New York City
Filtration Avoidance Determination

Prepared By

New York State Department of Health

in consultation with

United States Environmental Protection Agency

December 2022

Revisions to the 2017 Surface Water Treatment Rule Determination for
New York City's Catskill/Delaware Water Supply System

Table of Contents

Acronyms

AOC	Administrative Order on Consent
BMPs	Best Management Practices
CE	Conservation Easement
CFI	Continuous Forest Inventory
CFR	Code of Federal Regulations
CO	Consent Order
COVID	COVID-19 Pandemic
CREP	Conservation Reserve Enhancement Program
CSBI	Catskill Streams Buffer Initiative
CT	Concentration-Time (chlorine contact time)
CWC	Catskill Watershed Corporation
CWMP	Community Wastewater Management Program
DDBPR	Disinfection and Disinfectant Byproducts Rule
DOI	NYC Department of Investigation
EFC	Environmental Facilities Corporation
EIS	Environmental Impact Statement
EOH	East-of-Hudson
EOHWC	East-of-Hudson Watershed Corporation
FAD	Filtration Avoidance Determination
FBO	Flood Buy-Out
FEMA	Federal Emergency Management Agency
FIRMs	Flood Insurance Rate Maps
GIS	Geographic Information System
HAA5	Haloacetic Acids (sum of five)
IESWTR	Interim Enhanced Surface Water Treatment Rule
KEC	Kensico-Eastview Connection
LAP	Land Acquisition Program
LFA	Local Flood Analysis
LFHMP	Local Flood Hazard Management Program
LiDAR	Light Detection and Ranging
LT2	Long Term 2 Enhanced Surface Water Treatment Rule
MAP	Forestry Management Assistance Program
MCL	Maximum Contaminant Level
MOA	New York City Watershed Memorandum of Agreement
MOU	Memorandum of Understanding
NASEM	National Academies of Sciences, Engineering, and Medicine
NEIWPCC	New England Interstate Water Pollution Control Commission
NPS	Nonpoint Source
NYC	New York City
NYCDEP	New York City Department of Environmental Protection
NYCFFBO	New York City-Funded Flood-Buyout Program
NYCRR	New York [State] Codes, Rules, and Regulations
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OST	Operations Support Tool
PFM	Precision Feed Management
PHL	Public Health Law
RTCR	Revised Total Coliform Rule
RWBT	Rondout West Branch Tunnel
SAP	Streamside Acquisition Program
SDWA	Safe Drinking Water Act
SEQRA	State Environmental Quality Review Act

SOEM	New York State Office of Emergency Management
SMP	Stream Management Program
SMIP	Stream Management Implementation Grant Program
SPDES	State Pollutant Discharge Elimination System
SWPPP	Stormwater Pollution Prevention Plan
SRP	Septic Repair Program
SWCD	Soil and Water Conservation District
SWTR	Surface Water Treatment Rule
TCR	Total Coliform Rule
TTHM	Total Trihalomethanes
USEPA	United States Environmental Protection Agency
UV	Ultraviolet
WAC	Watershed Agricultural Council
WAP	Watershed Agricultural Program
WaLIS	Watershed Land Information Systems
WDRAP	Waterborne Disease Risk Assessment Program
WECC	Watershed Enforcement Coordination Committee
WIG	Watershed Inspector General
WFP	Whole Farm Plan
WOH	West-of-Hudson
WR&Rs	Watershed Rules and Regulations
WSP	Water Supply Permit
WWTP	Wastewater Treatment Plant

Mid-Term Revisions to the 2017 Filtration Avoidance Determination

Executive Summary

Since 1993, New York City ("the City") has met the requirements of the 1989 Surface Water Treatment Rule (SWTR) and, after 1998, the Interim Enhanced SWTR (IESWTR). This has allowed the City to avoid filtering its Catskill/Delaware water supply. The conditions that the City must meet to maintain filtration avoidance are described in the City's Filtration Avoidance Determination (FAD).

The first FAD was issued by the United States Environmental Protection Agency (USEPA) in 1993, with USEPA issuing subsequent FADs in 1997, 2002, and 2007. The 2007 FAD required the City to undertake a ten-year land acquisition program and included specific commitments to activities in other programs for the first five years. After the 2007 FAD was issued, USEPA transferred primacy for regulatory oversight of the City's FAD to the New York State Department of Health (NYSDOH). In May 2014, NYSDOH, in consultation with USEPA, issued the Revised 2007 FAD, which defined the City's requirements for the remaining period of the 2007 FAD. In December 2017, NYSDOH issued the 2017 FAD, which included ten-year requirements for all programs. Following upon the 2020 recommendations of the National Academies of Science, Engineering, and Medicine expert panel on the City's Watershed Protection Program, NYSDOH, in consultation with USEPA, has revised several requirements and deadlines in the 2017 FAD, as well as added a number of new requirements.

The draft Revised 2017 FAD was made available for a 45-day public comment period from April 20 to June 3, 2022. At the request of the Coalition of Watershed Towns, the comment period was extended 30 days to July 1, 2022.

This Revised 2017 FAD supersedes the 2017 FAD and will remain effective until a further determination is made, currently scheduled for July 2027. As the primacy agency, NYSDOH has authority to determine whether the City's Watershed program provides adequate protection of the City's water supply, pursuant to the SWTR/IESWTR and/or other avoidance criteria in the SWTR/IESWTR. If NYSDOH were to determine that the City was not adequately protecting the Catskill/Delaware water supply, NYSDOH also has authority to require the City to filter the water from that water supply.

1. Background and Basis for Determination

As required under the Safe Drinking Water Act (SDWA) Amendments of 1986, USEPA promulgated the SWTR on June 29, 1989, specifying the criteria pursuant to which filtration is required as a treatment technique for public water systems supplied by a surface water source. The SWTR is codified in the Code of Federal Regulations (CFR) at Subpart H of 40 CFR, Part 141 - National Primary Drinking Water Regulations. The SWTR was promulgated to reduce the risk of waterborne disease occurrence from microbial contaminants at public water systems with surface water sources, either through filtration or by meeting the stringent water quality, disinfection, and site-specific avoidance criteria that make filtration unnecessary.

In response to requirements set forth in the 1996 Amendments to the SDWA, USEPA amended the SWTR on December 16, 1998 with the IESWTR, which is codified in Subpart P of 40 CFR, Part 141. USEPA amended the SWTR again on January 5, 2006 with the Long Term 2 Enhanced Surface Water Treatment Rule (LT2), which is codified in Subpart W of 40 CFR, Part 141. The IESWTR requires unfiltered systems to meet additional provisions to remain unfiltered, including compliance with more stringent disinfection byproduct maximum contaminant levels (MCLs) and the requirement to address *Cryptosporidium* in their watershed control programs. The LT2 provisions for unfiltered systems are not specifically identified as requirements for filtration avoidance, but do require that unfiltered systems provide treatment for *Cryptosporidium*.

The following sections of the SWTR (40 CFR §141.71 and §141.72) and the IESWTR (40 CFR §141.171), define the criteria that must be met to maintain filtration avoidance. Applicable sections of Title 10 of the New York State Codes, Rules and Regulations (NYCRR), Subpart 5-1 are cited following the corresponding federal code citations.

Source water quality conditions:

§141.71 (a)(1), §5-1.30(c)(1):	Fecal or total coliform concentration requirements
§141.71 (a)(2), §5-1.30(c)(2):	Turbidity level requirements

Site-specific conditions:

§141.71 (b)(1)(i)/§141.72(a)(1), §5-1.30(c)(3):	Disinfection and CT requirements.
§141.71 (b)(1)(ii)/§141.72(a)(2), §5-1.30(c)(4):	Redundant disinfection components and auxiliary power supply requirements.
§141.71 (b)(1)(iii)/141.72(a)(3), §5-1.30(c)(5):	Entry point residual disinfectant concentration requirements.
§141.71 (b)(1)(iv)/§141.72(a)(4), §5-1.30(c)(6):	Distribution system residual disinfectant concentration requirements.
§141.71(b)(2), §5-1.30(c)(7)(*i*)-(*vii*):	Maintain a watershed control program which minimizes contamination by *Giardia lamblia* cysts and viruses.
§141.71 (b)(3) and §141.171(b):	Be subject to an annual on-site inspection, which includes determination of adequacy of the watershed protection program to limit potential contamination from *Cryptosporidium.*
§141.71 (b)(4), §5-1.30(c)(8):	Must not be identified as a source of a waterborne disease outbreak.

§141.71 (b)(5), §5-1.30(c)(10):	Must comply with the MCL for total coliforms in at least 11 of the 12 previous months (starting April 1, 2016, comply with MCL for *Escherichia coli)*.
§141.71 (b)(6), §5-1.30(c)(9):	Must comply with disinfection byproduct requirements (this provision of Subpart H was amended as part of the IESWTR).
§141.171(a), §5-1.30(c)(7):	Minimize the potential for contamination by *Cryptosporidium* oocysts in the source water.

If, at any time, a system fails to meet the avoidance criteria, it will be required to provide filtration within 18 months of such failure.

Additional National Primary Drinking Water Regulations that apply to unfiltered systems, but that are not specifically identified as filtration avoidance criteria, are included in the Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2) and LT2. The Stage 2 DDBPR strengthens public health protection by tightening compliance monitoring requirements for trihalomethanes (TTHM) and haloacetic acids (HAA5). Systems must identify specific locations in the distribution system with the highest disinfection byproduct concentrations. Systems must further comply with MCLs for TTHM and HAA5 based on a locational running annual average, rather than averaging all monitoring locations across the system, as was previously allowed. April 1, 2012 was the compliance date for these tighter monitoring and compliance requirements. Although implementation of Stage 2 changed which sites are being sampled, unfiltered systems are still required to calculate a system-wide running annual average based on the results from the Stage 2 sample sites. These system-wide averages must comply with the TTHM and HAA5 MCLs for the water system to maintain filtration avoidance.

LT2 established important new requirements for both filtered and unfiltered systems. LT2 requires all systems to conduct source water sampling and provide effective treatment for *Cryptosporidium*. For unfiltered systems, LT2 requires use of two disinfectants. April 1, 2012 was the compliance date for this rule, although up to two additional years were provided for certain systems that were making capital improvements. A schedule for the City's compliance with LT2 requirements was established by an Administrative Order on Consent (AOC) that was issued by the USEPA in February 2007. Milestones for this AOC were also included in the 2007 FAD. The City selected water treatment using ultraviolet (UV) light, in addition to chlorine disinfection, to meet the LT2 requirements. The AOC was revised in September 2012 to accommodate the need for additional UV light treatment unit validation testing. The revised UV AOC terminated upon the City's completion of all activities required by the AOC, and as reflected in a USEPA letter dated July 7, 2016. The Catskill/Delaware UV facility has been online since December 1, 2012, providing UV treatment to all Catskill/Delaware water delivered to the City.

Revisions to the 1989 Total Coliform Rule (TCR) were published February 13, 2013. Starting April 1, 2016, compliance with the Revised TCR is based on an MCL for *Escherichia coli* (§141.63(c)), rather than total coliforms.

Previous Filtration Avoidance Determinations

USEPA's January 1993 Determination: Following the City's July 1992 submission of an application not to filter its Catskill/Delaware water system, USEPA began an in-depth review of the City's water supply to determine whether the Catskill/Delaware system could fully meet the avoidance criteria. USEPA concluded that the system met each of the objective criteria for

filtration avoidance. USEPA also concluded that the City's existing Watershed protection programs were adequate and met the SWTR goal for a Watershed control program, but that the program's ability to meet the criteria in the future was uncertain. Accordingly, on January 19, 1993, USEPA issued a conditional determination granting filtration avoidance until a further determination was made, on or before December 31, 1993.

USEPA's December 1993 Determination: In September 1993, the City submitted *New York City's 1993 Long-Term Watershed Protection and Filtration Avoidance Program* to demonstrate that the Catskill/Delaware system could and would continue to meet the filtration avoidance criteria in the future. USEPA reviewed historic and 1993 water quality data, *New York City's 1993 Long-Term Watershed Protection and Filtration Avoidance Program*, the City's achievements meeting the conditions contained in USEPA's January 19, 1993 conditional determination, the USEPA March 23, 1993 Expert Panel Report, public comments received, and additional documentation submitted by the City and interested parties relating to the Watershed. USEPA concluded that the Catskill/Delaware system met each of the SWTR objective criteria for filtration avoidance. USEPA also concluded that the City's existing Watershed protection programs continued to be adequate and met the SWTR's criteria for a Watershed control program, but that the program's ability to meet the criteria in the future was still uncertain. USEPA determined that progress had been made toward enhanced Watershed protection programs. However, USEPA sought a more refined characterization of the Watershed and more specific data concerning the identification and location of the activities within the Watershed. USEPA also wanted the City's Watershed protection programs to operate for a longer time period, to evaluate the effectiveness of the programs' long-term ability to monitor and control activities that have the potential to pollute the water supply.

On December 30, 1993, USEPA issued a second conditional determination which allowed the City's Catskill/Delaware public water system to remain unfiltered. This second determination was intended to be effective until a further determination was made, scheduled for December 15, 1996. The second determination also contained conditions primarily related to enhanced Watershed protection and monitoring programs, pathogen studies, reservoir modeling, and other efforts to characterize the Watershed and human activities. The conditions included continued design of filtration facilities should USEPA deem filtration necessary in the future, as well as a requirement that the City remove bottom sediment from and cover Hillview Reservoir. Hillview Reservoir was believed to be the cause of violations of the Total Coliform Rule in 1993 and again in 1994. Hillview remediation requirements are now part of an AOC that was issued by USEPA and are no longer FAD requirements.

