



SAVING THE LAND THAT MATTERS MOST

Scenic Hudson, Inc.

One Civic Center Plaza
Suite 200
Poughkeepsie, NY 12601-3157
Tel: 845 473 4440
Fax: 845 473 2648
info@scenichudson.org
www.scenichudson.org

January 11, 2012

Mr. Eugene Leff
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233-6510

Dear Mr. Leff:

Please accept this summary of Scenic Hudson's key recommendations on the Marcellus Shale Revised Draft Supplemental Generic Environmental Impact Statement ("SGEIS"). Scenic Hudson's full comments on the SGEIS immediately follow this summary.

Scenic Hudson has serious questions as to whether fracking can safely take place without subjecting New York State and particularly the Hudson Valley to serious, irreversible environmental harm. DEC should take the time to thoroughly study all potential impacts and ensure that *if* fracking is allowed in our state, no significant risk to our environment and health will result. If New York is to allow fracking to take place, it must have the most stringent regulations *and best enforcement* in the nation in place to protect its citizens.

The below recommendations highlight specific topics that warrant deeper analysis and study before New York should even consider permitting fracking operations.

(1) Increase Setbacks and Require Baseline Monitoring for Primary Aquifers and Private Wells

The current bans on fracking within 4,000 feet of the New York City and Syracuse watersheds do not go far enough – other drinking water sources deserve the same protection. Principal aquifer and private well setbacks must be increased beyond the respective 2,000 and 500 foot buffers proposed. In addition, baseline testing of wells for methane and chemicals used in the fracking process must be required so more definitive conclusions can be drawn about the origin of any chemicals and/or methane found once operations begin.

(2) Classify Fracking Fluid and Wastewater as Hazardous and Subject to Rigorous "Cradle-to-Grave" Tracking

Fracking fluid and wastewater containing toxic chemicals should be treated as hazardous and subject to all relevant "cradle-to-grave" tracking systems applicable to hazardous waste pursuant to the Resource Conservation and Recovery Act and other laws, and the attendant monitoring and handling restrictions must be imposed on handlers and transporters.

(3) Require Lifecycle Management of and Limitations on Surface Water Withdrawals

A comprehensive lifecycle management program for water withdrawals related to fracking must be instituted. DEC should adopt and enforce against natural gas drilling operations the proposed amendments to 6 NYCRR Parts 601 and 621 requiring permits for water withdrawals over 100,000 gallons a day.

(4) Prohibit Underground Wastewater Injection and Carefully Study Seismic Incidents in Other States

Given recent seismic activity in other states that has been linked to fracking operations, specifically deep-well injection of fracking wastewater, this practice of wastewater disposal must be prohibited. Fracking-induced seismicity warrants further study in the wake of incidents around the world where previously seismically inactive areas suddenly experience a great deal of seismic activity in the vicinity of fracking operations.

(5) Increase Mitigation Measures for Impacts to Ecosystems and Wildlife

The network of pads, roads and pipeline rights-of-way essential to economic gas extraction will result in massive forest fragmentation and a number of cascading and largely irreversible ecological effects. Mitigation measures, including placing off-limits to drilling areas of the state with sensitive ecological resources, must be implemented.

(6) Fully Analyze Cost to Communities; Require Operator-Funded Remediation Funds and Proof of Adequate Capitalization and Insurance

The potential negative socioeconomic impacts resulting from fracking activity must be thoroughly evaluated, including costs to communities associated with increased demand for community social services, police and fire departments, first responders, local hospitals, schools and road repair and maintenance. Impacts to traditional upstate industries such as agriculture and tourism from industrialization of the landscape and land and water contamination must be assessed. Remediation funds should be established for the benefit of individuals and communities that may suffer as a result of fracking contamination, and proof of adequate capitalization and insurance must be required of any drilling company proposing to do business in New York.

(7) No Permitting Until Adequate Number of Well-Trained DEC Staff Are Available; Impose Severance Taxes and Permit Fees to Offset Costs to Hire Additional DEC Staff

Even the most stringent regulations in the nation will do little to prevent serious health and environmental risks if there is not vigilant regulatory oversight. DEC should not consider beginning to process permit applications until an adequate number of well-trained staff are available to monitor and enforce regulations. To help offset the necessary cost of hiring hundreds of additional staff for this task, severance taxes and permit fees must be assessed on drilling companies.

(8) Mandate Measurement, Disclosure and Strict Limits on Air Emissions

Air quality has been notably degraded in several areas around the country as a result of fracking operations. Companies should be required to measure and disclose air emissions from all shale gas sources, and there should be strict regulations and limits on all sources of

fracking-related air pollution, from drilling wells to production pads and rigs, treating facilities, compression stations and related mobile sources.

(9) Prohibit Wastewater Disposal at Publicly Owned Wastewater Treatment Plants, Underground Injection of Waste Fluids and Open Pits

The SGEIS must propose a safe and comprehensive plan for disposal of fracking wastewater, as a number of potential disposal methods discussed in the SGEIS pose unacceptable dangers. Publicly-owned wastewater treatment plants, including several which discharge into the sensitive Hudson River Estuary, are not equipped to treat the toxic chemicals contained in fracking waste and should not be permitted to treat fracking wastewater under any circumstances. Underground injection of wastewater into disposal wells creates potential for movement of injected fluids into underground sources of drinking water and is suspected of causing earthquakes in several states. Open surface pits pose dangers to the health of nearby residents, pets and wildlife and can also cause groundwater contamination.

(10) Ban Fracking in Catskill Park and the Hudson River Watershed

Impacts to the Hudson River watershed are possible from drilling in the Utica Shale formation and through potential disposal of fracking wastewater at publicly-owned wastewater treatment plants located on the River. Any impacts to the sensitive Hudson River Estuary are unacceptable, and the Hudson River watershed should be afforded at least the same protection from the adverse impacts of fracking as the New York City and Syracuse watersheds. In addition, Catskill Park should be off-limits to all drilling.



