

# **Response to Public Comments on the Draft Mid-Term Revisions to NYC's 2007 Filtration Avoidance Determination**

## **Introduction**

In accordance with New York City's 2007 Filtration Avoidance Determination (FAD), the New York State Department of Health (NYSDOH) has conducted a mid-term review of NYC's implementation of its Long-Term Watershed Protection Plan and its compliance with the 2007 FAD. Based on this review, and with input from Watershed stakeholders, draft Mid-Term Revisions to the 2007 FAD were developed and released for public review on August 23, 2013. A 45-day period was provided for public comment on the draft revisions. In response to public requests, the comment period was extended by 30 days, closing on November 15, 2013. Notice of the availability of the FAD for review was made via email to key Watershed stakeholders, posted on the NYSDOH website, and published in area newspapers.

This document summarizes the public comments received on the draft revisions to the 2007 FAD, along with responses from the NYSDOH. In all, NYSDOH received 157 individual letters and emails, 157 form letters, 437 signatures on petitions, and 25 written testimonies, which were presented at a public hearing held by the Ulster County Legislature's Environmental Energy and Technology Committee on September 25, 2013.

Responses to these comments are being provided in conjunction with the issuance of the Final Mid-Term Revisions to the 2007 FAD ("Final Revised FAD"). The Final Revised FAD includes a number of changes that have been made in response to these public comments. New program requirements that have developed from this process have also been incorporated into the New York City Department of Environmental Protection's (NYCDEP) Long-Term Watershed Protection Plan. Some of the more significant changes that have been included in the Final Revised FAD are as follows:

1. A requirement has been added to initiate a review of the efficacy and adequacy of the City's Watershed Protection Plan. An independent scientific organization, such as the National Academy of Sciences (NAS) or National Research Council (NRC), will be asked to select a panel of experts in fields related to watershed protection, who will conduct this study. During the 2007 FAD period, stakeholders will be convened to discuss the scope of the review, NYCDEP will develop a scope of work for the expert panel, and NYCDEP will begin the process of contracting for the funds to support the study. Study results will inform the mid-term review of the 2017 FAD.
2. A paragraph has been added to the introductory narrative that addresses public request for more transparency in the FAD process. Starting in 2014, NYCDEP will post NYSDOH's comments on FAD deliverables and NYCDEP's responses to comments on the NYCDEP website.
3. The footnote on page 9 has been changed to: "A recently announced State program may cover a portion of these costs. Regardless of the State contribution, the City is committed to providing necessary funding to ensure that the land portion of the purchase price and all acquisition-related soft costs are covered."

4. Language describing the Flood Buy-Out (FBO) program has been clarified to say that purchased properties will have existing structures and potential sources of water contamination removed and will be maintained in accordance with local flood hazard mitigation goals.
5. In the introductory narrative describing changes to the east-of-Hudson Nonpoint Source Pollution Control Program, language describing septic systems that will be addressed by the Septic Repair Program has been changed from “potentially failing” to “reasonably likely-to-fail in the near future, as judged by a qualified inspector”.
6. References to New Sewage Treatment Infrastructure Program (NIP) reporting have been removed from the introductory narrative.
7. Wording under “Regulatory Authority” has been changed to correspond with regulatory language (... ~~perform~~ maintain the watershed control program ~~in a timely fashion~~ ...”).
8. A date has been corrected in the Septic Maintenance Program narrative; January 1, 1997 has been changed to November 1, 1995.
9. The date for the Catskill Watershed Corporation (CWC) program rules has been updated from 3/1/11 to 7/2/13 in the activity box for the Small Business Septic Remediation and Replacement Program.
10. A statement has been added to the introductory narrative stating that NYSDOH may request NYCDEP to pursue a wastewater management system for Phoenicia if there is community support for such a project in the future.
11. Due dates for Community Waste Management Program (CWMP) projects have been extended.
12. In the Stormwater Program section, language has been clarified to indicate that funding for 9 stormwater retrofit projects per year is in addition to funding for projects that will be completed related to CWMP projects.
13. A sentence has been added to the Land Acquisition Program (LAP) narrative stating how much land has been acquired by NYCDEP since January 1, 2010.
14. The number of acres that the City is required to solicit has been changed from 250,000 to 300,000 in order to include acreage solicited in 2012. The average number of acres per year remains the same as in the draft: 50,000 acres/year.
15. Due date language for the LAP has been revised (“Biennially” instead of “Biannually”, and starting in 2014 instead of 2013, for solicitation plans and meeting on the Farm CE program).
16. The requirement to meet with regulators to discuss funding for the LAP has been changed from “as needed” to “annually”. Discussion at the annual meeting will include a review of the adequacy of funds for the City-funded Flood Buy-out (FBO) Program.
17. Language in the LAP section regarding funds for the forest easement program was changed to clarify that unused funds must be returned to the LAP for land acquisition and easements, not returned to a general fund.
18. A requirement for the City-funded FBO program has been changed to state that, “The need for additional funds for this program will be reviewed with NYSDOH/EPA and NYSDEC during an annual LAP budget meeting, or sooner if necessary. Additional funds required to maintain the program will be drawn from the general LAP funds.”
19. The due date for the Forest Easement Program evaluation report has been changed from “4 years and 3 months after commencement” to “12/15/17”, based on the contract for this program having been executed by 9/15/13.
20. A requirement has been added to the LAP section for the City to request a modification to the Water Supply Permit prior to conducting the City-funded FBO program.

21. References to developing Conservation Reserve Enhancement Program (CREP) alternatives have been removed since CREP has been reauthorized in the Farm Bill.
22. The activity to provide funding to support a riparian buffer restoration program in east-of-Hudson basins has been incorporated by the Watershed Agricultural Council into their funding and work plan; therefore, this task has been marked “Complete”.
23. In the Stream Management Program (SMP) section, the narrative has been changed to clarify that non-anchor, not just anchor, businesses are also eligible to be removed and relocated as part of the Local Flood Hazard Mitigation Program (LFHMP).
24. In the SMP, clarifying language has been added that Catskill Stream Buffer Initiative (CSBI) projects that were completed in 2013 will be credited towards program goals.
25. In the SMP, the due date for executing contracts with the City’s Stream Management Program partners has been changed to “12/31/14, or as necessary to maintain program continuity.”
26. In the SMP section, the due date for a contract with the CWC to fund the LFHMP has been changed from 07/31/14 to 12/31/14. NYCDEP and CWC have worked to ensure that funding is available for the LFHMP during the interim period until new program funds become available. In addition, the due date for program rules for the CWC LFHMP was revised to 06/30/14.
27. Due dates for storm water projects at Michael Brook and Sycamore Park have been updated.
28. A requirement has been added to the Kensico Water Quality Control Program for the City to complete the design for a shoreline stabilization project at Kensico Shaft 18 by 12/31/16.
29. In the Catskill Turbidity Control (CTC) Program section, a task has been added for the Expert Panel. They will now also review the City’s plan for the use of the Operations Support Tool (OST) in evaluating the Catskill turbidity control alternatives to be considered in the Environmental Impact Statement (EIS) associated with the City’s Catalum SPDES permit modification. To the extent possible, the results of this review will be made available in time to inform the development of the draft EIS.
30. Language has been added to clarify what information on the City’s OST will be provided to the Expert Panel.
31. Due dates for deliverables associated with the CTC Program have been changed to align with the anticipated timing for the draft EIS and the EIS.
32. In the CTC Program section, the requirement for NYCDEP to ask NAS/NRC to convene an Expert Panel has been changed to reflect that NYSDOH and the City have already requested NRC to convene and manage a panel.
33. In the CTC Program section, a requirement has been added for NYCDEP to submit a summary report on the alternatives that have been reviewed for Catskill turbidity control, including estimated costs, benefits, and drawbacks.
34. A task has been added to the scope of work for the Expert Panel that they will review the City’s existing studies on the potential effects of climate change on the City’s water supply, and how these changes might impact the City’s use of OST.
35. A milestone has been added to the Catskill Aqueduct Stop Shutter project: Project out to bid by 10/31/14. The due date for completion has been moved to 12/31/16 to mitigate the risks associated with the aqueduct shutdowns that will be required to complete the work.
36. The due date for the annual meeting of the Riparian Buffer Working Group has been changed from November 30<sup>th</sup> to January 30<sup>th</sup> of each year.

## **NYSDOH Response to Comments**

### **General FAD Comments**

Comment: A number of comments were received that supported NYC's Watershed Protection Programs, noting successes in protecting the drinking water supply for NYC, while benefiting watershed communities and the environment.

Response: *NYSDOH acknowledges these comments.*

Comment: Commenters suggested that the FAD process and NYC's activities pursuant to the FAD should be more transparent to the public. For example, FAD reports and permits should be posted on the internet, there should be outreach to elected officials and communities on FAD program activities, and technical working groups should be formed to inform programs and projects.

Response: *NYSDOH believes that the City has a strong record of making information on its FAD activities available to the public. For example, the City posts reports that are required by the FAD, as well as other NYC Watershed information, on the NYCDEP website ([http://www.nyc.gov/html/dep/html/drinking\\_water/index.shtml](http://www.nyc.gov/html/dep/html/drinking_water/index.shtml)). The Catskill Watershed Corporation's website (<http://www.cwconline.org/>), the Stream Management Program websites (<http://ashokanstreams.org/>; <http://www.catskillstreams.org/>; <http://www.gcswcd.com/swp/smp>), and the Watershed Agriculture Council website (<http://www.nycwatershed.org/>) are also excellent sources for additional information on FAD-related activities, such as the Septic Repair Program, the Stormwater Program, stream management projects, the Catskill Stream Buffer Initiative, and agricultural programs. The City has offered workshops, seminars, informational brochures, and training to the public through activities conducted pursuant to their FAD Education and Outreach Program. The City has continued working, in the spirit of the 1997 Memorandum of Agreement, to bring key stakeholders together for input when developing new FAD or FAD-related programs. Watershed community elected officials, the Coalition of Watershed Towns, the Catskill Watershed Corporation, environmental groups, and other watershed protection partners have all participated in the development and implementation of programs that have the potential to impact watershed communities. The City's Water Supply Permit, the Riparian Buffer Program, the Local Flood Hazard Mitigation Program, the Flood Buy-Out Program, and the Stream Management Program are examples of these collaborative efforts.*

*With regard to the public's concerns about the transparency of the FAD process, NYSDOH is required to comply with State and federal rules related to regulatory processes, including providing opportunities for public review and comment, and providing responses to comments. The process guiding the development and issuance of the FAD is not defined in statute, but the process that has been followed in the past by USEPA is described in the introduction to the 2007 FAD. As the current primacy agency, NYSDOH has been and will follow the procedures described in the 2007 FAD for developing and issuing the Mid-Term Revisions to the FAD. In an effort to*

*further open the process of FAD regulation to public view, starting in 2014 NYSDOH's comments on FAD deliverables and the City's responses will be posted on the NYCDEP's website.*

Comment: A number of stakeholders requested that a public hearing be held on the draft mid-term revisions to the FAD.

Response: *In developing the Mid-Term Revisions to the 2007 FAD, NYSDOH has followed the procedures used by USEPA for developing past FADs. These procedures are not prescribed in Public Health Law, but are described in the introduction to the 2007 FAD. Four meetings were held in Delhi, Highmount, Somers, and NYC to receive public input during development of FAD program requirements. A 45-day public comment period was provided once the draft revisions were released for public review. Upon requests from the public, this period was extended by 30 days. NYSDOH feels that appropriate procedures were followed and that sufficient opportunities were provided for public input on the FAD.*

Comment: All changes to watershed rules and regulations should be preceded by public outreach, including summary of provisions, statement of purpose, and anticipated impacts to businesses and residents prior to a public hearing.

Response: *All changes to NYC's Watershed Rules and Regulations must undergo processes defined by the City Administrative Procedures Act (CAPA) and the State Administrative Procedures Act (SAPA) prior to being adopted. CAPA and SAPA require that documentation be prepared that summarizes the substance of the changes, the reasons for the changes, and the potential impacts of the changes on rural areas, small businesses, local governments, jobs, and job opportunities. This documentation is available for public review. A public comment period is provided before the rules and regulations can be amended. Prior to the most recent changes made to NYC's Watershed Rules and Regulations, amended in 2010, public hearings were held in Belleayre, Delhi, Onteora, Carmel, and Yorktown. In addition, pursuant to the State Public Health Law, the rules and regulations must be published in at least one newspaper in each watershed county, at least once per week for two consecutive weeks. NYC's 2010 amended Watershed Rules and Regulations were published in accordance with this requirement.*

Comment: A number of stakeholders commented that a "Blue Ribbon" panel should be convened to review the adequacy and efficacy of the City's watershed protection programs. Additional metrics should be developed to measure the effectiveness of Watershed protection programs, for example, evaluating phosphorus levels in agricultural soils.