USEPA's January and May 1997 Determinations: By 1995, implementation of a number of conditions of the 1993 determination had not yet occurred. At that time, USEPA and other interested stakeholders urged the Governor of New York State to intercede. Then Governor George E. Pataki brought the parties together in a consensus-building approach to negotiate reasonable, effective, and scientifically-defensible Watershed protection programs.

The January 1997 New York City Watershed Memorandum of Agreement (MOA), signed by New York State, the City, Watershed towns and counties, environmental parties, and USEPA, enabled the City to implement Watershed protection programs necessary to continue to avoid filtration. On January 21, 1997, the New York City Department of Environmental Protection (NYCDEP), which operates the Catskill/Delaware system, received a Water Supply Permit (WSP) from the New York State Department of Environmental Conservation (NYSDEC). This permit authorized NYCDEP to acquire land and conservation easements in the Watershed of the City's water supply system. The City promulgated new Watershed Rules and Regulations

(effective on May 1, 1997) and established economic partnerships with Watershed communities to assist the City and stakeholders in their efforts to protect the Watershed. In addition, the MOA mandated wastewater treatment plant (WWTP) upgrades, nonpoint source pollution controls, and the review of the existing monitoring program.

USEPA issued a four-month interim FAD on January 21, 1997, followed by a FAD in May 1997, granting the City conditional relief from filtering its Catskill/Delaware water system until the agency made a further determination, scheduled for April 15, 2002.

USEPA's November 2002 Determination: Based on NYCDEP's *2001 Long-Term Watershed Protection Program*, USEPA issued a FAD in November 2002, which included significant enhancements to the overall Watershed protection program. In addition, the 2002 FAD highlighted two major themes in the City's program: a long-term commitment to Watershed protection programs, and a reliance on Watershed partners (such as the Catskill Watershed Corporation (CWC) and the Watershed Agricultural Council (WAC)) to enhance program acceptance and implementation.

Program enhancements in the 2002 FAD included expansion of the agricultural program to include small farms and East-of-Hudson (EOH) farms; commitment to seven new wastewater projects for communities on the MOA prioritized list; an expanded stream management program (SMP); study of Catskill turbidity and evaluation of control alternatives; and commitment to construction of a UV light disinfection plant for the Catskill/Delaware water supply.

USEPA's July 2007 Determination: In accordance with the provisions of the 2002 FAD, the 2007 FAD development process was initiated by the City's submittal of a report entitled *2006 Watershed Protection Program Summary and Assessment* in March 2006. After extensive consultation with USEPA, NYSDOH and NYSDEC, the City submitted its *2006 Long-Term Watershed Protection Program* in December 2006. In developing its *2006 Long-Term Watershed Protection Program*, the City, among other things, committed to take additional steps to address several significant issues and challenges that are important to the continuation of filtration avoidance: 1) excessive turbidity in the Catskill system that is produced by large storm events; 2) compliance with new, more stringent national standards for disinfection byproducts; and 3) the potential for changes in development patterns, and how to refine the City's land acquisition program. The *2006 Long-Term Watershed Protection Program* was premised on the 2007 FAD being issued for a period of five years and thus geared its various programs and activities to such a five-year period.

After the City submitted its *2006 Long-Term Watershed Protection Program*, and based on input received from interested stakeholders and discussions among the parties, the City, USEPA, and NYSDOH agreed that the 2007 FAD would cover a term of ten years, consisting of two five-year periods: 2007-2012 ("First Five Year Period"), and 2012-2017 ("Second Five Year Period"). As part of this agreement, the City committed to a land acquisition program covering ten years, rather than five as originally proposed. The City also agreed that, by January 21, 2010, it would apply for a WSP from NYSDEC covering a ten-year period. The 2007 FAD included requirements for programs other than land acquisition for the First Five Year Period, with provisions for developing program commitments for the Second Five Year Period. A mid-term review of the 2007 FAD would consider what programs should be continued during the Second Five Year Period; whether and how any of the continuing programs should be modified; and/or whether additional programs were needed to justify the continuation of the FAD for the second five years of its term. Proposed requirements for the Second Five Year Period were subject to USEPA and NYSDOH review and approval. USEPA and NYSDOH would seek input from

Watershed stakeholders regarding the commitments to be established for the Second Five Year Period and would then issue a mid-term revision to the FAD in 2012 memorializing the new commitments.

On April 12, 2007, USEPA released a draft 2007 FAD which incorporated a land acquisition program covering ten years, as described above. Based on public response to this draft, the City made several additional commitments to enhance its Watershed protection program, including: expanding the Septic Remediation and Replacement Program to include cluster systems and small businesses; funding wastewater management systems in the final five communities listed in Paragraph 122 of the Watershed MOA; and improvements to the agricultural programs.

In July 2007, USEPA, in consultation with NYSDOH, determined that the City's *2006 Long-Term Watershed Protection Program*, along with the milestones, clarifications, and additions set forth in the 2007 determination, would achieve the objectives of the SDWA and the SWTR for unfiltered systems.

Developments Following the Issuance of the 2007 FAD: In September 2007, USEPA granted NYSDOH primary regulatory responsibility for the SWTR as it applies to the Catskill/Delaware water supply, making NYSDOH the primacy agency for oversight of the City's FAD.

On April 4, 2010, the City adopted amendments to its *Rules and Regulations for the Protection from Contamination, Degradation and Pollution of the New York City Water Supply and Its Sources* (WR&Rs). These amendments made the City's WR&Rs consistent with the State's requirements for storm water pollution prevention plans (SWPPPs), and revised the definition of "phosphorus-restricted basin" to include basins for source water reservoirs whose phosphorus levels exceed 15 micrograms/liter.

After significant discussion among the City, the State, USEPA, and Watershed stakeholders on the conditions that would apply to the City's Land Acquisition Program, the City applied to NYSDEC for a WSP in 2010, and the City was issued a fifteen-year WSP on December 24, 2010.

NYSDOH's Revised 2007 FAD: At the end of the First Five-Year Period, NYSDOH, as the recently-designated primacy agency, took the lead on conducting a review of the City's implementation of its *2006 Long-Term Watershed Protection Plan* and compliance with the requirements of the FAD. NYSDOH, in consultation with USEPA, issued an assessment in September 2011. This assessment, along with multiple meetings with the City, stakeholder outreach and public input, formed the basis for the Revised 2007 FAD.

In May 2014, NYSDOH issued the Revised 2007 FAD. In general, the activities set forth for the First Five Year Period of the 2007 FAD remained relevant and formed the basis for program implementation during the remaining period of the 2007 FAD. However, a number of program requirements were revised to enhance program effectiveness or to improve efficiency of implementation. In particular, severe flooding due to tropical storms that occurred in 2011 demonstrated the detrimental impacts flooding can have on water quality. In response, a new focus was placed on flood hazard mitigation in the Revised 2007 FAD. A City-funded Flood Buy-Out (NYCFFBO) program and Local Flood Hazard Mitigation Programs (LFHMPs) associated with the Stream Management Program (SMP) and CWC were developed to address flood-related water quality issues. Other program enhancements included a Septic Repair Program for the EOH FAD Basins (i.e., West Branch, Boyd Corners, Croton Falls, and Cross River

Reservoirs and Lake Gleneida), a requirement to work with the National Research Council to convene an Expert Panel to review the City's use of the Operations Support Tool (OST), and a requirement to begin the process of convening an Expert Panel to review the City's overall Watershed protection strategy and provide recommendations for improving Watershed protection programs.

NYSDOH's 2017 Determination: In December 2017, NYSDOH issued the most recent FAD, which included program requirements from 2017 to 2027. Preparations began for development of the 2017 FAD in early 2016. As required by the Revised 2007 FAD, the City submitted its *2016 Watershed Protection Program Summary and Assessment* (March 2016). Based on this report, ongoing review of the City's Watershed protection activities, and water system inspections, NYSDOH issued its FAD compliance assessment report in July 2016. This report concluded that the City continued to provide drinking water to NYC and upstate consumers that met all requirements of the SWTR."

Throughout 2016, community representatives and the CWC met with NYSDOH, USEPA and NYSDEC to discuss issues related to the City's implementation and enforcement of its WR&Rs, the City's Watershed program partnerships, and FAD programs. The results of these discussions were documented in a Supplemental Agreement associated with the 2017 FAD. Previous side agreements were associated with the City's WSP and essentially serve as updates to the MOA. Many of the resolutions resulting from the 2016 discussions were included in the 2017 FAD as new or revised program requirements.

The City's 2016 Long-Term Plan and the 2017 FAD were developed to cover a ten-year period from 2017-2027, documenting the City's long-term commitment to its Watershed protection programs. The 2017 FAD was structured to provide for a focused review of the City's Watershed Protection Programs (WPP) around the halfway point of the FAD term to ensure that the programs are adequate for the City to continue to meet the requirements of filtration avoidance in the future, with the review being informed by the findings of an independent panel of experts ("Expert Panel") convened by the National Academies of Sciences, Engineering, and Medicine (NASEM).

Developments since the issuance of the 2017 FAD

The Revised 2017 FAD is informed by a number of developments which have occurred since the 2017 FAD was issued. Foremost among them are the global COVID-19 pandemic and issuance of the NASEM WPP Expert Panel recommendations for the City's Watershed Protection Program in August 2020.

COVID-19 Pandemic

The COVID-19 (COVID) pandemic began in New York State in March 2020 and has impacted the implementation of virtually all FAD programs. Some delays were outside of the City or its partners control, such as government "stay at home" orders, while other delays related to the timely processing of contracting invoices. In order to protect field staff during the pandemic, the City reduced certain non-compliance watershed monitoring to minimize potential exposures. Contractors working on WAC and CWC projects experienced an increase in construction and material cost across all programs. Additionally, due to an increase in demand for contractors, there were fewer contractors putting in project bids. WAC staff, like many others, were unable to attend most in-person outreach and educational opportunities instead substituting virtual meetings and presentations. Due to concerns regarding the City's timely payment of contract

invoices during the pandemic, CWC closed the Septic Repair and Replacement Program to new applicants from August 2020 to April 2021.

NASEM WPP Expert Panel

The NASEM WPP Expert Panel was comprised of 17 members drawn from academia and other public water utilities, covering multiple disciplines, including engineering, environmental science, geology, hydrology, limnology, and watershed and water resource management. The panel's task was to determine if the City's existing suite of programs remain appropriate and adequate to maintain compliance with the SWTR. The work of this panel follows almost two decades after the original National Academies review published in 2000, when a number of these watershed protection programs and partnerships were still in their infancy. The panel held seven multi-day meeting events from 2018 through 2020, with four of those events open to the public. Presentations were made by the City, NYSDOH, partner organizations, and stakeholders. The panel also met separately with several stakeholders and reviewed extensive documentation, including historical water quality data. On August 10, 2020, NASEM released the panel's report and held a public briefing to summarize the panel's recommendations. The panel noted that land cover and land use changes from development in the West of Hudson watershed have been minimal, and that turbidity remains the top water quality priority by nature of the regulatory compliance limit in the SWTR. (More information on the expert panel and the final report can be found here: https://www.nationalacademies.org/our-work/review-of-the-new-york-city-watershed-protection-program.)

In general, the panel found that the City's WPP has been and will continue to be effective, though some components could benefit from rebalancing efforts to programs that offer a more direct contribution to water quality. Most prominently, the panel recommended that resources devoted to the Land Acquisition Program should be reduced and redirected toward the Watershed Agricultural Program, Stream Management Program, and Watershed Forestry Program. In addition, the panel recommended that, moving forward, the LAP emphasis should be on the Flood Buyout and Streamside Acquisition Programs, targeting the most valuable lands for water quality protection. Additional recommendations from the panel included: increased and consistent funding for septic system repairs and replacements; specific statistical and trend analyses for water quality, including phosphorus flux trends; integrating modeling for long-term decision support across programs; and performing a comprehensive social and economic analysis to understand the effects of the Watershed Protection Program on the watershed communities.

The Panel, in their summary, included these concluding thoughts (emphasis in original):

> The 1997 MOA and Watershed Protection Program have largely succeeded in maintaining or enhancing water quality for the NYC water supply system and providing sustained investments to enhance the economic vitality of watershed communities. Active and evolving partnerships with the Catskill Watershed Corporation, Watershed Agricultural Council, and many other organizations and agencies show the potential—and tradeoffs—of balancing water quality protection with community vitality. The following conclusions and recommendations are made to improve the overall effectiveness and direction of the Watershed Protection Program.
>
> **The Watershed Protection Program overall appears to have admirably supported watershed water quality sufficient for compliance with the Surface Water Treatment Rule, with strong indications that it will remain effective into the future.** However, in the last 25 years many of the most effective watershed management actions have already been implemented. Additional efforts will likely be more costly and less effective per incremental investment for achieving water quality objectives. Hence, many near-optimal combinations of

> program activities could provide similar overall performance. This means that there is increased flexibility to select watershed management actions that also support community vitality with little or no adverse influence on water quality.
>
> **Component programs within the Watershed Protection Program are generally well-balanced, with a few exceptions. The New York City Department of Environmental Protection should reduce expenditures in the Land Acquisition Program to fund other programs that will lead to more direct improvements in water quality.** Programs with greater incremental value include an improved Watershed Agricultural Program, an improved Septic System Program, and the Watershed Forestry Program. This reallocation of funds is based on the seemingly small incremental contributions of the Land Acquisition Program to drinking water quality and its negative effects on community vitality, compared with the likely improvements to water quality from additional resources provided to these other programs.
>
> *National Academies of Sciences, Engineering, and Medicine. 2020. Review of the New York City Watershed Protection Program. Washington, DC: The National Academies Press. https://doi.org/10.17226/25851.*

Following upon this report, the City, in cooperation with NYSDOH, convened several Watershed stakeholder meetings to present the Expert Panel's findings and solicit stakeholder input. A number of stakeholders provided written input to the City and NYSDOH on the panel's recommendations and other matters relevant to the existing FAD programs. The City, in consultation with NYSDOH, USEPA, and NYSDEC, evaluated this feedback in the process of developing the commitments contained in the December 2021 Long Term Watershed Protection Plan.