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Dear Mr. Leff:

Thank you for this opportunity to comment on the Marcellus Shale Revised Draft Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program ("SGEIS").

Scenic Hudson is a not-for-profit organization working to protect and restore the Hudson River as an irreplaceable national treasure and a vital resource for residents and visitors. An advocate for the valley since 1963, today we are the largest environmental group focused on the Hudson River Valley. Scenic Hudson combines land acquisition, support for agriculture, citizen-based advocacy and sophisticated planning tools to create environmentally healthy communities, champion smart economic growth, open up riverfronts to the public and preserve the valley's inspiring beauty and natural resources.

Scenic Hudson is concerned that if high-volume hydraulic fracturing ("hydrofracking"/ "fracking") moves forward in New York State without additional comprehensive studies and a robust enforcement regime, it has the potential to irreparably damage our valuable natural resources, drinking water supplies, scenic vistas and community character for generations to come for an economic benefit that is far from guaranteed and that will be limited in duration.

As a non-profit organization with a mission based around the Hudson River and its surrounding Valley, Scenic Hudson is particularly concerned with the potential impacts to this vital resource, though we offer comments on consequences of fracking that may be experienced wherever fracking is implemented in New York State. There are frackable gas reserves in the Utica Shale that lie within the Hudson Valley and under the Hudson River. Even if drilling does not occur in the immediate vicinity of the River, there are multiple ways that the air, water and other resources of the River and Valley may be impacted. While banning drilling in state parklands, forest lands and wildlife management areas and within the NYC and Syracuse watersheds is a good start, additional protections are required to safeguard valuable resources in New York.

Statewide Impacts

Methane Migration/Water Contamination

Recommendation: Increase Setbacks and Require Baseline Monitoring for Primary Aquifers and Private Wells

Regulatory and industry representatives alike have admitted they are incapable of fully understanding the complexity of the fracture, reservoir and flow fluid regimes of hydraulic fractures.¹ There are naturally existing hydrogeologic pathways that expose groundwater aquifers to contamination, as well as pathways created by drilling operations. There have been documented allegations of private drinking water well contamination up to 2,000 feet from hydrofracked gas wells. Further, industry and government studies show that fractures can spread up to 2,500 feet and that hydrofracking can open natural fractures. In light of this information, the buffer zones proposed in the SGEIS of 500 feet from private wells and primary aquifers and 2,000 feet from public drinking water supplies (aside from the NYC and Syracuse watersheds, which receive the special protection of a 4,000 foot buffer), are inadequate.²

Though lower-volume vertical hydrofracking has taken place in other states for years, the magnitude of impacts to the environment and human health is only just coming to light. Last year, the Environmental Protection Agency (“EPA”) warned residents in Pavillion, Wyoming not to drink their water and to ventilate their homes when they showered while EPA investigated potential well and groundwater contamination from nearby fracking operations. Just last month, EPA announced that their investigation in Pavillion has turned up alarming levels of underground pollution, including cancer-causing chemicals consistent with those used in fracking nearby. While analysis and investigation is continuing, the chemicals are identical in composition to those used in the fracking operations, and there is no other known source for these chemicals.³

EPA has determined that water sampled from homes near the Pavillion gas fields was saturated with methane gas that matched the deep layers of natural gas being drilled for energy. The gas did not match the shallower methane that the gas industry says is naturally occurring in water, a signal that the contamination was related to drilling and was less likely to have come from drilling waste spilled above ground.⁴ In its most recent draft report on the Pavillion area contamination, EPA revealed that it not only detected high concentrations of benzene, qylenes, gasoline range organics, diesel range organics and total pugeable hydrocarbons as well as methane in groundwater at concentrations far above EPA’s maximum concentration level (“MCL”), but also detected a pattern of dispersion and degradation with upward migration.⁵ This is inconsistent with industry’s claims that fracking takes place so deep underground that shallower ground water supplies will not be affected.

While further analysis is needed to confirm the mechanisms of contamination in Wyoming, there are three potential mechanisms EPA is investigating at this time: (1) transport due to insufficient or inadequate cement production casing; (2) fracture fluid excursion from thin tight sandstone units into sandstone units of greater permeability; and (3) that fracking generates new fractures or enlarges existing ones above the target formation, increasing the connectivity of the fracture system.⁶ While the SGEIS purports to regulate the type and methods of cement casing used, the other two possible mechanisms of contamination are unaddressed in the SGEIS.

A study by Duke University into methane contamination resulting from fracking in Pennsylvania documented systematic evidence for methane contamination in drinking water associated with shale-gas

¹ Vincent, M.C. “Examining Our Assumptions – Have Oversimplifications Jeopardized Our Ability to Design Optimal Fracture Treatments?”, published by Society of Petroleum Engineers, 2009, at 13.

² SGEIS Executive Summary at 20-21.

³ EPA Region 8 Groundwater Investigation, November 9, 2011 documents, available at: <http://www.epa.gov/region8/superfund/wy/pavillion/>.

⁴ Id.

⁵ DiGiulio, Dominic C., et. al. “EPA Investigation of Ground Water Contamination near Pavillion, Wyoming”, December 14, 2011.

⁶ Id. at 32.

extraction in aquifers overlying the Marcellus Shale. The study found that methane concentrations were seventeen times higher, on average, in shallow wells in active drilling and excavation areas than in wells from non-active areas.⁷ Further, the average methane concentration in shallow groundwater in active drilling areas fell within the defined action level for hazard mitigation recommended by the Department of Interior, and the maximum observed value was well above this hazard level. Importantly, like the Wyoming investigation by EPA, the average ratios of certain hydrocarbons found in shallow groundwater in drilling areas was consistent with a deep thermogenic methane source and was not consistent with shallower, biologically derived methane.⁸

Reusing fracking fluid is currently favored because it spares water supply, but it also serves to concentrate the toxicity of fracking waste. EPA estimates that 20%-40% of the fracking wastewater stays underground. The Marcellus Shale lies within an intricate network of underground aquifers supplying drinking water in New York and therefore poses a cumulative threat to the state's complex system of aquifers that source our groundwater.

