



THE CITY OF NEW YORK
OFFICE OF THE PRESIDENT
BOROUGH OF MANHATTAN

SCOTT M. STRINGER
BOROUGH PRESIDENT

April 7, 2010

Mr. Edward Hanlon
EPA Science Advisory Board (1400F)
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW.
Washington, DC 20460

Dear Mr. Hanlon:

In the FY10 Interior and Environment Appropriations Bill signed by the President on October 20, 2009, Congress urged the EPA to “carry out a study on the relationship between hydraulic fracturing and drinking water.” I am writing to provide input on how the EPA Science Advisory Board should frame its study design and research areas in order to assess the unique environmental, public health and economic impacts that hydraulic fracturing may have on upstate New York’s Catskill/Delaware watershed.

The Science Advisory Board should consider the exceptional impact that hydraulic fracturing in the Catskill/Delaware watershed could have on the eight million New York City residents, workers and visitors that consume some 1.2 billion gallons of unfiltered drinking water from this watershed every single day. I believe that the magnitude of New York City’s drinking water supply system merits an individualized review from the Science Advisory Board in order to determine how the relationship between hydraulic fracturing and drinking water may affect the New York City drinking water supply.

In the coming months, it is anticipated that the New York State Department of Environmental Conservation (DEC) will issue a final Supplemental Generic Environmental Impact Statement (SGEIS) on well-permit issuance for horizontal drilling and high-volume hydraulic fracturing to develop the Marcellus Shale and other low-permeability gas reservoirs. The current draft SGEIS will permit hydraulic fracturing in nearly 70 percent of the Catskill/Delaware watershed.

Because the Science Advisory Board has also been urged by Congress to consult with appropriate State agencies in preparation for its forthcoming study, I would like to highlight specific concerns with the draft SGEIS that I have raised with the DEC.

In written comments submitted to the DEC on December 22, 2009, I noted that the SGEIS does not adequately evaluate the potential for severe degradation to New York City’s drinking water supply and subsurface water supply infrastructure should hydraulic fracturing occur in the Catskill/Delaware watershed. Specifically, I am troubled that the SGEIS did not adequately

analyze the composition and impact of hydraulic fracturing fluids on New York City's drinking water supply; the SGEIS did not adequately identify and provide mitigations for impacts of naturally occurring radioactive materials that may be released in the Marcellus Shale as a result of hydraulic fracturing; and the SGEIS did not adequately analyze the risks of non-compliance with the environmental safeguards that New York State proposes. A complete copy of my comments to the DEC has been enclosed for the Science Advisory Board's review.

Furthermore, I am deeply concerned about the immediate economic and budgetary impacts that would be caused by the use of hydraulic fracturing in the Catskill/Delaware watershed. Drilling in the Catskill/Delaware watershed would negate the terms of the July 2007 Filtration Avoidance Determination (FAD) drafted by the EPA in consultation with the New York State Department of Health. A breach of the July 2007 FAD would require the construction of a water treatment facility costing the City and State a minimum of \$10 billion to build and nearly \$1 million to operate per day.

The Catskill/Delaware watershed is the origin of the world's largest unfiltered drinking water supply. Lax regulatory protocols at the State and Federal level, if not strengthened, could compromise this essential natural resource. I urge the Science Advisory Board to consider the exceptional nature of New York City's unfiltered drinking water supply and carefully study whether distinct measures to protect the Catskill/Delaware watershed are merited.

Sincerely,

Scott M. Stringer
Manhattan Borough President



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**MANHATTAN BOROUGH PRESIDENT'S OFFICE COMMENTS
ON THE NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION'S
DRAFT SUPPLEMENTAL GENERIC ENVIRONMENTAL IMPACT STATEMENT ON
THE OIL, GAS AND SOLUTION MINING PROGRAM
AND WELL PERMIT ISSUANCE FOR HORIZONTAL DRILLING AND HIGH-
VOLUME HYDRAULIC FRACTURING TO DEVELOP THE MARCELLUS SHALE
AND OTHER LOW-PERMEABILITY GAS RESERVOIRS**

December 22, 2009

The Manhattan Borough President's Office submits these comments in response to the New York State Department of Environmental Conservation's (DEC) *Draft Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Program and Well Permit Issuance for Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low-Permeability Gas Reservoirs (SGEIS)*.