WAC organizational and fiscal challenges

In October 2020, WAC's Executive Director and Board Chair resigned, in part related to ongoing issues with the contractually-required process for receiving payments from the City. WAC and DEP worked together to implement corrective actions that included reviewing current bookkeeping practices and policies. In February 2021, an outside accounting firm specializing in financial management for nonprofit organizations was brought in to aid WAC in organizing their contract accounting and reconciliation practices. The City also conducted a third-party audit of WAC's fiscal practices. As this process revealed deficiencies and areas for organizational improvement, WAC began implementing corrective actions in several programs. Upon completion of the third-party audit, the City's Department of Investigations (DOI) and WAC agreed on terms for a Monitor Agreement, which was signed in November 2021. Under the Monitor Agreement, DOI staff are actively reviewing WAC's ongoing fiscal management, program activities, and payment invoicing, which will improve operations, transparency, and accountability as WAC continues to implement the Watershed Agricultural Program on behalf of the City. As these issues are being resolved, the City and WAC have moved forward on the extension of the current Agricultural Easement program contract and negotiation of the successor contract.

Revisions to the 2017 FAD

As required by the 2017 FAD, the City submitted its *2021 Watershed Protection Program Summary and Assessment* (March 2021). Based on this report, ongoing review of the City's Watershed protection activities, and water system inspections, NYSDOH issued its report entitled *Implementation of New York City's Watershed Protection Program and Compliance with*

the 2017 Filtration Avoidance Determination (July 2021). This report concluded that "NYSDOH finds that the City has a comprehensive and robust Watershed protection program, which, overall, is being effectively implemented by the City and its partners. The City continues to provide drinking water to NYC and upstate consumers that meets all requirements of the Surface Water Treatment Rule (SWTR)."

NYSDOH has developed revisions to the 2017 FAD based on the NASEM WPP Expert Panel report, the City's March 2021 Watershed Protection Program Summary and Assessment Report, and stakeholder input. In general, the activities set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining 2017 FAD period. However, several program requirements have been revised to enhance program effectiveness or to improve efficiency of implementation. The following paragraphs describe changes to some program elements under the Revised 2017 FAD.

Septic System and Sewer Programs: The City's various Septic System and Sewer Programs have successfully reduced the potential for sanitary waste from failing septic systems to contaminate the City's Catskill/Delaware water supply. Under the 2017 FAD, the City and CWC increased eligibility and funding under what is now known as the Expanded Septic Program (formerly the Small Business Septic System Rehabilitation and Replacement Program) to include certain small business, not-for-profit organizations, and governmental entities. In July 2018, eligibility for the Septic Remediation and Replacement Program was expanded throughout the West of Hudson Watershed and in 2019, reimbursement for second-time repairs was allowed. CWC closed the program to new applicants in early 2019 due to delays in the registration of the $86 million Septic V contract, which funded the Septic Remediation and Rehabilitation Program and the Expanded Septic Program. It was registered by the City in June 2019. However, since that time, the average cost of a residential septic repair/replacement has increased from approximately $24,000 to $30,000 (as of 2021). CWC requested contract changes to allow for more flexible program implementation and in recognition of the increased per-system cost. The City and CWC have agreed on a contract amendment that will address these issues.

Under the Cluster System Program, although program rule modifications and additional operation and maintenance funding were addressed under the 2017 FAD, no communities have used this program. Therefore, the City will work with CWC to explore options for utilizing the existing $2 million in program funds for other eligible septic projects.

Community Wastewater Management Program: During the initial five years of the 2017 FAD, the City consulted with CWC to update design and construction dates for several CWMP projects that were subsequently approved by NYSDOH as revised milestones. Projects in the communities of Claryville, Shandaken, and West Conesville have completed construction. Projects in the communities of Halcottsville and New Kingston have completed the design phase and under construction. Pursuant to the 2017 FAD, the City established funding for a community wastewater management system for the Hamlet of Shokan. The Shokan project scope has since been expanded beyond the Hamlet of Shokan to also include the Boiceville wastewater service area. The Revised 2017 FAD mandates the City transmit to CWC the remaining block grant funding for the Shokan project.

Stormwater Programs:
The 2017 FAD required the City to replenish funds in the amount of $4,720,869 to CWC for the Future Stormwater Program (MOA Paragraph 128), and the City registered that contract in July 2019. In 2018, DEP transferred the administration of the Future Stormwater Controls Paid for by

the City Program (MOA Paragraph 145) to CWC, collecting all WOH stormwater funding programs under one agency. The City continues to contract with CWC to provide funding for nine projects per year in the Stormwater Retrofit Program.

Land Acquisition Program: The Environmental Impact Statement (EIS) completed by the City in conjunction with issuance of its WSP in 2010 analyzed the potential impacts of the City's Land Acquisition Program (LAP) on selected towns in the Watershed. The EIS determined there would be no adverse environmental impacts at the levels of acreage projected for the analysis. During the 2016 WOH stakeholder meetings, the WOH communities expressed concern that the City was nearing the projected levels of acquisition in some towns. In response, the City updated or completed assessments for 21 towns, and accepted comments on those assessments. While the study was being conducted, the City agreed to stop or reduce solicitation under the core LAP in nine towns. In 2019, based on the updated Town Level Assessments and its review of comments received, the City, in consultation with NYSDOH, USEPA, and NYSDEC, modified its 2012-2022 Long-Term Land Acquisition Plan with refinements to the criteria it uses to determine properties of interest. These include increasing the minimum surface water criteria from 7% to 15% for properties not adjoining existing City lands and eliminating solicitation in towns where LAP acquires either 4000 acres or 100% of the EIS projection since 2010. To continue to ensure that Watershed communities have adequate funding to review the City's land acquisitions, including the Town Level Assessments, the City increased the cap on local consultation funding from $30,000 to $40,000 per incorporated town and village.

The 2017 FAD committed the City to solicit landowners for a total of 350,000 acres over the seven-year period from 2017 through 2024. The Revised 2017 FAD reduces the solicitation total from 350,000 acres to 200,000 acres, in part due to the increased focus on parcels with surface water or in floodplains as well as reducing the level of program activity. The 2017 FAD allowed up to 20,000 acres per year of credit for solicitation under WAC's easement programs, SAP, and the NYCFFBO Program. Under the Revised 2017 FAD, that cap on solicitation credit has been removed. The City will continue to receive five acres credit for every one acre solicited under the NYCFFBO program and the SAP. Although the 2017 FAD covers program requirements through 2027, the FAD acknowledges that the City's WSP, which permits the City to conduct a land acquisition program, expires in 2025. To address this, the Revised 2017 FAD provides that the City solicit landowners only through 2024 and assess funding annually, with review by NYSDOH, USEPA, and NYSDEC, to ensure program funds are adequate to cover program needs. In 2018 and 2020, the City deposited $23 million into the land acquisition segregated account. Under the Revised 2017 FAD, the third deposit of $23 million into that account will depend on a demonstrated need for those additional funds.

All FAD requirements for LAP beyond 2025 are conditioned upon reissuance of the City's WSP. However, NYSDOH anticipates that land protection activities will continue to be an important component of the City's overall Watershed protection strategy. To avoid a potential gap in program activities, and to allow adequate time for stakeholder input on the LAP, the Revised 2017 FAD continues to require that the City apply in 2022 for a water supply permit to succeed the 2010 WSP, which is three and a half years before the permit expires. The City submitted the application in June 2022. In addition, the City must develop a Long-Term Land Acquisition Plan covering the period 2023-2033, which will now be due in 2023 instead of 2022 to better align with the WSP timeline. This long-term plan will provide continuity as the City transitions from the City's last plan, covering the period 2012-2022, and will consider the findings of the NASEM Expert Panel regarding the LAP as well as public input.

The Revised 2017 FAD continues to require the City to support WAC's Agricultural Easement Program and a stewardship fund to provide for continuing oversight of WAC's acquisitions. The City has agreed to extend the Agricultural Easement contract (CAT-403) through March 2025 and provided additional funding while the successor contract undergoes City approval and registration. The Revised 2017 FAD also requires that adequate funding will be available for the WAC Forest Easement Program, as this program continues its pilot phase.

In 2019, an additional $3 million contract was registered between the City and the Catskill Center to continue implementation of SAP through 2022. The 2017 FAD acknowledges that, in accordance with the City's WSP, and in consultation with NYSDOH, NYCDEP, and other agencies or local governments, NYSDEC may make a written determination whether or not the SAP should be expanded beyond the Schoharie Reservoir Basin. Two written evaluations of SAP were conducted to determine if the program should be continued, modified, or terminated. Several workgroups were also convened to explore payment approaches or incentives that may be applied to purchasing streamside lands. NYSDOH approved an initial set of financial and non-financial set of incentives proposed by the City in 2019. The City submitted a proposed schedule to begin implementing some of the incentives in 2020 except the two primary non-financial incentives which required further discussions with stakeholders. Following several stakeholder meetings held in 2020-2021, the City submitted a status report in 2021 on the two primary non-financial incentives.

The Revised 2017 FAD no longer includes specific requirements for the City to explore opportunities to enhance the LAP through partnerships with land trusts or for a transitioning farm program.

The City will remain involved with stakeholder-led efforts to explore opportunities to use certain City-owned lands that have lower water quality protection values to facilitate relocation of development out of the floodplain.

Watershed Agricultural Program: The Watershed Agricultural Program (WAP) has continued to control agricultural sources of pollution though multiple watershed partnerships and the implementation of structural and non-structural best management practices (BMPs). The Revised 2017 FAD extends the due date for new BMPs to be designed, allocated funding, and scheduled for implementation from 2022 to 2023, and the date for implementation has been extended from 2024 to 2025. A new requirement for the Revised 2017 FAD is the submittal of a Long-Term Management Plan for the WAP by March 31, 2026. This Plan will include evaluating the BMP backlog reduction metric, prioritization of WFPs, and NASEM recommendations. A meeting will be held with regulators to discuss the plan following submission.

Watershed Forestry Program: The Watershed Forestry Program continues to develop new ways to engage foresters and forest landowners and promote the stewardship of healthy, sustainable forests in the Watershed. The Revised 2017 FAD continues to promote the use of tools like NYS's forest tax abatement program, the MyWoodlot.com website, and the Conservation Awareness Index to achieve program goals. The Revised 2017 FAD adds additional requirements for reports pertaining to the status and effectiveness of MyWoodlot.com and on the Management Assistant Program (MAP) modifications and improvements.

Stream Management Program: The Stream Management Program continues to inventory stream features in the Watershed and work to prioritize stream restoration work based on water quality protection benefits. To support these efforts, the City pursued a study evaluating stream management projects' effectiveness in turbidity reduction. The City submitted the final Esopus

Creek watershed turbidity study design in 2019. Data collection and analysis for this study is on-going, with the first 5-year study findings reported in 2022. The Revised 2017 FAD continues requirements to complete 24 stream projects and to fund at least 100 community-driven projects through the Stream Management Implementation Program (SMIP). The metric of streambank revegetation miles under the Catskill Streams Buffer Initiative (CSBI) has been increased from 5 to 10 miles. Through programs administered by both the SMP partners and the CWC, the City also commits to funding flood mitigation projects that are generated from the Local Flood Analyses (LFAs) that have been done in a number of WOH communities.

During the period of the 2017 FAD, Delaware County and WAC implemented a pilot program to make use of a new funding opportunity from the Conservation Reserve Enhancement Program (CREP). CREP now provides funding to vegetate riparian buffers on fallow agricultural lands. Metrics to evaluate the pilot program's effectiveness were agreed upon in 2018 by the City and its partners. The program was evaluated in 2019 based these metrics to assess effectiveness/progress within Delaware County, and to assess whether pilot should be extended permanently. The City evaluated the program in 2019 and recommended a two-year extension of the pilot followed by another evaluation. Program activities during the extension were limited due to the Covid-19 pandemic and state and federal program pauses, so the 2021 evaluation recommended an additional extension and third evaluation report in 2025. These are reflected in the Revised 2017 FAD.

Ecosystem Protection Program: Watershed protection efforts under the Forestry, Wetlands, and Invasive Species programs were brought together in the 2017 FAD as the Ecosystems Protection Program. The City has continued to collaborate with partners to ensure coordination of invasive species management across programs. Invasive species including the emerald ash borer, *Hydrilla*, water chestnut, and zebra mussel are monitored, treated or removed when applicable. In 2019, DEP expanded their Light Detection and Ranging (LiDAR) wetland mapping pilot study to improve the resolution of wetland and stream mapping for monitoring and planning future management strategies. The Forestry monitoring completed by DEP continues to improve forest health and management strategies on City-owned land. Overall, the Ecosystem Protection Program has continued to aid in wetland protection, forest and invasive species management.

