Comments on the Draft Supplemental Generic Environmental Impact Statement on Horizontal Drilling and High-Volume Hydraulic Fracturing to Produce Natural Gas in the Marcellus Shale in the New York City Watershed

Comments by the Office of Watershed Inspector General December 31, 2009

I. Introduction

The Office of the Watershed Inspector General for the New York City Watershed ("WIG Office") respectfully submits these comments concerning the Draft Supplemental Generic Environmental Impact Statement ("DSGEIS" or the "Draft Study"), prepared by the Bureau of Oil and Gas Regulation, Division of Mineral Resources ("the Bureau"), New York State Department of Environmental Conservation ("DEC"), for the issuance of well permits under Article 23 of the Environmental Conservation Law ("ECL") for horizontal drilling and high-volume hydraulic fracturing to produce natural gas in the Marcellus Shale ("Proposed Action").

The West of Hudson portion of the New York City Watershed ("WOH Watershed") is the most critical water resource in the State because it provides 90 percent of the drinking water consumed by 9 million State residents each day. These policy comments are intended to address potential adverse impacts of the Proposed Action on the WOH Watershed, and recommend a number of areas where the environmental analysis in the DSGEIS should be expanded prior to issuance of the Final Supplemental Generic Environmental Impact Statement ("FSGEIS") as it pertains to that watershed, as well as additional mitigation measures. The comments are accompanied by a supporting technical analysis by an independent consulting firm with expertise in preparing environmental impact statements for the development of oil and natural gas (the "Arcadis Report," included as Exhibit A). WIG's policy recommendations focus on how to improve and build upon the DSGEIS. They do not include any legal analysis or opinions.[1]

The position of WIG was created by Executive Order 86 in 1998 "to enhance current efforts to protect the New York City drinking water supply from activities that have the potential to adversely affect the New York City Watershed reservoirs and tributaries."[2] See 9 NYCRR §§ 5.86, 6.5. The WIG submits these comments pursuant to his responsibility under that Executive Order to "recommend legislative, regulatory and management practice changes . . . relating to the use, operation and protection of the Watershed." See 9 NYCRR §§ 5.86, 6.5.

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[1] The WIG is a joint appointee of the Attorney General and the Governor within the employ of the Attorney General. See id. These comments do not necessarily reflect the position of any State agency that now or later may be represented by the Attorney General in any matter relating to the Proposed Action.

[2] See 9 NYCRR §§ 5.86, 6.5.

II. Executive Summary

Many aspects of natural gas development utilizing horizontal drilling and hydrofracking within the Marcellus Shale pose risks of contamination to the WOH Watershed -- the source of drinking water for millions of New Yorkers each day. The DSGEIS reflects hard work and dedication by the Bureau's staff and others in State government who assisted in its preparation. The Draft Study also proposes various mitigation measures and includes helpful information needed to perform a thorough analysis of those risks (and other potential adverse impacts) of the Proposed Action.

The WIG Office recommends that the Draft Study be expanded in several important respects before issuance of the FGEIS. A quantitative analysis of the Proposed Action's potential risks of contaminating or degrading the New York City water supply should be performed, including analysis of potential impacts on existing public programs to protect the WOH Watershed, that water supply's Filtration Avoidance status, and public confidence in New York City water. The FGEIS should also include consideration of a greater number of alternatives to the Proposed Action, including prohibiting such drilling in that watershed or a "phased" approach in which drilling would first proceed in lower risk areas outside the Watershed.[3] Finally, the FSGEIS should include additional protective mitigation measures.

III. Protecting the WOH Watershed

Water in the WOH Watershed is collected by streams and reservoirs from precipitation, runoff from rain and melting of snow, and other sources. The water is disinfected and distributed by a system of aqueducts, tunnels and pipes to consumers in New York City, its northern suburbs, and Upstate. Pursuant to a series of Filtration Avoidance Determinations ("FADs") issued by the United States Environmental Protection Agency ("EPA") under the federal Safe Drinking Water Act, 42 U.S.C. § 300f et seq. ("SDWA"), water from the WOH Watershed is not treated by a filtration system, making it the largest unfiltered surface drinking water supply in the Nation. In accordance with those Determinations, rather than filtering the water, almost $1.5 billion dollars of public funds have been spent on pollution prevention efforts to protect the Watershed and ensure safe drinking water. This "Pollution Prevention" approach, adopted instead of filtration, represents the longstanding consensus of State and federal agencies, New York City, Watershed communities, and environmental groups, as agreed in their landmark 1997 Memorandum of Agreement.[4]

The Pollution Prevention approach includes purchasing Watershed lands to serve as buffers for pollutant discharges, strict regulation of human activities that generate pollution, upgrading sewage treatment plants, and various other programs. Pollution Prevention and Filtration Avoidance have been effective in ensuring the safety of WOH water and have been

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[3] To the extent possible, the WIG Office recommends that the public be provided with an opportunity to comment on the proposed additional environmental review.

