about the interests surrounding the negotiation, such as property values, resource values, air and water quality values, and tourism values. Local boards must also help to drive outcomes based on objective criteria. It is essential to start the dialogue early in the process and ensure it continues even after the projects agreed upon in negotiation are complete.

²⁷² GAIL BINGHAM, *WHEN THE SPARKS FLY: BUILDING CONSENSUS WHEN THE SCIENCE IS CONTESTED* 6 (2003), available at http://www.resolve.org/wp-content/uploads/2011/02/When_the_Sparks_Fly.pdf.

²⁷³ See RESOLVE, *RESOLVE REPORTS: CLIMATE SCIENCE COMMUNICATIONS ASSESSMENT* 30 (2012) available at <http://www.resolve.org/wp-content/uploads/2012/04/RESOLVE-Climate-Science-Communications-Assessment-Final-Full-Report-Feb.-2012.pdf> (providing an assessment of "current climate science communications capacity and stakeholder needs" determining that decision makers need information that moves beyond the defense of causal science to focus on more granular science, movement away from advocacy science towards collaborative science, diversification of the conversation, i.e. they need more focused, local, actionable science from non-advocacy sources to be the driver for actions, focus on the business of climate mitigation and adaptation, and strategic coordination across climate change initiatives. In this context HVHF science is a good analogy as the science is far from settled, dominated by advocacy sources, and polarizing).

²⁷⁴ See generally BINGHAM, *supra* note 272.

²⁷⁵ See RESOLVE, *supra* note 273, at 28.

E. Challenges of ADR in the Context of Town Level Discussion on Hydraulic Fracturing

1. Defining and Engaging Stakeholders

Because the hydraulic fracturing debate in New York has many interested parties and complex issues, “organizing a negotiation or consensus-building process can prove difficult.”²⁷⁶ One critical component of negotiation in the HVHF context is that it must include a diverse mix of public participants ranging from landowners to citizen advocacy organizations, energy companies, and more. Another set of difficulties arises in determining which parties may participate in the discussions and to what extent each may participate.

Citizen engagement is essential, and dealing with the representatives of multiple parties, while challenging, can be solved through a number of means, including coalition building, “establishing subcommittees, structuring simultaneous ‘roundtable’ conversations with small[er] groups, hosting ‘open houses,’” and through the creative use of technology.²⁷⁷ As seen in New York with the siting of wind farms, the process of proposing gas drilling must begin long before an application is filed and should include opportunities for citizen engagement and reframe the discussion from a focus on positions to a focus on interests.²⁷⁸

To engage many diverse stakeholders, local communities may consider creative use of technology to manage some of the dialogue.²⁷⁹ For example, communities may set up carefully managed conference calls with the principal parties to the negotiation that also allow the public to listen in and provide written comments afterward. Communities may also consider using “webinars” that are open to the public. Similarly, communities may engage citizens through online discussions or blogs on specific areas of the negotiation. Several benefits to engaging stakeholders with technology include: the ability to synthesize large amounts of information, allowing more people to participate in a meaningful way, and supporting people’s ability to learn through access to information.²⁸⁰ Technology may also help to control costs of engaging in large multi-stakeholder processes. Despite its benefits, the use of technology may also have some drawbacks. When considering the use of technology to facilitate multi-stakeholder

²⁷⁶ BINGHAM, *supra* note 272, at 5.

²⁷⁷ *Id.*

²⁷⁸ See Nolon, *supra* note 200, at 353.

²⁷⁹ See RESOLVE, COLLABORATIVE VALUES AND PRINCIPALS: GUIDANCE FOR CHOOSING TECHNOLOGICAL TOOLS 3 (2010), available at http://www.resolve.org/wp-content/uploads/2011/02/Collaborative_Values_and_Principles-Guidance_for_Choosing_Collaborative_Tactics_and_Tools.pdf (describing collaborative technological tools to increase partnerships and consensus building).

²⁸⁰ See *id.*

negotiations it will be essential to consider the target audience's access to and comfort with this technology.²⁸¹

2. *Reaching an Agreement*

Another challenge with multi-stakeholder negotiations is getting the decision makers to agree to the terms of the negotiation. In local-level negotiations, authorized decision makers for each party might not directly participate, but instead may participate via an intermediary, such as a company representative participating for the energy company. Town officials will find it useful "to know the degree to which each representative [is authorized to] speak for his or her organization or constituency" during the negotiations.²⁸² Without actual decision-makers present at negotiations, the process may become drawn out and less effective.

3. *Enforceability*

"A negotiated settlement is only enduring if all parties honor the commitments they [have made]."²⁸³ Energy companies must be cognizant of the fact that if a local community does not believe that the company has upheld its end of the bargain, current New York law allows a local board to pass a ban on HVHF. While this would not affect wells in operation or permitted at the time of the ban, it could block future well development.²⁸⁴ The legitimacy of the agreement provides a safeguard against a local community banning HVHF after the conclusion of the negotiation – the durability of any negotiated outcome is premised on the agreement satisfactorily meeting the interests of all local stakeholders. Nevertheless, in order to ensure the long-term durability of an agreement, parties will have to build trust through actions.

One way to build trust between energy companies and local communities is to create a commitment structure that can be implemented in stages. "Parties may be more willing to make a deal with an opponent when there is an opportunity to demonstrate that each side is honoring their commitments along the way."²⁸⁵ For instance, a town may agree to allow limited HVHF in a small area of the town under the terms of an initial agreement. Should the agreement be implemented successfully, the town

²⁸¹ *Id.* at 2-3. (explaining that, for example, older or economically disadvantaged individuals may not have fluency in use of, or access to, the technology required to participate).