East-of-Hudson (EOH) Nonpoint Source Pollution Control Program: The Revised 2017 FAD commits the City to continue to implement an EOH Septic Repair Program (SRP) in the four Catskill/Delaware FAD basins (Boyd Corners, Croton Falls, Cross River, and West Branch Reservoirs, including Lake Gleneida), providing funding to cover at least 50% of the cost of repair or replacement of 35 septic systems per year. To date, the existing program, as established by the Revised 2007 FAD, has had little participation. Under the 2017 FAD, the program was expanded to include basins that are upstream and hydrologically connected to the Croton Falls Reservoir. The Revised 2017 FAD updates the requirement to fund the EOH Septic Repair Program by allowing the City to fund the program by contracting with either the Environmental Facilities Corporation (EFC), New England Interstate Water Pollution Control Commission (NEIWPCC), or directly with homeowners. The City will conduct an assessment of the SRP to determine whether funding for at least 35 systems per year is appropriate to meet demand from eligible septic systems in the program areas.

In 2018, the City entered a $3.3 million contract with NEIWPCC to administer the EOH Community Wastewater Planning Assistance Program, providing funding to municipalities for preliminary planning and engineering studies of potential community wastewater solutions in

eight areas of the Cross River and Croton Falls basins. The City submitted a report summarizing those planning studies in June 2022.

In 2019, the City contracted with the East of Hudson Watershed Corporation (EOHWC) to provide $22 million dollars to support stormwater retrofit grants in the EOH FAD Basins and basins upstream and hydrologically connected to the Croton Falls Reservoir. In 2020, the City completed the construction of the two stormwater retrofit projects originally required under the Revised 2007 FAD at Maple Avenue and Drewville Road. These projects provide suspended solids and sediment protection for stormwater entering Cross River and Croton Falls reservoirs respectively.

Catskill Turbidity Control Program: The Revised 2007 FAD required the City to fund an Expert Panel review of its use of the Operations Support Tool (OST). The City contracted with the NASEM to conduct that review, and the panel issued its final report in 2018. The City used those recommendations to update the performance measures and criteria for evaluating the Catskill Turbidity Control Measures and continues to implement them. The Revised 2017 FAD continues the requirement for the City to report and meet with regulators on the EIS being completed in relation to proposed modifications to the City's Catalum SPDES permit. On February 9, 2022, NYSDEC announced that the agency would require the City to undertake additional analyses and prepare a supplemental DEIS. Modifications to the City's Catskill turbidity control strategies may result from this environmental impact study.

Multi-tiered Water Quality Modeling Program: The Revised 2017 FAD continues the City's annual progress meeting with the regulators to present and discuss results of the modeling program's work. As the activity in this program continues to expand and as modeling has become an increasingly important tool used in planning for, managing, and operating the Catskill/Delaware water system, these meetings will help ensure that NYSDOH is up-to-date and understands the modeling the City uses to meet its Watershed protection goals. Based on the 2020 recommendations of the NASEM WPP Expert Panel, the City will explore the use of models and applications coupled with statistical analysis of monitoring data to evaluate, optimize, and integrate management and protections programs

Watershed Rules and Regulations: In 2019, the City revised the WR&Rs to provide for greater consistency with the state's regulatory program for stormwater and wastewater. Revisions were also incorporated in response to concerns raised by stakeholders in WOH communities, in particular related to noncomplying regulated activities, subsurface sewage treatment systems, holding tanks, SWPPPs, and variances. NYSDOH will update 10 NYCRR Part 128 to reflect the City's amended regulations.

The City meets the requirement to pay for the replacement of watershed equipment at eligible WWTPs through funding the Capital Replacement Program. In 2018, EFC elected to no longer administer the Capital Replacement Program on behalf of the City. In 2019, the City entered a new agreement with the New England Interstate Water Pollution Control Commission (NEIWPCC) to manage the capital replacement program.

Within this program, the City also commits to provide NYSDOH with an annual update on the capital replacement of equipment and methods at eligible WWTPs that are required by the WR&Rs and not otherwise required by State or federal law.

Catskill/Delaware Filtration Plant Design: Under the 2017 FAD, the City and NYSDOH agreed that a comprehensive review of the Catskill/Delaware filtration facility design should be

conducted and that a new conceptual design should be developed, using the knowledge and technologies that are currently available. The City and their contractor have completed the paper and bench studies, and have commenced the conceptual design and larger-scale pilot studies. The Revised 2017 FAD requires the City to meet with NYSDOH, USEPA, and NYSDEC to discuss the pilot study results.

FAD Administration: The Revised 2017 FAD continues to require the City to report annually on the status of key partnership contracts and funding projections. In addition, NYSDOH may request to meet with the City and program partners to discuss and foster resolution to any contract or funding issues that may be interfering with FAD program implementation. The Revised FAD continues the requirement for the City to co-locate staff with CWC in the Arkville building, including at least 40 NYCDEP staff assigned to that location by December 31, 2026.

References to program partner contracts throughout this FAD require the City to "execute and register" the contract by the specified due date. In accordance with the City's contracting procedures, an "executed" contract has been signed by the City and the program partner. Once an executed contract has been "registered", funding becomes available so that the program partner may begin invoicing to fund program activities.

Other Stakeholder Issues: In its 2020 report, the NASEM WPP Expert Panel concluded that the City's source water protection program would benefit from analyses of the vitality of watershed communities. The panel acknowledged that many of City's substantial investments in watershed protection have resulted in benefits to the regional economy and recommended further study of community well-being and the relative contributions of City's various programs elements. The goal is to optimize the mix of program activities to continue effective source water protection while enhancing the incremental benefits to community vitality. The Revised 2017 FAD requires the City to undertake this study and submit a report in 2025. It is anticipated that the results of this study will help inform decisions about future FAD program activities to be recommended for the 2027 FAD.

Program Revisions Made in Response to Public Comments

The Draft Revised 2017 FAD was released to the public for review and comment April 20, 2022 with a 45-day public comment period. In response to a request from the Coalition of Watershed Towns, NYSDOH extended the comment period by 30 days to end on July 1, 2022. Several revisions were made to the FAD in response to the public comments and watershed developments after the draft was released.

Septic and Sewer Programs: New activities were added for the City, in cooperation with CWC, to study the current and future septage disposal needs in the West of Hudson Watershed, as well for the City to fund the necessary capital improvements at the selected WWTPs.

Community Wastewater Management Program: An activity was added for the City to reimburse CWC for funds drawn from the Catskill Fund for the Future to cover additional project costs for the Halcottsville and New Kingston community wastewater projects.

Land Acquisition Program: A requirement was added for the City to extend the agricultural easement contract with WAC for 27 months and provide an additional $4 million in funding. Three new workgroups activities were added. One workgroup will explore the suitability of pre-emptive purchase rights within WAC conservation easements. Another workgroup is exploring potential changes to conservation easement language to allow for certain activities, including

public utilities and renewable energy infrastructure. A third workgroup will explore issues related to the expansion of SAP outside of the Schoharie Basin. A requirement was added for the City to complete the mechanism(s) necessary to allow for third-party ownership of land acquired through SAP.

Stream Management Program: A requirement was added for the City to nominate three stream projects in the Ashokan Basin for construction during the successor FAD period. Another requirement was added for the City to execute and register a $15 million Local Flood Hazard Mitigation Program contract with CWC.

Kensico Water Quality Control Program: Activities were added for an evaluation of certain unsewered areas in the Kensico Basin for potential future connection to a centralized sewage connection system.

In Conclusion

The Revised 2017 FAD is one component of the City's comprehensive Watershed protection program, which has been established within the context of the MOA and previous FADs. Many of the program activities will be implemented through partnerships with Watershed stakeholders that the City has developed and maintained since the signing of the Watershed MOA. This FAD includes all the commitments made by the City in their 2021 Long-Term Plan. Note that the City is required to meet the requirements and due dates as set forth in this determination, rather than those in the 2021 Long-Term Plan, in instances where they differ from those in the 2021 Long-Term Plan.

In addition, the Revised 2017 FAD requires continued implementation of the WR&Rs (effective May 1, 1997 and amended November 29, 2019) and compliance with the WSP issued by NYSDEC for land acquisition (last reissued December 24, 2010). The Revised 2017 FAD also requires that the City continue to meet the filtration avoidance criteria, detailed in 40 CFR §§141.71, 141.72, 141.171, and 141.712; and 10 NYCRR Part 5, Subpart 5-1, Section 1.30(c).

The Revised 2017 FAD will supersede the 2017 FAD and be effective until a further determination is made, currently scheduled for July 2027. To transition from the Revised 2017 FAD into the 2027 FAD, NYSDOH expects that the City will undertake a comprehensive evaluation of its Watershed protection program to be completed by March 31, 2026. NYSDOH will conduct a FAD compliance review and issue a compliance assessment report on this review by July 31, 2026. This report will assist the City in its development of a new Long-Term Watershed Protection Plan due on December 15, 2026. The 2026 Long-Term Watershed Protection Plan will serve as the principal reference for the next FAD reissuance, scheduled for July 2027. The dates above are tentative and may be re-evaluated by NYSDOH as necessary.

Regulatory Authority

NYSDOH possesses authority under both State and federal law to enforce the Revised 2017 FAD and the City's Long-Term Watershed Protection Plan, as revised in December 2021. Collectively, these documents, along with the City's WR&Rs and related requirements of the State Sanitary Code, *see* 10 NYCRR § 5-1.30, and federal regulations, *see* 40 CFR § 141.71(b), and 141.171, embody the "watershed control program" for filtration avoidance under State law and under the federal Safe Drinking Water Act, 42 USC § 300f *et seq.*

The City would be in violation of State and federal filtration avoidance requirements if it failed to comply with its obligations to fully maintain the watershed control program, including any failure by the City to make adequate, timely, and approvable submissions to NYSDOH required by that program. *See* 40 CFR § 141.71(b)(2) and (3) (watershed control program and disinfection treatment process must be "adequately designed and maintained" to "the State's satisfaction"); 10 NYCRR § 5-1.30(d). The City also would be in violation of State and federal filtration avoidance requirements if it were to fail to meet applicable standards for water quality and disinfection. *See* 40 CFR § 141.71(a)(1) and (2); 141.71(b)(1), (4), (5), and (6); 141.71(c)(2); 10 NYCRR § 5-1.30(d).

NYSDOH may take enforcement action against the City to address any such violations through the Commissioner's assessment of civil penalties of up to $25,000 per day for each violation, *see* Public Health Law § 206(4)(d), and in a State or federal court action brought by the Attorney General on NYSDOH's behalf to compel the City to comply with the watershed control program or, in the alternative, to compel the City to filter its Catskill/Delaware water supply.

2. SWTR Filtration Avoidance Criteria Requirements

The Surface Water Treatment Rule (SWTR) at 40 CFR §141.71, the Interim Enhanced Surface Water Treatment Rule (IESWTR) at 40 CFR §141.171, and 10 NYCRR, Subpart 5-1, §5-1.30 require that all surface water supplies provide filtration unless certain source water quality, disinfection, and site-specific avoidance criteria are met. In addition, the supplier must comply with: (1) the Revised Total Coliform Rule (RTCR); and (2) the Stage 1 Disinfectants and Disinfection Byproducts Rule. Further, the Stage 2 Disinfectants and Disinfection Byproducts Rule and the Long Term 2 Enhanced Surface Water Treatment Rule (LT2) establish additional important requirements for unfiltered systems, although these provisions are not identified in USEPA regulations as filtration avoidance criteria.

The City will continue to report to NYSDOH and USEPA on two items not specifically required by the SWTR as conditions of filtration avoidance. The requirements are to: (1) report on the operational status of the Catskill/Delaware Ultraviolet Disinfection Facility, as required by LT2; and (2) notify NYSDOH and USEPA within 24 hours of learning that a sample from a distribution system RTCR compliance site has tested positive for *E. coli*.

Expert Panel Review

The 2017 FAD continued the requirement from the Revised 2007 FAD that the City convene an expert panel to review the City's Long-Term Watershed Protection Plan, water quality and water quality trends, and anticipated future activities that might adversely impact the City's water supply. The City achieved this requirement through a contract with the National Academies of Science, Engineering, and Medicine (NASEM) which commenced in March 2018. The 17-member expert panel met a total of eight times from 2018 through early 2020, received public comments, met with stakeholders, reviewed extensive documentation, conducted site visits and analyzed water quality and programmatic data. The final report was released in December 2020. The report contains numerous recommendations for enhancement, integration, and evaluation of watershed programs.

Following the release of the NASEM report, DEP convened five stakeholder meetings in January, February, and April 2021 to discuss the major recommendations and potential changes to the City's Long-Term Watershed Protection Plan and, correspondingly, some requirements of the revisions to this FAD.