The proposed action poses potential environmental impacts in New York State that have not been adequately evaluated. These impacts include severe degradation of New York City's drinking water supply and harmful impacts to subsurface New York City water supply infrastructure, resulting in irreparable devastation of a unique and invaluable natural resource.

The SGEIS fails to provide adequate analysis of unprecedented impacts and risks of the proposed action, including new pollutants, radioactive contamination, geological impacts, public health and socioeconomic impacts. It also fails to propose mitigations that ensure the protection of the New York City water supply. DEC should prohibit all development of horizontal drilling and high-volume hydraulic fracturing within the boundaries of the New York City Watershed in light of the substantial risks and exceptional environmental harms that are likely to be created by the proposed action.

PROPOSED ACTION

DEC proposes to permit horizontal drilling and high-volume hydraulic fracturing to obtain natural gas in the Marcellus Shale, including drilling within the boundaries of the New York City Watershed.

INADEQUATE ANALYSIS OF POTENTIAL ENVIRONMENTAL AND ECONOMIC IMPACTS

The Draft SGEIS Fails to Identify the Uniquely Devastating Impact of the Proposed Action on Natural Resources and Fails to Provide the Necessary Alternative for Balanced Utilization and Protection of Resources

DEC states that its three primary statutory responsibilities are to prevent pollution, regulate solids, liquids and gases to prevent pollution and to “manage natural resources to assure their protection and balanced utilization.”¹ In addition, a cornerstone principle of environmental policy, the “precautionary principle”, states that “where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”²

New York City’s Watershed is a unique and unmatched natural resource which is vital to the public health and economic well-being of half of the population of the State. As the SGEIS recognizes, the Watershed is the largest unfiltered drinking water supply in the nation. It provides 1.3 billion gallons of water per day to over nine million residents of New York City and surrounding counties. The water supply is also an important driver in the City’s economic well-being and development. No horizontal wells have ever been drilled in the Marcellus Shale in New York, making it difficult or impossible to project the impacts of the proposed action. Contamination of the water supply would not only destroy an unparalleled local and national resource but also have disastrous socioeconomic impacts on the New York City region. As a recent report by the New York City Independent Budget Office (IBO) found, the risk of not satisfying the next Filtration Avoidance Determination (FAD) with the U.S. Environmental Protection Agency would likely lead to exorbitantly higher capital costs and water rates for New York City and other areas dependent on the Watershed.³ The SGEIS ultimately fails to analyze the vast public health and socioeconomic impacts that contamination of the Watershed would cause to New York City and the State.

With this proposed action, the actual environmental effects of a first-time application of a new drilling technology in New York’s Marcellus Shale are not scientifically certain, but the damage to the New York City water supply would be catastrophic and irreparable. Based on DEC’s responsibilities and the precautionary principle, DEC should strictly prohibit development of all horizontal drilling and high-volume hydraulic fracturing in the Watershed region to ensure a balanced utilization and protection of natural resources. A prohibition would ensure protection of an essential water supply while preserving the potential for recovery and utilization of natural gas in other areas.

The SGEIS fails to adequately consider the necessity of banning all horizontal drilling and high-volume hydraulic fracturing to protect the New York City Watershed. The SGEIS emphasizes that the water supply is significantly protected by City and State ownership and control of acreage within the Watershed, preventing drilling in that area. This emphasis, however, is misleading since the government ownership protects only 30.5 percent of the Watershed, leaving 69.5 percent and 1,077 square miles of the Watershed completely open to drilling. From the other standpoint, the Watershed comprises a mere 9 percent of the drillable area in New York

¹ NYS Department of Environmental Conservation Division of Mineral Resources, “Supplemental Generic Environmental Impact Statement On The Oil, Gas and Solution Mining Regulatory Program” Draft, September 2009. Page 1-2

² U.N. General Assembly, *Report of the United Nations Conference on Environment and Development, including the Rio Declaration on Environment and Development* (A/CONF.151/26). 12 August 1992

³ New York City Independent Budget Office Fiscal Brief, “Drilling for Natural Gas in the Catskills Could Lead to Higher Water Bills in the City”, December 2009.

