UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
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NEW YORK, NY 10007-1866

DEC 30 2009

dSGEIS Comments
Bureau of Oil & Gas Regulation
NYSDEC Division of Mineral Resources
625 Broadway, Third Floor
Albany, NY 12233-6500

Dear Sir or Madam:

The U.S. Environmental Protection Agency (EPA) has reviewed the September 2009 draft Supplemental Generic Environmental Impact Statement (dSGEIS) that was prepared by the New York State Department of Environmental Conservation (NYSDEC) Division of Mineral Resources on the Oil, Gas and Solution Mining Regulatory Program Well Permit Issuance for Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low-Permeability Gas Reservoirs. The purpose of the dSGEIS is to satisfy the requirements of the State Environmental Quality Review Act (SEQRA) for NYSDEC to review and process permit applications for the horizontal drilling and hydraulic fracturing (hydrofracturing) of natural gas bearing shales, including the Marcellus Shale. This letter responds to NYSDEC's requests for comments on the dSGEIS and presents EPA's major concerns. Technical comments on the dSGEIS are enclosed.

EPA believes that the analysis and discussion of cumulative and indirect impacts in the dSGEIS need to be significantly expanded. Even with its generic format, the dSGEIS should discuss the impacts that may result from past, present, and reasonably foreseeable future projects as well as those impacts associated with gas drilling and hydrofracturing that may occur later in time or at a distance from the immediate project site. For example, as the New York State Public Service Commission (PSC) has the regulatory authority over the construction and operation of the natural gas gathering pipes, the dSGEIS does not include an evaluation of the environmental impacts of the separate yet interrelated actions of siting and constructing gathering lines. EPA also notes that the dSGEIS does not analyze the impacts from new drilling service industries that would undoubtedly result. To ensure a full analysis of cumulative and indirect impacts, we recommend that the PSC become a cooperating agency and that the PSC-related issues be fully integrated in the finalization of this document, and that all potential environmental impacts for the actions of drilling, hydrofracturing, collecting and transporting natural gas from the Marcellus Shale be assessed. Such collaboration may also provide the opportunity to coordinate actions in order to minimize the amount of flaring of gas between the time of opening a well and the construction of gathering lines.

In addition, a greater emphasis needs to be placed on the potential health impacts that may be associated with gas drilling and hydrofracturing. EPA suggests that the New York State Department of Health (DOH) join NYSDEC as a co-lead on the SEQRA document. Not only does DOH have expertise to offer on health impacts, but it was delegated primary enforcement responsibility (primacy) of the Safe Drinking Water Act

by EPA. This is of direct interest to EPA as we are responsible for overseeing DOH's implementation and enforcement of the drinking water program.

While EPA understands that this dSGEIS is the SEQRA documentation to specifically evaluate hydraulic fracturing, it supplements a 1992 SEQRA document. EPA is concerned that over the past 17 years since the 1992 GEIS was written, the "existing" environment and conditions in New York State have changed sufficiently that using the information from that report as a baseline for the dSGEIS will not take into account the cumulative impacts from habitat fragmentation, population increase, and climate change that may have occurred during that time.

EPA is particularly concerned about the potential risks associated with gas drilling activities in the New York City watershed and the reservoirs that collect drinking water for nine million people. As a signatory to the 1997 New York City Watershed Memorandum of Agreement (MOA), EPA strongly supports its major tenets, one of which is that watershed protection and community vitality can be achieved concurrently. Nevertheless, the potential for gas drilling in the watershed poses new challenges that were unanticipated at the point at which the MOA signatories agreed on a common approach to protect drinking water. Despite the mitigation measures already proposed by NYSDEC in the dSGEIS, EPA has serious reservations about whether gas drilling in the New York City watershed is consistent with the vision of long-term maintenance of a high quality unfiltered water supply. As NYSDEC is well aware, the watershed supplies drinking water to over nine million people and the avoidance of filtration saves New York taxpayers billions of dollars that would be needed to construct and operate a water filtration plant should the watershed be compromised.

EPA agrees with the sentiments expressed by Acting Commissioner Steven Lawitts of the New York City Department of Environmental Protection (NYCDEP) in his December 23, 2009 comment letter to NYSDEC: "Balancing environmental and public health concerns with the need for adequate energy resources and economic development is a complex and challenging issue – not only in New York but throughout the nation." Acting Commissioner Lawitts also states, "New York City's watershed is a unique resource and deserves special attention and consideration." To address this concern, EPA recommends a very cautious approach in all watershed areas so that NYSDEC can gain experience with, as well as ensure it has the resource capacity for regulating, high volume hydraulic fracturing activities.