[4] See "New York City Watershed Memorandum of Agreement" (January 21, 1997) (hereinafter "MOA") at www.nysefc.org?home/index.asp?page=294.

endorsed by the National Research Council.[5] In addition, the program has been much less expensive than filtration, which would require capital expenditures of over $10 billion and annual operation and maintenance costs exceeding $100 million.

The Marcellus Shale geologic formation underlies the WOH Watershed, most of the State's Southern Tier region, and large portions of Pennsylvania and other states along the Appalachians. While the Marcellus Shale underlies all of the WOH Watershed, that watershed covers only about 8 percent of the area of the Marcellus Shale within New York.

IV. Pollutants of Concern in the WOH Watershed

The Proposed Action could, by far, be the largest development in the WOH Watershed in many decades, resulting in the disturbance of thousands of acres of undeveloped and typically forested land. The construction and development of land, including land used for natural gas production, is a major source of phosphorus and other pollutants discharged in stormwater runoff. Discharges of stormwater from construction sites include sediment which, when suspended in water contributes to turbidity (murkiness) in the water and serves as a carrier of other pollutants, such as phosphorus, metals, organic compounds, and pathogens. "It is generally acknowledged that erosion rates from construction sites are much greater than from almost any other land use."[6] Sediment loads in stormwater discharges from construction sites are typically 1,000 to 2,000 times the sediment loads in discharges from undeveloped forested land.[7]

Well development and natural gas production could risk exacerbating existing water quality problems in the WOH Watershed by causing increased discharges of stormwater polluted by turbidity, pathogens, phosphorus, and the wide variety of pollutants associated with natural gas development. Turbidity not only facilitates the transportation of pollutants, but it can shelter pathogens from exposure to attack by chlorine, a disinfectant routinely used in the WOH Watershed to protect public health. In addition, the organic particles that contribute to turbidity can also combine with chlorine to create disinfection by-products which increase the risk of cancer or miscarriage for people drinking the water.[8] For these reasons, EPA prohibits raw water turbidity measurements in unfiltered drinking water at the intake to the distribution system in excess of 5 nephelometric turbidity units ("NTUs"). See 40 CFR § 141.71(a)(2).

Violations of this turbidity standard could provide grounds for the New York State Department of Health ("NYSDOH"), which now holds primacy in enforcing Filtration Avoidance regulations, to require that the City filter the water from its WOH Watershed. In the

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[5] Nat'l Research Council, Watershed Management for Potable Water Supply: Assessing the New York City Strategy (2000) (hereinafter, "NRC Study").

[6] "National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Stormwater Discharges; Final Rule," 64 Fed. Reg. 68722, 68724, 68728. (Dec. 8, 1999).

[7] EPA, "Storm Water Phase II Final Rule: Small Construction Program Overview (Fact Sheet 3.0)," EPA 833-F-00-013 (Jan. 2000), available at http://www.epa.gov/npdes/pubs/fact3-0.pdf.

[8] See NRC Study, supra, at 2, 5-6, 102-05, 109.

2007 FAD, EPA and NYSDOH found that "significant improvement to the City's ability to prevent, manage, and control turbidity in the Catskill System [which provides close to half the water in the WOH Watershed] is required in order to maintain filtration avoidance for the long-term."[9]

Preventing pathogens from contaminating the water is of particular concern for the WOH Watershed because of the risks pathogens pose to public health. Pathogens include viruses and bacteria, such as Giardia llamblia, cryptosporidium, and E.coli 0157:H7, which can cause serious illness or death, especially among the elderly and immunocompromised.[10] Because of the health risks of pathogens, EPA requires that each unfiltered water system meet strict requirements "ensuring that the system is not a source of a waterborne disease outbreak." 40 C.F.R. § 141.71. If the WOH Watershed fails to comply with these requirements, the City could be forced to filter that water supply.