Response: *The National Research Council (a sub-unit of the National Academy of Sciences and the National Academy of Engineering) published a comprehensive report in 2000 on New York City's overall watershed management strategy. Now that the City's strategy has been implemented for more than fifteen years, NYSDOH agrees that this is an appropriate time to seek input from national experts about the effectiveness of the City's program and additional strategies that could be employed to enhance watershed protection moving forward. To initiate this process, milestones have been added to the Revised FAD that require the City to meet with Watershed stakeholders, then develop a scope of work for a panel of experts who will review the City's Watershed protection programs. In addition, the City will begin the contracting process to fund this review.*

*The scope of work for the expert panel will include assessing the adequacy of the City's watershed protection programs and providing recommendations as necessary to improve the City's program. Recommendations for appropriate metrics for assessing the effectiveness of Watershed protection programs could be one goal of this study. Milestones for the study have been included in the Revised 2007 FAD to ensure that the findings are available in time to help inform a mid-term (~2021) review of the next FAD.*

Comment: A couple of commenters suggested that NYSDOH is not providing the necessary resources/staff to adequately enforce the Surface Water Treatment Rule (SWTR) and to independently study the efficacy of FAD programs.

*Response: NYSDOH believes it has an adequate number of well-qualified staff to enforce the provisions of the SWTR. Regulatory oversight of the NYC Watershed is the primary function of six research scientists in the NYC Watershed Section of the NYSDOH's Bureau of Water Supply Protection (BWSP). Assistance with interpretation of regulations and enforcement is provided by BWSP's Compliance Section, and review of engineering plans for the City's water system treatment and infrastructure projects is provided by the BWSP's Design Section, with assistance from the New York City Department of Health and Mental Hygiene. Additional legal consultation and enforcement resources are available from the Department's Division of Legal Affairs. In addition, NYSDOH consults with USEPA as necessary to ensure that USEPA is in concurrence with NYSDOH decisions. Additional oversight of wastewater, septic, storm water, stream management, wetlands, and other non-point source pollution issues is provided by the NYSDEC. Together these staff perform annual and other periodic program-related inspections of the watershed and water system facilities, review and comment on FAD deliverables and other reports, participate in FAD program meetings, and perform surveillance sampling.*

*NYSDOH is confident that all the resources listed above enable us to provide adequate and independent oversight of the City's compliance with the SWTR. Overall, the effectiveness of the City's Watershed Protection Plan is demonstrated by the continued ability of the City's water supply to meet State and federal water quality criteria. However, NYSDOH recognizes that the City's Watershed Protection Plan is broad and comprehensive in its approach. Understanding the effectiveness of any one component of the Plan and its contribution to safe drinking water is complex. In consideration of this, as noted in the previous response, an independent scientific review of the effectiveness of FAD programs will be initiated as a new requirement in this FAD revision. NYSDOH anticipates that this review will help supplement and enhance the ongoing oversight and review provided by NYSDOH and its regulatory partners.*

Comment: It is inappropriate to extend approval authority of FAD programs to NYSDEC. References to NYSDEC approval should be removed from the Community Wastewater Management and Watershed Agricultural Program (WAP) sections of the FAD.

*Response: As drafted, the Mid-Term Revisions to the 2007 FAD do not require NYSDEC approval for WAP deliverables. For the Community Wastewater Management Program, NYSDOH believes that NYSDEC's involvement is appropriate. Community wastewater treatment falls under NYSDEC's programmatic jurisdiction. Obtaining NYSDEC approval for the study done to determine the need for a Community Wastewater Management system in the Hamlet of Shokan will*

*ensure that the study provides the background information NYSDEC requires to move forward with review and approval of a wastewater management system, if such a system is required. This FAD language will not be changed.*

Comment: In the General Program Requirement Changes narrative, reference to reporting on the New Infrastructure Program (NIP) should be deleted from the text. NIP has been completed and no additional reporting on the Program is required.

Response: *Comment acknowledged. NIP references have been removed from the FAD narrative.*

Comment: Several comments were received regarding the requirement to perform a State Environmental Quality Review Act (SEQRA) review on the FAD. Commenters stated that the SEQRA review should include the impacts of the use of the Ashokan Release Channel, and should be coordinated with SEQR being done by NYSDEC for the Catalum SPDES permit modification. One commenter stated that NYCDEP should not be the lead agency for performing the SEQR on the FAD.

Response: *A SEQRA review has been conducted on NYC's Long-Term Watershed Protection Plan ("Long-Term Plan") to assess the potential environmental impacts of the watershed protection program that is being required by the Surface Water Treatment Rule as a condition of filtration avoidance. Prior to this, the City's Long-Term Plan, which was submitted to NYSDOH in December 2011, was amended to include all new program elements that have been required by the Final Mid-Term Revisions to the 2007 FAD. In this way, the program commitments described in the Long-Term Plan exactly mirror those in the Final Revised FAD. The focus of the SEQR done on the Long-Term Plan was to identify any potential environmental impacts that might result from the enactment of a watershed protection plan in the NYC Watershed. This is a broad review, and does not include investigation of individual projects that might be implemented pursuant to the FAD. Environmental review of individual projects will be completed as these projects are developed and as required by Environmental Conservation Law. NYCDEP requested to be the Lead Agency for the SEQRA review of their Long-Term Plan. As an involved agency, NYSDOH concurred with this request as we believe that the City is the agency that has the most knowledge of its Long-Term Plan and potential impacts of that plan. The Lead Agency for SEQRA review performed on any individual project conducted pursuant to the FAD will be determined on a case-by-case basis.*

*Separately, NYSDEC will serve as lead agency under SEQRA for an environmental review of the proposed modifications of the City's Catalum SPDES Permit. The Environmental Impact Statement (EIS) for those proposed modifications will assess, among other things, the potential impacts of the City's use of the Ashokan Release Channel. The action that has triggered this SEQRA review is different, and has independent utility, from that of revising the FAD; however, NYSDOH and NYSDEC recognize that activities conducted by the City to comply with FAD requirements may also help inform the EIS being conducted for the Catalum SPDES permit modification. In particular, under the Catskill Turbidity Control Program, the Revised 2007 FAD requires that the City fund an Expert Panel, which will be convened by the National Academy of Sciences and which will provide an independent review of the City's use of the Operations Support Tool (OST). This includes use of the Ashokan Release Channel. This Expert Panel can also serve*

*an important role in reviewing the City's use of OST to assess alternatives for Catskill Turbidity Control as part of the EIS. In order to make use of this resource, NYSDOH has expanded the charge for the Expert Panel in the Revised FAD and has included due dates in the FAD with the goal of aligning the FAD and EIS timelines. NYSDOH and NYSDEC are working together, with input from watershed and lower Esopus Creek stakeholders, to address Catskill Turbidity Control within the watershed and to identify any potential adverse environmental impacts of the City's efforts to minimize turbidity in its water supply and, to the extent such impacts are identified, provide appropriate mitigation.*

### **SWTR Avoidance Criteria Requirements**

No comments were received on this section of the FAD.

### **Environmental Infrastructure Programs**

#### **FAD Section 3.1 – Septic and Sewer Programs**

Comment: In the Septic Maintenance Program narrative, the text states that the “program funds 50% of the cost for septic pump-outs for homeowners in the west-of-Hudson watershed who installed or replaced septic systems after January 1, 1997.” Based on the CWC Program Rules, the correct eligibility date is November 1, 1995.

Response: *Comment acknowledged. This date has been corrected in the Revised FAD.*

Comment: Under the activities listed for the Septic Remediation and Replacement Program, the date for the CWC program rules should be updated to July 2, 2013.

Response: *Comment acknowledged. The date for the CWC program rules has been updated in the Revised FAD.*

Comment: Provide within FAD Section 3.1 a one-time septic system repair/upgrade to assist in bringing large water users into compliance and help keep these critical businesses in the community. Criteria for funding could require the business to be outside the 1% annual floodplain and priorities could be given to those that have been issued a Notice of Violation from NYCDEP for a failing system.

Response: *The City has addressed and continues to address potential contamination from wastewater from businesses through the CWC Small Business Septic System Rehabilitation and Replacement Program and the City's Wastewater Treatment Plant Upgrade Program. The highest priority for these programs has been wastewater sources that pose the greatest risk to water quality, i.e., those that discharge near or into waterways. The CWC Small Business Septic System Rehabilitation and Replacement Program currently helps pay for repair and replacement of failed septic systems serving “small” businesses in the Catskill/Delaware Watershed. For the purposes of this program “small” businesses are those that employ 100 people or fewer. This program reimburses business owners 75% of the cost of the repair/replacement, up to a maximum of \$40,000. Eligible businesses must be 100 feet or less from a watercourse or 500 feet or less from a reservoir, or within the 60-day travel time priority zone. The Wastewater Treatment Plant*



*Upgrade Program funded the upgrade of wastewater treatment systems for a number of businesses in the watershed, bringing them into compliance with the City's Watershed Rules and Regulations.*

### FAD Section 3.2 - New Sewage Treatment Infrastructure Program

Comment: A number of comments were received related to the fact that a wastewater treatment facility was not constructed for Phoenicia. It was suggested that this was a missed opportunity to improve water quality. Commenters stated that: the FAD should require the City to revisit the funding and incentives that have been offered through their wastewater treatment infrastructure program; the FAD should require the City to revisit sewer funding for Phoenicia if a central sewer system is a recommendation that comes out of the NY Rising program efforts; and, should a community wastewater system be built in Phoenicia, the NYCDEP should pay for operations and upkeep.

*Response: The New Sewage Treatment Infrastructure Program has addressed the wastewater management needs of a number of communities in the Watershed to the benefit of community members, businesses, and water quality. Through this program, the City made a considerable effort to support a wastewater management project for the Hamlet of Phoenicia. In the end, however, there was not sufficient local support for the project to continue these efforts. NYSDOH still considers that the implementation of a wastewater management system in Phoenicia could provide valuable water quality benefits. If in the future it becomes apparent that there is community support for a wastewater management system in Phoenicia as prescribed by the current program, NYSDOH may ask the City to reconsider pursuing such a project. Language indicating that a wastewater management solution may be considered for Phoenicia in the future has been added to the introductory narrative of the Revised FAD. To be consistent with the terms of the New Sewage Treatment Infrastructure program under the 1997 Memorandum of Agreement, if a wastewater system were constructed for Phoenicia, operations and maintenance of that system would be the responsibility of the Hamlet of Phoenicia.*

Comment: The Catskill Watershed Corporation (CWC) should be commended for providing assistance during the Phoenicia negotiation process.

*Response: NYSDOH acknowledges this comment and commends the CWC for its efforts to bring resolution to the quest for a wastewater management solution for Phoenicia. Although in the end there was not sufficient community support to pursue a project, the CWC provided a forum for discussion among the parties, demonstrating the importance of its role in encouraging the economic development of Watershed Communities while seeking to protect water quality.*

### FAD Section 3.3 - Community Wastewater Management Program

Comment: The dates applicable for study, design, and construction of all listed CWMP projects (Shandaken, West Conesville, Claryville, Halcottsville, and New Kingston) should be extended by one year.

*Response: Comment acknowledged. The applicable due dates have been extended by one year.*

### FAD Section 3.5 – Stormwater Programs

Comment: Funding for construction of nine stormwater retrofit projects per year should be separate from funding for community wastewater stormwater projects. The Stormwater Retrofit program should be available for traditional redevelopment projects, in addition to CWMP projects.

Response: *Funding for the nine projects is in addition to funding already committed to the program to cover retrofit projects that are installed in coordination with Community Wastewater Management projects. The FAD language has been clarified.*

Comment: Stakeholders commented that continued investment in the Stormwater Program is important, and that adequate funding for this program should be ensured by the FAD.

Response: *NYSDOH agrees that the Stormwater Program is an important component of NYC's watershed protection plan. The Revised FAD continues to require the City to fund the incremental costs of complying with the stormwater provisions of NYC's Watershed Rules and Regulations. In addition, the revisions have added a requirement that the City provide funding necessary to construct nine stormwater retrofit projects per year, starting in 2013. This number is based on historical program activity and will ensure that adequate funding is in place to address stormwater projects, should there be a need, for the remaining FAD term. As noted in the previous comment response, funding for the nine projects is in addition to funding already committed to the program to cover retrofit projects that are installed in coordination with Community Wastewater Management projects.*

Comment: Financing infrastructure investments, such as stormwater treatments for new development, would be needed if flood relocation projects are to be successful. Funds for new development projects associated with relocation plans recommended in the Local Flood Hazard Mitigation Analysis (LFHMA) should not be removed from the west-of-Hudson Future Stormwater Controls program. Funds for infrastructure should be allocated from the LFHMP, as well as many other sources. The ability to leverage other sources should factor into supporting a relocation plan.