Periodically, EPA reviews drinking water quality in the New York City watershed to ensure that drinking water meets all drinking water standards. If gas drilling, however, adversely impacts water quality in the watershed, the city of New York would likely be required to build a filtration treatment system at an expenditure of $10 billion in capital costs and $100 million in annual operating costs. Clearly, it is in all our interests to avoid this scenario.

Although EPA has not had the opportunity to fully review the information contained in NYCDEP's Final Impact Assessment Report, we expect NYSDEC to incorporate appropriate technical information into the SEQRA document. Furthermore, we repeat

our proposal of late 2008, that NYSDEC partner with EPA and the NYCDEP to develop an enhanced oversight approach for the New York City watershed that would allow for coordination of regulatory programs such as stormwater permitting, industrial pretreatment, and underground injection control as they relate to horizontal drilling and high volume hydraulic fracturing of the Marcellus Shale. While protecting the New York City watershed is important because of the millions of New Yorkers who rely on this drinking water supply, we also have concerns about water quality impacts throughout the state. Just because fewer people rely on upstate water sources does not imply that these supplies are not also worthy of protection. Therefore, we extend an offer to partner with NYSDEC on similar coordinated efforts state-wide.

Moreover, EPA strongly recommends that the SEQRA documentation reflect any and all direct consultation with each of the Indian Nations in New York State as the dSGEIS does not specifically discuss the impact on the nations. While EPA is aware that NYSDEC has already taken steps in this regard, at the EPA annual Indian leaders meeting in November 2009, representatives of virtually every Indian Nation expressed serious opposition to hydrofracturing. Indian Nation concerns include the radioactivity of cuttings and flowback materials, the fate of toxic/carcinogenic chemicals used in hydrofracturing solutions, the impact on water quality and supply, climate impacts and long-term sustainability.

In addition, to the extent allowed by law, EPA encourages NYSDEC to release information regarding the composition of the hydrofracturing solutions that are expected to be used.

In conclusion, EPA believes that NYSDEC has prepared an informative dSGEIS on hydrologic fracturing of the Marcellus Shale. However, we have concerns regarding potential impacts to human health and the environment that we believe warrant further scientific and regulatory analysis. Of particular concern to EPA are issues involving water supply, water quality, wastewater treatment operations, local and regional air quality, management of naturally occurring radioactive materials disturbed during drilling, cumulative environmental impacts, and the New York City watershed. EPA recommends that these concerns be addressed and essential environmental protection measures established prior to the completion of the SEQRA process.

Thank you for the opportunity to comment on the dSGEIS. EPA's technical comments on the document are enclosed. If you have any questions, please call Lingard Knutson of my staff at (212) 637-3747.

Sincerely,

John Filippelli, Chief
Strategic Planning and Multi-Media Programs Branch

Enclosure

ENCLOSURE
Technical Comments

General:

The draft Supplemental Generic Environmental Impact Statement (dSGEIS) references several documents, but relies heavily on reports commissioned by the New York State Energy Research and Development Authority (NYSERDA). The more important of these documents (such as ICF International 2009 task reports) should be easily available to the public for review on the NYSDEC website and placed in library repositories across the state.

The dSGEIS should strive to use the same terminology to discuss the physical nature of the drilling site. Job, well, well site, well pad and pad site are all used, but may not mean the same thing for each usage. This becomes particularly important when estimates of emissions or water usage are being made. The document should state whether a job is equal to one well. When estimating the emissions from a well pad or pad site indicate whether this equates to capturing the impacts from all the wells on the pad (as many as ten). This should be made clear on all emissions tables, too.

According to its website, NYSERDA has funded several projects to evaluate the potential of New York State's gas bearing shales for carbon sequestration. (Website http://www.nyserda.org/Programs/Environment/EMEP/Geological_Sequestration_projects.asp) These efforts make it reasonably foreseeable that the Marcellus shale may be used for carbon sequestration as well as gas production. The dSGEIS should discuss the possible future use of the shale as a carbon sequestration area in terms of the possible synergistic environmental impacts and cumulative effects with natural gas drilling.

NYSDEC should evaluate whether drilling permits should be awarded to any companies that have open environmental violation cases in other states.

Cumulative Effects:

The Environmental Protection Agency (EPA) is concerned that cumulative and indirect impacts need to be more thoroughly discussed in the dSGEIS. Even with its generic format, the EIS should discuss the impacts that may result from past, present, and reasonably foreseeable future projects as well as those impacts associated with drilling and hydrofracturing that may occur later in time and/or further from the immediate project site. The SEQRA handbook states, "Cumulative impacts do not have to all be associated with one sponsor or applicant. They may include indirect or secondary impacts, long term impacts and synergistic effects" and when two or more simultaneous or subsequent actions are related.