An internal document from Pennsylvania's Department of Environmental Protection outlines over 60 instances of water contamination and fugitive methane migration from gas drilling operations, many of which were due to unexpected pockets of underground pressure, the failure to contain well pressure, faulty production casing, or the accidental drilling into other abandoned or producing gas wells.⁹

According to Dr. Anthony Ingraffea of Cornell University, methane contamination can occur from "disturbances of previously blocked migration paths through joint sets or faults, or by puncturing pressurized biogenic gas pockets and allowing migration through as-yet un-cemented annulus, or through a faulty cement job."¹⁰ In large scale hydraulic fracturing operations, underground fracture propagation is difficult to predict, even according to industry insiders.

Given the foregoing ample evidence of drinking water contamination from fracking operations, drilling in potable water supplies should be prohibited and a large buffer should be required around aquifers and wells. The draft proposes to put some areas off limits to drilling, but upon closer examination, many of the restrictions have sunset dates and some protective buffers only call for site-specific individual environmental review, rather than clear restrictions. Scenic Hudson recommends that DEC require the use of closed-loop drilling systems and prohibit open pits to further mitigate potential impacts to groundwater.

There should also be baseline testing of wells near proposed drilling sites prior to the commencement of any drilling or well operation, so that future post-drilling samples can be compared and draw more definitive conclusions on the origin of fracking chemicals and/or methane should any be found. The US Department of Energy ("DOE") Shale Gas Production Subcommittee – a group that has been criticized by some environmentalists for the fact that its membership consists largely of energy industry insiders – has strongly recommended baseline testing of water sources surrounding planned well sites before any

⁷ Osborn, Stephen G. et. al. "Methane contamination of drinking water accompanying gas-well drilling and hydraulic fracturing", Duke University, May 17, 2011.

Available at: www.pnas.org/cgi/doi/10.1073/pnas.1100682108.

⁸ Id.

⁹ Pennsylvania Department of Environmental Protection, Bureau of Oil and Gas Management, "Stray Natural Gas Migration Associated with Oil and Gas Wells."

¹⁰ Testimony of Dr. Anthony R. Ingraffea before Parliament of Canada Standing Committee on Natural Resources, February 1, 2011, available at: <http://www.parl.gc.ca/HousePublications/Publication.aspx?DocId=4918403&Language=E&Mode=1&Parl=40&Ses=3>

fracking operations should be allowed to take place. Such testing is necessary to establish an objective benchmark to assess potential damage to water resource, and can be integral to establishing facts and verifying disputed contamination claims.¹¹

These studies warrant further consideration by DEC and seem to run counter to the assertion in the SGEIS that there have been no documented instances of groundwater contamination associated with fracking. The mitigation measures currently proposed in the SGEIS are insufficient because even when multiple layers of well casing are used, there is a 5% well failure rate at startup – a failure rate that increases as time passes. Further, faulty well casing is not the only suspected cause of methane migration and toxic fracking fluid contamination, as the EPA study notes.

Transport of Hazardous Waste

Recommendation: Classify Fracking Fluid and Wastewater as Hazardous Waste Subject to Rigorous “Cradle-to-Grave” Tracking

Fracking fluid and wastewater containing toxic chemicals should be treated as hazardous and subject to all the relevant “cradle-to-grave” tracking systems applicable to hazardous waste pursuant to the Resource Conservation and Recovery Act and other relevant laws, and the attendant monitoring and handling restrictions must be imposed on handlers and transporters. Fracking wastewater contains several difficult-to-treat pollutants including: total dissolved solids (“TDS”), including toxic metals; petroleum hydrocarbons; and radionuclides/naturally occurring radiological material (“NORM”). Treating these chemicals as non-hazardous industrial waste as the SGEIS proposes is inconsistent with practice in other industries, where even tiny traces of these chemicals warrant special handling procedures.

Many of these chemicals are known to be serious human and animal carcinogens, and there has not been any study of the cumulative effect of exposure to the hundreds of dangerous chemicals used in the fracking process. In addition to potential discharge as solid waste and waste water, accidents happen regardless of precautions taken and a surface spill of fracking wastewater containing hazardous, cancer-causing materials would pose a serious threat to human health and the environment. While Scenic Hudson appreciates that the public disclosure component has been strengthened, telling the public what toxic chemicals will be used is not sufficient to protect them and the environment from the negative health impacts.

Further, the SGEIS provides that this hazardous waste may be treated in municipal wastewater treatment plants if certain conditions are met. TDS containing toxic metals aren’t biodegradable and thus are unaffected by the bacteria that are used to break down human waste in a sewage treatment plant. While some become concentrated in the sludge, most of the compounds pass from the plant right into the surface water body. Hydrocarbons, which include the solvents benzene and toluene in small concentrations, are difficult to degrade and typically not broken down quickly enough. They can survive and go into the surface water into which the wastewater treatment plants discharge. Because radionuclides are radioactive, they can therefore concentrate in anything they come in contact with. It is imperative that fracking wastewater be treated as the hazardous waste it is.

There are some chemicals used in the fracking process that have not even been tested for human or environmental toxicity.¹² And although hazardous chemicals can be diluted during the drilling process, there are some chemicals known to pose severe risk to human and environmental health “even at

¹¹ United States Department of Energy Secretary of Energy Advisory Board Shale Gas Production Subcommittee Second Ninety Day Report, November 18, 2011.