State's portion of the Marcellus Shale, making up a very small fraction of the proposed development area. In light of the Watershed's small proportion of the entire drilling area, excluding all of the Watershed from drilling is an appropriate and balanced alternative that would protect the entire water supply while allowing utilization of the remaining, vast majority of development area.

The Draft SGEIS Fails to Adequately Analyze the Composition and Impacts of Fracturing Fluids

As this office cited in its recent report, "Uncalculated Risk: How Plans to Drill for Gas in Upstate New York Could Threaten New York City's Water System," the waste water generated by high-volume, horizontal hydraulic drilling is considered by the United States Department of Energy to be one of the most toxic industrial byproducts produced by gas and oil drilling. Despite this fact, the SGEIS recommends that drilling proceed within the boundaries of New York City's water supply even without understanding the actual chemical composition and toxic effects of the fluid used in this drilling.

Fracturing fluid is known to consist of a mix of many toxic chemicals, but many of the chemicals and their effects remain unknown. DEC lacked compositional information on a significant number of additives proposed for use in fracturing shale formations in New York. According to the SGEIS, DEC lacked information for at least 45 of 197, or nearly a quarter, of all of the chemical products. The Department could obtain only information about chemicals that were voluntarily disclosed by well-service companies and chemical supply companies, which poses additional concern about the chemicals which were not disclosed. In addition, health effects information for over 80 chemicals was not available. Much of this information is continually withheld by the industry as trade secrets. DEC did not adequately analyze the impacts of the drilling fluid since it lacked such substantial amounts of basic compositional information.

Apart from the chemicals that could not be identified, there is very limited research and data available on the impacts of known fracture fluid chemicals, particularly in the context of the geological conditions of high-volume horizontal hydraulic drilling. The SGEIS states that "[c]ompound-specific toxicity data are very limited for many chemical additives to fracturing fluids...."⁴ In addition, the SGEIS determined that "In the event of environmental contamination involving chemicals lacking readily available health effects information, the toxicology literature would have to be researched for chemical-specific toxicity data."⁵ Furthermore, the Findings of ICF International state that "mixtures of chemicals in a geologic formation will behave differently than pure chemicals."⁶ Therefore, many of the environmental dangers of the identified chemicals are very difficult or impossible to ascertain.

In addition, the higher volume of fracturing fluid required for this type of drilling presents additional unknown risks. As the SGEIS states,

⁴ NYS Department of Environmental Conservation Division of Mineral Resources, "Supplemental Generic Environmental Impact Statement On The Oil, Gas and Solution Mining Regulatory Program" Draft, September 2009. Page 5-52

⁵ Ibid. Page 5-64

⁶ ICF International, "Technical Assistance for the Draft Supplemental Generic EIS: Oil, Gas and Solution Mining Regulatory Program; Well Permit Issuance for Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low Permeability Gas Reservoirs" (Agreement No. 9679), 7 August 2009. Page 33

The total amount of fracturing additives and water used in hydraulic fracturing of horizontal wells is considerably larger than for traditional vertical wells. This suggests the potential environmental consequences of an upset condition could be proportionally larger for horizontal well drilling and fracturing operations.⁷

Although the SGEIS generally projects there will be greater risk in this case, it fails to analyze the actual impacts of higher volumes of toxic fluids.