This also applies to page 2-6 where the dSGEIS points out that the Schlumberger Technology Corporation is planning to build a large facility in Horseheads, New York to

service the oil and gas exploration companies in the Southern Tier, but does not include the impacts of this facility, or discuss if other corporations may be planning similar facilities. This is especially important if a negative declaration under SEQRA is contemplated.

Page 2-4 of the dSGEIS states that currently there are about 6,700 active natural gas wells in New York State. In addition, there are numerous active horizontal wells in Pennsylvania and West Virginia. EPA recommends that NYSDEC utilize permit and applicant records of water usage, truck trips, pipeline construction, etc. to develop an environmental baseline of the impacts of this industry. This will provide NYSDEC a platform on which to develop cumulative effects, and provide a baseline for monitoring water usage, air impacts, road creation, habitat destruction and other environmental impacts.

Page 6-7 of the dSGEIS discusses the cumulative impacts of water withdrawal. This section should calculate potential peak water withdrawals and total current and projected assimilative capacity at the predicted height of production of natural gas.

NYSDEC should note that EPA is nationally considering how to aggregate emissions from related sources (e.g., multiple heavy duty engines operating at multiple wells) associated with oil and gas industry activities. Decisions in this area could affect permitting under the Prevention of Significant Deterioration rules which apply in clean air areas and affect state operating permits under Title V of the Clean Air Act. Since these requirements may change depending upon the results of EPA's evaluation of the issue, the dSGEIS should acknowledge that for permitting purposes, the definition of a source will be determined according to the regulations and guidance that are in place at the time of the application.

Air Quality:
Emission Inventories

The NYSDEC emissions inventory for the Ozone State Implementation Plan (SIP) is currently being developed. EPA recommends that the anticipated volatile organic compounds (VOC) and nitrogen oxide (NOx) emissions from drilling the Marcellus Shale in New York State be added to the updated inventory.

Oil and natural gas operations are the largest anthropogenic source of methane, or CH4, emissions in the United States and the second largest human-made source of CH4 emissions globally. Given methane's role as both a potent greenhouse gas and clean energy source, reducing these emissions can have significant environmental and economic benefits. Efforts to reduce CH4 emissions not only conserve natural gas resources but also generate additional revenues, increase operational efficiency, and make positive contributions to the global environment.

Mobile Sources

NYSDEC should identify and require steps to minimize diesel pollution from trucks and equipment involved in natural gas extraction operations through practices such as idle reduction and use of technologies such as exhaust retrofits with verified diesel particulate filters. NYSDEC should also encourage deployment of newer engines (e.g., Tier 4 diesels) that meet EPA's most stringent applicable emissions standards. Truck idling should be minimized through strict anti-idling programs and the use of system/devices such as auxiliary power units, direct fired heaters and automatic engine shut down/start up. NYSDEC and the New York State Department of Transportation should also consider recommending that trucks be routed away from sensitive receptor areas such as hospitals and schools.

The impacts analysis should model on-road air emissions from mobile sources by using EPA's Motor Vehicle Emission Simulator (MOVES). MOVES is a new emission modeling system to estimate emissions for on-road and nonroad mobile sources. A final version of MOVES is pending. Upon its release, EPA will consider MOVES to be the most appropriate model for estimating mobile source air emissions. MOVES will serve as the replacement for MOBILE6 and NONROAD for all official analyses associated with regulatory development, compliance with statutory requirements, and national/regional inventory projections. The on-road portion will be available in the first release.

Page 6-63. Details of the PM10 and PM 2.5 analysis, prepared by the NYSDEC Division of Air Resources, indicating that emissions from truck operations would be "well below the CP-33 threshold of 15 tpy" should be made available. It does not appear that any modeling was performed for these pollutants.

Page 6-64. Summarize and explain NYSDEC's Commissioner's Policy CP-33/Assessing and Mitigating Impacts of Fine Particulate Matter Emissions. (It is listed in the dSGEIS as CP-3341. That appears to be a typographical error.)

Page 6-77. A more detailed citation for "EPA document44" should be provided.

Page 7-92: The document should contain more information regarding the types of "efficient transportation engines." In addition to the examples of measures that could be included in a greenhouse gas emissions impacts mitigation plan, NYSDEC should consider recommending the use of ultra low sulfur diesel (ULSD) fuel and implementing a strict anti-idling program.

Operational Sources

Page 5-99. NYSDEC should estimate the longest period of time an onsite lined reserve pit holding flowback water for several well pads could be open. This would directly impact the emissions of VOC and other air pollutants from the pits.

Page 5-126. Additional information should be supplied in the document regarding Fortuna Energy and hydrogen sulfide testing. Specify what is meant by "brief period" and indicate what instrument was used, how often monitoring was conducted, and what the detection level of the instrument was.