²⁸² BINGHAM, *supra* note 272, at 5.

²⁸³ Food & Agric. Org., *supra* note 232, at 23.

²⁸⁴ *Anschutz Exploration Corp. v. Town of Dryden*, 940 N.Y.S.2d 458, 473 (N.Y. Sup. Ct. 2012).

²⁸⁵ Food & Agric. Org., *supra* note 232, at 23.

may then consider opening up additional areas within the town to further hydraulic fracturing.

4. Costs

Another challenge of negotiation is cost; negotiations take time and cost money. Furthermore, enforcing the agreement will require monitoring, which may impose additional costs. Determining ahead of time the funding available for such expenses will be helpful. Potential sources of funding might be available through state or federal government programs that are designed to encourage mediation of environmental disputes or study key issues associated with energy development in the state.²⁸⁶ Additionally, energy companies could fund an escrow account to offset negotiation and enforcement costs the towns might incur. Energy companies may even agree to fund a full-time DEC staff member to oversee active HVHF operations for compliance with the negotiated agreement. Despite these costs, negotiation is still likely to be less costly in the long run than litigation.

F. Benefits of ADR for Hydraulic Fracturing in New York: Opportunities and Options

As in any negotiation, options in HVHF negotiations can be tailored to address site-specific concerns. In other words, when considering the myriad options available for addressing local concerns over HVHF there is no such thing as a “fixed pie.”²⁸⁷

Many opportunities for BMPs in hydraulic fracturing exist. These include green completions, the use of natural gas-powered engines rather than diesel fuel powered engines, vapor recovery units on condensate tanks, “green” fracturing chemicals, tank storage of flowback fluids, and reuse of produced water in multiple wells where technically feasible.²⁸⁸ Additionally, some other field practices can be utilized to address wellhead emissions, reducing the impact of air emissions on local communities.²⁸⁹ A review and analysis of the development and use of “green,” or

²⁸⁶ E.g., *Environmental Dispute Resolution Program*, N.Y. STATE DEP'T OF ENVTL. CONSERVATION, <http://www.dec.ny.gov/regulations/2580.html> (last visited Oct. 16, 2012); see also *Environmental ADR*, OFF. ARMY GEN. COUNS., http://ogc.hqda.pentagon.mil/ADR/ADR_environmental.aspx (last visited Oct. 16, 2012). See generally Mandi Herring, *Summary of State Alternative Environmental Dispute Resolution Institutions*, MEDIATE.COM, <http://www.mediate.com/articles/scsg1.cfm> (last visited Oct. 16, 2012).

²⁸⁷ See FISHER & URY, *supra* note 233, at 59.

²⁸⁸ See Pekney, *supra* note 71, at 5; see also GRAND VALLEY CITIZENS' ALLIANCE, *supra* note 39, at 13. See generally *Natural Gas STAR Program*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/gasstar/index.html> (last updated Sept. 27, 2012).

²⁸⁹ Martin, *supra* note 72, at 15.

nonchemical, fracturing alternatives may provide reasonable alternatives to chemical fracturing fluid additives.²⁹⁰ Careful planning and reclamation can serve to mitigate or reduce wildlife habitat impacts.

Mitigation and reclamation of well pad sites, access roads, and other surface disturbances provide further opportunities for the parties to cooperate. Developers could agree to use wetland banking to address certain wetland disturbances or could agree to reclaim disturbed sites by replanting native species. Developers could also help mitigate the impacts of road construction, which often introduces new pathways for invasive species, by offering to participate in an invasive species eradication or control program. Furthermore, non-technological options may include the creation of a subgroup to work on the development of a simple standard oil and gas lease for homeowners and to educate the public about their abilities to require special setbacks, protections and privileges.²⁹¹ The options are limitless. Local communities and energy companies must recognize that there is no fixed pie – any option that can be created can be discussed as a potential solution for addressing community concerns.

V. CONCLUSION

Clean water, clean air, and energy are some of society's most fundamental needs. As demand for these resources increases, sustainable and socially responsible development of these resources will be critical to ensure the health and viability of future generations. It is necessary to identify, consider, and minimize the potential impacts to water, air, and ecosystem resources in natural gas development. Local communities in New York have never been in a more influential position to usher in the next wave of responsible energy resource development. Leveraging the power afforded by the two recent New York Supreme Court decisions gives local communities an unprecedented opportunity to negotiate with energy companies and shape the future of natural gas development in New York. Negotiation is an option that all communities that do not intend to ban HVHF outright should exercise. While there are some risks to negotiation - the enforceability of outcomes, the potential for a patchwork of results across the state, the inconsistent approaches taken to environmental protection, and increased costs for business investments - negotiation should be considered an additional tool, beyond stringent regulation by the DEC, to ensure environmentally and socially responsible hydraulic fracturing in New York.

²⁹⁰ See NYS DEC, *supra* note 36, at 28.

²⁹¹ Cf. Kurkoski, *supra* note 49, at 16 (explaining that many landowners have turned to landowner coalitions to increase their bargaining power, and address specific landowner concerns). See generally, N.Y. STATE RESEARCH & DEV. AUTH., NEW YORK STATE: WIND ENERGY TOOLKIT (2009), available at http://www.nyserda.ny.gov/-/media/Files/EERP/Renewables/wind-energy-toolkit.ashx?sc_database=web.