Stormwater discharges of the nutrient "phosphorus" are also of great concern in the WOH Watershed because it contributes to the eutrophication of reservoirs, pathogenic and other contamination, and creation of harmful disinfection by-products. A eutrophic reservoir suffers from abundant algae growth (called algae blooms) when phosphorus discharges into it are excessive. Algae blooms can impair the taste and odor of reservoir water and deplete levels of dissolved oxygen in the reservoir's bottom waters, impairing aquatic life and releasing metals and phosphorus previously bound in the sediment into the water.[11] Phosphorus-induced algae blooms increase organic and other matter suspended in the water and facilitate pathogenic contamination and adverse effects associated with chlorination.[12]

The Proposed Action could result in the generation of numerous other contaminants which could risk harm to the environment or public health if discharged into waters within the WOH Watershed. See DSGEIS, pp. 5-46 through 5-66. The Draft Study identified many additives to fracking fluids which may pose risks to health and the environment, including the aromatic hydrocarbons benzene, toluene, ethylbenzene, and xylene ("BTEX"); microbiocides; glycols; glycol ethers; and petroleum products. Id. Flowback water, brought to the surface in the hydrofracking process, will contain these fracking additives. Spills and leaks of flowback water, production brine, and other wastes from tanks, reserve pits, containers, well bores, and other drilling infrastructure can flow directly, or be carried by stormwater runoff, into watercourses and reservoirs within that watershed.

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[9] 2007 FAD, pp. 13-14.

[10] In 1993, the water supply for the City of Milwaukee became contaminated with cryptosporidium causing over 400,000 people to suffer stomach cramps, fever, diarrhea and dehydration, and killing over 100 people. In August 1999, the largest outbreak of waterborne E. coli O157:H7 illness in United States history occurred at the Washington County Fair in New York, when a drinking water supply well became contaminated with that pathogen, infecting 781 people, and resulting in the hospitalization of 71 people and two deaths.

[11] Id., at 106-07.

[12] Id., at 2.

Pollutants contained in production brine and cuttings will also be generated by the Proposed Drilling, but the Draft Study provides much less information about them then about fracking fluid additives. EPA has found that production brine "can be very damaging to the environment and public health if it is discharged to surface water or the land surface."[13] If conveyed to a wastewater treatment plant, the high concentrations of total dissolved solids in production brine (and the biocides found in flowback) may interfere with the plant's ability to treat sanitary sewage.[14] In addition, production brine may contain toxic metals and radioactive substances.[15] According to Appendix 13 of the Draft Study, most production brine samples obtained by the Bureau from the Marcellus Shale disclose very high concentrations of radioactive substances (called "naturally occurring radioactive materials" or "NORMs").

The cuttings derived from both the vertical and horizontal components of drilling may also contain contaminants such as toxic metals, NORMs, petroleum hydrocarbons, and volatile organic compounds which could be released into water. Before issuance of the FSGEIS, more substantial information and analysis about the constituents likely to be found in production brine and cuttings should be performed.

In addition to stormwater discharges, groundwater contamination of the various pollutants described in this section could also pollute watercourses and other surface waters in the WOH Watershed which supply drinking water. Spills and leaks from above-ground tanks, pits and containers, and leaks from defects in well design or construction can result in groundwater contamination. Groundwater generally flows toward and recharges surface waters. Local geologic features below the land surface, such as faults, fractured bedrock, coarse gravel, or other permeable materials can facilitate the migration of contaminated groundwater to surface waters. Moreover, the fracking process itself is likely to create many additional fractures in the underlying rock, thereby further facilitating that migration.

V. Areas Where the DSGEIS Should Be Expanded

The Draft Study describes, in general fashion, the geology of the Marcellus Shale, how horizontal drilling for natural gas employing hydrofracking works, how wastes and pollutants associated with drilling for natural gas in this manner are generated, and various existing laws and regulations that address this contamination. As previously requested by many commenters on the Draft Scope for the DSGEIS (including WIG), the Draft Study includes information identifying many of the constituents of "fracking fluids." The Bureau is to be commended for providing this information.[16] Included also is some discussion of the nature of the risks to the

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[13] USEPA, Underground Injection Control Program. Oil and Gas Injection Wells: Class II, at www.epa.gov/safewater/uic/wells_class2.html.

[14] Congressional Research Service, Memorandum to House Committee on Natural Resources: Marcellus Shale Gas Development: Royalty Rates, Surface Owner Protection, and Water Issues (October 14, 2008), at CRS-15.

[15] Id. at CRS-13 and CRS-14.