Page 6-51. Consider monitoring and controlling the emissions related to venting off the flash separator and/or reboiler, even if not required under a National Emission Standard for Hazardous Air Pollutant (NESHAP).

Page 6-52. Define "small amount" and "a period of time" when the gas is vented. These vented/uncontrolled emissions could add up to a considerable amount of gas being emitted to the atmosphere. NYSDEC should require flaring the gas kick and the main vent line as opposed to venting it.

Page 6-55. NYSDEC should consider requiring the collection of gas from the natural gas condensate tanks into the gathering line and flaring it. The types of checks that will occur in order to minimize leaks should be identified. EPA recommends that NYSDEC use infrared camera technology to monitor vapors from the tanks and to determine whether corrective actions have been completed.

Page 6-56. Indicate whether pits will be covered or controlled. EPA recommends using control technology to minimize emissions venting out of pits.

Page 6-111. Infrared cameras are very effective in finding invisible leaks and should be used by NYSDEC as a method to detect fugitive emissions and leaks. Enough funding should be provided to NYSDEC to ensure sufficient availability of infrared cameras to monitor drilling and related activities.

Page 7-93. "Limiting flaring during the flowback…" should be changed to "Limiting flaring **and venting** during the flowback…." EPA also recommends that more information regarding procedures for leak detection surveys, such as frequency of surveys and instruments to be used, be included in the dSGEIS or subsequent documents.

Air Quality Modeling Recommendations

The modeling appears to follow NYSDEC protocols for dispersion modeling and risk characterization for toxic air pollutants. With minor amendment, it should be acceptable as an evaluation of the risks from these projects with regard to airborne pollutants.

NYSDEC should look ahead to the implementation of today's stringent ozone standard and the possibility of an even more stringent standard being enacted. Moreover, NYSDEC should consider the local and long-range impact of the VOC and nitrogen oxide emissions from this project on state plans to meet these standards. Also, evaluate the impact of emissions from all sites that may be built during the 6 to 9 year period when New York State is developing and implementing plans for attainment of new ozone standards.

NYSDEC should estimate and include discussion of hourly sulfur dioxide impacts as EPA is proposing an hourly standard for sulfur dioxide.

Water Quality:
Water Usage

The dSGEIS does not provide for sufficient mitigation of the potential environmental impacts from the withdrawal of surface or ground water for the purpose of high volume hydraulic fracturing. Generally, the dSGEIS relies on the authority of the Susquehanna River Basin Commission (SRBC), the Delaware River Basin Commission (DRBC) and the Great Lakes Commission to regulate surface water withdrawals within their respective jurisdictions. For those areas of New York State outside of the jurisdiction of the SRBC, DRBC or the Great Lakes Commission, the dSGEIS offers mitigation through the public water supply permit program established under New York State Environmental Conservation Law (ECL) Article 15 Title 15. However, EPA understands that this permitting process is for the regulation of public drinking water purveyors only and does not regulate withdrawal of surface water for commercial/industrial use. NYSDEC should explain how water withdrawals outside of the SRBC, DRBC, and Great Lakes Commission areas will be managed.

Several EPA Regional Offices have identified water quality issues related to elevated levels of total dissolved solids (TDS) in water bodies in areas where energy extraction operations are taking place (mountaintop mining, coal bed methane extraction and unconventional gas operations). The major concern associated with elevated levels of TDS is the resultant impacts to the aquatic life communities in the affected water bodies. As a result of the stated Regional concerns, EPA's Office of Science and Technology has developed a transferable methodology which incorporates both water quality data for the TDS-based parameter of concern (e.g., conductivity, chloride, sulfate, etc.) and high quality biomonitoring data to derive applicable water quality criteria to protect aquatic life. In the case of the West Virginia mountaintop mining scenario it was determined that conductivity was the most appropriate parameter on which to base the applicable aquatic life endpoint. In the case of Marcellus Shale, Office of Science and Technology has indicated that chloride may be the predominant ionic toxicant of concern. The Office of Science and Technology methodology is transferable and can be used to calculate an applicable aquatic life-based endpoint for most applicable TDS-based parameters of concern, including chloride. The Office of Science and Technology methodology requires that biological and water quality data be collected concurrently and be "site" specific.

EPA offers this information for NYSDEC's consideration in future Marcellus Shale permit actions.

Page 3-5. EPA finds the methodology to define high-volume hydraulic fracturing confusing. A "job" should be clearly defined as a completed single horizontal well, specifying the amount of hydrofracturing stages that the NYSDEC is estimating in one job. Up to 10 "jobs" or wells could be drilled on a single pad. The methodology therefore implies that one well (using 80,000 to 299,999 gallons) may be considered high volume. But the document repeatedly states that most applicants would drill several wells per well pad.