Response: *NYSDOH supports combined funding from LFHMA, the Future Stormwater Controls program, and other funding sources for relocation projects. While the program rules for the LFHMP have not yet been finalized, consideration is being given to placing priority on projects that leverage outside funding.*

Comment: Comments suggested that a dedicated Stormwater position or consultant be funded to provide technical assistance to landowners, contractors, local communities and highway departments for stormwater projects, including roadside ditch maintenance.

Response: *The Revised FAD ensures that funding will continue to adequately support an engineering position at the Catskill Watershed Corporation. The function of this position is to assist applicants who are undertaking regulated activities to comply with the stormwater provisions in the NYC Watershed Rules and Regulations. In addition, educational workshops, including stormwater management topics, are conducted through the City's education and*

*outreach program. Target audiences for these workshops include, among others, landowners, highway departments, local officials, loggers, and farmers. NYSDOH feels that FAD provisions are adequate to ensure that stormwater regulation and management questions can be addressed.*

Comment: The NYC water supply is in danger from increased erosion due to changes in weather patterns. Because of this, the Belleayre Ski Center and the Belleayre Resort must not develop the full-build option, and instead build a smaller expansion.

Response: *Planning for the Belleayre Resort project has been extensively reviewed and numerous changes have been made to date to address environmental concerns. A SDEIS was released April 2013, and the review process continues. While there is nothing in the current plan for the project that warrants specific new involvement in the Second Five Year Period of the 2007 FAD, appropriate agencies (i.e., NYCDEP, NYSDEC, and NYSDOH) will remain involved in reviewing and regulating this project (e.g. through NYC Watershed Rules and Regulations, SPDES permit requirements, stormwater regulations, etc.) as it progresses.*

Comment: The Revised FAD should require the City to take into account more recent precipitation data and climate change in watershed evaluations and planning for stormwater management, by using the 2011 Northeast Regional Climate Center hydrologic data and rainfall distributions.

Response: *It is NYSDOH's understanding that the NYSDEC may be updating its Stormwater Design Manual. At such time, NYSDEC will also likely be updating the precipitation data to reflect the most recent data reported by the National Oceanic and Atmospheric Administration (NOAA) that should be used to design associated stormwater practices. Once updated, it is NYSDOH's expectation that the City will in turn initiate any regulatory amendments necessary to incorporate this updated information to ensure stormwater practices in the NYC Watershed are designed and sized appropriately.*

#### FAD Section 4.1 – Waterfowl Management Program

Comment: Planting trees and shrubs is a known deterrent for Canada Geese and other waterfowl. The FAD language should include a strategy of planting natural vegetation around reservoirs to discourage waterfowl from settling near reservoirs.

Response: *Geese have been documented by DEP as the only species of concern with respect to maintained lawns in and around New York City reservoirs. Most of the open grassy-type habitats that exist around the New York City reservoirs include reservoir dams, where the planting of trees and shrubs is prohibited for compliance with dam maintenance (Owners Guidance Manual for the Inspection and Maintenance of Dams in New York State, Chapter 7, Maintenance Guidelines, NYSDEC, June 1987). DEP converted maintained lawn to a natural meadow in the early 1990s at Kensico, but it proved to be completely ineffective as the geese continued to nest, forage, and loaf in the tall grasses and forbs and were oftentimes observed walking as a group through wooded areas near Shaft 18. In recent years, the United States Department of Agriculture, Wildlife Services has been contracted by Westchester County Airport to depredate Canada Geese within a 7-mile radius around the airport (which includes all of Kensico Reservoir), which has resulted in a reduction of nesting, foraging, and loafing geese.*

## FAD Section 4.2 – Land Acquisition Program

Comment: The Revised FAD should include how much land has been acquired, or is under contract, since the January 1, 2010 start date for authorization for acquisition of 105,043 acres in the west-of-Hudson watershed under the 2010 Water Supply Permit (WSP). This figure is necessary to evaluate the need and reasonableness of the new solicitation requirement and the additional funds for the Land Acquisition account.

Response: *According to the City's reports, the LAP has acquired approximately 27,800 acres in fee title, conservation easements and watershed agricultural easements since the beginning of 2010 and up to March 1, 2014. Almost half that amount, 11,536 acres, was acquired in 2010 alone due to a favorable real estate market. In addition, during 2010-2012, the City exceeded the required minimum solicitation rate of 50,000 acres per year. More recent program activity figures reflect a slower market. However, even if the highest rate of acquisition achieved during the City's peak period of acquisition (about 10% of the acres solicited during 2010 were purchased) is projected forward over the remaining 11 years of the WSP term, the City would be predicted to acquire about 81,578 acres from 2010 to 2025, which is less than the 105,043 acres authorized by the WSP.*

Comment: A couple of commenters suggested that the solicitation rate and funding for the Land Acquisition Program (LAP) should be reduced from the 250,000 acres in 5 years/\$50 million that is in the Draft Revised FAD. For example, the solicitation rate should be reduced to 25,000 acres/year (or 100,000 in 5 years) and funding reduced to \$20 or \$25 million. A number of comments stated that funding should be shifted from the LAP to other programs such as Stream Management, the Local Flood Hazard Mitigation Program (LFHMP), infrastructure projects, and to mitigate reservoir releases.

Response: *In general, NYSDOH believes that the City's Land Acquisition Program (LAP) is an important component of their watershed protection plan and that the solicitation goals and funding levels required in the Revised FAD will continue to support a successful program. Case studies and scientific investigations (both within the NYC watershed and elsewhere) have demonstrated that the protection of watershed lands is of primary importance to safeguard water quality, and land acquisition has been shown to be a key element in watershed protection programs. For example, the American Water Works Association (1991) published results of a watershed management study that stated: "[t]he most effective watershed control measures, according to water managers, were obtaining land ownership in the watershed and restricting use of reservoirs." The National Research Council supported this concept in its report: "Watershed Management for Potable Water Supply: Assessing the New York City Strategy" (2000). Mehaffey et al. (2005) showed strong relationship between land cover and water quality indicators in the NYC watershed. Furthermore, Anderson et al. (2012) demonstrated that parcelization of privately owned forest lands led to new development and increases in impervious areas (which are known to degrade water quality) without changing the forested land cover classification.*

*The Revised FAD provides for a solicitation rate of 300,000 acres in 6 years (i.e., 50,000 acres/year) and additional funding for the LAP of \$50 million. Fifty thousand acres per year has*

*been the minimum solicitation rate required by the 2007 FAD. The City has demonstrated that maintaining at least this level of activity in the LAP has provided the City with adequate opportunity to acquire parcels that are important to water quality protection. In 2012, NYSDOH and USEPA requested that the City assess the status of the LAP and the potential need for any additional funds for the program. The requirement to commit an additional \$50 million to the program was based on this assessment and was determined to be adequate to meet program goals. NYSDOH believes that land acquisition is one of the most effective ways to ensure watershed protection; maintaining the solicitation rate required by the 2007 FAD will support the effectiveness of the LAP, while recognizing the limits of the City's Water Supply Permit. Funding for FAD programs other than the LAP is determined based on respective program requirements and is reviewed annually by NYSDOH/USEPA and NYSDEC.*

Comment: Several comments were submitted in support of the LAP, noting that land acquisition is the only true way to ensure land protection. Commenters suggested that funding for the program be increased, and that the FAD should direct DEP to solicit and resolicit aggressively, to assess if LAP staffing levels are adequate, and to focus on acquiring land in the Catskills and Kensico Reservoir basin.

Response: *NYSDOH agrees that land acquisition is an effective and important tool for watershed protection. Consequently, the Revised FAD is requiring the City to maintain at least the level of solicitation that has been required in the First Five-Year Period of the 2007 FAD and to commit the funds required to support that level of solicitation. Staffing levels for the LAP, and for all FAD programs, are reviewed annually by the FAD regulators, and have been determined to be adequate. While the City's participation in the FEMA/SOEM Flood Buy-Out (FBO) program and implementation of the City's new FBO Program may be somewhat more time intensive for LAP staff, this has been accounted for in the Revised FAD by setting the City's solicitation goal as a total that may be achieved over the entire Second Five-Year Period, and by allowing the City to take credit for two acres of lands solicited for every acre of FBO or riparian land solicited.*

*The FAD requires the City to submit solicitation plans every two years. While these biennial plans define near-term goals, the City's long-term goals for the LAP were described in its "Long-Term Land Acquisition Plan 2012-2022", which was submitted in September 2009. The long-term plan focuses on soliciting in the reservoir basins that have less than 40% of their land protected (i.e., Schoharie, Pepacton, and Cannonsville). At the time of that report, 65% of the Ashokan basin and 41% of the Kensico basin were protected by the City, State, or other entities. Since 2009, the level of protection in the focus basins has been increased from 34.0% to 37.4%. While the focus of the LAP in recent years has been on the less-protected basins, the City has continued to seek acquisition of properties in other basins, such as Kensico and Ashokan, that are important to water quality protection. For example, two conservation easements covering 114 acres were secured in the Kensico basin since January 2010.*

*NYSDOH is satisfied with the performance of the LAP, and will continue to review the program's direction and accomplishments through the biennial solicitation plans and semi-annual reports required by the FAD. In addition, the Due Date for the requirement for the City to consult with regulators regarding the adequacy of LAP funding has been changed from "As needed" to "Annually" in the Revised FAD.*

Comment: Comments were received suggesting that the LAP should place additional focus on acquiring riparian parcels, floodplains, and critical habitat and should be targeted at parcels that provide higher water quality, volume and flow benefits.

Response: *NYSDOH agrees that these objectives should be important focuses for the LAP and has included new requirements in the Revised FAD that address these objectives. The Revised FAD requires that the City implement the following new initiatives: the Pilot Riparian Buffer Acquisition Program (\$5 million), participation in FEMA/SOEM's Flood Buy-Out (FBO) Program (provide 25% matching funds), the City-funded FBO Program (\$15 million), and the Local Flood Hazard Mitigation Program (LFHMP). Functions of the LFHMP will be to identify features that impede flood water flow through communities and raise flood water elevations, develop plans to reduce flood levels, and provide funding to help implement those plans. The City-funded FBO program will provide a tool for the buy-out of properties that are prone to flooding and removal of structures on those properties that may be contributing to elevated flood levels elsewhere. This program will also work to remove potential sources of pollution from floodplain areas.*

*The City also continues to improve the effectiveness of its LAP in identifying properties that may be particularly important to water quality protection. For example, in 2013, the City coordinated stream, waterbody, and slope data collected by Light Detection and Ranging (LiDAR) to construct Geographic Information System maps that could be used to more accurately pinpoint properties of significant value. This information will be used to rank properties and to direct the activities of the LAP towards obtaining lands that are important to water quality protection.*

Comment: Require that DEP consult with regulators annually on the need for additional LAP funding (e.g., within 60 days of submission of annual FAD report).

Response: *The Draft Revised FAD required that the City consult with NYSDOH/USEPA and NYSDEC "as needed" regarding the potential need for additional monies for the LAP. NYSDOH agrees that meeting annually with the City to discuss the status of funding for the program could be useful and will add this requirement to the Revised FAD. The appropriate timing for the meeting will be discussed with NYCDEP.*

Comment: The FAD should clarify that any money left unused from the Forest Easement Program must be returned to the LAP for use for land acquisition and easements, not general funds.

Response: *The FAD language under the Activity section of the Land Acquisition Program will be clarified as follows: "If a determination is made by the NYSDOH/USEPA, NYSDEC, and the City not to continue the program, all unused funds, with any earnings thereon, are to be returned to the City to be deposited in the LAP-segregated account for use by the LAP."*

Comment: The FAD should require the City to do an assessment of land use trends to evaluate future risks to priority lands (e.g., filling/development of wetlands/floodplains and creation of subdivisions).

Response: *A new requirement for the City in the Revised FAD is to complete a small-scale Light Detection and Ranging (LiDAR) wetland mapping project, which may be used to improve National Wetlands Inventory mapping in the NYC Watershed. The information obtained from this project may better enable the City to do an assessment of land use trends, in particular land use impacts on wetlands. NYSDOH will consider asking the City to perform the suggested assessment as a follow up to this project. An important consideration when assessing changes in land use, is what impacts those changes may have on water quality. As required by the FAD, the City's Multi-tiered Water Quality Modeling Program has applied the City's modeling capabilities to evaluate the effectiveness of watershed management programs. Previous work, for example as reported in the NYCDEP's Watershed Water Quality Annual Reports for 2010 and 2011, has examined the potential impact of watershed land use changes on water quality.*

*Another new requirement in the Revised FAD is for the City to initiate steps for a study to be conducted by nationally-recognized experts in watershed protection-related sciences, which would serve as an independent review of the City's watershed protection program. The study will be conducted during the 2017 FAD period. In preparation, a scope of work for the panel will be developed during this current FAD period. An assessment of land use trends in the watershed may be an appropriate item to include in the scope of work for the study group.*

Comment: There are two due dates listed in the activities section of the LAP that are incorrect. The due date to "Submit solicitation plans for each two-year period" should read "Biennially, beginning October 2013". The due date to "Meet with NYSDOH/USEPA and NYSDEC to review the status of the Farm CE Program" should read "Biennially, beginning December 2013".