[16] It bears noting that it is important to obtain and analyze additional data, including the concentration of each additive in fracking fluid and the identity of remaining additives not yet disclosed.

environment and human health which such constituents, and some other pollutants associated with the Proposed Action, can pose.

The DSGEIS also proposes various measures intended to mitigate risks to pollution of water resources which would apply State-wide, and other measures which would apply only to Proposed Drilling in the WOH Watershed and other sensitive water resources. Among the mitigation measures proposed are: use of steel tanks to contain flowback waters; and, in the WOH Watershed, prohibition of central flowback impoundment facilities, expedited removal of reserve pit and flowback fluids, and site-specific SEQRA analysis for sites where the well pad lies within certain setbacks of reservoirs and watercourses.

However, the environmental analysis in the DSGEIS should be expanded in several areas before issuance of the FSGEIS to include important elements of environmental review of natural gas development that are currently not included. For example, the risk posed by a handful of wells would be very different than that of hundreds or thousands of wells. Analysis of likely scenarios concerning the number of wells which would be developed in the future and the speed of such development (called "Reasonably Forseeable Development" or "RFD" scenarios) should be performed. As the DSGEIS acknowledges (at p. 9-4), such analysis is necessary for understanding the magnitude of risks posed to the New York City water supply system. As shown in the Arcadis Report, not only is developing an RFD scenario necessary, but it is feasible and a common practice in environmental review of oil and gas development.

In addition, the FSGEIS should support its conclusions concerning environmental impacts, alternatives to the Proposed Action, and mitigation measures based on sufficient data and scientific analysis. For example, the Draft Study asserts that existing laws and regulations and specified mitigation measures will adequately prevent pollution of the New York City Watershed but does not currently provide evidence based on science or scientific literature to support that conclusion. DSGEIS, pp. 6-41, 7-63.

Illustrating its limitations are acknowledgments in the Draft Study that existing wastewater treatment plants may not be capable of treating production brine wastewater generated by the Proposed Action and that not enough data is currently available concerning the radioactivity of that wastewater. The FSGEIS should discuss data already obtained by the Bureau that are not currently addressed in the DSGEIS. These data show that 11 of 13 wastewater samples have extremely high concentrations of Radium-226, orders of magnitude higher than applicable federal and State maximum contaminant levels and water quality standards for surface and groundwaters in the WOH Watershed.[17] In addition, before issuance of the FSGEIS, facilities or processes capable of treating or disposing of flowback, production brine and other wastewaters should be identified, additional data concerning radioactivity should be obtained and analyzed, and environmental impacts associated with wastewaters should be assessed.

Similarly, the DSGEIS discounts impacts from stormwater pollution based largely on the

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[17] See DSGEIS, p. 2-16; 6 NYCRR § 703.5.

Bureau's proposal to develop a new general stormwater permit tailored specifically to the Proposed Action. Because that permit has not yet been drafted or made subject to public review, its efficacy in mitigating stormwater pollution has not yet been, and cannot be, assessed. In addition, general permits may be of limited effectiveness in preventing pollution because they typically rely on permittees to design and implement stormwater pollution prevention plans without subjecting the plans to review by regulators.[18]

The FSGEIS should also address potential interrelated environmental and economic impacts. The Draft Study dismissed the possibility that pollution could lead to the imposition of a requirement under the SDWA to "filter" the WOH Hudson drinking water supply. But filtration would cost the public at least $10 billion; accordingly, it is important to apply the best science available to determine before issuance of the FSGEIS whether the Proposed Action would put the City's Filtration Avoidance Determination at risk. That scientific work should proceed promptly and should also address the risk that pollution of surface waters by turbidity, pathogens, phosphorus, drilling related contaminants, or other harmful substances could occur and undermine large prior public investments to secure clean water.[19] As illustration, Attachment B provides a starting point for a scientific analysis of potential risks to the Cannonsville Reservoir portion of the WOH Watershed.

The potential impact that expanded drilling in the New York City Watershed could have on public confidence in New York City water should be assessed. Whether fairly or unfairly, it is possible that media images of an industrialized Watershed landscape dotted with well pads, drilling rigs, and other infrastructure, could lead consumers to stop drinking or otherwise using City water. Reports of spills or discharges of pollutants -- such as radioactive wastewater -- could have the same effect. If so, the Proposed Action could put at risk large prior public investments which built and secured the City's water supply system under State policies for over a century.