EPA is also concerned that the proposed methodology to determine if a well is "high volume" does not seem to account for any drought events, when water usage would have higher impacts on the environment and water supply.

Page 3-10. The Fluid Disposal Plan should include a waste characterization of the fluid for disposal.

Page 5-104. The document should indicate how the uncertainty associated with the data in Table 5-9 (Typical Concentrations of flowback constituents based on limited samples from PA and WV) was incorporated into NYSDEC's decision making.

Page 5-121. This section should cite Appendix 21 for a list of in-state Publicly Owned Treatment Works (POTW) with approved pretreatment or mini-pretreatment programs. NYSDEC should indicate whether the existing POTWs and private treatment plants have the capacity to accept future estimates of flowback water. If not, any expansion of existing treatment facilities or the construction of new facilities must be analyzed as indirect impacts.

On Page 5-121. The document states, "Ultimately, NYSDEC needs to approve such analysis and modify State Pollution Discharge Elimination System (SPDES) permits as needed to insure water quality standards in receiving waters are maintained at all times." For approved pretreatment programs, EPA also needs to approve the analysis. This should be acknowledged in the dSGEIS.

Page 7-3. Section 7.1.1. The dSGEIS discusses the "Natural Flow Regime Method" as an alternative to the SRBC, DRBC regulatory authorities or the water supply permit program, to avoid adverse environmental impacts due to water withdrawals for high volume hydraulic fracturing. Under this method water withdrawals must provide for a passby flow in the stream to assure adequate surface water flow, thereby mitigating the impacts to aquatic habitat and aquatic ecosystems. This method, however, can only be used when the quality and duration of historic stream flow data adequately represent the natural flow regimes of the stream. The dSGEIS does not provide sufficient detail as to mitigation of the potential environmental impacts when the stream flow data does not exist or is insufficient in quality or duration.

The use of the Natural Flow Regime Method for all surface water withdrawals is also proposed as a method to mitigate cumulative impacts on stream flows. However, the dSGEIS does not explain how multiple requests for water withdrawal will be evaluated or tracked. EPA recommends that the state provide a revised description of policies and procedures that can be implemented to ensure that multiple withdrawals of water do not cause adverse environmental impacts or adversely affect public/private water supplies.

Page 7-6. The dSGEIS should include more information on the NYSDEC's concern for aquifer depletion, and what is currently being studied as it may have bearing on the issue of water usage in hydrofracturing.

Effluent Pre-Treatment

Please note that to date, the EPA has provided a total of $492,286,097 in State Revolving Funds and American Recovery and Reinvestment Act funds to the State of New York in 2009. These monies were provided to upgrade wastewater treatment throughout the state. The effluent created by the production of natural gas from the Marcellus Shale in New York should in no way counteract the ongoing state and federal efforts to ensure water quality protection.

Page 7-56. The dSGEIS states that "The NYSDEC's Division of Water shares pretreatment program oversight (approval authority) responsibility with the USEPA." While NYSDEC has shared pretreatment roles and responsibilities with the USEPA, it is not accurate to state that NYSDEC is the Approval Authority for pretreatment. For non-approved mini-programs, NYSDEC is the primary agency for implementation. For approved pretreatment programs, EPA Region 2 is the Approval Authority under the definition at 40 C.F.R. § 403.3(c). As such, EPA Region 2 must provide approval of local discharge limits, including any such limits for additional pollutants which may need regulation due to acceptance of flowback water and production brine (including barium, benzene, cadmium, chloride, silver, tetrachloroethylene, and total dissolved solids).

Page 7-57. The dSGEIS states that NYDEC approval of headworks analysis is necessary for Publicly Owned Treatment Works (POTW) to receive flowback water and production brine. Since EPA is the Approval Authority, EPA approval is also necessary for approved pretreatment programs. The sentence should read, "Department approval of the headworks analysis **and EPA approval for approved pretreatment programs**, and the modification of the POTW's SPDES permit if necessary, must be received prior to the acceptance of flowback water or produced brine from wells permitted pursuant to this Supplement."

Page 7-58. The discussion must include submission of the headworks analysis to EPA Region 2 for programs with approved pretreatment programs. The discussion regarding public and private treatment facilities in this section should note that such facilities may need to install tertiary treatment (e.g., reverse osmosis or evaporation/crystallization) that

generates a separate waste stream which must be disposed. This should also be noted in section 7.1.9.

Page 8-10. Table 8-1. This table needs to include EPA for POTW disposal under Federal Agencies. Based on the symbols used, it probably needs to be a P with an asterisk since EPA is the Approval Authority for approved pretreatment programs, but NYSDEC would have responsibility for mini-programs.