The City's Filtration Avoidance Criteria Requirements are described in Section 2.1 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

During the remaining period of the Revised 2017 FAD, the City must continue to implement the SWTR Objective Criteria requirements in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
Continue to meet SWTR filtration avoidance criteria (40 CFR §141.71 and §141.171, and 10 NYCRR §5-1.30) and submit reports and certification of compliance on:	Monthly[1]

• §141.71(a)(1) and §5-1.30(c)(1) – raw water fecal coliform concentrations • §141.71(a)(2) and §5-1.30(c)(2) – raw water turbidity sampling • §141.71(b)(1)(i)/§141.72(a)(1) and §5-1.30(c)(3) – raw water disinfection CT values • §141.71(b)(1)(ii)/§141.72(a)(2) and §5-1.30(c)(4) – operational status of Kensico and Hillview disinfection facilities, including generators and alarm systems • §141.71(b)(1)(iii)/§141.72(a)(3) and §5-1.30(c)(5) – entry point chlorine residual levels • §141.71(b)(1)(iv)/§141.72(a)(4) and §5-1.30(c)(6) – distribution system disinfection levels (the City will include a discussion of any remedial measures taken if chlorine residual levels are not maintained throughout the distribution system) • §141.71(b)(5) and §5-1.30(c)(10) – distribution system coliform monitoring, including a summary of the number of samples taken, how many tested positive for total coliform, whether the required number of repeat samples were taken at the required locations, and which, if any, total coliform positive samples were also *E. coli* positive. For each *E. coli* positive sample, include the investigation of potential causes, problems identified and what has or will be done to remediate problems. Include copies of any public notices issued as well as dates and frequency of issuance.	
All requirements described in §141.71(b)(4) and §5-1.30(c)(8) must continue to be met. Notify NYSDOH and USEPA within twenty-four hours of any suspected waterborne disease outbreak.	Event Based
All requirements described in §141.71(b)(6) and §5-1.30(c)(9) must continue to be met. Submit report on disinfection byproduct monitoring results.	Quarterly[2]
Notify NYSDOH/USEPA within twenty-four hours, if at any time the chlorine residual falls below 0.2 mg/L in the water entering the distribution system.	Event Based
Notify NYSDOH/USEPA by the close of the next business day, whether or not the chlorine residual was restored within four hours.	Event Based
Report on the operational status of Kensico Reservoir, West Branch Reservoir (on-line or by-pass), Hillview Reservoir, and whether any of these reservoirs experienced unusual water quality conditions.	Monthly[1]

Regarding the emergency/dependability use of Croton Falls and Cross River source water: • The City shall not introduce Croton Falls or Cross River source water into the Catskill/Delaware water supply system without the prior written approval of NYSDOH. • As a condition of approval, the City must demonstrate continuing, substantial compliance with the Watershed protection program elements being implemented in the Croton Falls and Cross River watersheds that are contained in this Determination. • As a condition of approval, the City will submit water quality data and monitor water quality at Croton Falls and/or Cross River, pursuant to the approved sampling plan submitted to NYSDOH and USEPA in November 2019, or as revised by the City, and approved by NYSDOH and USEPA, thereafter. NYSDOH approval under this Section may include additional conditions including, but not limited to, project schedules or specific operating goals or parameters for the City's water supply facilities (such as maximizing use of the Croton Filtration Plant, or operation of the Catskill/Delaware UV Plant at 3-log inactivation). In evaluating requests for approval from the City, NYSDOH shall consult with USEPA.	Continuous

Contract with the National Academies to conduct an Expert Panel review of the City's Long-Term Watershed Protection Plan, water quality and water quality trends, and anticipated future activities that might adversely impact the water supply and its ability to comply with 40 CFR §141.71 and §141.171, and 10 NYCRR §5-1.30. Evaluate the adequacy of the City's Watershed Protection Programs for addressing these concerns and provide recommendations, as necessary, for improving programs.	
• Issue Commence Work notice to National Academies.	1/31/2018 Completed
• Upon request of the National Academies, provide any necessary background information and respond to any pertinent questions within the scope of the review.	Completed
• Ensure the schedule for public meetings is widely available either on a project-specific website, National Academies website or the NYCDEP website.	Completed
• Report on the status of the Expert Panel review in the FAD Annual Report.	Completed
• Provide the final report to NYSDOH, USEPA, and NYSDEC.	12/15/2020 Completed
• Convene a public meeting with the regulators and Watershed stakeholders to discuss the major findings and recommendations of the Expert Panel review.	Completed

Report Description	Due Date
Submit 2021 Long-Term Watershed Protection Plan	12/15/2021 Completed
Submit 2026 Long-Term Watershed Protection Plan	12/15/2026
Report on program implementation in the FAD Annual Report.	Annually[3]

[1] Monthly means reports for a monthly reporting period must be submitted no later than ten days after the end of each month.
[2] Quarterly means reports for a calendar quarter reporting period must be submitted no later than ten days after the end of each quarter.
[3] Annually means reports for a calendar year reporting period must be submitted no later than March 31 of the following year.

3. Environmental Infrastructure Programs

3.1 Septic and Sewer Programs

The City implements a comprehensive set of programs that serve to reduce the number of failing or potentially failing septic systems in the Watershed.

The goals for the Sewer and Septic Program under the Revised 2017 FAD are to:

- Provide adequate funding for the Septic Remediation and Replacement Program.
- Provide adequate funding for the Expanded Septic Program (formerly known as the Small Business Program).
- Continue to fund the Septic Maintenance Program.
- Complete the currently active Sewer Extension Projects.

In all the septic system programs, where sewer extensions to City-owned WWTPs or to WWTPs not owned by the City are more cost-effective than stand-alone solutions, the City will support the design and construction of such sewer extensions. The City will charge households served by a sewer extension to a City-owned WWTP no more in annual operation and maintenance costs than the maximum for households served by WWTPs in the New Infrastructure and Community Wastewater Management Programs pursuant to MOA Paragraph 122. Where a sewer extension to WWTP not owned by the City is warranted, the City will provide additional funding to the owner of the WWTP to cover any annual operation and maintenance costs above the household maximum established in MOA Paragraph 122. Where a sewer extension serves an entity other than a household, the City will provide supplemental funding to ensure that the entity's annual operation and maintenance costs are comparable to those of non-residential sewer users served by WWTPs in the New Infrastructure or Community Wastewater Management Programs.

Septic Remediation and Replacement Program

The Septic Remediation and Replacement Program provides for pump-outs and inspections of septic systems serving single or two-family residences in the WOH Watershed; upgrades of substandard systems; and remediation or replacement of systems that are failing or reasonably likely to fail in the near future. Participation is currently available to all residential properties with provisions for prioritization based on distance to a watercourse or within the 60-day Travel Time Area. The goal is to ensure funding is in place to remediate or replace approximately 300 failing or likely-to-fail septic systems per year.

Alternate Design Septic Program

The City previously funded the Alternate Design Septic Program under the Watershed MOA to address the incremental compliance costs of the septic provisions of the WR&Rs. In 2019, CWC incorporated the balance of Alternate Design funding into the Septic Remediation and Replacement Program.

Expanded Septic Program

The Expanded Septic Program (formerly the Small Business Septic System Rehabilitation and Replacement Program) helps pay for repair or replacement of failed septic systems serving small businesses, not-for-profit organizations, and governmental agencies in the WOH

Watershed. The City and CWC expanded the Program per the 2017 FAD to include funding for 100% of the costs of repairs and qualifying alterations and modifications to septic systems for: small businesses with 20 or fewer employees; not-for-profit organizations with 5 or fewer locally-based employees; and governmental entities. The City also funds 75% of the costs of repairs of, and qualifying modifications to, septic systems up to $100,000 for a single system, plus 100% of any cost over $100,000 for: small businesses with 21 or more employees; and not-for-profit organizations with 6 or more locally-based employees. For any equipment or methods of operation required solely by the WR&Rs and not otherwise required by State or federal law, the City will fund 100% of the cost for a septic system serving a population center or an entity that is "public" for purposes of Public Health Law (PHL) Section 1104.

Cluster System Program

The Cluster System Program was established in 2008 to fund the planning, design, and construction of cluster systems in thirteen communities in the WOH Watershed. Through CWC, eligible communities may elect to establish septic districts that would support cluster systems and tie multiple properties to a single subsurface disposal system. This enables communities to locate disposal systems on larger sites in areas where existing structures were sited on insufficiently-sized lots. Since there has not been a demonstrated need for this program in the 13 years since it was established, DEP will work with CWC to conclude the standalone Cluster Program and explore options for utilizing the $2 million in available Cluster Program funds already paid to CWC for eligible septic projects, including cluster systems should future projects materialize.

Septic Maintenance Program

The Septic System Maintenance Program is a voluntary program that covers most residences, small businesses, not-for-profit corporations, and governmental entities. It is intended to reduce the occurrence of septic system failures through regular pump-outs and maintenance. Through CWC, participants are reimbursed a portion of eligible costs for pump-outs and maintenance. As part of the program, CWC also develops and disseminates septic system maintenance educational materials. The goal is to reduce the incidence of septic failures by incentivizing West of Hudson septic system owners to properly maintain their treatment systems.

Sewer Extension Program

The Sewer Extension Program has funded the design and construction of wastewater sewer extensions connected to City-owned WWTPs discharging in the WOH Watershed. The goal of this program is to reduce the number of failing or potentially failing septic systems by extending WWTP service to priority areas. The City has completed projects in the towns of Roxbury (Grand Gorge WWTP); Hunter-Haines Falls (Tannersville WWTP); Neversink (Grahamsville WWTP); Hunter-Showers Road (Tannersville WWTP), Shandaken (Pine Hill WWTP); and Middletown (Margaretville WWTP). The long-term goal for this program will depend upon future determination of need for projects.

The City's Septic and Sewer program is described in Section 2.2.1 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to implement the Septic and Sewer Program in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
In accordance with CWC Program Rules, contract with CWC to provide adequate funding in support of the Septic Remediation and Replacement Program at a funding level sufficient to address 300 septic systems per year and to cover the future costs of 300 additional septic systems per year as they are identified and enrolled in the program.	Ongoing
Execute and register a contract amendment for the Septic Remediation and Replacement Program which provides additional funding for CWC based on the increased per system unit cost.	Completed
In accordance with CWC Program Rules, contract with CWC to provide adequate funding in support of the Expanded Septic Program provided that the need for such funding has been demonstrated.	Ongoing
• Make additional funding available to the Expanded Septic Program to address a total of 15 systems per year. A minimum of $13 million shall be made available to this program through 2027. • Reimburse CWC for funding used to support the Expanded Septic Program prior to contract execution.	6/30/2019 Ongoing 6/30/2019 Completed

In accordance with CWC Program Rules, contract with CWC to provide adequate funding in support of the Cluster System Program component of the Septic Remediation and Replacement Program provided that the need for such funding has been demonstrated. • Work with CWC to modify the Cluster System Program Rules, if the City and CWC conclude that modifications are necessary to facilitate implementation of cluster systems. Such modifications may include, but are not limited to: (i) incorporating defined time frames for milestones in project schedules (e.g., Study Phase to be completed 1 year after community agrees to participate in the program; funding for project to be approved or denied within 90 days after receipt of completed Study Phase report); (ii) indicating that if the Study Phase determines that a cluster system(s) is not the most cost-effective wastewater solution for an area identified with septic system failures, then the consultant may recommend a more cost-effective solution (e.g., sewer extension or other wastewater management system); (iii) clarifying that where a sewer extension to a City-owned WWTP or to a WWTP not owned by the City is the most cost-effective solution, the City will provide funding to ensure that operation and maintenance costs charged to the entities served by such a sewer extension are comparable to what they would be under the New Infrastructure and Community Wastewater Management Programs; and (iv) identifying operation and maintenance costs of cluster systems that are eligible for funding under the program. Make an additional $1 million available to the Cluster System Program to cover the eligible operation and maintenance costs of cluster systems that are implemented under the program. The need for additional funding for this program will be assessed annually.	Ongoing 6/30/2018 Completed 6/30/2019 Completed
Contract with CWC to provide funding, if necessary, to allow maintenance each year of 20% of the total number of septic systems eligible under the Septic Maintenance Program Rules.	Ongoing
Construct sewer extension projects in Shandaken (Pine Hill WWTP) and Middletown (Margaretville WWTP).	Completed
Support the use of the already provided funding to cover the eligible incremental costs for septic systems serving population centers or entities that are “public” for purposes of PHL Section 1104 to comply with the septic system provisions of the WR&Rs to the extent that they are not otherwise required by state or federal regulations.	Ongoing

In cooperation with CWC, study the current and future septage disposal needs in the WOH Watershed.	6/30/2024
Submit a schedule to fund the necessary capital improvements needed at the selected non-City owned WWTPs to accept septage.	12/31/2025

Report Description	Due Date
Report on septage disposal needs in the WOH Watershed.	6/30/2024
Report on program implementation in the FAD Annual Report: • Septic Remediation and Replacement Program • Expanded Septic Program • Septic Maintenance Program	Annually, 3/31

3.2 New Sewage Treatment Infrastructure Program

This program was concluded under the Revised 2007 FAD.

3.3 Community Wastewater Management Program

The Community Wastewater Management Program (CWMP) funds construction of community septic systems and/or septic maintenance districts in communities identified in Paragraph 122 of the MOA (the 8-22 communities). This program is designed to improve water quality and protect public health by reducing the transport of pathogens, nutrients and organic matter into waterways. Much of this work has already been completed under prior FADs, and final projects have been completed for the following communities: Bloomville, Boiceville, Hamden, DeLancey, Bovina, Ashland, Haines Falls, Trout Creek, Lexington, South Kortright, Shandaken, Claryville and West Conesville. The New Kingston and Halcottsville projects have received block grant approval, completed design and are eligible to start the construction phase. For all projects, the timeline of the Design Phase commences when the proposed project outlined in the Study Phase is approved by the parties, the timeline of the Construction Phase commences when the plans drafted during the Design Phase are approved. During the initial five years of the 2017 FAD, the City consulted with CWC to alter design and construction dates for several CWMP projects that were subsequently approved by NYSDOH as updated 2017 FAD milestones; where applicable, these altered dates are indicated as such to distinguish from the original estimated dates.