The SGEIS identifies the probability of substantial health and environmental impacts resulting from the nature and volume of chemicals in fracturing fluid. However, the SGEIS also states that information about these impacts could not be obtained and quite possibly does not exist. The absence of such crucial data combined with the likelihood of substantial harm to an irreplaceable resource militates in favor of prohibiting the proposed drilling. The lack of information about chemical composition and effects prevents an adequate assessment of the environmental impacts as well as the identification of appropriate mitigations.

The Draft SGEIS Fails to Adequately Identify and Provide Mitigations for Impacts of Radioactive Materials

The SGEIS recognizes that drilling may release high levels of radioactive material (known as “Naturally Occurring Radioactive Materials or “NORM”) in the Marcellus Shale, creating potential health impacts on drill site workers and the general public and also environmental risks in the proper disposal of the material. While the SGEIS identifies that significant NORM impacts exist, it fails to adequately analyze actual impacts and propose reasonable mitigations. As the SGEIS states, “data indicate the need to collect additional samples of production brine to assess the need for mitigation and to require appropriate handling and treatment options, including possible radioactive materials licensing.”⁸ In addition, the SGEIS states that “[e]xisting data from drilling in the Marcellus formation in other States, and from within NYS for wells that were not hydraulically fractured, shows significant variability in NORM content,”⁹ suggesting that the magnitude of effects are difficult or impossible to project. However, the radioactivity that has been measured indicates dangerous levels. As a recent article reported, DEC “found that the [NORM] contain levels of radium-226, a derivative of uranium, as high as 267 times the limit safe for discharge into the environment and thousands of times the limit safe for people to drink.”¹⁰ In addition, the radioactivity measurements suggest that radioactivity in the New York shale is higher than in other areas.¹¹ The SGEIS goes on to propose an alarming wait-and-see approach: “During the initial Marcellus development efforts, sampling and analysis will be undertaken to assess this variability... [and] to determine whether additional mitigation is necessary to adequately protect the public health and environment of the State of New York.”¹²

⁷ NYS Department of Environmental Conservation Division of Mineral Resources, “Supplemental Generic Environmental Impact Statement On The Oil, Gas and Solution Mining Regulatory Program” Draft, September 2009. Page 5-65

⁸ Ibid. Page 5-129

⁹ Ibid. Page 7-102

¹⁰ Lustgarten, Abrahm. “Is New York’s Marcellus Shale Too Hot to Handle?.” *ProPublica* [New York] 9 Nov. 2009, sec. Energy & Environment, 20 Dec. 2009. <<http://www.propublica.org/feature/is-the-marcellus-shale-too-hot-to-handle-1109>>

¹¹ Ibid.

¹² NYS Department of Environmental Conservation Division of Mineral Resources, “Supplemental Generic Environmental Impact Statement On The Oil, Gas and Solution Mining Regulatory Program” Draft, September 2009. Page 7-102

The SGEIS effectively states that DEC does not understand the impacts of radioactive waste and does not know how to mitigate the effects. Similar to the toxic chemicals in the fracturing fluid, radioactive material is known to be dangerous to public health and the environment but the actual effects were not and cannot be determined. It is relatively certain that the high level of radioactive material in the Marcellus Shale and high volume of required fluid would generate substantial amounts of radioactive wastewater risking different forms of human exposure, including potential exposure to water supplies. In addition, significant environmental harms from disposal of NORM are virtually certain in light of the fact that New York State lacks facilities to properly dispose of large amounts of radioactive waste. The agnostic, play-it-by-ear approach proposed by DEC to mitigate these unprecedented encounters with radioactive material is inadequate, unacceptable and unjustifiable. A strict prohibition of the proposed drilling in the Watershed is a necessary to avoid these potential impacts.