Appendix 6. Page 3. It should be noted that EPA approval would also be necessary for approved pretreatment programs where it states, "If a POTW, date of NYSDEC approval to receive flowback water (attach a copy of approval notification)"

Appendix 22. It must be stated that for approved pretreatment programs, the analysis must be submitted to EPA for approval as well.

Non-Stormwater Effluent Guidelines

Prior to New York State's approval of disposal of flowback water through a conventional wastewater treatment facility, the State should first review the chemical makeup of the flowback and ensure that water quality criteria or guidance values that are protective of aquatic life are in place for those pollutants of concern not substantially removed by conventional treatment such that numeric State Pollution Discharge Elimination System (SPDES) permit limits can be developed for those pollutants.

The discussion of SPDES permitting does not include potential national effluent guidelines that may apply – including the prohibition of direct discharge under effluent guidelines at 40 C.F.R. Part 435. The dSGEIS also does not address potential effluent guidelines under 40 CFR Part 437 that may apply (for instance at 5.13.3.6 Private In-State Industrial Treatment Plants).

These technology-based regulations (40 CFR Part 435, Subpart C) apply to onshore facilities engaged in the production, field exploration, drilling, well completion and well treatment in the oil and gas extraction industry. The effluent guidelines at 40 CFR 435.32 establish best practicable control technology currently available (BPT) requirements: "there shall be no discharge of waste water pollutants into navigable waters from any source associated with production, field exploration, drilling, well completion or well treatment (i.e., produced water, drilling muds, drill cuttings, and produced sand)."

Discharges from a Centralized Waste Treatment (CWT) system of gas extraction produced waters are subject to the effluent limitations and pretreatment standards established under 40 CFR Part 437. However, additional limits and conditions may be required to address pollutants that were not considered in developing the CWT Effluent Guidelines or to address pollutants that must be controlled more stringently in order to meet applicable water quality standards.

Available data indicate that several pollutants are found in process waters (e.g., radionuclides, chlorides) that were not considered in the development of the CWT Effluent Guidelines. For such pollutants, EPA's National Pollutant Discharge Elimination System (NPDES) regulations require that permit writers include technology-based limits developed on a case by case, "best professional judgment" basis. See 40 CFR §125.3(c)(3) ("Where promulgated effluent limitations guidelines only apply to certain aspects of the discharger's operation, or to *certain pollutants,* other aspects or activities are subject to regulation on a case-by-case basis…") (emphasis added). In developing technology-based best professional judgment limits, the permit writer must consider the factors specified in 40 CFR § 125.3(d), the same factors that EPA considers in establishing categorical effluent guidelines. In addition, the permit writer must include any more stringent limits that are necessary to achieve water quality standards. See 40 CFR 122.44(d).

Consequently, for a CWT facility that accepts process waters or other waste from oil and gas extraction facilities, the permitting authority will need to develop technology-based best professional judgment limits to address those pollutants not considered in the development of the CWT Effluent Guidelines and incorporate these limits in the facility's NPDES permit. Additionally, the permit writer will need to develop water quality based effluent limits as stringent as necessary to meet applicable water quality standards.

Other Water Concerns

The dSGEIS includes a discussion and list of the drinking water standards in Chapter 2, but does not include the applicable NYSDEC surface water standards. NYSDEC should include the applicable surface water quality standards for known pollutants including chloride, radionuclides, acrylonitrile (and other fracturing additives) and total dissolved solids (TDS) in its dSGEIS. In the document, NYSDEC discusses including TDS limits in permits for POTWs accepting the wastes, but does not specify what the basis for the derivation would be. Presenting the water quality standards would provide an idea of the limits that may apply.

Pg 6-44 Section 6.4.1 regarding the invasive species issue should include potential invasive species that can be carried by equipment transported from other drilling locations. For instance, in Pennsylvania, there is an ongoing investigation of the possibility that golden algae (*Prymnesium parvum*) that may have been transported on equipment potentially contributed to a fish kill in Dunkard Creek.

Stormwater

EPA recognizes that NYSDEC intends to regulate storm water runoff during the construction of gas drilling infrastructure (well pads, access roads, etc.) through its Multi-Sector General Permit. Specifically, the dSGEIS states that Sector AD of the Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity

(GP-0-06-002) will be revised to include construction phase requirements. Also, condition number 10 in the Proposed Supplementary Permit Conditions for High-Volume Hydraulic Fracturing (the drilling permit issued by the Division of Mineral Resources), states that authorization under the Multi-Sector General Permit must be obtained prior to any site disturbance. However, for clarity, EPA recommends that NYSDEC include a statement in the text of the dSGEIS which explicitly explains that construction activities associated with gas drilling infrastructure are subject to SPDES program jurisdiction. Such a statement would clarify that the state has authority over such activities despite the exemption included in the 2005 Energy Policy Act for construction of oil and gas facilities.