¹² Bishop, Ronald E. “Chemical and Biological Risk Assessment for Natural Gas Extraction in New York.” State University of New York, College at Oneonta, Draft Report 2011.

concentrations near or below their chemical detection limits.”¹³ Industry groups maintain that hydraulic fracturing is largely performed using water and sand and that only a fraction, 0.5%, is made up of the chemical additives. Yet, given the enormous amounts of water required, this ‘fraction’ is not negligible: a conservative estimate is 20 tons of chemicals per 1 million gallons of water.

In a typical well this could amount to 34,000 gallons of chemicals by volume. Many of these toxins are poisonous in parts per billion, most do not biodegrade and many have been proven to cause illness and death in humans and experimental animals through conditions such as asthma, cancer, nerve degeneration and serious birth defects.

Tracking this chemical-laden wastewater with a procedure similar to that required for medical waste, as the SGEIS proposes, is simply insufficient to protect against the dangers of these toxic chemicals.¹⁴ As recommended by the DOE Advisory Panel, there should also be full disclosure of all chemicals used in fracking – not only those on Material Safety Data Sheets (“MSDS”) – and the bar for trade secret protection should be very high.¹⁵ Specific concentrations of chemicals used in fracking fluid should be disclosed, not merely that a chemical is present. This information should be reported on a well-by-well basis and posted on a website with user-friendly tools for easy searching by the general public.

Water Usage

Recommendation: Lifecycle Management and Limitations on Surface Water Withdrawals

EPA estimates that 70 to 140 billion gallons of water are used to fracture 35,000 wells in the United States each year.¹⁶ This is approximately equal to the annual water consumption of 40 to 80 cities each with a population of 50,000. Deep horizontal shale wells, such as those that underlie New York, can use anywhere from 2 to 10 million gallons of water to fracture a single well.¹⁷ The extraction of so much water for fracking has raised concerns about the ecological impacts to aquatic resources, as well as dewatering of drinking water aquifers.

It has been estimated that the transportation of a million gallons of water (fresh or waste water) requires 200 truck trips. Thus, not only does water used for hydraulic fracturing deplete fresh water supplies and impact aquatic habitat, the transportation of so much water also creates local and regional air quality, safety and road repair issues. While the fracking industry has recently begun recycling a large percentage of fracking wastewater, reducing to some extent the surface water withdrawals necessary for operation, this brings with it its own problems, including concentrating the levels of hazardous chemicals in the wastewater that must eventually be disposed of. A comprehensive tracking and management program for water withdrawals related to fracking should be instituted before fracking is allowed to go forward in New York.

DEC should adopt and enforce against natural gas drilling operations the proposed amendments to 6 NYCRR Parts 601 and 621 requiring permits for water withdrawals over 100,000 gallons a day. In addition to considering significant cumulative or individual impacts on aquatic life in its permitting

¹³ Id.

¹⁴ SGEIS at 1.7.9.

¹⁵ U.S. Department of Energy Secretary of Energy Advisory Board Shale Gas Production Subcommittee Second Ninety Day Report, November 18, 2011.

¹⁶ EPA Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources, November 2011, at 22.

¹⁷ SGEIS at 5.8

decisions, DEC should establish “quantitative standards that maintain stream flow protective of aquatic life” as authorized by the Water Resources Protection Act.¹⁸

Seismic Impacts

Recommendation: Prohibit Underground Wastewater Injection and Carefully Study Seismic Incidents in Other States

The SGEIS dismisses the threat of increased seismic activity due to hydrofracking as insignificant. Recent studies that appear to arrive at different conclusions should be fully investigated. DEC admits that the mechanisms that limit vertical fracture growth are not completely understood.¹⁹ Further, even fracking operators have agreed their activities can cause seismic activity; Cuadrilla Resources, a British energy company, recently admitted that its hydraulic fracturing operations “likely” caused an earthquake in England.

Recent analysis of dramatic increases in seismic activity in the proximity of drilling operations in Oklahoma has shown that shortly after deep-well injection of fracking wastewater began, small earthquakes started occurring, and more than 50 were identified, of which 43 were large enough to be located. Most of these earthquakes occurred within a 24 hour period after hydraulic fracturing operations had ceased. There have been previous cases where seismologists have suggested a link between hydraulic fracturing and earthquakes, but data was limited, so drawing a definitive conclusion was not possible for these cases. The Oklahoma Geological Survey has stated that “cases of clear anthropogenically-triggered seismicity from fluid injection are well documented with correlations between the number of earthquakes in an area and injection, specifically injection pressures, with earthquakes occurring very close to the well.”²⁰ Nearly 50 earthquakes were recorded in Oklahoma in 2009, and 1047 were recorded in 2010. This includes the strongest earthquake recorded in Oklahoma history, of 5.6 magnitude.²¹ This dramatic increase in earthquake activity coincides with an increase in nearby fracking activity, particularly fluid injection into disposal wells. The large amounts of fluid disposed of in this way can seep into cracks and lubricate already stressed faults, making it easier for them to slip and cause an earthquake.²²

The Youngstown, Ohio area recently experienced its first ever recorded series of earthquakes, which all happened over the past nine months in the vicinity of a new fracking disposal well that opened around the same time as the quakes began. While the incidents are still being studied, the Ohio Department of Natural Resources has suspended operations at the deep-injection disposal wells based on its belief that injecting wastewater had created enough pressure to cause the earthquakes.²³ The latest quake, which took place December 31, 2011, was of 4.0 magnitude – well above the insignificant and undetectable levels that the SGEIS claims any fracking-related seismic activity would be limited to. Data from Columbia University’s Lamont-Doherty Earth Observatory concluded that the earthquake occurred at the same depth as the injection well. According to John Armbruster at Lamont-Doherty, “There is a relationship between when they started to inject into the well and the earthquakes started near the bottom of the well so it is unlikely to be coincidental.”²⁴ In Arkansas, the Arkansas Oil and Gas Commission

¹⁸ See NY ECL § 15-1501.4.

¹⁹ SGEIS at 5.8.2.