The SGEIS Fails to Adequately Analyze the Adequacy of Supplementary Conditions, Including Risks of Non-Compliance with Such Conditions

The SGEIS relies upon existing requirements and certain new supplementary conditions as mitigations for most of the impacts on New York City's water supply. However, these mitigations are insufficient and weak as they rely on incomplete analyses of impacts, self-certifications of compliance by the industry, and an inadequate permitting process with DEC. Many of the proposed standards and requirements for drilling have not been sufficiently justified with case-specific research and analysis. Proposed systems of self-reporting create risks of error and intentional non-compliance and require unfeasible administrative monitoring of compliance. Furthermore, the SGEIS proposes allowing the industry to bypass various minimal environmental protections by seeking ad hoc environmental review by DEC. An administrative review process for waiving environmental protections provides unjust advantages to the industry, particularly where new technology is involved, and creates prohibitive burdens for an administrative agency with limited capacity to ascertain impacts. The SGEIS fails to justify these proposed mitigations and identify the additional impacts they present.

Water withdrawal

The SGEIS fails to adequately identify impacts of water withdrawal on the New York City Watershed and fails to propose reasonable mitigations for this impact. High-volume horizontal hydraulic drilling requires tremendous and unprecedented amounts of water which likely require disturbance and degradation of surrounding water supplies. The SGEIS fails to provide an analysis of the specific impacts of water withdrawal on the unique conditions of the New York City Watershed.

In addition, the proposed mitigation is inadequate in that it relies on an unreliable self-reporting procedure that does not ensure protection of water sources and risks discovery of a violation only after harm has occurred. Specifically, the SGEIS proposes that well operators comply with the "Natural Flow Regime Method" to set a standard flow to prevent aquifer depletion and harms to water quality and infrastructure. However, the SGEIS merely adopts this as a generic standard without analyzing how it specifically applies to the conditions and infrastructure of the Watershed. In making its determination, DEC also fails to consider any information about actual plans for water withdrawal, including what the sources will be, by the companies. Furthermore, the proposed requirement provides only an affirmation by the companies that they have met the flow standard, creating risk for error or intentional noncompliance.

The SGEIS also does not adequately justify its mitigation for cumulative impacts of water withdrawal. It suggests that adverse cumulative impacts could be addressed by the Natural Flow Regime Method “if each operator of a permitted surface water withdrawal estimated or reported the maximum withdrawal rate and measured the actual passby flow for any period of withdrawal.”¹³ This mitigation relies again on voluntary compliance and yields too much discretion to the well operator to assess and report cumulative impacts of water withdrawal, a critical potential impact on New York City’s water supply.

Stormwater

The SGEIS fails to adequately examine the specific potential stormwater impacts on the New York City Watershed and proposes an insufficient mitigation of stormwater pollution. First, DEC acknowledges that it does not know what many of the potential pollution effects of this specific technology will be. As another stopgap mitigation, DEC defers determining solutions to the future by proposing “the option of amending this...General Permit to address a number of potential pollutant discharges associated with the subject operations.”¹⁴ Second, the SGEIS proposes the use of a generic standard and self-certification of stormwater discharges without consideration of its application to the specific features of the Watershed. DEC recognizes the likelihood of increased harms resulting from this specific drilling method but does not analyze these impacts or propose concrete protections from them. Lastly, the proposed stormwater mitigation also requires regular monitoring of the self-certified compliance from DEC which is burdensome and not impractical for the agency.

Surface Spills and Releases at the Well Pad

One of the most harmful impacts of the proposed action is contamination of the Watershed from exposure to toxic fracturing fluids, pollutants and radioactive waste. As discussed above, the SGEIS fails to identify the impacts of such exposure since it does not have information about many of the chemicals and resulting pollutants in the drilling fluid and the radioactivity impacts. In addition, the mitigations do not sufficiently protect against harmful spills and releases of fluid in the Watershed. Generally, the SGEIS proposes timeframes for removal of fluids and pollutants, buffer distances between tanks and surface water, flexible containment conditions and intensive review by DEC of risks of liquid chemical releases. DEC does not explain how these mitigations will prevent spills and releases. DEC also does not identify means to provide sufficient assurance of compliance with and monitoring of these requirements.