Response: *Comment acknowledged – these corrections have been made.*

Comment: A number of comments were received expressing support for the City's participation in the FEMA floodplain buy-out (FBO) program and the new FAD requirement for a City-funded FBO program.

Response: *In the wake of Tropical Storms Irene and Lee, the City was very responsive to assisting Watershed residents whose homes were damaged by flooding and who needed assistance to move out of harm's way. While the City's participation in FEMA's program and the City-funded FBO program are included as requirements in the Revised FAD, the City had already committed to providing this assistance prior to this revision. NYSDOH commends the City for its proactive participation in these programs, which help maintain the economic vitality of the Watershed while benefiting water supply protection.*

Comment: The new City-funded Flood Buy-Out (FBO) Program will require a modification of the City's Water Supply Permit (WSP).

Response: *This is correct - the WSP will need to be modified in order to implement the new FBO program. In order to make this clear, a requirement has been added to the Revised FAD that the City must request from NYSDEC a modification of the WSP prior to conducting the City-funded FBO Program.*

Comment: Two-for-one credit should not be given for solicitation of Riparian and Floodplain Buy-Out acres. This artificially lowers the total acreage required to be solicited by the City.

Response: *NYSDOH feels that providing the two-for-one credit appropriately acknowledges the additional staff time spent relative to acres acquired that the City has experienced is required to process these smaller, floodplain buy-out (FBO) properties. While the City agrees that acquisition of these properties can be highly important for water quality protection, the time intensive nature of these acquisitions can serve as a disincentive as the City strives to meet its solicitation goals. Allowing this additional credit reduces the possible disincentive to pursue these properties. In addition, although the potential water quality benefits of protecting these properties is high, the actual number of acres of FBO properties that are anticipated to be solicited is a small percentage of the 300,000 acres required to be solicited over the six-year period from 2012-2017.*

Comment: The City-funded FBO program should be independently well-funded and not draw from the base Land Acquisition Program funding. \$10 million should be added to this program.

Response: *The Revised FAD requires the City to allocate \$15 million for the City-funded FBO program. Since this is a new program, funding for this program could not be based on past records. Absent this information, funding for the program was based on the estimated value of properties that had initially applied for FEMA's FBO program after Tropical Storms Irene and Lee, but in the end did not participate in the program. NYSDOH feels that funding for this program is at an adequate level for the remaining period of this FAD, with the assurance that LAP general funds will be available to fund this program should a shortfall be determined. A requirement has been added to the Revised FAD that NYSDOH/USEPA and NYSDEC will review annually, or sooner if necessary, the adequacy of funding for this program. Funding needs for this program will also be re-evaluated, and adjusted as necessary, for the next FAD term.*

Comment: Support was expressed for the use of land acquisition funds to supplement the City's Flood Buy-Out (FBO) program. Floodplain development is a significant source of direct contamination to adjacent waterways and also prevents the creation of a vegetated buffer that can help filter pollution from runoff or extract it from the water column by supporting healthy aquatic ecosystems.

Response: *Comment noted. A requirement has been added to the Revised FAD that NYSDOH/USEPA and NYSDEC will review annually, or sooner if necessary, the adequacy of funding for this program. Additional funds required to maintain the program will be drawn from the general LAP funds.*

Comment: FAD language should be clarified to state that flood hazard mitigation achieved through the FBO Program will be accomplished by protecting the land in a natural state, not by using structures that will redirect or channelize flood flows.

Response: *Comment noted. The language describing the FBO Program has been modified to make clear that purchased properties will have existing structures and potential sources of water contamination removed and will be maintained in accordance with local flood hazard mitigation goals.*



Comment: The FBO program should complement the Local Flood Hazard Mitigation Program (LFHMP), not be separate, and should require community concurrence.

Response: *A program plan for the City-funded FBO program is being developed in consultation with Watershed stakeholders, including the Stream Management Program (SMP) partners and the Catskill Watershed Corporation (CWC). The SMP and the CWC will be responsible for implementing components of the LFHMP. While the FBO program plan has not yet been finalized, stakeholders are considering how these two programs can complement one another. In addition, the City has expressed the belief, and there appears to be stakeholder agreement, that participation in the FBO program should require community concurrence.*

Comment: Development of the program rules for the City-funded Flood Buyout (FBO) program should be done in conjunction with those that are administering the current FEMA program and facilitating the Local Flood Hazard Mitigation Analyses.

Response: *A program plan for the City-funded FBO program is being developed in consultation with Watershed stakeholders, including County representatives who have been involved with the FEMA FBO program, and the Stream Management Program partners and Catskill Watershed Corporation who will be administering the LFHMP. NYSDOH commends the City for bringing together the key stakeholders who will lend their experience and perspectives to create a complementary suite of programs that can effectively and efficiently address both flood hazard mitigation and water supply protection.*

Comment: The focus of the FBO Program should be on the 500-year floodplain instead of limited to the 100-year floodplain. Lands purchased with these funds should be restored to a forested buffer.

Response: *A program plan for the City-funded FBO program is currently being developed in consultation with Watershed stakeholders, the Stream Management Program partners, the Catskill Watershed Corporation, and FAD regulators. While not yet finalized, under the proposed program plan, properties that are identified by a Local Flood Analysis would be eligible for the FBO program. Criteria for eligibility would not be focused on whether the property was in the 100- or 500-year flood plain, but whether acquisition of the property, including removal of structures and integration of the property into the flood plain, could provide a meaningful reduction in flood elevations and protection of water quality. Purchased properties would be restricted from future development, and ongoing maintenance of the properties will be done in accordance with local flood hazard mitigation goals.*

Comment: The FAD should provide more detail on the specifics of the City-funded FBO program and include more milestones.

Response: *Details (i.e. program plans) for FAD programs are generally not specified in the FAD, but are developed by the City in consultation with their program partners. This practice avoids the risk of the FAD being overly restrictive as to how a program is implemented, and ensures that stakeholder input is incorporated. The FAD provides a due date for development of a program*

*plan. Beyond that date, implementation of the program may rely on the pace of implementation of the LFHMP, so setting additional independent FAD milestones for implementation of the program may not be meaningful.*

Comment: The State should provide an additional 5-10% funding to the City FBO program to incentivize prospective landowners to participate in the program.

*Response: State regulators and the City recognize that the success of a local flood hazard mitigation plan may rely heavily on the ability to buy-out certain floodplain properties and remove the structures from those properties. In some cases, incentives may be needed to encourage participation in the program in order to carry out a flood mitigation plan. This issue is being considered as the plans for this program are being developed.*

Comment: The following footnote appears on page 9: “A recently announced State program may cover a portion of these costs. The City is committed to providing necessary funding regardless of the State Contribution.” It is recommended that the second sentence be modified for clarity as such: “Regardless of the State contribution, the City is committed to providing necessary funding to ensure that the land portion of the purchase price and all acquisition-related soft costs are covered.”

*Response: Comment acknowledged – the second sentence has been modified as suggested.*

#### FAD Section 4.3 – Land Management

Comment: In order to determine if the water supply is adequately protected from the risk of introduction of invasive species from recreational boating, the FAD should require an evaluation of the rate of compliance with the steam cleaning requirement for boats participating in the recreational boating program.

*Response: The NYCDEP Police currently keep records of violations committed by recreational boaters, including for not following the steam cleaning and permit requirements. Significant violations have been rare to date.*

Comment: The City should be required to construct and maintain public access areas to DEP land, including parking, signage, wildlife viewing platforms, and ADA fishing platforms on a given number (minimum of 2) land acquisitions in each of the 6 reservoir basins in the next 5 years. Selection of areas would involve community input and recommendations from Stream Management Plans, Recreational Access plans, or other studies.

*Response: The City does much to foster public access to their lands within the context of managing their holdings for the primary goals of water quality and public health protection. For example, when new lands are acquired, historical and proposed recreational opportunities are reviewed by the appropriate Sporting Advisory Committee and local communities in relation to features of the land and proximity to public and private lands. Also, the City convened a variety of regulators and stakeholders to develop and implement the new recreational boating program. This effort included: advertising the program, promoting an associated triathlon, creating new*

*launching facilities, and the creation of scenic vistas. These activities have been accomplished by NYCDEP staff in collaboration with other parties (e.g. NYSDEC, NYSDOT, private contractors, and various other local organizations). The City also continues to reduce the amount of land where an access pass is required while improving the public's ability to obtain these permits online. In the past few years, the City has posted thousands of signs delineating property lines and explaining recreational access opportunities on City lands. Communities may wish to submit applications for additional projects that facilitate public access to City lands (e.g., parking areas and viewing platforms) to the Stream Management Implementation Grant Program (SMIP) or the Catskill Watershed Corporation. These programs will consider the benefits of such projects as well as the concerns of neighboring landowners, wildlife impacts, and water quality protection in reviewing project applications.*

#### FAD Section 4.4 – Watershed Agricultural Program

Comment: NYCDEP should implement a way to make Conservation Reserve Enhancement Program (CREP) easements permanent.

Response: *In the Catskill/Delaware Watershed the majority of CREP contracts are located on marginal pastureland, which usually requires a significant amount of structural Best Management Practices (BMPs) to have successful CREP. If these farmers enroll their CREP lands under a permanent conservation easement that requires them to maintain a vegetated cover on their buffers, they would become ineligible for CREP re-enrollment according to federal program requirements. This could make it difficult and expensive for a farmer to maintain the buffer and all associated BMPs in perpetuity. In lieu of a permanent CREP program, DEP recommends that the Watershed Agriculture Program (WAP) encourage CREP participants to re-enroll their expiring contracts for another 10-15 year term. CREP re-enrollment is a part of the current WAP staff work plan. Alternatively, as recommended by the “Program Development Initiative Report” for the Pilot Riparian Buffer Acquisition Program, permanent protection of CREP parcels may be an option through this program.*

Comment: DEP should develop specific recommendations for how to continue a program similar to CREP in the event that CREP is not reauthorized.

Response: *The Draft Revised FAD had included a requirement that, in the event that CREP was not reauthorized in the federal Farm Bill, the City would develop and submit a report that describes possible alternatives to CREP. The Farm Bill was recently passed and includes funding for CREP. Since the Farm Bill covers a five-year period, the requirement for the City to develop an alternative to CREP was removed from this FAD revision. The need for such a requirement will be reviewed during development of the next FAD.*

Comment: The Coalition of Watershed Towns supports the involvement of NYSDEC in evaluating the status of the WAP.

Response: *NYSDOH frequently consults with USEPA and NYSDEC in reviewing the City's compliance with the FAD, and we value the breadth of experience and knowledge the USEPA and NYSDEC bring to our oversight. This collaboration is recognized throughout the FAD.*

Comment: The requirement that a Whole Farm Plan be developed on a Small Farm to be eligible for CREP slows enrollment of Small Farms into the Program. The NYC Watershed is the only watershed in the nation that requires this provision. Considering that the WAP Small Farms Team develops 6 – 10 plans per year, and that there are approximately 150 farms yet to be planned, enrollment in CREP is held back by the Whole Farm Plan requirement. By removing the Whole Farm Plan requirement for Small Farms, CREP enrollment could be significantly expedited.

Response: *The requirement to have a Whole Farm Plan (WFP) in order to be eligible for CREP is based on a NYC Watershed CREP Memorandum of Understanding (MOU) that is signed by NYCDEP, the NYS Department of Agriculture and Markets, and the US Department of Agriculture's (USDA) Commodity Credit Corporation. Removing this requirement would require a revision to this MOU and concurrence from MOU signatories. The USDA has expressed concern for the cost of implementing CREP Best Management Practices (BMPs) on small farms relative to the water quality benefits that might be achieved. While there are approximately 150 small farms not yet enrolled in the WFP program, NYCDEP reports that the animal units represented by these remaining small farms is only about 4% of the animal units currently covered by the 285 large and small farm WFPs in the Watershed. As such, the overall potential contribution from these remaining small farms may be relatively small. However, NYSDOH acknowledges that a few animals improperly managed may present a risk to water quality, and has encouraged the City to address these potential sources of contamination when identified. The City has reported that when farms that may pose a risk to water quality are observed, efforts are made to offer the assistance of the Watershed Agriculture Program.*

Comment: A couple of comments were received stating the FAD should include funding for the emergency repair of agricultural Best Management Practices (BMPs) that are damaged or destroyed due to storms and flooding.