The potential need for a community wastewater management system for the Hamlet of Shokan was identified subsequent to the MOA. The Revised 2007 FAD required the City to complete a study to determine that potential need. Under the 2017 FAD, NYSDOH, in consultation with NYSDEC, directed the City to fund an engineering study to determine the appropriate community wastewater management system to serve the hamlet of Shokan in the Town of Olive, as well as to fund the design and construction of that system. The Shokan project scope has since been expanded beyond the Hamlet of Shokan to also include the Boiceville wastewater service area. The City approved the block grant for the Shokan project in August 2020. Through May 2021, the City had transferred to CWC $25 million of the $49 million block grant. In November 2021, NYSDOH directed the City to transfer the remaining amount by the issuance date of the Revised 2017 FAD. The City transferred the remaining funds to CWC in August 2022.

The City's CWMP is described in Section 2.2.2 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to implement the CWMP in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
Complete preliminary study for Halcottsville and New Kingston.	Completed
Approve block grant for Halcottsville.	Completed
Approve block grant for New Kingston.	Six months from date of completed Study Phase (estimated 3/31/2018) Completed
Complete design for the following projects:	One year from date of town approval to enter Design Phase
• Shandaken	Estimated 9/30/2018 Completed
• Claryville	Estimated 10/31/2018 Revised 5/31/2019 Completed
• West Conesville	Estimated 12/31/2018 Revised 3/31/2020 Completed
• Halcottsville	Estimated 12/31/2018 Revised 3/31/2021 Completed
• New Kingston	Estimated 6/30/2019 Revised 12/31/2021 Completed

Complete construction for the following projects:	Two years from date of completed Design Phase
• Shandaken	Estimated 9/30/2020 Completed
• Claryville	Estimated 10/31/2020 Completed
• West Conesville	Estimated 12/31/2020 Revised 9/30/2021 Completed
• Halcottsville	Estimated 12/31/2020 Revised 6/30/2024
• New Kingston	Estimated 6/30/2021 Revised 6/30/2024
Execute and register a contract amendment to reimburse CWC for funds drawn from the Catskill Fund for the Future that loaned to the Community Wastewater Management Program to cover project costs for the Halcottsville and New Kingston projects.	Completed
<u>Community Wastewater System for the Hamlet of Shokan</u> • Work with CWC to provide funding for the engineering study for a community wastewater system for the Hamlet of Shokan.	Completed
• Contract with CWC to provide funding to implement the Shokan project.	12/31/2018 Completed
• Complete preliminary study for Shokan, which includes the proposed service area to be approved by NYSDOH, USEPA and NYSDEC.	3/31/2019 Completed
• Approve block grant for Shokan project.	Six months from date of completed Study Phase (estimated 9/30/2019) Completed
• Transmit to CWC the remaining block grant funding for Shokan project.	Completed

• Complete design for Shokan.	One year from date of town approval to enter Design Phase (estimated 12/31/2020; revised 12/31/2024)
• Complete construction for Shokan.	Two years from date of completed Design Phase (estimated 12/31/2022; revised 12/31/2026)

Report Description	Due Date
Report on program implementation in the FAD Annual Report: • Halcottsville • New Kingston • Shokan	Annually, 3/31

3.4 Wastewater Treatment Plant Upgrade Program

As of the Revised 2007 FAD, this program was concluded. The City's commitment to pay for Capital Replacement of Watershed Equipment and Methods at eligible WWTPs can be found in Section 6.1 of this FAD.

3.5 Stormwater Programs

As part of the MOA, three Stormwater Programs were established: (1) Future Stormwater Controls paid for by the City for Single Family Houses; Small Business and Low Income Housing Program (MOA Paragraph 145); (2) the WOH Future Stormwater Controls Program (MOA Paragraph 128); and (3) the Stormwater Retrofits program (MOA Paragraph 125). These programs are administered by CWC on behalf of the City.

Both Future Stormwater Controls programs provide financial support for the cost of designing, constructing and, in some cases, maintaining stormwater controls that are required by the WR&Rs, but not otherwise required by federal or State law, for certain new development projects. The Future Stormwater Controls Program (MOA 145) reimburses low-income housing project and single-family homeowners 100% and small businesses 50% of eligible costs. The WOH Future Stormwater Controls Program (MOA 128) reimburses municipalities and large business 100% and small business 50% for eligible costs. In 2019, the City replenished funding for the Future Stormwater Controls Program in the amount of $4,720,869, based on projected needs for the program.

The Stormwater Retrofit Program (MOA 125) addresses existing stormwater runoff problems in the WOH Watershed through the construction of stormwater BMPs. Funding is provided for design, permitting, construction, and maintenance of BMPs that address runoff from concentrated areas of impervious surfaces, as well as community-wide stormwater infrastructure assessment and planning. Program funding can also be used for retrofit projects installed in coordination with the CWMP. DEP has provided CWC with funds for an appropriate position at CWC to assist applicants undertaking regulated activities to comply with the stormwater provisions of the WR&R.

The goals for the Stormwater Program under the Revised 2017 FAD are to:

- Fund eligible incremental costs to comply with the stormwater provisions of the City's WR&Rs.
- Ensure funding for a position at CWC to assist applicants in complying with the stormwater provisions of the City's WR&Rs, including attendance at pre-application and preconstruction meetings.
- Provide funding for nine stormwater retrofit projects per year.
- Fund operations and maintenance of retrofit projects completed under the Stormwater Retrofit Program.
- Contract with CWC to fund payments under MOA Paragraph 145 via CWC instead of directly from the City.

The City's Stormwater Programs are described in Section 2.2.3 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to implement the Stormwater Programs in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
Contract with CWC to provide $4,720,869 to CWC to replenish the Future Stormwater Funds to be used in accordance with MOA Paragraph 128.	On or Before 5/31/2019 Completed
Fund, in accordance with the MOA, and consistent with the CWC program rules, as amended, the eligible incremental costs to comply with the stormwater provisions of the WR&Rs to the extent that they are not otherwise required by federal or State law.	Ongoing
Contract with CWC to provide adequate funding for an appropriate position at CWC to assist applicants undertaking regulated activities to comply with the stormwater provisions of the WR&Rs.	Ongoing
Continue to contract with CWC to provide the funding needed to allow the Stormwater Retrofit Program to construct nine (9) stormwater retrofit projects per year, consistent with the Stormwater Retrofit Program Rules. Selection and implementation of eligible projects will be based on potential to benefit water quality protection. These projects are in addition to those installed in coordination with CWMP projects.	Ongoing
Support the use of program funding for retrofit projects installed in coordination with CWMP projects.	Ongoing
Continue to contract with CWC to provide the funding needed for the operations and maintenance of retrofit projects funded through the Stormwater Retrofit Program consistent with the Stormwater Retrofit Program Rules, provided the demonstrated need for such funding continues.	Ongoing

Report Description	Due Date
Report on implementation of the Future Stormwater Controls Programs and the Stormwater Retrofit Program in the FAD Annual Report. Include descriptions of reviewed projects, approval status, and justification.	Annually, 3/31

4. Protection and Remediation Programs

4.1 Waterfowl Management Program

Surveys of Kensico Reservoir in 1992 established a strong relationship between avian populations and bacteria (fecal coliform) levels in untreated water. As a result, the City instituted a Waterfowl Management Program to reduce or eliminate, where possible, all waterbird activity in order to mitigate seasonal elevations of fecal coliform bacteria. A similar program was established at Hillview Reservoir, and was expanded on an "as needed" basis to several more reservoirs.

"Bird dispersal" refers to use of pyrotechnics, motorboats, airboats, remote control motorboats, propane cannons, and other methods employed to physically chase or deter waterbirds from inhabiting the reservoirs.

"Bird deterrence" refers to preventative methods employed to prevent waterbirds from inhabiting the reservoirs, such as: nest and egg depredation, overhead bird deterrent wires, bird netting on shaft buildings, meadow maintenance, and other methods.

"As needed" refers to implementation of bird management measures based on criteria including fecal coliform concentrations approaching or exceeding 20 colony-forming units at reservoir effluent structures coincident with elevated bird populations. Other criteria include current bird populations, recent weather events, operations flow conditions within the reservoir, reservoir ice coverage and Watershed snow cover, and determination that active bird management measures would be effective in reducing bird populations and fecal coliform bacteria levels.

The goals for the Waterfowl Management Program under the 2017 FAD are to:

- Continue active and "as needed" waterbird management through dispersal and deterrent methods at Kensico Reservoir and Hillview Reservoir.
- Continue "as needed" management at other City Reservoirs.

The City's Waterfowl Management Program is described in Section 2.3.1 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to implement the Waterfowl Management Program in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
Active Waterbird Dispersal – Kensico Reservoir.	Annually, 8/1 to 3/31
Active Waterbird Dispersal – Hillview Reservoir.	Year-round
"As Needed" Bird Dispersal – West Branch, Rondout, Ashokan, Croton Falls, and Cross River Reservoirs.	Annually, 8/1 to 4/15
"As Needed" Bird Deterrent Measures – Kensico, West Branch, Rondout, Ashokan, Croton Falls, Cross River, and Hillview.	Year-round

Report Description	Due Date
Summary of Waterfowl Management Program activities at all reservoirs, including wildlife management at Hillview Reservoir (8/1 to 7/31).	Annually, 10/31

4.2 Land Acquisition Program

The Land Acquisition Program (LAP) seeks to prevent future degradation of water quality by acquiring environmentally-sensitive lands. The overarching goal of the LAP is to ensure that these high priority Watershed lands are placed into permanently protected status, either through fee simple purchase or conservation easements (CEs), so that the Watershed continues to be a source of high-quality drinking water for the City and upstate counties. In pursuit of this goal, since 1997 the City has secured over 154,000 acres of land and CEs. Prior to 1997, the City owned 34,193 acres of reservoir buffer land. Now more than 39% of the more than one million acres covered by the Catskill/Delaware Watershed is currently protected by the City, the State, and/or other entities such as municipalities and land trusts.

The City's strategy for prioritizing lands for acquisition is defined in its 2012-2022 Long-Term Land Acquisition Plan. This plan focuses its core land acquisition activities for this period toward less-protected basins and sub-basins, in particular the Schoharie, Pepacton, and Cannonsville Reservoir basins. The plan also seeks to develop parcel selection procedures that will maximize the water quality benefits of acquisitions. While the long-term plan favors the purchase of more cost-effective parcels in the less protected areas of the Watershed, the City has continued to look for opportunities to acquire properties in the well-protected Kensico, West Branch and Boyd Corners Reservoir basins when properties important to water quality protection become available.

In addition to the City's core land acquisition activities, the LAP includes some other important land acquisition efforts in the Watershed. The City-funded Flood Buy-Out (NYCFFBO) Program was initiated by the Revised 2007 FAD and allows the City to acquire high-priority improved parcels that are important from a flood mitigation and water-quality perspective, but which did not participate in or qualify for a federal and/or State flood buy-out program. The City supports, through partnership with WAC, an Agricultural and a Forest Easement Program. The Revised 2007 FAD committed the City to fund the costs of stewardship and enforcement of the current and future portfolio of these CEs. The Streamside Acquisition Program (SAP) is being piloted by the Catskill Center, in partnership with the City, to focus on securing, in fee simple or CE, streamside (riparian) buffer lands and floodplains in the Schoharie Reservoir basin. During 2018-21 the City convened work groups to explore payment approaches and incentives that might increase participation in this program; several were developed and are being implemented. The 2017 FAD required that an additional $3 million be committed to support the SAP pilot, which the City completed in 2019. If it is determined that a streamside acquisition program should be continued for the duration of the FAD, the Revised 2017 FAD requires the City to commit an additional $8 million to the program. If needed, additional funding for acquisitions made under the SAP may be drawn from the funding appropriated for the core LAP.

The City has continued to work with land trusts to explore and implement additional ways to enhance the efforts of the LAP. As directed by the 2017 FAD, the City convened workgroup meetings with stakeholders to consider the feasibility of a program, in partnership with land trusts and stakeholders, focused on transitioning farms (for example, a farm that is at risk of foreclosure or farms with retiring farmers). In 2018, the City submitted a report which found no consensus on program need or direction. In addition, the Delaware County Board of Supervisors issued a resolution stating a lack of support for such a program. NYSDOH therefore determined that the City would not be required to develop such a plan under the FAD.

The City is authorized to implement the LAP by a Water Supply Permit (WSP) issued by NYSDEC. The current WSP became effective December 2010 and expires in 2025. While the term of the Revised 2017 FAD extends into 2027, solicitation and funding requirements for the LAP beyond 2024 are contingent upon reissuance of the WSP. Application for a WSP to succeed the 2010 WSP is required by June 2022 to ensure adequate time for stakeholder input on the conditions of the successor WSP. In addition, the FAD requires the City to develop a new Long-Term Land Acquisition Plan, which will cover the period 2023-2033 and will consider the findings of the National Academies Expert Panel review of the City's Watershed Protection Program. It is anticipated that the Long-Term Land Acquisition Plan and the Expert Panel findings will also help inform the conditions of the successor WSP.