²⁰ Holland, Austin. “Examination of Possibly Induced Seismicity from Hydraulic Fracturing in the Eola Field, Garvin County, Oklahoma.” Oklahoma Geological Survey, August 2011.

²¹ Id.

²² Choi, Charles Q. “Did Fracking Cause Oklahoma’s Largest Recorded Earthquake?”, Scientific American, Nov. 14, 2011.

²³ Fountain, Henry. “Ohio – Sites of Two Earthquakes Nearly Identical”, New York Times, January 3, 2012.

²⁴ McCallister, Edward. “Avoiding fracking earthquakes: expensive venture”, Reuters, January 3, 2012.

also banned disposal wells for fracking waste in a region that was inundated with earthquakes after disposal drilling began.²⁵

Fracking-induced seismicity is a subject that warrants further study in the wake of incidents the world over where previously seismically inactive areas suddenly experience a great deal of seismic activity when fluid injection into fracking disposal wells begins.

Ecosystems and Wildlife

Recommendation: Greater Mitigation

Fracking operations have the potential to bring significant industrial development to relatively rural areas of New York, which would result in impacts to habitats, species distributions and populations, and overall natural resource biodiversity. The use of open pits to store wastewater would expose animals to toxic pools that have already proved lethal in other states.

Areas of intensive gas drilling in the Pennsylvania Marcellus Shale have resulted in forest fragmentation; according to one study, an average of 8.8 acres of forest was cleared for each drilling pad due to the roads and other infrastructure necessary for operation. Each drilling pad, then, affected 30 acres of forest; given that in some areas wells are as dense as 1 per 40 acres, a very high degree of fragmentation can result.²⁶ This fragmentation will result in significant adverse impacts to wildlife and biodiversity, as the SGEIS itself states, but the only mitigation proposed - that allowing fracking in forest or grassland focus areas would be contingent on a site-specific assessment - is inadequate.²⁷

The network of pads, roads, and pipeline rights of way, all of which are essential to economic gas extraction, will also result in massive forest fragmentation and a number of cascading and largely irreversible ecological effects. In places where this landscape conversion from rural woodland to industrial land use is proceeding without a comprehensive land use plan, the impacts could be especially devastating.

Community Character/Visual Impacts

Recommendation: Fully Analyze Cost to Communities; Require Operator-Funded Remediation Funds and Proof of Adequate Capitalization and Insurance

As the SGEIS highlights the potential economic benefits to New York from allowing hydrofracking, it largely ignores the myriad potential negative socioeconomic impacts from allowing this same activity. These negative impacts must also be realistically considered and not merely glossed over in a single sentence or two without substantive evaluation.²⁸

The SGEIS should be revised to include an analysis of costs to communities associated with increased demand for community social services, police and fire departments, first responders, local hospitals and schools. Similarly, the SGEIS must explain how our local governments are to deal with the hundreds of millions of dollars in increased annual road costs that fracking will bring.

The SGEIS ignores the potential negative impacts to traditional upstate industries such as agriculture from land and water contamination risks. Further, New York has spent enormous resources to develop the economy of upstate New York by attracting new high tech industries, by developing tourism, protecting

²⁵ See Transcript of Hearing Order 180A-2-2011, Arkansas Oil and Natural Gas Commission, August 2, 2011

²⁶ Johnson, N. "Pennsylvania energy impacts assessment: Report 1: Marcellus shale natural gas and wind." Nature Conservancy - Pennsylvania Chapter, 2010.

²⁷ SGEIS at 1.7.13.

²⁸ See SGEIS Economic Assessment Report.

agricultural lands, endangered species and historic sites, and encouraging land use compatible with these goals. The impacts of gas drilling on these investments in the region must be analyzed.

In May 2011, Cornell University released a study providing evidence that over time, communities where hydrofracking takes place are actually economically worse off than other communities in personal income, employment growth, economic diversity, educational attainment and ability to attract investment.²⁹ These issues must receive a “hard look” in the SGEIS; the cursory treatment they are given in the current draft does not rise to that level.

The extraction of non-renewable natural resources such as natural gas is typically characterized by a “boom-bust” cycle, in which a rapid increase in economic activity is followed by a rapid decrease. Given the concentration of experienced equipment manufacturers, laborers, and skilled workers in states like Texas and Oklahoma, it is likely that most of the economic effects of drilling would not benefit New York. In Pennsylvania, for example, most fracking company employees are imported from other states. The initial drilling period that will bring the money and people into the region will likely last under 10 years, if experiences in other regions are an accurate indication. The region as a whole will become industrialized to support continued drilling, storage and transportation of natural gas, while the temporary positive “boom” impacts will be far more local and temporary.³⁰

There will also be significant impacts on valuable scenic resources, which can translate to negative impacts on tourism – one of New York’s most important industries. These are similarly dismissed in the impact statement without any serious consideration. Visual blights that could destroy the bucolic landscapes of New York include: well pads; water extraction sites to fill trucks transporting water to the well pads; networks of pipelines and compressor stations to move the gas from the well sites to main transmission lines; and transport of flowback and produced water from the wells to treatment facilities, which likely will have to be built (as municipal treatment plants cannot handle this waste unless very costly modifications are undertaken) to handle any toxic waste present.

The changes to the landscape – from pastoral, agricultural, and rural to industrial – will far outlast the life of profitable gas extraction. These changes cannot be undone when the wells dry up and the gas producers move on. The landscapes of rural and exurban New York State induce tourism, the leading industry in many areas. The income from tourism will dry up with the advent of large-scale fracking operations in New York. The noise and pollution associated with drilling activity can negatively impact these other industries.

In addition, many major mortgage companies refuse to lend on properties that have gas leases, or even on properties that may be adjacent to property on which there is a gas lease due to the long-term liabilities. New construction in areas where fracking is prevalent could be diminished since construction loans depend on risk-free property. The impacts this would have on local real estate values in areas where fracking is prevalent could far outweigh the benefit to a small portion of residents from direct lease payments.