Response: *After the devastating flooding caused by Tropical Storms Irene and Lee in 2011, the WAP contacted more than 40 Watershed farms to assess impacts, and then followed up with inspections to inventory damages to stream banks and farm BMPs. Working with the local Soil and Water Conservation Districts, the WAP successfully applied for relief funding from the NYS Agricultural and Community Recovery Fund. As a result, 18 farms received \$389,000 in assistance. In addition, one farm received \$23,900 from FEMA and the WAC provided \$9,472 for restoration work on two farms. NYSDOH commends the WAP for their response to these significant storm events. The WAP has demonstrated that, through use of existing program funds and by leveraging other State and federal disaster recovery funds, the program has the capacity to address emergency needs.*

#### FAD Section 4.5 – Watershed Forestry Program

Comment: The number of completed forest management plans adopted by landowners does not necessarily indicate rates of compliance. There may be more valuable ways to evaluate the success of the Watershed Forestry Program, for example: obtain rates of implementation of best management practices and an evaluation from loggers of their effectiveness; review use and

activity of the model forests, analyze rate of conversion from private forest holdings to development; and analyze effectiveness of economic programs.

*Response: Since forests cover more than 75% of land in the Catskill/Delaware watershed, well-managed forests are considered a beneficial land use of the area. Well-maintained forests serve multiple functions: reduce erosion of, and nutrients depletion in, soil; improve ecological integrity of the region, including water quality benefits; provide various recreational opportunities; and support local economic sustainability. Started in 1997 by the nonprofit Watershed Agricultural Council (WAC), the Watershed Forestry Program represents a successful partnership between NYCDEP, the WAC, and the forestry community.*

*Compliance with the requirements of the Watershed Forestry Program and/or evaluation of successful programmatic implementation have been demonstrated in multiple reports, such as: Watershed Forestry Program Evaluation Report Five-Year Implementation Status of Forest Management Plans (January 31, 2011); Implementation of New York City's Watershed Protection Program and Compliance with the 2007 Filtration Avoidance Determination - Status Review of the First Five-Year Period (September 30, 2011); New York City Watershed Forest Management Plan (CAT-374) prepared by USDA Forest Service TEAMS Enterprise Unit for the New York City Department of Environmental Protection (November 10, 2011); and Section 2.3.5 of the City's 2011 Long-Term Watershed Protection Plan (December 2011).*

*The WAC Forestry Program recently completed an evaluation to determine the value Forest Management Plans have added to Watershed Protection. The research determined that a land owner being enrolled in the NYS 480a tax program, and not a landowner with a Forest Management Plan, is the best way to protect water quality in the watershed. The WAC Forestry Program Committee discussed and debated this research, and they decided to make appropriate changes to the program. The committee anticipates shifting the management plan program to focus on 480a by July 2014, and they are beginning the development of a website that will allow all landowners to create their own Forest Management Plan.*

*The City will continue and expand its commitment to the program during the remaining part of the 2007 FAD. As a variety of forestry-related Best Management Practices (BMPs) are being implemented and numerous free samples of BMP technologies continue to be distributed to local loggers, landowners, and foresters, more data become available for evaluation. As required by the Revised 2007 FAD, pertinent updates will be reflected in the annual program reports.*

**Comment:** The activity to provide funding to support a riparian buffer restoration program in east-of-Hudson basins has been incorporated by WAC into their funding and work plan. Therefore, this task should be marked "Complete".

*Response: This task has been marked "Completed" in the Revised FAD.*

#### FAD Section 4.6 – Stream Management Program

**Comment:** The FAD should require a new program that provides communities with expertise to address bank failure and drainage along highways.

*Response: During the remaining term of the 2007 FAD, the City will continue and enhance the existing Stream Management Program, with additional emphasis placed on its education and outreach efforts. Highly trained and broadly experienced NYCDEP staff will provide technical assistance, regular audience-specific workshops, and professional development training in order to educate various targeted groups. Since part of the responsibility of the town and county officials is to oversee maintenance of highway infrastructure in floodplains and at stream crossings, the City and its partner organizations in the west-of-Hudson watershed developed a strategy to offer trainings in streams, floodplain and watershed management techniques specifically to municipal officials. On November 30, 2013, as required by the Revised FAD Section 4.6, the City submitted the Revised FAD deliverable entitled “Training in Practices in Stream, Floodplain, and Watershed Management for Municipal Officials: Plan and Schedule.” Among other things, this document provides a schedule for routine, systematic training to stakeholders which will include information on maintenance practices for roadside ditches.*

**Comment:** A more comprehensive analysis of the durability of structural stream practices (e.g, how do practices perform 10 years after installation) should be included in the FAD.

*Response: As specified in the Revised FAD, Section 4.6, the City is required to submit an annual report on the Stream Management Program, which is due on March 31 for the remainder of the FAD. The report will include general information on the overall progress made, along with specific details regarding the status of each individual stream management project. The report will provide a forum for discussion regarding the durability of various best management practices, including structural components, site specific factors, impact of meteorological events and other topics. In addition, a new requirement for this mid-term revision of the 2007 FAD is for the City to propose a study for monitoring some stream management project sites with a goal of evaluating the efficacy of the projects in reducing turbidity. Durability of a project would be contributing factor to the efficacy of that project. The information from this study and the other work of the program will assist in developing programmatic strategies for the next 2017 FAD.*

**Comment:** The Neversink River in Claryville has changed course due to deposition of rock, gravel, and large woody debris. This has led to streambank erosion and property damage. It has also contributed to turbidity in the Neversink Reservoir. The Neversink River SMP should be implemented, and it should empower residents to employ measures to protect their lives and property. In addition, the riparian buffer project on the West Branch of the Neversink River (Claryville) used buried tree trunks, top soil, and small trees, along with rock cribbing. It was destroyed by flooding in September 2012, except for the rock cribbing. Only rock cribbing should be installed on the banks to prevent erosion and reduce turbidity. The river also needs removal of rocks, gravel, and dead trees. This would help protect the Claryville Fire House.

*Response: As stated in the Revised FAD, the goal of the Stream Management Program (SMP) is to restore stream stability to achievable levels and to provide water quality benefits while protecting the natural habitat. Unfortunately, treating bank erosion with traditional methods such as riprap revetment or solid concrete walls often places little value on fisheries, wildlife habitat, water quality or aesthetic appeal.*

*The demonstration restoration project on the West Branch of the Neversink River was not completed at the time of the September 2012 (50-year return) flood. Critical final grading and soil surface stabilization plantings were to be conducted in October and November. Even so, the material lost to the September flood was primarily soil fill; the rootwad and log bioengineering treatments remained largely intact, even in this unfinished state. Recent advances in environmental sciences demonstrate that bioengineered solutions, when biological, ecological and mechanical concepts are combined and balanced, can help effectively accomplish sustainable erosion control and preservation of wildlife and the fisheries habitat. NYCDEP has reported a number of cases where stream management projects have survived major storms, but even when stream restoration is based on a scientific approach, the stability of streams may still be vulnerable to severe storm impacts, particularly in the year following construction.*

*Recognizing that local site-specific knowledge and day-to-day observations can also inform stream management, the Revised FAD encourages streamside landowners to participate in the SMP, especially in the Catskill Streams Buffer Initiative (CSBI) projects. The CSBI program has been set up to offer bioengineered solutions for minor erosion occurring on private lands, where acceptable. Landowners in the Rondout and Neversink basins are encouraged to work directly with NYCDEP and its SMP partners in assisting to design and install bioengineered solutions that would slow bank erosion and give riparian buffers the opportunity to regenerate. Minor stream bank erosions/instabilities may lead to devastating stream bank failures. Local participation in stream management can help to identify streamside-related problems at their incipient stages and to apply optimized solutions of streamside property management in a timely manner.*

Comment: Many commenters noted support for the Revised FAD's focus on flood hazard mitigation, e.g., the LFHMP and Flood Buy-Out (FBO) programs.

Response: *After the devastating impacts of Tropical Storms Irene and Lee, watershed communities, NYCDEP, NYSDOH, USEPA, NYSDEC, and other watershed stakeholders came together to discuss how federal, State, and City resources could best be coordinated and leveraged to help mitigate the possible impacts of future storm events. All parties recognized the multiple benefits of flood hazard mitigation, from removing people from harm's way to keeping sources of contaminants out of the water supply. The LFHMP and City-funded FBO program arose from the spirit of cooperation and common purpose that characterized these meetings. NYSDOH commends the City and the watershed communities for their foresight and perseverance in continuing to bring these programs to fruition.*

Comment: NYCDEP commented that they are working diligently with CWC to finalize a contract for the Local Flood Hazard Mitigation Program (LFHMP). Given the steps in the City process needed to register the contract, NYCDEP requested that the due date for execution of the contract be adjusted from July 31, 2014 to December 31, 2014. However, another commenter noted that funding for the program may be needed sooner than July 31, 2014. It was suggested that \$5 million for the CWC LFHMP should be given to CWC sooner than July 31, 2014.

Response: *The due date for this FAD deliverable has been changed to December 31, 2014 as requested. However, local flood analyses are already being conducted in some communities. As expressed by some public comments, these communities may be ready to make use of LFHMP*

*funds before they become available. Given this possibility, the City's contract agreement with CWC specifies that Future Stormwater Funds may be used to fund the LFHMP until LFHMP funds become available.*

Comment: \$17 million may not be enough funding for the LFHMP in this FAD term.

*Response: Since the LFHMP is a new FAD program, NYSDOH acknowledges that predicting how much money will be required to implement the program is difficult. \$17 million was committed to the program for this FAD term based on our best estimates. Given that it will take some time for communities to conduct local flood analyses and to decide what projects to implement before this funding is required, NYSDOH believes that this amount of funding will be adequate for the remaining term of this FAD. Funding needs for the program will be reassessed for the next FAD term.*

Comment: Projects that are implemented through the LFHMP should be locally controlled, and should not be limited to designated hamlet areas.

*Response: The program rules for the LFHMP are still being developed with input from the Stream Management Program partners, the CWC, community leaders, and the NYCDEP. Eligibility for participation in the program has been focused on the hamlet/village/village extension areas that were identified for purposes of the 1997 Memorandum of Agreement. However, consideration is being given to other population centers in the Watershed. Since Local Flood Analyses may indicate that houses, businesses, and/or other critical community facilities need to be removed to reduce flood hazard risks, community buy-in on the projects that are selected is critical to the success of this program. For this reason, community representatives will participate in the selection of projects that are ultimately implemented, ensuring local control over the decisions made to reduce flooding risks in their community.*

Comment: LFHMP eligibility should not exclude non-anchor businesses. It is critical that communities have the option to relocate any structure, both anchor and non-anchor businesses, as well as residences, for the purpose of floodplain reclamation and/or enhancement. The FAD should reflect that all businesses, not just "anchor" businesses are eligible for relocation. However, "anchor" businesses may proceed without community support.

*Response: While the program rules for the LFHMP are still being developed, they do not currently exclude non-anchor businesses from being eligible for relocation. The Revised FAD language has been changed to make this clear. As drafted, the CWC LFHMP rules allow anchor businesses to come directly to the CWC to apply for relocation funds to be relocated within the same town, while relocation of non-anchor businesses must have community support.*

Comment: Several commenters suggested that the LFHMP should allow infrastructure investments for LFHMP relocation sites to be part of the eligible activities. The ability to leverage other funding sources should factor into supporting a relocation plan with the LFHMP being one source to which applicants can turn. Projects that are included in the NY Rising Community Reconstruction Program should receive priority for LFHMP funding. In addition, relocated homes should be eligible for Community Waste Management Program (CWMP) funds.



*Response: The program rules for the CWC LFHMP are still under development with input from the CWC, Stream Management Program partners, community leaders, and the NYCDEP, and the relocation costs that will be eligible for funding have not yet been determined. The CWMP was established by the 1997 Memorandum of Agreement to provide funding for wastewater management solutions in designated west-of-Hudson villages and hamlets that were experiencing water quality problems due to failing septic systems or where such failures were likely to occur in the future. As such, homes that may be relocated through the LFHMP or FBO program would not be eligible for CWMP funds. However, the currently drafted LFHMP rules give weight to funding projects that can leverage outside sources of funding. State and federal programs such as the NY Rising Community Reconstruction Program, FEMA, and the Natural Resources Conservation Service's Emergency Watershed Protection Program are potential sources of additional funding for flood hazard mitigation projects, including some infrastructure projects. Effort has been made to align the local flood analyses that are being done for the NY Rising Program with the analyses that are being proposed for use with the LFHMP. This will help minimize duplication of efforts and optimize use of resources. NYSDOH commends the community representatives, SWCDs, CWC, NYCDEP and other Watershed stakeholders who have cooperatively worked together to reduce the impacts of future severe weather events on both the residents of the Watershed and the water supply.*

**Comment:** The FAD should establish a “Non-Federal Disaster Declaration Fund for Infrastructure/Communications” that would provide money to communities with All-Hazard Mitigation Plans or Stream Corridor Management Plans in the event of smaller floods that do not get federal or State disaster declarations.