Solid Waste:

Page 5-118. NYSDEC should discuss whether there is enough existing capacity at solid waste landfills in the region of the Marcellus Shale to accept cuttings that are generated during drilling with polymer- or oil- based muds and any salt cake from treatment facilities. If additional or expanded solid waste landfills will be required, that also warrants discussions including potential locations for new or expanded landfills and environmental controls.

Habitat and Other Sensitive Area Impacts:
Habitat

The NYSDEC should require that applicants minimize the impact to existing habitat by using the smallest footprint possible for access roads and well pads. EPA recommends that any non-toxic materials brought in to construct roads be re-used or recycled.

The National Audubon Society has recognized six sites within the Finger Lakes Focus Area as Important Bird Areas; Cayuga and Seneca Lakes, Finger Lakes National Forest, Catherine Creek Marsh, Salmon Creek, and Connecticut Hill Wildlife Management Area (Wells 1998). Pollutant impacts to these areas warrant special scrutiny in the dSGEIS.

Page 5-9. The document states that more land will be disturbed on a per-pad basis than described in the 1992 GEIS. Please include the size and descriptions of the well pads from the 1992 GEIS for comparison.

Page 5-19. Describe what justification(s) would warrant vertical infill wells from separate surface locations in the horizontal well unit, and whether infill wells would require additional environmental assessment.

Page 6-48. The document states that "DFWMR (Division of Fish, Wildlife and Marine Resources) staff believes that flowback water is probably not acutely toxic to waterfowl from short term contact." EPA recommends that until the toxicity of flowback water to waterfowl and other wildlife is known, the ponds should be covered. At a minimum, measures to prevent long term contact should be described.

Page 6-134. While the dSGEIS discussed noise in terms of human impacts, it does not analyze the noise of drilling in terms of impacts to wildlife. EPA is especially concerned about the noise impacts of hydraulic fracturing on the hibernating bat population of New York State. The population of the federally and state endangered Indiana Bat (*Myotis sodalis*) has been decimated by white nose syndrome while in their hibernacula. Other bat species have been affected as well. EPA strongly recommends that NYSDEC address this issue with the Fish and Wildlife Service to determine if buffers or drilling time restrictions are needed near bat hibernacula to prevent further stress on these already impacted species.

Page 7-73. Section 7.4. This section is incomplete, and does not account for the changes in the ecosystems in New York State since the preparation of the 1992 GEIS. For example, more animals and plants are on federal and state endangered species lists, habitats of all kinds are more fragmented, invasive species have impacted existing animal and plant populations, and climate change has impacted plant and animal ranges and migrations. EPA is concerned that the NYSDEC has not taken a comprehensive look at the existing environment or established the baseline to evaluate the environmental impacts (direct, indirect and cumulative) of hydraulic fracturing activities in the state.

Floodplains

EPA is supportive of the decision not to approve centralized flowback water impoundments nor associated above-ground flowback water piping and conveyances within the 100 year floodplain. NYSDEC should closely monitor any other infrastructure placed in the 100 year floodplain to ensure minimal impacts and provide future data.

Wetlands

EPA encourages the avoidance and minimization of wetlands impacts. All federal, state and local wetlands protection policies should be strictly enforced and monitored.

Tully Valley/Onondaga Creek

EPA is concerned about impacts that hydrofracturing may have in the Tully Valley and Onondaga Creek watershed, an area already impacted by mud boils and slope collapses caused by previous brine operations as well as natural phenomena.

Seismic Impacts:

The dSGEIS notes that the State of New York is fairly active seismically. EPA recommends that NYSDEC limit the number of wells in areas of higher seismic activity, or require additional protective measures and monitoring.

Naturally-Occurring Radioactive Material (NORM):

EPA has and continues to monitor the plans for disposition of water and brine containing naturally occurring radioactive materials (NORM). The NORM concentrations in the production brine have the potential to far exceed the Maximum Concentration Limits (MCLs) specified in the Safe Drinking Water Act (SDWA).

We are aware of preliminary discussions between NYSDEC and NYSDOH that have been held since the issuance of the dSGEIS regarding potential water discharges in drinking water resources and brine discharges into POTWs. These discussions about treatment and disposal options should be reflected in the dSGEIS.

We believe that NYSDEC should establish a regulatory program to meet the SDWA MCLs if the water is to be discharged into drinking water bodies. Should NYSDEC implement the U.S. Nuclear Regulatory Commission (NRC) regulations, then NYSDEC should ensure that such discharges do not impact drinking water bodies. Furthermore, a worker health and safety program should be considered to prevent exposure and to educate workers about NORM and protective measures. Should scale build-up inside pipes and the treatment of backwash water occur indoors, then any radon that is part of the NORM, could be a major route of exposure for indoor workers.