As the DOE states in its Shale Gas Production Subcommittee Draft Report, “Shale gas production brings both benefits and cost of economic development to a community, often rapidly and in a region that is

²⁹ Christopherson, Susan and Ned Rightor. “A Comprehensive Economic Impact Analysis of Natural Gas Extraction in the Marcellus Shale”, Cornell University, May 2011, at 25. Available at: www.greenchoices.cornell.edu/downloads/development/marcellus/Marcellus_SC_NR.pdf

³⁰ Barth, Jannette M. “Unanswered Questions About the Economic Impact of Gas Drilling”, Cornell University, March 22, 2010.

unfamiliar with oil and gas operations. Short and long term community impact range from traffic, noise, land use, disruption of wildlife and habitat, with little or no allowance for planning or effective mechanisms to bring companies, regulators, and citizens to deliberate about how best to deal with near term and cumulative impacts.”³¹

Compulsory integration and forced pooling of a group of land parcels is another issue facing individuals and municipalities in areas where fracking operations take place. New York law allows a property owner who does not desire any drilling below its property to be forced into a drilling pool if the lessee (in this case, the gas company) has control of at least 60% of the pooled land.³² Local governments should be able to outlaw forced pooling and should not have their hands tied by state law with respect to this matter of local concern. New York should not allow any sort of forced pooling by gas companies.

A severance tax should be assessed on those who extract natural gas, bringing offsetting revenue to the state. Still, municipalities will bear the brunt of the direct impacts from fracking operations. A remediation fund of monies contributed by fracking operators, based on number of wells or volume of gas extracted, must be set up to ensure that environmental and human health threats from ground water contamination, explosions, or other disasters at natural gas drilling sites can be remediated without the cost falling on the taxpayers.

Despite industry’s claims to both potential gas lessors and the media that fracking is a safe and low-risk activity, disclosures to their own investors tell a different story. According to 10-K forms filed with the Securities and Exchange Commission (a securities filing of the company’s performance) by large fracking companies such as Range, Chesapeake, and Cabot, the fracking companies are undercapitalized and underinsured. If a major spill or other environmental disaster were to take place as the result of their operations, costs of clean-up and consequential damages would fall to the taxpayers and to the victims of the incident.

For example, Range’s 2010 10-K states that “Our indebtedness could limit our ability to successfully operate our business,” and that “Our business is subject to operating hazards that could result in substantial liabilities that may not be fully covered under our insurance policies...we may elect not to obtain insurance if we believe that the cost of available insurance is excessive relative to the risks presented.”³³ Chesapeake’s 10-K contains similar statements about the under-capitalized and under-insured nature of their operations. Fracking operators also admit that there is an inherent risk of incurring significant environmental costs and liabilities in their operations. Cabot acknowledges in its 2008 10-K that “our business involves a variety of operating risks, including: well-site blowouts; cratering and explosions; equipment failures; pollution and other environmental risks.”³⁴

Cumulative impacts, including the impact of multiple well pads and ancillary facilities such as pipelines and compressor stations, are not fully evaluated in the SGEIS. The cumulative impact of these facilities could have far greater detrimental impact on human health and the environment in communities where fracking will take place than would an individual well pad.

Since the operators will reap the vast majority of the benefits from fracking, they should also bear the costs of potential disaster. There should be robust minimum insurance and capitalization requirements for companies proposing to conduct fracking operations in New York, and they should also be required to

³¹ USDOE Secretary of Energy Advisory Board, Shale Gas Production Subcommittee, Ninety Day Report, November 18, 2011.

³² See NY ECL § 23-0901.

³³ Range Resources Corporation Form 10-K, United States Securities and Exchange Commission, 2010.

³⁴ Cabot Oil and Gas Co. Form 10-K, United States Securities and Exchange Commission, 2008.

post surety bonds and contribute to remediation funds designed to offset the costs to government and individuals from impacts of their operations.

Lack of Trained Personnel and Financial Resources for Oversight

Recommendation: Severance Taxes and Permit Fees to Offset Costs to Hire Additional DEC Staff; No Permitting Until Adequate, Well-Trained Staff Are Available to Monitor and Enforce

Despite assertions that New York will have the most stringent fracking regulations in the nation, it seems that DEC continues to push the regulatory process forward even as new information and studies pointing to potential dangers of fracking are released on almost a daily basis. This limits the public's opportunity to express their concerns and have these concerns actually influence DEC's decision-making. DEC issued draft regulations governing shale gas extraction and fracking on September 28, 2011, and is holding simultaneous public comment periods and hearings for the SGEIS and regulations. Yet, a core principle of the state's environmental review process is that DEC finalizes impact statements such as the SGEIS after incorporating public input, and prior to drafting regulations so that the impact statement findings inform the regulatory process. By issuing regulations before the environmental review process is complete, DEC will not be fully considering public comments in the development of those draft regulations, and instead basing its regulations on a draft SGEIS that has not benefitted from the opportunity for public comment.

DEC also has not committed to wait to begin permitting until regulations have been finalized. Moving forward with issuing permits before final regulations are in place is a backwards approach – DEC should process permit applications only after it promulgates detailed regulations that adequately protect against the environmental, public health and safety risks associated with horizontal drilling and fracking. This push to complete the regulatory review process to pave the way for permitting as soon as possible is unfair and unreasonable to the public.

DEC declared in its August 16, 2011 report to the State Advisory Panel on High-Volume Hydraulic Fracturing that shale gas extraction in this state will only be successful, environmentally protective, and economically beneficial through a “vigilant environmental regulatory program” backed by staff and other resources to ensure “rigorous permitting, inspections and compliance.”³⁵ In that same report, DEC states that it does not have the necessary resources to accomplish those goals, and presents its staff needs: at least 140 new positions immediately, and over 200 new positions in the first 5 years. DEC also does not have the funds to hire new staff and therefore must count on the next state budget process. DEC projects that even if it is completely successful in achieving its budget request in this fiscal climate, which seems highly unlikely, it will likely not have the necessary staff in place before January 2013, at which time it will begin the time consuming process of training that new staff.