At the start of the 2017 FAD, NYSDOH projected that the funding needed to support the level of solicitation required through 2024 for the City's core LAP would be a minimum of $69.3 million. The City deposited $23 million into a segregated account for land acquisition funds in July 2018 and July 2020; a third deposit of $23 million shall be made in July 2022 or thereafter depending on the City demonstrating a need for this additional funding. Funding for the remaining term of the 2017 FAD will be based on projections for program activity consistent with the 2023-2033 Long-Term Land Acquisition Plan.

Pursuant to discussions with WOH stakeholders, on April 28, 2017, the City provided new or updated Town Level Assessments for 21 WOH towns to NYSDOH, USEPA, NYSDEC, and WOH stakeholders. Following the release of those assessments, the City accepted stakeholder comments for 180 days. Based on the updated Town Level Assessments and its review of comments received, the City evaluated the need for modification of its 2012-2022 Long-Term Land Acquisition Plan and discussed its conclusions with NYSDOH, USEPA, and NYSDEC. The City shared the resulting proposed modifications of its solicitation plan with the WOH stakeholders and adopted the modified solicitation plan in 2019.

The City provides funding through the Local Consultation Funds program, administered by the CWC, to cover the eligible costs to communities related to their review of the City's proposed land acquisitions. The City increased the cap on this funding from $30,000 to $40,000 for each incorporated town and village, and up to $5,000 was made available for municipalities to review the updated Town Level Assessments.

The goals for the LAP under the Revised 2017 FAD are to:

- Continue to acquire land and CEs in accordance with all program requirements set forth in the MOA, FAD, and WSP;
- Develop a new Long-Term Land Acquisition Plan for the period 2023-2033, which will consider the recommendations of the Expert Panel review of the City's Watershed Protection Program;
- Continue to work with and support partners to secure properties and CEs pursuant to the applicable programs (i.e., the NYCFFBO Program, the Agricultural and Forest Easement Programs, and the SAP, which are funded outside the traditional land acquisition segregated account) and related requirements.
- Explore, develop, and begin reporting on additional program metrics that address the water quality protection values of newly acquired parcels as recommended by the National Academies Expert Panel review of the City's Watershed Protection Program.

The City's LAP is described in Section 2.3.2 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to implement the LAP in accordance with the milestones below.

Activity	Due Date
Continue to provide sufficient funding to support the LAP in accordance with the 2010 Water Supply Permit (WSP) and program objectives. • The City shall deposit or cause to be deposited $23 million into the land acquisition segregated account. • The City shall deposit or cause to be deposited $23 million into the land acquisition segregated account. • The City shall deposit or cause to be deposited $23 million into land acquisition segregated account, depending on the City demonstrating a need for this additional funding.	7/01/2018 Completed 7/01/2020 Completed 7/01/2022 Deferred by NYSDOH
During annual budget discussions with NYSDOH, USEPA and NYSDEC, discuss potential need for any additional monies beyond that already committed to all land acquisition programs. If such funding is needed, sequester the funds within six (6) months from written request by NYSDOH.	Annually, 11/30
Submit plans for each two-year period to solicit 200,000 acres through 2024.[1] SAP and NYCFFBO acres may be credited 5 acres for every 1 acre solicited pursuant to the agreed methodology.	Biennially, beginning October 2018
Accept stakeholder comments on updated Town Level Assessments. If warranted based on the updated Town Level Assessments and comments received, modify the 2012-2022 Long-Term Land Acquisition Plan and submit to NYSDOH for approval. Such a submission may include recommendations for modifications to the solicitation and funding milestones for the core LAP.	Completed 4/30/2018 Completed

Submit a Long-Term Land Acquisition Plan, subject to NYSDOH approval, for the period 2023-2033. This plan will consider the findings of the National Academies Expert Panel review of the City's Watershed protection programs, including the LAP, as well as public input received in response to the Expert Panel review. Based on the approved plan, solicitation rates for 2025 through 2027 will be determined by NYSDOH, in consultation with USEPA and NYSDEC.[2]	5/31/2023
Submit application for a WSP to succeed the 2010 WSP.	6/30/2022 Completed
Contingent upon issuance of a successor WSP to the 2010 WSP, continue to implement the LAP for the remainder of the 2017 FAD term.	Upon issuance of a successor WSP
The City shall deposit or cause to be deposited into the land acquisition segregated account sufficient funds to support projected program activity based on solicitation rates approved for 2025 through 2027.[3]	7/1/2025
Revise program rules for the Local Consultation Funds Program and execute and register contract change with CWC to increase the cap on funding to $40,000 per incorporated town or village. Amend agreement with CWC for the Local Consultation Funds Program to provide $5,000 per municipality to review updated Town Level Assessments.	6/30/2018 Completed 6/30/2018 Completed
WAC Agricultural Easement Program • Extend the current Easement contract for 27 months and provide a minimum of $4 million funding. • Execute and register a successor contract to provide the remainder of the $11 million.	 2/28/2023 3/31/2025

Continue to work with stakeholders to explore the feasibility of a program that will protect the majority of each transitioning farm (agricultural land that is at risk of foreclosure or farms with retiring farmers). This program would seek to secure a conservation easement on the majority of the farm.	
• Report on the findings of this workgroup.	6/30/2018 Completed
• Meet with NYSDOH, USEPA, and NYSDEC to discuss findings of the workgroup.	7/31/2018 Completed
• If NYSDOH determines, informed by the findings of the workgroup, that a farm transition program would be feasible, compatible with Community goals, and beneficial to Watershed protection, the City, in consultation with NYSDOH, USEPA, NYSDEC, and stakeholders, shall propose a plan to implement such a program in the Watershed.	1/31/2019 Completed
In consultation with WAC, convene a workgroup to explore the suitability of including pre-emptive purchase rights within WAC conservation easements.	
• Convene the workgroup	1/31/2024
• Submit the findings of the workgroup	12/31/2024
Participate in a stakeholder workgroup to explore potential changes to conservation easement language to allow for certain activities, including public utilities and renewable energy infrastructure.	
• Convene the workgroup	1/31/2023
• Submit the findings of the workgroup	12/31/2023
Based on the requirements of the 2010 WSP, submit a program evaluation report on the NYCFFBO Program.	
• First evaluation report	6/15/2018 Completed
• Second evaluation report	6/15/2021 Completed
The City shall ensure that funding for full implementation of this program is continued during the evaluation period.	

<u>WAC Forest Conservation Easement</u> Based on the requirements of the 2010 WSP, submit a written evaluation of the WAC Forest Conservation Easement acquisition program, making recommendations as to whether the program should be continued, modified, or terminated, as well as any proposed improvements to the program.	Completed
Submit a status report on the WAC Forest Conservation Easement acquisition program.	12/15/2020 Completed
Continue to fund and implement the pilot program.	Ongoing
If, in accordance with the City's 2010 WSP, a written determination is made by NYSDEC, in consultation with NYSDOH, the City, and other agencies or local governments, to authorize that the WAC Forest Easement Program be continued, the City shall provide WAC a minimum of $8 million to continue the program for the remainder of the 2017 FAD.[3] Such determination will consider the recommendations of the City's evaluation of its ancillary programs.	
• Complete contract amendment with WAC, including the transfer of funds.	Within 18 months from written determination
If authorization is not given 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.	
<u>SAP</u> Continue implementation of a $5 million Pilot SAP.	Ongoing, in accordance with the 2010 WSP
Based on the requirements of the 2010 WSP, submit a written evaluation of the SAP, making recommendations as to whether the program should be continued, modified, or terminated, as well as any proposed improvements to the program.	Completed
The City shall execute and register a contract or contract amendment to make an additional $3 million available to the Catskill Center to continue to implement the SAP through at least 2022.[3]	6/30/2019 Completed
Submit a status report on the SAP.	12/15/2020 Completed

If, in accordance with the City's 2010 WSP, a written determination is made by NYSDEC, in consultation with NYSDOH, the City, and other agencies or local governments, to authorize that a streamside acquisition program be continued and expanded beyond the Schoharie Reservoir Basin, execute and register a contract to make a minimum of $8 million available to the Catskill Center to implement or continue to implement such a program for the remainder of the 2017 FAD.[3] Consistent with the WSP, such written determination will include addressing the City's recommendations for the program.	Within 18 months of such written determination
If such determination is issued by NYSDEC, the City shall submit a status report of the expanded SAP in consultation with the Catskill Center.	6/30/2025
If authorization is not given to continue the program, all unused funds, with any earnings there on, are to be returned to the City to be deposited in the LAP-segregated account for use by the LAP.	
If NYSDOH determines that additional funding is required for acquisitions under the SAP or other streamside acquisition program, funds may be drawn from the City's LAP-segregated account.	As needed
The City shall convene a working group of stakeholders to explore payment approaches and incentives that might increase participation by landowners in SAP.	
• Convene stakeholder group to develop incentive payments for certain types of properties.	2/28/2018 Completed
• Submit to NYSDOH, USEPA, and NYSDEC for review and NYSDOH approval a proposed approach to provide payment or incentives to increase participation in SAP. If a WSP modification is required to implement this new approach, submit a request to NYSDEC to modify the WSP.	3/31/2019 Completed
• Convene stakeholder subcommittee to develop (1) a proposed subdivision ordinance for towns to consider adopting that would provide waivers for certain SAP configurations and (2) a mechanism to allow third parties to own land acquired through SAP.	6/1/2021 Completed
• Submit proposals on the above two items.	12/15/2021 Completed

• Complete mechanism(s) to allow third parties to own land acquired through SAP. If a WSP modification is required to implement this new approach, submit a request to NYSDEC to modify the WSP. • Make incentives available to increase participation in SAP	Upon issuance of a successor WSP Ongoing
The City shall convene a working group of stakeholders to explore issues related to the expansion of SAP outside of the Schoharie Basin, including an evaluation the proposed Delaware County riparian buffer lease/rental pilot program. • Convene stakeholder group • Submit to NYSDOH, USEPA, and NYSDEC for review and NYSDOH approval a proposed approach to modify SAP implementation. If a WSP modification is required to implement this new approach, submit a request to NYSDEC to modify the WSP.	1/31/2023 12/31/2023
Submit a report that evaluates the need, opportunities, and options for enhancing riparian buffer protection efforts in the Kensico and EOH FAD Basins, including, but not limited to, establishing a riparian acquisition program for these basins, either through the City's existing programs or another entity. The report shall discuss the metrics used for evaluating these options.	9/30/2018 Completed
Participate in a workgroup convened to assess opportunities to use certain potentially developable LAP-acquired lands that have lower water quality protection value to facilitate relocation of development out of floodplains. • Report on the progress of this workgroup. • Participate in future workgroups if convened by stakeholders.	6/30/2018 Completed Ongoing
If requested by a local governmental entity which has applied to FEMA for funding, the City will engage in good faith negotiations to participate in any future FEMA/SOEM Flood Buy-out (FBO) Program, providing up to 25% of the eligible costs as the local match for each NYC Watershed property that is participating in the program and deemed eligible and acceptable by the willing buyer, whether it be the City or local community.	As required by FEMA/SOEM FBO program rules

Continue to implement a NYCFFBO program pursuant to the 2010 WSP, as amended, and agreements with local stakeholders. Properties may be eligible for the Program based on municipal concurrence, referral, expected flood mitigation, and water quality benefits derived.	Ongoing

[1] Solicitation beyond 2024 is contingent upon re-issuance of a NYSDEC WSP authorizing continuation of the LAP beyond 2025. Solicitation rates beyond 2024 will be evaluated based on the NASEM Expert Panel review of the City's Watershed protection programs and public input and will be consistent with the Long-Term Land Acquisition Plan.
[2] Implementation of this Long-Term Land Acquisition Plan beyond 2025 will be contingent upon re-issuance of a NYSDEC WSP authorizing continuation of the LAP beyond 2025.
[3] The requirement to allocate funding for purchases beyond 2025 is contingent upon re-issuance of a NYSDEC WSP authorizing continuation of the LAP beyond 2025. Funding amounts may be re-assessed by NYSDOH based upon the 2023-2033 Long-Term Land Acquisition Plan. With respect to the determinations following the evaluations of the WAC Forest Conservation Easement program and the SAP, the City will not be required to allocate additional funds for those programs unless and until such acquisitions are also authorized under a NYSDEC WSP.

Report Description	Due Date
Submit a modified solicitation plan or a statement that the City does not intend to modify the 2012-2022 Long-Term Land Acquisition Plan at this time.	Completed
Submit the first evaluation report on the NYCFFBO Program.	6/15/2018 Completed
Report on progress of workgroup convened to assess opportunities to use LAP-acquired lands to facilitate relocation of development out of the floodplain.	6/30/2018 Completed
Submit report evaluating need, opportunities, and options for enhancing riparian buffer protection efforts in Kensico and EOH FAD Basins.	9/30/2018 Completed
Submit proposed approach for providing payments or incentives that might increase participation by landowners in SAP.	3/31/2019 Completed
Submit a status report on the WAC Forest Conservation Easement acquisition program.	12/15/2020 Completed
Submit a status report on the SAP.	12/15/2020 Completed
Submit the second evaluation report on the NYCFFBO Program.	6/15/2021 Completed
Submit a Long-Term Land Acquisition Plan for the period 2023-2033.	5/31/2023
Submit semi-annual reports on program activities and status, including the following: • Acres protected for the categories of riparian buffers, floodplains, wetlands and forest land. • Miles of streambank protected. • Average surface water criteria for fee and CE parcels acquired through the core LAP and SAP. • Acres subdivided out of solicited parcels. • Number of solicited acres that result in accepted offers and closed deals.	Semi-annually, 3/31 in FAD Annual Report and 7/31

4.3 Land Management Program

The City has made a significant investment in purchasing water supply lands and conservation easements. However, to maximize the utility of these lands in protecting the long-term water supply for the City, they must be monitored, managed and secured properly. Effective and routine monitoring of lands and easements is vital to discovering encroachments, timber trespass, and overuse of lands that the City has purchased, and potential violations for easements. The City inspects the lands it has purchased on a prioritized basis per its fee monitoring policy (up to once per year) and easements semi-annually, which enables the City to identify and address encroachments expeditiously.