*Response: The response of the City and its partners in the Watershed in the wake of Tropical Storms Irene and Lee provides a good demonstration of the resources that can be brought to bear when damaging storm events strike the Watershed. After Irene and Lee, the City's Stream Management Program and its partners responded quickly to remove debris jams from bridges and culverts and to address road washouts. The Post-Flood Emergency Stream Intervention Protocol that has been developed by Delaware County Soil and Water Conservation District was applied to guide reconstruction of damaged streams. The City's contract engineering firm was made available to help inspect bridges, evaluate the safety of flood control structures, and to advise State and local governments on flood response and recovery activities. In addition, the Catskill Watershed Corporation (CWC) stepped forward to assist in flood response by providing \$5million to small businesses in the Watershed to repair structural damage. The City provided an additional \$1 million to CWC to be used for debris, bulk, and hazardous material removal in areas not eligible for FEMA funding, furthering the protection of health, property, and the water supply. NYSDOH commends the City and its Watershed partners for making these resources available and enabling the type of timely response to flooding events that is sought by this comment.*

#### FAD Section 4.7 – Riparian Buffer Program

**Comment:** The FAD should require that there be adequate technical and scientific support and staff for successful implementation of the Riparian Buffer Program (RBP).

Response: *NYSDOH and USEPA meet annually with NYCDEP to review staffing and budgeting for all FAD programs. NYCDEP has demonstrated success with the Stream Management Program, and the regulators are confident that the technical and scientific ability of the City and its partners is adequate for the successful implementation of the RBP.*

Comment: The FAD language only cross-references the Water Supply Permit language for the Pilot Riparian Buffer Acquisition Program. The FAD should specify goals, process for selection of Land Trusts, implementation schedule, and criteria for evaluating success.

Response: *The 2013 Program Development Initiative Report, which serves as a feasibility analysis for the Riparian Buffer Program required by the 2010 Water Supply Permit, includes the goals, stewardship options, pilot program timeline, and evaluation criteria for the program.*

Comment: The Riparian Buffer Acquisition Program, which is being piloted in the Schoharie Watershed, should be done in conjunction with the Schoharie Watershed Program, based in Tannersville and operated by the Greene County SWCD. The office already encompasses the stream management and watershed assistance programs.

Response: *Comment noted. The 2013 Program Development Initiative (PDI) Report, which serves as a feasibility analysis for the Riparian Buffer Program required by the 2010 Water Supply Permit, explains the duties and expectations of the primary contractor that would facilitate the pilot program. The PDI Report also states that a goal of the program is to "Consult with DEP-SMP and Greene County Soil & Water Conservation District to identify key reaches based on water quality protection, if a ranking system becomes necessary." The report also states that promotion of the pilot program and participation outreach must be conducted as a partnership including the Greene County Soil and Water Conservation District.*

Comment: The Riparian Buffer Acquisition Program should include guidance for buffer widths, with 100 feet being the minimum goal.

Response: *The 2013 Program Development Initiative Report, which serves as a feasibility analysis for the Riparian Buffer Program required by the 2010 Water Supply Permit, determined that a 150-foot, three-zone buffer was supported by the scientific literature.*

Comment: The current proposed due date for the annual meeting of the Riparian Buffer Working Group overlaps with the planning and implementation of annual fall Catskill Streams Buffer Initiative projects. The due date of the annual meeting should be moved from November 30<sup>th</sup> to January 30<sup>th</sup> of each year.

Response: *This due date has been changed to January 30 in the Revised FAD.*

#### FAD Section 4.8 – Wetlands Protection Program

No comments were received on this section of the FAD.

#### FAD Section 4.9 – East-of-Hudson Nonpoint Source Pollution Control Program

Comment: The east-of-Hudson septic repair program should be expanded to Cross River and Croton Falls Reservoir basins.

Response: *The east-of-Hudson septic repair program is being implemented on a priority basis, starting with reservoir basins that, by virtue of their proximity to the City's terminal reservoirs and routine use, confer the greatest risk of contamination to the City's water supply (i.e., West Branch and Boyd Corners Reservoir basins). The FAD recognizes that Cross River and Croton Falls Reservoirs may be used by the City to supplement their Catskill/Delaware supply under emergency conditions. As such, the City will be required to submit a proposal to NYSDOH, USEPA and NYSDEC on June 30, 2015 to expand the septic repair program to these two reservoir basins.*

Comment: The following sentence is contained in the narrative for the East-of-Hudson Nonpoint Source Pollution Control Program: "To address the lack of a septic repair funding program in the EOH water supply basins, NYC must implement, or cause to be implemented, a phased septic repair program that provides funding to share the costs with homeowners for the repair or replacement of failing or potentially failing septic systems." Since the design of the EOH Septic program is based on reimbursements of failed septic systems (not "potentially failing" systems), the phrase "and potentially failing" should be removed.

Response: *Comment noted. The term "potentially failing" has been changed to "reasonably likely-to-fail in the near future, as judged by a qualified inspector" to be consistent with the language used for the west-of-Hudson septic repair program and to help clarify the intended scope of the program.*

#### FAD Section 4.10 – Kensico Water Quality Program

No comments were received on this section of the FAD.

#### FAD Section 4.11 – Catskill Turbidity Control Program

Comment: A large number of comments were received stating objection to the City using releases of turbid water to the lower Esopus as a method of turbidity control for the Catskill system. It was stated that since the FAD-required Catskill Turbidity Control Program has resulted in adverse environmental impacts, the Revised FAD should require DEP to evaluate Catskill turbidity control measures, determine if there are feasible alternatives to the Catskill Turbidity Control Program, and modify Catskill turbidity control mechanisms during the 2007 FAD term. It was noted that there should be a direct connection between the FAD and the NYSDEC Consent Order related to NYCDEP's violation of their Catalum SPDES Permit. A number of comments suggested studies that should be included in the Environmental Impact Statement (EIS) being conducted in relation to the City's Catalum SPDES permit modification. For example, these suggestions included:

- examine turbidity in the lower Esopus with and without releases from the Ashokan Reservoir;
- reconsider use of alum as a means to address turbidity;
- perform a cost/benefit analysis of alum use;
- reexamine the "Value Engineering Study";
- consider alternative release sites from the Ashokan Reservoir for turbidity and flood control; and

- consider allowing releases from the Ashokan Reservoir only in an emergency.

*Response to Multiple Comments: Due in large part to the underlying geology of the streams in the Catskill system, fine sediment particles can be suspended in Catskill system water causing turbidity at levels that would exceed the City's limits for maintaining filtration avoidance. To address this issue, the 2002 and 2007 FADs required the City to conduct a Catskill Turbidity Control Study and develop a Catskill Turbidity Control Plan. In 2008, the City submitted the Phase III Catskill Turbidity Control Implementation Plan ("Phase III Plan"), which proposed three initiatives that the City would pursue in order to reduce the number of days that alum would be needed to treat turbid water before it entered Kensico Reservoir. The three components of the plan were: 1) modified reservoir operations guided by an Operations Support Tool (OST); 2) an interconnection of the Catskill and Delaware Aqueducts at Shaft 4; and 3) improvements to the stop shutters in the Catskill Aqueduct to facilitate reduction of flow in the aqueduct. One of the modified reservoir operations that was included in the Phase III Plan was use of the Ashokan Release Channel, which allows water from either the East or West Basin of the Ashokan Reservoir to be released in a controlled manner to the lower Esopus Creek. As presented in the Phase III Plan, these releases would be used to discharge water from the West Basin in anticipation of a storm event, thereby creating a void in the West Basin to capture turbid storm water runoff from the upper Esopus Creek watershed. Capture of this water would in turn protect the water quality of the East Basin, allowing East Basin water to be used for water supply purposes without alum treatment.*

*In Fall 2010, after heavy rainfall in the Catskill watershed, the City used the Ashokan Release Channel for a sustained period in order to mitigate downstream flooding and protect water quality in the East Basin. These releases led to objections from residents of the lower Esopus Creek basin, who expressed that the turbid releases were having negative environmental and economic impacts in the lower Esopus region. In 2011, the NYSDEC initiated an enforcement action against the City for alleged violations of the City's Catalum SPDES permit. The Catalum SPDES permit sets forth the conditions under which the City is allowed to add alum to treat Catskill water prior to discharging to Kensico Reservoir under the Clean Water Act. The City had not met certain conditions of the permit that related to dredging of alum floc in the Kensico Reservoir, among other conditions. An Order on Consent (CO) was subsequently executed by the City and NYSDEC in 2013, which, in part, requires the City to operate the Ashokan Release Channel in accordance with an Interim Release Protocol (IRP). The IRP recognizes three uses of the release channel: 1) Community Releases, which are intended to provide environmental, recreational, and economic benefits without negatively impacting water supply; 2) Spill Mitigation Releases, which help to mitigate flooding in the lower Esopus; and 3) Operational Releases, which are aimed at protecting the quality of drinking water supply by reducing the spill of turbid water from the West Basin into the East Basin. In addition, the City requested a modification of its SPDES permit to incorporate the IRP. The City is also required under the CO to prepare an Environmental Impact Statement (EIS) analyzing the proposed modification; NYSDEC is the lead agency for this environmental review and will issue the Draft EIS and EIS. The CO requires that the scope of the EIS include an investigation of the potential impacts (biological, chemical, physical, and economic) of the City's use of the Ashokan Release Channel in accordance with the IRP. In addition, the EIS will include an analysis of alternative methods for operating the Catskill water supply system, both structural and nonstructural, examining and comparing the potential adverse and beneficial impacts of these*

*alternatives. The draft scope for the EIS was recently issued by NYSDEC for public review and comment under the State Environmental Quality Review Act (“SEQRA”). The draft scope reflects input from lower Esopus stakeholders and considers many of the issues raised by comments submitted during the Revised FAD public comment period.*

*In response to the comments regarding the City’s use of the Ashokan Release Channel, NYSDOH recognizes that the environmental concerns expressed by residents of the lower Esopus basin should be and are being addressed under the regulatory authority of the NYSDEC under its SPDES program, in particular through the 2013 NYSDEC CO and the EIS being developed in relation to the City’s Catalum SPDES permit modification. While this is the case, NYSDOH recognizes that the analyses conducted as part of the EIS may result in changes to the City’s Catskill Turbidity Control Phase III Implementation Plan, which was developed under the authority of the FAD. To ensure that the best currently available science is applied to the City’s Turbidity Control Plan, the NYSDOH has revised the 2007 FAD to include the following provisions:*

- A panel of nationally-recognized experts (“Expert Panel”) in modeling will be convened for the purpose of critically examining the City’s use of OST and its effectiveness in managing turbidity, and to provide recommendations for evaluating the effectiveness of the Catskill Turbidity Control program;*
- In response to public comments, the scope of work for the Expert Panel has been expanded to include a review of the City’s plan for use of OST to assess Catskill turbidity control alternatives being considered under the EIS;*
- The timeline in the FAD for use of this panel has been aligned with the timeline for the EIS under the NYSDEC CO with the intent that the recommendations of the panel will be provided in time to inform the investigation being performed under the EIS;*
- The Expert Panel will produce a report on its findings. The City will meet with NYSDOH, USEPA, NYSDEC, and the Office of Attorney General Watershed Inspector General to discuss this report. Keeping in mind the limitations of the procedures of the NAS/NRC who has convened the Expert Panel, the Expert Panel will be asked to participate in this meeting;*
- The City must report on the findings of the Final EIS and how they relate to the Phase III Plan and meet with NYSDOH, USEPA, NYSDEC, and the Office of Attorney General Watershed Inspector General to discuss these findings; and*
- The City must submit a report that summarizes the alternatives that have been or are being considered for Catskill turbidity control, describing benefits, drawbacks, and estimated costs for each alternative.*

*These new FAD requirements have been scheduled to optimize use of the tools required by and developed under the authority of the FAD (e.g., OST and the Expert Panel review) to help inform work being required by the EIS under the authority of NYSDEC. In addition, the FAD revisions have provided placeholders so that the results of the environmental investigation being done under the auspices of NYSDEC can be used to re-examine the Phase III Plan and direct changes to that plan as necessary.*

*In sum, NYSDOH and NYSDEC are pursuing a cooperative approach to the concerns in the lower Esopus, which makes the most efficient and effective use of NYSDOH’s and NYSDEC’s regulatory authorities to resolve these complex turbidity control issues.*

Comment: A FAD determination should be stayed until the Environmental Impact Statement (EIS) being conducted in relation to the City's Catalum SPDES permit modification is completed and results can be considered in the NYSDOH's decision making.