In addition, DEC places undue faith in adherence to proper practices by the industry and does not adequately assess the risks of error, operational failures and intentional non-compliance. The SGEIS recognizes these risks when stating that contamination “would require a failure of operational controls such as an accident, a spill or other non-routine incident.”¹⁵ However, it does not gauge the level of such risks and their impacts. For example, the SGEIS does not analyze the risks of direct discharges of toxic wastewater onto the ground or in water supplies on the basis that “direct discharge of fluids onto the ground or into surface water bodies from the well pad are prohibited.”¹⁶ However, there are no regular monitoring mechanisms for such discharges to ensure that they do not occur. In addition, there is no analysis of the adequacy of industry controls, education or monitoring to ensure compliance with this and other important prohibitions. Lastly, the SGEIS does not adequately assess the impacts of direct discharge on the New York City Watershed should it occur.

¹³ Ibid. Page 7-22

¹⁴ Ibid. Page 7-23

¹⁵ Ibid. Page 5-61

¹⁶ Ibid. Page 6-39

The SGEIS also reviews prior incidents of contamination of water supplies but dismisses these incidents as unlikely aberrations without sufficiently evaluating the likelihood of their repeated occurrence. The SGEIS describes a 2007 occurrence in the Town of Brookfield where a drilling operational error near a well led to turbidity that temporarily degraded the drinking water quality. However, the SGEIS reconciles the risk by assuring that “[o]perators that use standard drilling practices and employ good oversight in compliance with their permits will not typically cause the excessive turbidity event seen at the Brookfield wells.”¹⁷ In the case of high-volume, horizontal hydraulic drilling in New York State, “standard” drilling practices and oversight and compliance practices appear to be works in progress, creating substantially greater risk that “non-routine” contaminations of more severe impact than the one in Brookfield will occur.

Groundwater Impacts Associated with Well Drilling and Construction

The SGEIS states that enhanced mitigations are needed to protect against contamination of groundwater “because of the high pressures that will be exerted, the large fluid volumes that will be pumped and potential concentration of the activity in areas without much subsurface well control.”¹⁸ However, the enhanced protection that DEC proposes is merely a self-certifying checklist that is to be submitted only hours before drilling is to begin. The SGEIS proposes submission of a Pre-Frac Checklist and Certification Form only 48 hours prior to commencement of high volume hydraulic fracturing operations. The “pre-frac form” will attest to proper well construction, the depth and estimated flow rates where fresh water, brine, oil and/or gas were encountered or circulation was lost during drilling and information about how any lost circulation zones were addressed.¹⁹ This procedure allows for too much critical information to be reported voluntarily by the company, risking too much manipulation of information and noncompliance. Therefore, the SGEIS fails to adequately identify the actual impacts of groundwater contamination, other than predicting they will be enhanced, and fails to provide a reliable mitigation.

Hydraulic Fracturing Procedure

The SGEIS relies upon the findings of ICF International and a survey of regulations in other states to conclude that “potential impacts to ground water from the high volume hydraulic fracturing procedure itself are, in most cases, not reasonably anticipated.”²⁰ This conclusion is inappropriate. First, the conditions in other states cannot be comparable to those in New York and the City’s Watershed since the effects of hydraulic drilling are environment and geology specific and the particular technology of high-volume, horizontal drilling is relatively new.

Second, the ICF Findings are qualified, vague and based on limited information, particularly regarding the chemical effects of the fracturing fluid additives. ICF bases its findings on mathematical calculations of water flow and the interaction of the fluid and its components with geological conditions. These calculations are based on assumptions of averages and “typical” practices without sufficient information or clarification about the impacts of deviations from such norms. For example, in estimating the pore storage volume, the potential for adverse impacts to overlying aquifers resulting from the volume of fluid injected compared to the volume of space within the ground, ICF bases its calculation on a “typical” slickwater fracturing