In light of these statements, it is difficult to imagine that DEC will be ready to begin issuing permits in 2013, as it now projects. Its current gasfields inspection staff is only 14 people; by comparison, Pennsylvania, which continues to be challenged by environmental problems from drilling, has over 200 inspectors. Even if New York has the most stringent regulations in the country, inadequate staff and equipment to monitor and enforce them will seriously undermine the integrity of the regulatory process. We hope that DEC will only review applications that it has the capacity to review at any given time, but it is difficult to take this seriously given the huge push to drill a significant number of wells in New York over the next several years. This begs the question: why should the state rush the process, when it admittedly doesn't have sufficient resources to process the volume of applications expected?

³⁵ Advisory Panel on High-Volume Hydraulic Fracturing: State Resource Needs, at 2 (August 16, 2011).

In addition, EPA has undertaken a major study on fracking's impacts to drinking water and groundwater which is due to be completed by 2014 and has plans to issue federal regulations subsequent to this, if the exemption for hydrofracking under the Safe Drinking Water Act can be repealed. The Energy Policy Act of 2005 amended the Safe Drinking Water Act so that the "underground injection of fluids or propping agents (other than diesel fuels) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities" are excluded from the EPA's jurisdiction.³⁶ The amended law left the regulation of hydraulic fracturing under the jurisdiction of the states, but EPA is taking steps to regain some level of authority over gas drilling operations. EPA has also recently proposed new rules to regulate and control air emissions through the natural gas extraction and production process, which are expected to be finalized in late 2012. New York should wait until these comprehensive federal studies and potential regulations are complete before permitting operations that have the potential to significantly impact New York's environment for generations.

Scenic Hudson also supports a severance tax imposed on gas produced in New York State to offset the costs to government from allowing fracking. A severance tax imposed on the value of nonrenewable natural resources that will be used outside the state from which they are extracted is an important device to help compensate New Yorkers for the risks and costs they will bear if fracking operations are permitted. Severance taxes are intended to cover costs associated with resource extraction and to compensate the state for the loss of a non-renewable resource. With the exception of New York and Pennsylvania, all significant producing states impose a severance tax on fossil fuel extraction. When towns "boom" as a result of energy extraction, there are increased job opportunities and a growing population. Along with this short-term growth come increased public costs – for planning and zoning and other administrative services, for intensified road traffic and reconstruction, and for increased demands on schools, social services and public safety – predominantly paid for by state, county and municipal governments. Most evidence indicates that severance taxes have little effect on natural gas company decisions about where and when to drill.

In addition, operating and permit fees should be assessed. These taxes and fees are necessary to help alleviate the additional burden on already strained state resources and enable DEC to hire and train the necessary personnel, and obtain the necessary equipment, to properly monitor and enforce its regulations. Still, proper training of new staff will take time, and Scenic Hudson urges that DEC slow down the regulatory process and not permit fracking unless and until more comprehensive studies are completed and all risks can be adequately mitigated.

Hudson Valley Impacts

Air Quality Impacts

Recommendation: Mandate Measurement, Disclosure and Strict Limits on Air Emissions

There are examples from around the country of severely degraded air quality as a result of fracking operations, an impact that could further devastate the air quality of Hudson Valley counties already considered nonattainment for some pollutants. For example, in sparsely populated Sublette County in Wyoming, which has some of the highest concentrations of wells in the nation, fugitive emission from wells reacting to sunlight have contributed to levels of ozone higher than those recorded in Houston and Los Angeles.³⁷

³⁶ "Regulation of Hydraulic Fracturing by the Office of Water". United States Environmental Protection Agency, June 23, 2011.

³⁷ Streater, Scott. "Air Quality Concerns May Dictate Uintah Basin's Natural Gas Drilling Future". New York Times, October 1, 2010.

Approximately 3.6% to 7.9% of the methane from shale-gas production escapes to the atmosphere in venting and leaks over the lifetime of a well. Methane is a powerful greenhouse gas, with global warming potential that is commensurate with that of carbon dioxide. In fact, compared to coal, the carbon footprint of shale gas is at least 20% greater and perhaps more than twice as great on the 20-year horizon, and is comparable to coal over 100 years. EPA issued a report in late 2010 that concluded that fugitive emissions of methane from shale gas may be far greater than for conventional gas. Recent modeling indicates methane has an even greater global warming potential than previously believed³⁸, calling into question the prevailing understanding of natural gas as a “clean burning” alternative to fossil fuels.

Companies should be required to measure and disclose air emissions from all shale gas sources, and there should be strict regulations and limits on all sources of fracking-related air pollution, from the drilling wells to the production pads and rigs, treating facilities, compression stations and related mobile sources. Health impacts to nearby residents and workers from increased exposure to volatile organic compounds (“VOC”) known to be vented into the atmosphere at natural gas drilling operations, including benzene, toluene, ethyl benzene and xylene, should be fully investigated and minimized.

Wastewater Treatment and Disposal

Recommendation: Prohibit Wastewater Disposal at Publicly Owned Wastewater Treatment Plants, Underground Injection of Waste Fluids, and Open Pits

A significant threshold issue is the safe and effective treatment of fracking wastewater. The SGEIS proposes to allow publicly-owned wastewater treatment plants (“WWTP”) to treat fracking wastewater laden with toxics. Several municipalities along the Hudson River are listed as having a sewage treatment plant with State Pollutant Discharge Elimination System (“SPDES”) permits that allow them to treat industrial waste and therefore have the capacity for “pretreatment” of fracking wastewater.³⁹ These include Kingston, Poughkeepsie, Newburgh, Peekskill, Beacon, Haverstraw, and Yonkers. While a site-specific analysis is required before any of these plants are allowed to receive waste, these plants are eligible to apply for approval since they can accept industrial waste. These WWTP are not equipped to fully break down and eliminate all the toxic components of fracking waste, which include radiological materials, TDS containing toxic metals and petroleum hydrocarbons. The potential for these WWTP to receive toxic fracking waste represents a direct and unacceptable threat to the Hudson River.