Response: *As described in the previous response, new requirements have been incorporated into the Revised 2007 FAD that will help ensure that FAD activities and activities conducted pursuant to the NYSDEC Consent Order will inform one another. In addition, these requirements provide a mechanism for making changes to the City's Catskill Turbidity Control Program, if necessary, based on the findings of the EIS. The EIS may not be issued by NYSDEC until 2017 or later. Based on the quality of the City's water supply, its compliance with previous FAD requirements, and its effective Watershed Protection Program, the NYSDOH has determined that the City will not be required to filter its Catskill and Delaware water supply. This determination is scheduled to be reviewed again in 2017.*

Comment: There should be a direct connection between the FAD and the NYSDEC Consent Order (CO), and the FAD should include enforcement provisions if the NYSDEC CO is not followed.

Response: *As noted in the responses above, requirements have been added to the Revised 2007 FAD to help ensure that FAD activities and activities conducted pursuant to the NYSDEC Consent Order will inform one another. While the requirements of the NYSDEC CO and the FAD are not the same, some FAD requirements may be further informed by the findings of the EIS being conducted in relation to the City's Catalum SPDES permit modification. NYSDEC has authority for enforcement of the NYSDEC CO, and is also serving as lead agency for the environmental review being conducted pursuant to the CO. However, some FAD requirements follow the issuance of the Final EIS. For example, the Revised 2007 FAD requires that the City report on the findings of the EIS, and discuss how these findings may impact the City's use of Catskill turbidity control measures that were identified in the Phase III Catskill Turbidity Control Implementation Plan. The FAD further requires that, in the event that the findings of the EIS indicate that the Phase III Plan must be modified, the City must propose alternative measures for achieving turbidity control and a timeline for implementing those measures.*

Comment: The FAD should require a panel of experts to be convened to identify and evaluate alternatives to using the Ashokan Release Channel to control turbidity. Focus should be on a water quality endpoint, including water quality of the lower Esopus, rather than reducing alum use. Include turbidity modeling for the lower Esopus. Revisit the Value Engineering alternatives that were examined as part of DEP's Phase III Catskill Turbidity Control Study. In addition, the results of the Expert Panel review being required by the FAD Catskill Turbidity Control Program should be considered in the EIS for the Catalum SPDES permit modification.

Response: *As described in a previous response, alternatives for Catskill turbidity control, both structural and nonstructural, will be investigated as part of the EIS. The alternatives that are selected for study are defined by the scope of the EIS. In order to conduct this study, the City has contracted with engineering consultants to evaluate these alternatives in terms of technical feasibility, effectiveness, and cost. This evaluation will involve the use of the City's Operation Support Tool. In response to public comments, the Revised FAD has been modified to expand the*

*scope of work of the Expert Panel that is being required by the Catskill Turbidity Control Program. The scope now includes reviewing the City's plan for use of OST to investigate the alternatives evaluated as part of the EIS. NYSDOH believes that creating this additional role for the Panel will provide an independent review of the alternatives assessment done through the EIS, benefiting both the EIS and FAD processes.*

Comment: Climate change, assumptions regarding the safe yield of NYC reservoirs, and targets for reservoir operating levels should be evaluated as they relate to operating protocols for NYC reservoirs.

Response: *The Revised FAD requires the City to fund an Expert Panel to review and evaluate the City's use of its Operations Support Tool (OST). OST is used by the City to inform operation of its reservoirs. This panel will also review the City's plan for use of OST to assess alternatives for turbidity control in the Catskill system. The panel will be provided with the information necessary to conduct their review, including the assumptions that are used in the models underlying OST. These could include historic weather and flow data, safe yield assumptions, and target operating levels. The Expert Panel will also review the City's existing studies of the potential effects of climate change to help identify how those effects might impact use of OST.*

Comment: The expert panel which evaluates the Catskill Turbidity Control Program should be convened by NYSDOH in consultation with USEPA, with funding provided by the City of New York. NYSDOH does not have the technical expertise to evaluate the modeling used as part of this program.

Response: *The Revised FAD has been modified to indicate that the NYSDOH and the City have already asked the National Research Council to convene and manage the expert panel who will review the City's use of OST. The FAD directs the City to fund the expert panel as necessary to support the work of the panel.*

Comment: The City should be required to develop a plan to remediate impacts from use of the Ashokan Release Channel on the lower Esopus and to compensate communities for damage.

Response: *Environmental impacts from use of the Ashokan Release Channel will be examined by the EIS associated with the City's Catalum SPDES permit modification. The NYSDEC CO and EIS are the appropriate regulatory vehicles to determine mitigation for any identified adverse environmental impacts.*

Comment: The City should provide \$100,000 to fund an expert review of the EIS on behalf of affected communities.

Response: *The FAD is not the appropriate context to address this request for funding; however, the NYSDEC CO requires the City to provide \$80,000 for a technical consultant to assist the Ashokan Release Working Group with its participation in the EIS process.*

Comment: The FAD should impose strict operating rules for the Ashokan Release Channel while the Expert Panel is reviewing alternatives to ensure that releases meet all State and federal water quality laws.

Response: *Operating rules for the Ashokan Release Channel are defined by the Interim Release Protocol (IRP), which has been developed by the NYSDEC and is included in the NYSDEC's Consent Order on the City (NYSDEC Case No.: D007-0001-11). The IRP defines three categories of use for the Release Channel: 1) flood mitigation; 2) environmental, recreation, and economic benefits; and 3) drinking water quality protection. This protocol has been designed to balance the uses of the Release Channel with the potential impacts that turbidity and flow associated with releases may have on the lower Esopus Creek. The IRP includes requirements for monitoring and reporting to ensure that NYSDEC and Ulster County and Town officials are informed of operational changes and can assess the City's compliance with the provisions of the IRP. The IRP is subject to revision if improved protocols are identified as the IRP is implemented, or as indicated by the Environmental Impact Statement that is being prepared in connection with the City's request to modify their Catalum SPDES permit.*

Comment: The FAD should recognize that USEPA has listed the lower Esopus on the 303(d) list of Impaired Water Bodies as a direct result of use of the Ashokan Release Channel.

Response: *NYSDOH acknowledges that the USEPA has listed the lower Esopus Creek as an impaired water body under the Clean Water Act, and that use of the Ashokan Release Channel was a factor in that action. NYSDEC is taking action consistent with its regulatory authority to address releases from the Ashokan Release Channel.*

Comment: Through NYSDOH's approval of the Phase III Catskill Turbidity Control Plan, NYSDOH currently requires NYCDEP to operate the Ashokan Release Channel to comply with the FAD. NYSDOH has no authority to require NYCDEP to violate State and federal laws in order to comply with the FAD.

Response: *NYSDOH agrees that it does not have the authority to require NYCDEP to violate State and federal law to comply with the FAD; all of the actions required by the FAD can be, and must be, fulfilled in compliance with law. As described in a previous response, the Ashokan Release Channel is one tool that was identified by the City in its Phase III Catskill Turbidity Control Implementation Plan that could be used to reduce the need for alum when turbidity is impacting the Catskill supply. However, NYSDOH has not required the City to operate the Ashokan Release Channel. Operation of the Release Channel is guided by an Interim Release Protocol (IRP), which has been developed by the NYSDEC and is included in a Consent Order on the City (NYSDEC Case No.: D007-0001-11). The IRP defines three categories of use for the Release Channel, including, but not restricted to, use for water supply purposes: 1) flood mitigation; 2) environmental, recreation, and economic benefits; and 3) drinking water quality protection. This protocol has been designed to balance the drinking water quality, flood mitigation, and aquatic ecosystem benefits of using the Release Channel with the potential impacts that turbidity and flow associated with releases may have on the lower Esopus Creek. The IRP is subject to revision if improved protocols are identified as the IRP is implemented, or as indicated by the Environmental*



*Impact Statement that is being drafted pursuant to the City's request to modify their Catalum SPDES permit.*

Comment: Several comments stated that towns of the Lower Esopus should be included in FAD development from an early stage, and that funding should be provided for various programs in the lower Esopus watershed, such as agricultural assistance, riparian buffer protection, and economic development. Also, the FAD monitoring program should include the lower Esopus.

Response: *NYSDOH's authorities under the Safe Drinking Water Act (SWDA), and the City's watershed protection obligations under the FAD, are not the appropriate context to address the request for funding and programs outside of the NYC watershed. The NYSDEC has included provisions in the CO for stream restoration activities in the lower Esopus basin, and water quality monitoring is being conducted in the lower Esopus as part of the EIS. Both these activities are being funded by the City. Also, local authorities may wish to explore other governmental programs (e.g., US Department of Agriculture, Water Resources Development Act, or NYSDEC's Environmental Protection Fund) to support environmental restoration projects.*

Comment: The Catskill Turbidity Control Program annual progress meetings should include communities below the dams, at least representatives of CWT.

Response: *Input from key watershed stakeholders, such as the Coalition of Watershed Towns (CWT), is sought during development of FAD program requirements. In addition, in many cases the CWT has participated in the development of program rules for these programs. Once FAD programs are finalized, oversight of the City's implementation of the FAD is the responsibility of the NYSDOH, as the primacy regulatory agency, with assistance from USEPA, NYSDEC, the Office of the Attorney General Watershed Inspector General, and other State agencies. Typically meetings held pursuant to FAD requirements include representatives from NYCDEP and the regulatory agencies. The City's reports on the activities and achievements of its FAD programs are available to the public for review on the NYCDEP website. In response to public comment during this FAD revision process, NYSDOH's comments on FAD deliverables and the City's responses will be posted on NYCDEP's website. The NYSDOH welcomes input from NYC Watershed stakeholders on FAD-related matters at any time.*

Comment: The Shaft 4 connection will encourage the City to draw more Delaware River water into the NYC drinking water system rather than fully and permanently resolve the water quality and turbidity issues faced in the Catskill system.

Response: *The Catskill system is naturally turbid due to its underlying geology, and much of the turbidity originates from within the stream channel itself. NYSDOH has required NYCDEP to study whether projects implemented through the City's Stream Management Program can help reduce turbidity inputs and provide some water quality benefits during baseflow and lesser storm event conditions. However, turbidity resulting from major storm events will continue to be a concern for the Catskill system. The City's current strategy during high turbidity conditions is to significantly reduce flow of Catskill water into the City's water supply. The Shaft 4 interconnection will allow the City to direct Delaware water into the Catskill Aqueduct during periods when Catskill water has elevated turbidity, thereby increasing the system's capacity to transfer*

*Delaware water to Kensico Reservoir and improving the system's ability to meet consumer demand. NYSDOH supports the Shaft 4 interconnection project and believes it will enhance the City's ability to manage turbidity events.*

Comment: The Catskill Turbidity Management Plan (to be developed for use when the Rondout-West Branch Tunnel is shut down) should look at structural measures to reduce alum use, and also how these might be employed to address long-term use of the Ashokan Release Channel for water quality purposes.

Response: *The City is currently undertaking work to address leaks in the Rondout-West Branch Tunnel (RWBT) portion of its Delaware Aqueduct. As part of this work, the RWBT will need to be shut down to connect a bypass that is being constructed to replace a part of the tunnel. The RWBT normally supplies approximately 50% of the City's water. During the time that the RWBT is shut down, the City will lose access to this supply, and will have to rely heavily on the Catskill and Croton water supplies. The Revised FAD includes a new requirement for the City to submit a Catskill Turbidity Control RWBT Shutdown Management Plan. The purpose of this plan is to demonstrate to the regulators that the City will be fully capable of providing adequate and safe drinking water to its water consumers during the period of the RWBT shutdown, even in the event of elevated turbidity in the Catskill system. Since this plan is directed at ensuring a safe and adequate water supply during a temporary situation of relatively short duration, large capital investment in permanent structures to address the situation is unlikely to be appropriate. If needed, alum use during this period may be an acceptable tool to maintain water quality.*

#### FAD Section 5.1 – Watershed Monitoring Program

No comments were received on this section of the FAD.

#### FAD Section 5.2 – Multi-Tiered Water Quality Modeling Program

No comments were received on this section of the FAD.

#### FAD Section 5.3 – Geographic Information System Program

No comments were received on this section of the FAD.

#### FAD Section 6.1 – Watershed Rules and Regulations and Other Enforcement/Project Review

Comment: The FAD should include a path for securing increased regulations that prevent new development in the 500-year floodplain.