¹⁷ Ibid. Page 2-27

¹⁸ Ibid. Page 7-44

¹⁹ Ibid. Page 7-45

²⁰ Ibid. Page 7-48

treatment volume of less than 4 million gallons of fracturing fluid.²¹ However, the actual volume of fluid that would be used is variable, depends on a myriad of factors and cannot be known in advance. DEC finds that “the entire multi-stage fracturing operation for a single well would require 2.4 million to 7.8 million gallons of water.”²² In addition, DEC acknowledges that “[m]ore or less water may be used depending on local conditions, evolution in fracturing technology or other factors with influence the operator’s and service company’s decisions.”²³ In addition, in estimating how quickly fluid will flow to the water supply, ICF cites variable conditions that could alter their calculations of velocity. The findings qualify that “actual gradients and seepage velocities will be influenced by non-steady state conditions and by variations in the hydraulic conductivities of the various strata.”²⁴ Furthermore, the estimate of the impacts of seepage velocity are premised on a “typical” fracture stage that lasts less than one day. This does not adequately assess the risks of operations that “may take longer for longer lateral wellbores, for many-stage jobs or if unexpected delays occur.”²⁵

ICF also fails to adequately analyze the potential groundwater effects of the chemical components of fracturing fluid. ICF recognizes that:

The ability of the chemical constituents of the additives in fracturing fluids to migrate from the fracture zone are influenced not just by the forces governing the flow of groundwater, but also by the properties of the chemicals and their interaction with the subterranean environment.²⁶

However, as the SGEIS shows, many of the chemicals in fracturing fluid and their effects are not known. In addition, ICF found that the “solubilities of many chemicals proposed for use in hydraulic fracturing in New York State are not well established or are not available in standard databases....”²⁷ Furthermore, ICF provides a caveat to its findings related to the unknown nature of involved chemicals and their interaction with geological conditions:

Mixtures of chemicals in a geologic formation will behave differently than pure chemicals analyzed in a laboratory environment, so any estimates based on the solubility, adsorption, or diffusion properties of individual chemicals or chemical compounds should only be used as a guide to how they might behave when injected with other

²¹ IFC International, “Technical Assistance for the Draft Supplemental Generic EIS: Oil, Gas and Solution Mining Regulatory Program; Well Permit Issuance for Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low Permeability Gas Reservoirs” (Agreement No. 9679), 7 August 2009. Page 30

²² Ibid. Page 5-92

²³ NYS Department of Environmental Conservation Division of Mineral Resources, “Supplemental Generic Environmental Impact Statement On The Oil, Gas and Solution Mining Regulatory Program” Draft, September 2009 Page 5-93

²⁴ IFC International, “Technical Assistance for the Draft Supplemental Generic EIS: Oil, Gas and Solution Mining Regulatory Program; Well Permit Issuance for Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low Permeability Gas Reservoirs” (Agreement No. 9679), 7 August 2009. Page 28

²⁵ NYS Department of Environmental Conservation Division of Mineral Resources, “Supplemental Generic Environmental Impact Statement On The Oil, Gas and Solution Mining Regulatory Program” Draft, September 2009. Page 5-93

²⁶ IFC International, “Technical Assistance for the Draft Supplemental Generic EIS: Oil, Gas and Solution Mining Regulatory Program; Well Permit Issuance for Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low Permeability Gas Reservoirs” (Agreement No. 9679), 7 August 2009. Page 32

²⁷ Ibid. Page 32

additives into the shale. Co-solubilities can change the migration properties of the chemicals and chemical reactions can create new compounds.²⁸

Therefore, DEC's reliance on the ICF Findings is inadequate for concluding that no negative impacts on New York City's water supply will reasonably result from high-volume hydraulic drilling.