Page 4-17. Section 4.4. Last paragraph. The last sentence reports uranium concentrations in terms of parts per million (ppm) instead of pico-Curie per gram (pCi/g) or pico-Curie per liter (pCi/L). Based on past experience and correlation between such units, the ppm analytical method could significantly underestimate the uranium concentration when such concentration reaches a certain level. As such, caution must be used when relying solely on the ppm analytical method to avoid underestimating the radionuclide concentrations.

Page 4-36. Section 4.6. 1st paragraph, last sentence. EPA recommends revising the last sentence to eliminate the use of "government scrutiny" so that the sentence can read "…NORM need to be handled appropriately to ensure adequate protection of human health and the environment." Incorporate this idea into Section 5.13.1, as well.

Page 5-3. Section 5.2.4.2. 1st paragraph**.** The text mentions "Table 5.2" while the associated table heading is "Table 5-2". Revise for consistency throughout document. Also, clarify the asterisks in Table 5-2.

Page 5-34. The statement "any product whose name does not appear within Table 5.3 and Table 5.4 was not evaluated in this SGEIS…" implies that NYSDEC will not allow the use of chemicals not on the lists.

Page 5-42. The second paragraph describes Figure 5.3. EPA recommends that NYSDEC provide the fracture fluid composition now being used in the Marcellus Shale in Pennsylvania or West Virginia, rather than that from the Fayetteville Shale.

Page 5-106. Clarify the substantial difference in values in Radium ^{226} in footnote 99 as compared to the data in Appendix 13.

Page 6-40. Section 6.1.9.1. 1st paragraph. The sentence states "… NORM levels in cuttings are not likely to pose a problem." The dSGEIS needs to be specific by what is meant by "problem" (e.g., waste disposal problem, radiation exposure problem) and provide data on the NORM levels. Also, a list of disposal sites that could accept cuttings with higher NORM levels should be included in the dSGEIS.

Page 6-130. Section 6.8. The dSGEIS should reference the document that contains the radionuclide concentrations referred to as reported by the USEPA in this section (i.e., 9000 pCi/L in produced water and 100,000 pCi/g in pipe and tank scale). Also such concentrations are considered elevated and may pose unacceptable human health risk mainly via external exposure, inhalation of radon and thoron decay products, and to some degree via inadvertent ingestion. Although, most states have not yet formally classified oil and gas drill rig personnel as occupational radiation workers, health and safety measures should be considered to educate personnel about radiation exposures and reduce their exposure to as low as reasonably achievable. The pipe scale and filter media could be the major sources of radiation exposure and need to be handled and disposed of appropriately.

Page 7-98 to 7-101, Section 7.8.1, 2nd paragraph. While the referenced regulatory program does not fall under the EPA uranium mill tailing standards (i.e., 40 CFR 192 and the associated OSWER Directives) NYSDEC should consider the uranium mill tailing standards as an applicable or relevant and appropriate requirement.

Page 7-98. Section 7.8. 2nd paragraph. Should the extracted NORM from the drilling activities present an impact on human health and the environment, implementation of a regulatory program should be considered.

Page 7-99. Section 7.8. 2nd paragraph, 1st bullet. Indicate whether the 150 pCi/g also apply to potassium-40.

Page 7-99. Section 7.8. 2nd paragraph, 2nd bullet. Given the long half-life of some of the radionuclides in the uranium and thorium series, considerations should also be given to inaccessible points/locations because of the potential that such inaccessible points/locations could become accessible in the future. Also, identify how the 50 µR/hr limit was derived, i.e., dose-based or instrument limitation-based.

Page 7-101 Section 7.8.2. The discharge limit of 60 pCi/L may be effective for industrial discharges such as to a POTW. Any permitted discharges to a drinking water system should be treated to meet the Safe Drinking Water Act Maximum Contaminant Level (SDWA MCL).

Page 7-102. EPA understands that the NYSDEC and New York State Department of Health are now working to develop standards that would address NORM in the scale buildup inside the drilling pipes. This effort to develop standards, and what the standards may impose on the disposal of the pipes or flowback water, should be discussed in the dSGEIS, and subject to public comment.

Appendix 13, NYS Marcellus Radiological data from Production Brine. A program must be implemented to properly manage the elevated radionuclide concentrations in the brine to protect worker health, public health, and the environment.

Environmental Justice:

Page 6-140. In addition to providing an opportunity for all stakeholders to comment on an environmental document, the environmental justice section of the dSGEIS should identify whether a minority or low income population may bear a disproportionately high and adverse environmental and public health burden due to the proposed project.

New York State should coordinate with the Indian Nations and the Haudenosaunee Environmental Task Force on actions related to the Marcellus Shale.