Response: *Watershed Rules and Regulations authorize the City and the State to regulate activities within the watersheds of reservoirs and impoundments to protect the sources of drinking water for public consumption, but do not give the City the authority to prevent development in the 500-year flood plain. However, the City's FAD includes a number of programs and tools that serve to minimize the potential impacts of development on the City's water supply. For example, the Land Acquisition Program allows the City to purchase land or Conservation Easements from willing sellers, effectively preventing those lands from ever being developed. The new Flood Buy-Out Program and Riparian Buffer Program target particularly vulnerable floodplain and streamside lands for protection from further development. Forestry and agriculture are considered to be*

*preferred land uses in the Watershed, and these uses, along with appropriate water quality protection practices, are supported by FAD programs. Potential sources of pollution from development in the Watershed, such as stormwater runoff and wastewater, are addressed by the City's stormwater, septic system, and wastewater infrastructure and monitoring programs. The 1997 Memorandum of Agreement and the FAD recognize that the NYC Watershed is a "living" watershed. The City and Watershed Communities have worked together to develop watershed protection programs that have successfully allowed the City's water supply to meet water quality standards while fostering economic vitality in the Watershed.*

FAD Section 6.2 – Wastewater Treatment Plant Compliance and Inspection Program

No comments were received on this section of the FAD.

FAD Section 7 – Catskill Delaware Filtration and UV Disinfection Facilities

No comments were received on this section of the FAD.

FAD Section 8.1 – Waterborne Disease Risk Assessment Program

No comments were received on this section of the FAD.

FAD Section 8.2 – Cross Connection Control Program

No comments were received on this section of the FAD.

FAD Section 9 – Administration

No comments were received on this section of the FAD.

FAD Section 10 – Education and Outreach

Comment: Create a "Celebrate the Catskills" fund to be used to help market festivals in the area.

Response: *Section 10 Education and Outreach of the Revised FAD requires the City to continue its commitment to the program. This includes allocation of substantial financial resources for "general public outreach" festivities, both in the watershed and within the City. As per the Filtration Avoidance Annual Report, March 2013 (p. 127), during 2012 the City performed outreach on Watershed topics at events such as county fairs and large outdoor festivals, which attracted more than 736,000 visitors. In addition to the City's outreach activities, the Catskill Watershed Corporation, through its Economic Development Program, provides a program from which funding can be sought to promote tourism in the Watershed. With support from this program, the "Best of Both Worlds" website was created, which promotes tourism in the Catskill Region.*

Other Comments

Comment: Create a fund for matching State and federal funds for economic projects inside and outside of the watershed.

Response: *The 1997 NYC Watershed Memorandum of Agreement (MOA) was drafted to address sustainability of the economic vitality of communities within the Watershed in a manner that is*

*consistent with providing an adequate supply of high quality drinking water to consumers. The MOA committed the City to funding the Catskill Watershed Corporation, and more specifically the Catskill Fund for the Future, in order to support the economic vitality of Watershed communities. The Catskill Fund for the Future, in part, provides low interest loans to help start new or enhance existing Watershed businesses. These funds can be used to help leverage additional State or federal funds. Another potential source of matching funds that may be used to help sustain Watershed communities is the new Local Flood Hazard Mitigation Program (LFHMP). While program rules are still in development, the CWC plans to make funds available for residential, business, and critical community facility relocation where, as identified by a Local Flood Analysis, removal of such structures will facilitate the lowering of off-site flood elevations. As drafted, the program will encourage use of program funds to leverage outside funds where available. This program, coupled with the new City-funded Flood Buy-Out Program, will help eligible Watershed residents and businesses who have been impacted by flood events to stay within their community. NYSDOH's authorities under the Safe Drinking Water Act (SWDA), and the City's watershed protection obligations under the FAD, are not the appropriate context to address the request for funding projects outside of the NYC watershed.*

Comment: Some commenters stated that the FAD should also consider impacts to the Delaware River Basin communities and environment resulting from operation of the NYC water system (e.g., incorporate these considerations into the Operations Support Tool (OST)).

Response: *NYSDOH believes that the FAD is not the appropriate mechanism for modifying the rules that regulate reservoir releases in the Delaware River Basin; any such proposed modifications should be addressed by the Parties to the 1954 Supreme Court Decree (Decree): the states of New York, Pennsylvania, New Jersey, Delaware and the City of New York (Decree Parties). In consultation with the Delaware River Basin Commission (DRBC), the Decree Parties have developed agreements, adopted by DRBC, designed to protect the Delaware River while balancing the various interests in this water resource, including its use for drinking water, natural habitat, recreation, and flood mitigation. Reservoir release requirements defined by these agreements have been incorporated into the City's operating rules used in the OST.*

Comment: NYSDOH received a number of comments related to operation of the NYC reservoirs to control flooding. For example one commenter stated that reservoirs are not designed for flood control and relying on them for flood control could provide a false sense of security, encourage floodplain development, and jeopardize other reservoir and downstream flow uses (e.g., drinking water supply, wildlife habitat, and salt line management). Reservoir operations should not include use of voids for flood flow storage to control floods downstream. However, other comments promoted the operation of reservoirs to mitigate flooding. For example, one comment suggested that NYCDEP be required to meet with the State to discuss reservoir management to reduce flooding risk versus drinking water needs, and to develop a contingency plan in the event of a significant weather event. Another comment stated that the FAD forces the NYCDEP to manage their reservoir system based primarily on water quality, rather than on balancing water quantity. This has increased flooding, unnecessary drought emergencies, and environmental degradation.

Response to multiple comments: *Water storage levels and releases from the City's water supply reservoirs are generally not within the scope of the FAD. The reservoirs in the Delaware system*

*are subject to the 1954 Supreme Court Decree and the rules developed by the Decree Parties in consultation with the Delaware River Basin Commission and through NYSDEC regulations. Flooding concerns were considered in the development of these rules. Reservoirs in the Catskill watershed are in part managed under a NYSDEC SPDES permit (Schoharie) and an Interim Release Protocol (IRP) (Ashokan). Use of the Ashokan Release Channel and alternatives for Catskill turbidity control will be assessed as part of the Environmental Impact Statement that is being drafted pursuant to the City's request to modify its Catalum SPDES permit. As part of this study, the City will explore the impacts of the operation of their reservoir system, including looking at how different operational modes might mitigate (or exacerbate) flooding, availability of water supply, environmental degradation, and water quality.*

Comment: The Village of Schoharie has experienced flooding in 1987, 1996, and 2011 due to releases from the Gilboa Dam. During Hurricane Irene, water flowing over the Gilboa Dam threatened property and lives in downstream communities. The dam should be upgraded and water levels in the Schoharie Reservoir should be lowered until that happens.

Response: *Water storage levels and releases at the Schoharie Reservoir are generally beyond the scope of the FAD. The Gilboa Dam at the Schoharie Reservoir is in the latter stages of a significant upgrade. The integrity of the dam has been structurally improved to modern standards, and operational flexibility has been increased with the addition of spillway crest gates. Final upgrades to the dam should be completed in 2014. DEP operates the Schoharie Reservoir to ensure adequate raw water supply for human consumption and also, in compliance with the Shandaken Tunnel SPDES permit, to enhance cold water storage for habitat needs in the Esopus Creek. Temporary siphons are in place to assist with dewatering of the reservoir on an as-needed basis, with a permanent release structure scheduled for future construction. Operation of the Schoharie Reservoir is informed by the City's Operations Support Tool (OST), which has been developed in response to requirements of the FAD's Catskill Turbidity Control Program. The OST incorporates real time reservoir and stream flow data, along with state-of-the art weather forecasting, to predict reservoir levels and assist the City in balancing water supply needs.*

Comment: Concern was expressed for the safety of dams when reservoirs are maintained at 100% full, and it was suggested that a void space should be maintained in all NYC reservoirs.

Response: *In general, evaluating dam safety is beyond the scope of the FAD. The NYSDEC's Dam Safety Section is responsible for safety inspections of dams, technical review of proposed dam construction or modification, monitoring of remedial work for compliance with dam safety criteria, and emergency preparedness.*

Comment: Some comments were received noting concern for water withdrawals from the watershed to be used for hydrofracking. One comment suggested that the NYC Watershed Rules and Regulations should be changed to require a permit for water withdrawals that are used for hydrofracking.

Response: *Should high-volume hydraulic fracturing be approved in NYS, all water used for high-volume hydraulic fracturing would be required to come from a source approved by the Susquehanna River Basin Commission (SRBC) or Delaware River Basin Commission (DRBC) or*

*be permitted by the NYSDEC. As such, NYC's Watershed Rules and Regulations would not have a role in this process. As a voting member of both DRBC and SRBC, NYSDEC is involved in the SRBC and DRBC application review process and would coordinate with their staff in the review of any NYS withdrawal applications (e.g., to ensure that any approvals are conditioned to include appropriate passby flow requirements). NYSDEC's water withdrawal regulations include permitting requirements that are similar to those imposed by SRBC or DRBC; therefore, if a withdrawal is approved by SRBC or DRBC, it would be exempt from the NYSDEC's water withdrawal permit requirements. Through the water withdrawal permitting process, the NYSDEC can monitor and enforce water quality and quantity standards by requiring: passby flow; fish impingement and entrainment protections; protections for aquatic life; reasonable use; water conservation practices; aquifer depletion protection; water withdrawal reporting; and evaluation of cumulative impacts on other water withdrawals.*

Comment: Other comments were received stating concern for shale gas development in the Watershed and near water system infrastructure. One commenter stated that the FAD should include a regulation that specifically prohibits shale gas development from happening within the boundaries of the NYC Watershed. Others stated that the FAD should require the City to advocate against drilling within and under the watershed; the FAD should require the City to develop a strategy to monitor and oppose any new gas production infrastructure projects within the watershed; and the FAD should require the City to advocate against drilling near water system infrastructure.

Response to multiple comments: *Oil and gas development in NYS is regulated by the NYSDEC's Division of Mineral Resources under Environmental Conservation Law (ECL) Article 23 and ECL Article 71, Enforcement. Any proposed changes to these regulations would more appropriately be addressed by NYSDEC, rather than the City's Watershed Rules and Regulations or the FAD. In 2009, the NYSDEC issued for public review and comment a draft Supplemental Generic Environmental Impact Statement (SGEIS) regarding shale gas development in NYS. In response to the draft SGEIS, the NYSDEC has received numerous comments, including comments from the City, expressing concern for the potential impacts of gas development on the Watershed and water system infrastructure. NYSDEC's 2011 revised draft SGEIS and accompanying proposed regulations included a prohibition against high volume hydrofracking in the Watershed and within 4000 feet of the Watershed boundary. The City supports this prohibition and has continued to advocate for increased setback distances from drilling sites to critical NYC Water System infrastructure such as dams and aqueducts. To support its requests, the City has consulted with geologists to assess and quantify the risks of hydraulic fracturing to water system infrastructure. For example, since hydraulic fracturing has been responsible for earth movement in several States and the United Kingdom, the City's consultants have identified where fault lines occur near critical infrastructure. The NYSDOH has supported the City's efforts to protect the City's water supply from the potential negative impacts of gas production to insure that the goal of filtration avoidance for the west-of-Hudson water supply reservoirs can be met currently and in the future. NYSDOH does not feel it is necessary to make the City's advocacy for adequate protection from shale gas development a FAD requirement.*

Comment: The City should be required to develop a contingency plan to address potential impacts of hydrofracking if NYSDEC allows drilling in the NYC Watershed or near water system infrastructure.

Response: *The Revised FAD includes language under its Watershed Monitoring Program section noting that if gas drilling is allowed in the NYC Watershed, the City will work with regulators to revise its monitoring plan to include sampling for pollutants that may be indicators of gas drilling impacts. The NYSDOH does not believe that the current FAD should mandate that the City develop a wide ranging contingency plan that specifically addresses gas drilling within the west-of-Hudson reservoir watersheds.*

### **References**

Anderson, N.M., R.H. Germain, M.H. Hall. An Assessment of Forest Cover and Impervious Surface Area on Family Forests in the New York City Watershed. 2012. *Northern Journal of Applied Forestry*. 29:67-73.

Mehaffey, M. H., M.S. Nash, T.G. Wade, D.W. Ebert, K.B. Jones, A. Rager. Linking Land Cover and Water Quality in New York City's Water Supply Watersheds. 2005. *Environmental Monitoring and Assessment*. 107:29-44.

National Research Council. *Watershed Management for Potable Water Supply: Assessing the New York City Strategy*. Washington, D.C. The National Academies Press. 2000.

Robbins, R.W., J.L. Glicker, D.M. Bloem, B.M. Niss. Effective Watershed Management for Surface Water Supplies. 1991. *JAWWA*. 83:12:34-44.