Waste Transport

The SGEIS fails to analyze and provide adequate mitigation for the risks of waste transport resulting from high-volume horizontal drilling. DEC recognizes that the impacts of waste, such as flowback water and radioactive materials (NORM), are not well known, and options for disposing this waste may not be enough. The SGEIS states that impact will be significant due to:

...the anticipated high volume of flowback water compared to traditional operations, the paucity of reliable data regarding flowback water and production brine composition, NORM concerns, the number of wells that may be drilled and the current limited disposal options....²⁹

This lack of information and analysis alone warrants prohibiting the proposed action of such widespread activity. Nonetheless, the SGEIS proposes to accept the risks with a mitigation for waste disposal that is entirely incommensurate with the potential magnitude of the harm. DEC merely requires a "Drilling and Production Waste Tracking Form" to be completed and maintained by generators, haulers and receivers of all flowback water".³⁰ This self-certifying tracking form for massive quantities of toxic waste is wholly inadequate to protect a natural resource as indispensable as the Watershed. DEC does not have the capacity or means to monitor and verify all of the self-reported statements in these forms. Even if DEC has the capacity to verify the modes of waste disposal, it cannot be fully known at this time whether the methods of disposal are environmentally sound. Furthermore, as discussed above, adequate options for radioactive waste disposal in New York are likely not available.

Setbacks from Surface Water Resources

The SGEIS proposes a number of setback requirements and environmental reviews for drilling activity near water resources. These mitigations are inadequate to protect New York City's water supply since they are based on incomplete analyses of risks and rely upon an unreasonable level of administrative discretion.

First, the SGEIS anticipates a uniformity of drilling practices without adequately evaluating the risk of departure from such practices. DEC states that "[s]ignificant surface spills at well pads which could contaminate surface water bodies...are most likely to occur during activities which are closely observed and controlled by personnel at the site."³¹ The SGEIS also relies on the accuracy and efficacy of certain self-reported practices to control fluid containment and fluid pressure without means of ensuring compliance with standards.

²⁸ Ibid. Page 33

²⁹ NYS Department of Environmental Conservation Division of Mineral Resources, "Supplemental Generic Environmental Impact Statement On The Oil, Gas and Solution Mining Regulatory Program" Draft, September 2009. Page 7-50

³⁰ Ibid. Page 7-50

³¹ Ibid. Pages 7-69 to 7-70

The SGEIS also proposes certain setback distances for wellpads and wells from water supplies such as well pads within 300 feet of a reservoir and 150 feet of a watercourse and well locations between 1000 and 2000 feet from a municipal water supply. The setbacks from surface water supplies are based in large part on a survey of regulations for similar drilling conditions in other States. However, every drilling operation has different characteristics and impacts depending on the specific location and its features. A comparison to generic setback distances in other parts of the country is not an adequate analysis of the unique risks of unprecedented high-volume horizontal drilling in the Marcellus Shale within the New York City Watershed.

Moreover, DEC does not ensure minimum protections but allows for unlimited ad hoc environmental reviews that would grant permission to drilling activity that violate these setback conditions. The SGEIS allows for site-specific SEQRA determinations for any proposed well pad within 300 feet of a reservoir, reservoir stem or controlled lake or within 150 feet of a watercourse. Permission may also be sought for well locations that are shallower than 2000 feet and less than 1000 feet below a fresh water supply, key conditions upon which the ICF Findings were based. These discretionary procedures pose an unrealistic administrative burden on DEC which lacks the resources, expertise and capacity to assess ad hoc such multiple actions. They also create unreasonable risk of environmental harm from potentially inconsistent practices and manipulations of the administrative review process.

Conclusion

The Manhattan Borough President's Office reviewed DEC's Draft Supplemental Generic Environmental Impact Statement. We concluded that the environmental review of the proposed action fails to adequately analyze impacts of and alternatives to the proposed action of high volume, horizontal hydraulic drilling in New York's Marcellus Shale and City Watershed. The substantial risks to New York City's water supply that are created by the current state of technology, scientific understanding and environmental conditions cannot be mitigated by any measure proposed by DEC. Our findings are consistent with the conclusions of the study commissioned by the New York City Department of Environmental Protection and released this month, finding unacceptable levels of risk to the water quality and infrastructure from the proposed drilling.

We respectfully urge DEC to prohibit all high-volume horizontal hydraulic drilling in the Marcellus Shale within the boundaries of New York City's unfiltered water supply. We also urge DEC to establish mandatory regulations in place of a discretionary permitting and environmental review process for such drilling throughout the State.