VI. Recommendation: Additional Environmental Analysis and Mitigation Measures

A. Additional Analysis

In summary, the WIG Office recommends that the following additional environmental analysis be performed and included in the FSGEIS:

(1) **Determine the Likely Scale of Gas Development**: development of RFD scenarios describing the likely scale and pattern of future development (including the number of wells and speed of development);

(2) **Quantify Risks**: quantitative risk analysis concerning contamination of water resources based on scientific data; analysis should evaluate potential for increased pollution or

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[18] See Waterkeeper Alliance, Inc. v. EPA, 399 F.3d 486, 498-500 (2d Cir. 2005); Environmental Defense Center, Inc. v. EPA, 344 F.3d 832, 854-56 (9th Cir. 2003).

[19] Potential seismic impacts which could damage the water system's tunnels and other essential infrastructure merit additional evaluation as well.

degradation of water quality in WOH Watershed streams, wetlands, and reservoirs; risk to Filtration Avoidance; and risk to public confidence in City water;

(3) **Consider Alternatives to Drilling in the Watershed**: meaningful consideration of alternatives to the Proposed Action, including, respectively, a possible prohibition of drilling in the Watershed; and a "phased" approach in which Proposed Drilling would first proceed in lower risk areas outside the Watershed for a period of time sufficient to develop data and experience to make a better informed decision concerning the advisability of extending drilling to the Watershed;

(4) **Evaluate Proposed and Alternative Watershed Mitigation Measures**: quantitative evaluation of the effectiveness of the Bureau's proposed mitigation measures and proposed alternatives in preventing pollution of the WOH Watershed;

(5) **Evaluate Surface/Stormwater/Groundwater Pollution Impacts**: analysis of impacts from potential surface, stormwater, and groundwater contamination pollutant discharges into Watershed streams, wetlands, and reservoirs. Analysis should address amounts and concentrations of pathogens, turbidity, phosphorus, and total suspended solids generated during development of well sites (including roads and pipelines), and spilled drilling fluids, fracking additives, flowback, production brine, and cuttings; analysis requires completion of model individual stormwater permits (see section VI.B(1)a. below) which would apply to the Proposed Action;

(6) **Analyze Treatment or Disposal of Wastewater**: thorough analysis of feasibility and impacts of treating or disposing of flowback, production brine, and other gas drilling wastewaters, including completion of further data gathering to characterize pollutants found in production brine within the Marcellus Shale (including, without limitation, total dissolved solids and Radium-226), quantification of volumes of wastewater which will be generated, and identification and evaluation of alternative disposal and treatment methods and facilities and their associated environmental impacts;

(7) **Impacts of Land Disposal of Cuttings**: sampling and evaluation of contaminants which may be found in cuttings; evaluation of pollution impacts of disposing cuttings on land in the WOH Watershed and alternative mitigation methods, including prohibiting land disposal of cuttings there or onsite treatment and management of cuttings to prevent discharges of cutting-related pollutants.

B. Additional Mitigation Measures:

The WIG Office recommends that the FSGEIS also include the following additional mitigation measures to be implemented in the WOH Watershed:

(1) **Enhanced Stormwater Pollution Controls**

a. Require individual stormwater permits, including prior regulatory review and approval by DEC's Division of Water ("DOW") of all stormwater pollution prevention plans

("SWPPPs") before any land disturbance may occur. DOW should take the lead on that detailed site-specific review for every well site, and adequate staff should be made available for such review, and for inspections and enforcement as well.

b. SWPPP design and implementation should meet the following performance standard: Each well development site must not cause an increase in pollutant discharges to surface waters during both well development and production phases. This requirement should be applicable to pathogens, turbidity, phosphorus, total suspended solids, and drilling related contaminants (e.g., total dissolved solids, BTEX, etc.).[20]

c. SWPPPs should include extensive stormwater sampling and monitoring plans: Stormwater samples shall be collected as soon as feasible during or after storms or snow melts of sufficient magnitude to generate at least one-half inch of runoff ("significant storm events"), but in no event later than 24 hours after the beginning of each such event. Samples should be taken at all design points where runoff enters and leaves the site and at all points where runoff from the site discharges to a watercourse or other surface water. Where discharges to a watercourse or surface water occur off-site, the permittee would be required to obtain permission from the appropriate landowner for access for sampling. All samples will be tested by a NYS/DOH certified contract laboratory for the following parameters, among others: fecal coliform, turbidity, total suspended solids, total dissolved solids, flow, temperature, total dissolved solids and selected drilling-related contaminants.