An alternative to using WWTP - although no more desirable - is underground injection of wastewater into disposal wells. Disposal wells create the potential for movement of injected fluids into or between potential underground sources of drinking water. As discussed earlier, injection of wastewater for disposal is also suspected of causing earthquakes in several states. A third option would be storing wastewater in open pits; this practice, too, has been linked to groundwater contamination, as methods for lining the pits are inadequate, especially when the high volume of truck traffic coming to the edge of the pit to dispose of the water is considered.⁴⁰ Further, these pits attract pets and wildlife that can be poisoned by the toxic water. If located near residential areas, the fumes from chemicals evaporating from these pits can sicken nearby residents as has happened in Pennsylvania.⁴¹

A number of the chemicals that make up the wastewater would be classified as “hazardous waste” in other uses; just because they make up only a small proportion of the wastewater product does not mean the dangerous nature of the chemicals is somehow lessened. In normal applications, even a trace amount

³⁸ Ingraffea, Anthony and Robert Howarth. “Methane and the greenhouse-gas footprint of natural gas from shale formations”, Cornell University, March 13, 2011.

³⁹ SGEIS at 5.13.3.

⁴⁰ See “EPA Investigation of Ground Water Contamination near Pavillion, Wyoming” at 17.

⁴¹ See Griswold, Eliza. “The Fracturing of Pennsylvania”, New York Times, November 17, 2011.

of these chemicals would trigger regulatory response and enforcement actions, yet in this context trucks full of water with hazardous chemicals will not be required to abide by existing hazardous waste regulations.

WWTPs should not be permitted to process this potentially dangerous wastewater. Only private industrial treatment facilities should be permitted to receive and treat flowback and produced water. While the SGEIS does state that any municipal wastewater treatment plant would have to undergo modifications and a site-specific study before being permitted to accept fracking wastewater, these plants were simply not designed to handle the hazardous materials and naturally occurring radioactive material (NORM) that comprise the wastewater. The required modifications would be so expensive that it is difficult to imagine that any municipal WWTP would be able to handle fracking waste, which begs the question, why allow them to at all? The potential additional, much-needed income could prompt some municipalities to accept wastewater when they do not truly have the capacity to fully and adequately treat it.

There are documented instances of wastewater facilities improperly treating produced water from hydraulic fracturing operations. Given its high levels of salt, radioisotopes, heavy metals and other contaminants, improper treatment of drilling wastes can have dire consequences for drinking water. EPA documents reveal that the water supply of 800,000 people was adversely affected by fracking contaminants discharged from a treatment facility into the Monongahela River in Pennsylvania 2008.

We are unaware of any wastewater treatment plants in New York State currently designed to treat wastewaters from high-volume fracking operations. The alternative disposal methods – underground wastewater injection and open pit storage – are fraught with their own unacceptable risks as discussed above. The SGEIS and proposed regulations are unacceptably vague with regard to what will become of the billions of gallons of toxic waste that will be produced in New York State once these operations are commenced.

Hudson River Watershed and Catskill Park

Recommendation: Ban Fracking in Catskill Park and the Hudson River Watershed

While drilling is unlikely to take place in the Hudson Valley immediately, impacts to the Hudson River watershed are quite possible, particularly from drilling in the Utica Shale and potentially through WWTPs as described above. These impacts should be more thoroughly evaluated in the SGEIS. Contamination of tributaries of the Hudson will inevitably impact the sensitive Hudson estuary and its vital wetlands. Drilling beneath streams in the Catskills and in the Mohawk River watershed could also impact the Hudson. Many communities, including Rhinebeck, Poughkeepsie, Esopus and others, get their drinking water from the Hudson, and typical water treatment would not be sufficient to remove all potential contaminants from fracking waste, such as radionuclides. The estuary therefore should be afforded at least the same protection from the adverse impacts of fracking as the New York City and Syracuse watersheds.

Catskill Park should be off-limits to all drilling – not merely surface disturbance as the SGEIS proposes.⁴² Further, such a ban should include private land within the park. Over 60% of the land in the Park is privately owned and much of that area would be vulnerable to industrialization and contamination from fracking operations. The Catskills offer rich farmland and forestland, clear-flowing streams and cascading waterfalls, grand panoramic mountain views, and historic villages. The ecologically important mountainous region so close to the largest city in the nation provides unique tourism and recreation that

⁴² SGEIS at 1.7.14.

support the economy of the Hudson Valley region. To allow fracking within the boundaries of the park would be inconsistent with its purpose and history.

There may be other areas of the state with sensitive ecological, recreational, scenic and tourism resources that warrant categorical protection from fracking as well.

Conclusion

Scenic Hudson strongly urges DEC to slow down its process to permitting fracking and take the time to thoroughly study the impacts and ensure that *if* fracking is allowed in our state, no significant risk to our environment and health will result. EPA is currently studying the impacts of fracking on drinking water, well contamination and air pollution in light of recent evidence that fracking may be more environmentally damaging than previously thought. If New York is to allow fracking to take place, it must have the most stringent regulations *and best enforcement* in the nation in place to protect its citizens. With serious scientific study of the impacts of fracking just beginning, New York should proceed slowly and cautiously and not rush into permitting an activity about which so little is known.

Very truly yours,
/s/Hayley Carlock/
Hayley Carlock, Esq.
Environmental Advocacy Attorney
Scenic Hudson, Inc.