(2) **Enhanced Groundwater Pollution Controls**

a. The following performance standard should apply: Each well development site must not cause an increase in pollutant discharges to groundwater both during the well development and production phases. See footnote 19. Adequate staff should be made available for inspections and enforcement activities to ensure compliance with this performance standard and with other applicable requirements imposed by DEC.

b. Extensive groundwater sampling and monitoring plans should be developed, reviewed by the DOW/Bureau, and implemented to ensure achievement of the Performance Standard set forth above. Pairs of shallow and deep monitoring wells should be established in the freshwater aquifer with respect to each well site as follows: 1 pair up-gradient, 2 pairs cross-gradient (each pair on either side of well site), and 3 pairs down-gradient. The permittee would be required to obtain any necessary permission from the appropriate landowner for access for monitoring. Sampling should occur on a monthly basis and include analysis of the parameters identified in the DSGEIS at pp. 7-40 and 7-41 and additional drilling-related contaminants of concern.

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[20] See 6 NYCRR §§ 554.1(b), 556.5 (prohibiting water pollution from natural gas activities). DEC may consider the feasibility of allowing offsets in these permits if appropriate. Offsets are being implemented in the Salem Hunt residential development project in the East of Hudson Watershed, as previously recommended by WIG.

(3) **Enhanced Spill Prevention Controls**

In addition to flowback, all other liquids containing potential contaminants (including production brine, other wastes, and chemical and petroleum products, but excluding fresh water uncontaminated by natural gas development activities or conditions) used at the well site should be stored in above-ground tanks in compliance with the standards set forth in 6 NYCRR § 360-6.3.

(4) **Closed Loop Systems Instead of Reserve Pits**

Use of reserve pits should be prohibited. Instead, to minimize generation of drilling waste muds and cuttings that require disposal and to prevent groundwater contamination associated with reserve pits,[21] drilling fluids and cuttings should be processed in closed-loop drilling fluid systems, entailing a series of storage tanks and related equipment used to separate and reuse liquids and solids.

(5) **Setbacks and Exclusion Areas**

Natural gas wells should not be sited:

a. Within 1000 feet of any stream and within 2000 feet of a reservoir;[22]

b. On sites which have steep slopes;[23]

c. On sites within 1000 feet of an underground geologic fault or major fissure, or significant deposit of coarse gravel or other highly permeable material (to mitigate the risk of migration of contaminated groundwater to surface waters);[24]

d. On sites in areas which pose possible seismic risks to tunnels, aqueducts, and other water supply infrastructure based on a detailed study to be completed before issuance of the FSGEIS.

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[21] See, e.g., "Cases Where Pit Substances Contaminated New Mexico's Groundwater," New Mexico Energy, Mining, and Natural Resources Department, at www.emrd.state.nm.us/ocd/documents/GWImpactPublicRecordsSixColumns20081119.pdf.

[22] Maryland imposes a similar limitation on natural gas drilling throughout that state. See 26 Code of Maryland Regulations § 19.01.09(G) (1,000 feet setback from a drinking water supply).

[23] Steep slopes could be defined as slopes exceeding 15%, see MOA ¶ 63(b)(iii)(E) (in light of threats to water quality posed by development on lands containing slopes greater than 15%, City may acquire and preserve such lands); 10 NYCRR Part 75, Appendix 75-A, § 75-A.4 (State Health Department prohibits siting septic systems on slopes exceeding 15%), or, alternatively, slopes exceeding 25%, see NYSDEC, "SPDES General Permit for Stormwater Discharges from Construction Activity, Permit No. GP-0008-001," Part I.D.7.c, 8.c, and 9.c.

[24] These underground features should be identified in additional generic/site-specific environmental review. For example, linear topographic features (lineaments) in the WOH Watershed have been mapped by the New York State Museum. See www.nysm.nysed.gov/gis/index.html (click on nyfaults.zip). Further study should determine whether these lineaments are expressions of faults or major fissures.

VII. Conclusion

The WIG Office thanks the Bureau in advance for considering these policy recommendations and looks forward to working with the Bureau as environmental review proceeds.

Respectfully submitted,

Philip Bein
Watershed Inspector General
Assistant Attorney General
Environmental Protection Bureau
Office of the Attorney General
The Capitol
Albany, New York 12224
(518) 474-7178
Philip.Bein@ag.ny.gov

Charles Silver, Ph.D.
Watershed Inspector General Scientist
Environmental Protection Bureau
Office of the Attorney General
The Capitol
Albany, New York 12224
(518) 473-6620
Charles.Silver@ag.ny.gov