The City supports and provides for many recreational uses of its land. As the second largest public land holder in the Watershed, the City has been successful in opening many of its lands and waters for expanded recreational uses, consistent with its mission to protect water quality. Improving some of these lands for recreational access, particularly along the reservoirs can help address the impacts of overuse if they arise. City lands can also be an important economic component to local communities, and the City continues to allow various uses of its lands, such as issuing revocable land use permits and allowing agricultural uses. The goals for the Land Management Program under the Revised 2017 FAD are to:

- Conduct routine monitoring and inspection of City Watershed protection lands to meet the primary mission of water quality protection.
- Ensure encroachments and other unauthorized uses of City land are dealt with in a timely manner.
- Facilitate and coordinate the protection and wise use of City lands and natural resources.
- Provide community benefits through allowing compatible recreation and agricultural uses and issuing revocable land use permits.
- Ensure the long-term protection and management of the City's significant investment in purchased lands and conservation easements.
- Ensure that conservation easements held by the City and WAC are administered effectively, including regular monitoring, consideration of activity requests, and documentation and correction of any violations that occur
- Provide for stewardship funding to WAC as previously agreed.
- Engage recreational users through education and outreach.

The City's Land Management Program is described in Section 2.3.3 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to implement the Land Management Program in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
Monitor and actively manage water supply lands.	Ongoing
Monitor and enforce City Watershed conservation easements. Ensure conservation easements held by WAC are inspected as needed, and that violations are addressed in a timely manner for both City and WAC easements.	Ongoing
Continue to assess and implement strategies to increase the public's recreational use of water supply lands.	Ongoing
Inform regulators when recreational use policies or proposals are substantively modified.	Ongoing
Engage recreational users of City land through outreach and events.	Ongoing

Report Description	Due Date
Report on program implementation in the FAD Annual report.	Annually, 3/31

4.4 Watershed Agricultural Program

The Watershed Agricultural Program (WAP) is a voluntary program that represents a successful longstanding partnership between the City and the Watershed Agricultural Council (WAC). The program began as a pilot in 1992 with the main goal to reduce pollution associated with agricultural land use and to protect source water quality. The WAP's primary activities include the development of Whole Farm Plans (WFPs) and the implementation of agricultural Best Management Practices (BMPs), along with the establishment of riparian buffers through the federal Conservation Reserve Enhancement Program (CREP). The WAP also supports nutrient management planning, precision feed management, and diverse educational programs that collectively provide farmers with a comprehensive suite of technical assistance and financial incentives to improve farm management and reduce pollution risks.

After two decades of expansion, the WAP has accumulated technical experience, established strong local leadership, and achieved extensive on-the-ground accomplishments. However, the WAP's historical focus on recruiting new participants and developing WFPs for these participants has resulted in the accumulation of a large BMP workload that needs to be addressed and managed in a more efficient and effective manner moving forward. The pace at which this workload can be addressed includes some factors beyond the control of the City or WAC, including the availability of building materials and contractors, and weather conditions. The BMP workload should remain a focus of the WAP during the remainder of the Revised 2017 FAD.

During the term of the Revised 2017 FAD, source water quality protection will remain the WAP's programmatic priority. However, the program will continue to be flexible and responsive to participant needs and pollution risks in the context of shifting farmer demographics and evolving agricultural operations. The priority WAP activities will include the need to repair or replace existing BMPs in a timely manner and managing the growing complexity of an extensive portfolio of voluntary WFPs in various stages of implementation. The WAP will continue to increase its focus on reducing the backlog of viable BMPs and improving the timeliness of BMP implementation for already approved WFPs.

To assure effective water quality protection and to sustain working relationships with hundreds of WAP's voluntary participants, the goals under the Revised 2017 FAD include:

- Continue to repair and replacement existing BMPs as needed, above the completed goal of 50%.
- Develop and assess for longer-term continuation a new approach for investigating and repairing certain WAP-implemented BMPs using an in-house field crew of WAP technicians, with a goal of reducing the Repair and Replacement BMP backlog and becoming more responsive to the BMP repair needs of participants.
- Offer the Nutrient Management Credit Program to all eligible farms.
- Maintain up to 60 eligible farms in the Precision Feed Management (PFM) Program, ensuring eligible dairy farms are prioritized, while adjusting for evolving trends in watershed dairy and beef operations.
- Engage greater numbers of WAP participants in farmer education programs in order to improve and enhance farm operation decisions and management behaviors.

- Assess and report on the adequacy of existing WAP metrics and/or the use of potential new metrics.

The City's Watershed Agricultural Program is described in Section 2.3.4 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set for in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to contract with WAC to implement the Watershed Agricultural Program in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
Manage the current portfolio of active WFPs, including the revision of existing plans and the development of new plans on eligible priority farms based on highest priority water quality concerns.	Ongoing
Conduct annual status reviews on at least 90% of all active WFPs every calendar year, with a goal of 100%.	Ongoing
Continue to implement new priority BMPs on active participating farms with WFPs, with the dual goals of reducing the existing backlog of new priority BMPs and limiting the potential backlog for newly identified BMPs, according to the following milestones: • Design, allocate project funding, and schedule for implementation within a 3-year timeframe at least 50% of all BMPs within pollutant categories I-VI that were identified by WAC as of January 1, 2017. Program funding will remain sufficient to achieve a goal of implementing 60% of identified new BMPs based on current cost estimates, or as may be recommended and adopted as part of an alternative proposal for BMP design/implementation. • Implement all viable BMPs if and until alternative recommendations for BMP implementation metrics (to be informed by the 6/30/2024 metrics report) are approved by NYSDOH.	Ongoing 12/31/2022 Revised 6/30/2023 12/31/2024 Revised 12/31/2025

Continue to repair or replace existing BMPs on active participating farms with WFPs, with the dual goals of reducing the backlog of existing BMPs in need of repair or replacement and limiting the potential backlog for newly identified BMPs, according to the following milestones: • Design, allocate project funding, and schedule for implementation within a two-year timeframe at least 50% of all BMPs needing repair or replacement that were identified by WAC as of January 1, 2017. Program funding will be sufficient to achieve a goal of implementing 70% of identified BMPs needing repair or replacement. • Repair or replace all viable BMPs that were designed and scheduled through calendar year 2022.	Ongoing Completed 12/31/2024
In consultation with WAC, assess the adequacy of current WAP metrics and submit a report that recommends the continuation of current metrics and/or the consideration of potential new metrics. Detail the status of current design and implementation metrics and account for the impact of Component BMPs, Repair and Replacements (>50%), and BMPs which are no longer viable relative to the 1/1/2017 BMP list. This report shall also assess the efficacy, cost-effectiveness and contributions of the WAP's in-house field crew towards reducing the Repair/Replacement BMP backlog and recommend modifications if needed.	6/30/2023 Revised 6/30/2024
Meet with NYSDOH, USEPA, and NYSDEC to discuss the WAP's metrics and future BMP implementation milestones for calendar year 2025 and beyond.	9/30/2023 Revised 9/30/2024
In consultation with WAC, develop a Long-Term Management Plan for the WAP that takes into account the evaluation of the BMP backlog reduction metric, existing data on planning and implementation, and recommendations from the NASEM. This plan will include strategies for improving WAP eligibility requirements, prioritizing WFP development and revisions, and more efficiently and effectively implementing BMPs in a timely manner. Meet with NYSDOH, USEPA, and NYSDEC to review and discuss adoption of the WAP's Long-Term Management Plan.	3/31/2026 6/30/2026
Continue to develop and update nutrient management plans on active participating farms that require such a plan, with a goal of maintaining current nutrient management plans on 90% of all active participating farms that require one.	Ongoing
Continue to offer the Nutrient Management Credit Program to all eligible farms based on water quality protection criteria.	Ongoing

Continue to implement the PFM Program on up to 60 eligible beef or dairy farms based on specific benchmarks and eligibility standards that prioritize dairy farms and maximize water quality benefits in a cost-effective manner.	Ongoing
Continue to develop new CREP contracts and re-enroll expiring contracts as needed.	Ongoing
Continue to implement a Farmer Education Program.	Ongoing
Continue to implement an Economic Viability Program.	Ongoing

Report Description	Due Date
Report on program implementation in the FAD Annual Report including: • Number of new and revised WFPs completed and approved, as well as the total number of eligible farms awaiting development of a WFP. • Number, types and dollar amounts of both new BMPs and repaired or replaced BMPs implemented each year. • Number, types, and dollar amounts of both new BMPs and repaired or replaced BMPs designed and scheduled for implementation in the following year. • Cumulative percentage of BMP backlog reduced (designed, implemented, or scheduled for implementation). • Number and percentage of annual status reviews completed on active Whole Farm Plans. • Number of new and updated nutrient management plans completed, as well as the percentage of current plans on all active participating farms that require such a plan. • Number of farms participating in the Nutrient Management Credit Program, including number of farms that are eligible for the program at the time of the report and efforts made to offer Nutrient Management Credit to all eligible farms. • Number of farms participating in the PFM Program and a summary of accomplishments. • Number of new and re-enrolled CREP contracts completed, along with a summary of total enrolled and re-enrolled acres. • Summary of Farmer Education Program accomplishments. • Summary of Economic Viability Program accomplishments.	Annually, 3/31
WAP Metrics Assessment and Recommendations Report.	6/30/2023 Revised 6/30/2024
WAP Long-Term Management Plan	3/31/2026

4.5 Watershed Forestry Program

The Watershed Forestry Program is a longstanding partnership between the City, WAC, and the United States Forest Service that began in 1997. The primary objective of the Watershed Forestry Program is to encourage long-term management of the Watershed forests for both water quality protection and economic viability purposes. A secondary objective is to promote good forest stewardship through the development and implementation of forest management plans; the implementation of BMPs during and after timber harvesting; professional training for loggers and foresters; educational forums for Watershed landowners; teacher training and educational programs for upstate and downstate students; and coordination of a Watershed model forest program that supports demonstration purposes as well as education and outreach.

The goals of the Watershed Forestry Program under the Revised 2017 FAD are to:

- Continue to monitor the use and progress of the new MyWoodlot.com website as a tool for understanding the needs and interests of Watershed landowners.
- Explore potential modifications and improvements to the Management Assistance Program (MAP) that may be needed to support and complement the recently redesigned WAC Forest Management Planning Program.
- Continue to use the Planning Analysis in Timber Harvesting (PATH) system, academic research, and any other appropriate tool or technique to monitor the economic viability of logging businesses in the watershed in order to maintain or increase their economic viability and maximize voluntary implementation of forestry water quality BMPs.

The City's Forest Management Program is described in Section 2.3.5 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to contract with WAC to implement the Watershed Forestry Program in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
Continue to support a Watershed forest management planning program that encourages landowner participation in New York's forest tax abatement program.	Ongoing
Continue to support the development of forest management plans and the implementation of these plans through the Management Assistance Program (MAP), with a goal of completing at least 60 MAP projects per year.	Ongoing

In consultation with WAC, assess and report on the effectiveness of the MAP in supporting the implementation of forest management plans, including a summary of any modifications that were made to the MAP or additional improvements that may be needed to promote good forest stewardship by landowners.	12/31/2025
Continue to support the implementation of forestry BMPs, with a focus on road BMP projects and forestry stream crossing projects.	Ongoing
Continue to support the Croton Trees for Tribs Program, enhancing program efforts to promote and install riparian plantings in the Kensico, West Branch, and Boyd Corners Reservoir basins, with a goal of completing six (6) projects per year in the EOH Watershed.	Ongoing
Use MyWoodlot.com and forest landowner education programs to provide family forest owners access to the knowledge they need to make positive conservation decisions for their Watershed forests. In consultation with WAC, assess and report on the status and effectiveness of MyWoodlot.com as a tool for understanding the needs and interest of landowners, and providing knowledge to make positive conservation decisions for family forest owners.	Ongoing 12/31/2024
Evaluate the effectiveness of the Watershed forest management planning program and landowner education programs once every five years using Conservation Awareness Index (CAI).	Ongoing
Continue to support professional training for loggers and foresters.	Ongoing
Continue to support educational programs for landowners.	Ongoing
Continue to support school-based education programs for teachers and students in both the Watershed and New York City.	Ongoing
Continue to support and coordinate four (4) Watershed model forests.	Ongoing

Report Description	Due Date
Report on program implementation in the FAD Annual report including: • Number of forest management plans completed and acres of forestland enrolled in the 480-a program (New York's forest tax abatement program). • Number and types of MAP projects completed. • Number and types of forestry BMP projects completed. • Number of Croton Trees for Tribs projects completed. • Summary of logger and forester training accomplishments. • Summary of landowner education accomplishments. • Summary of school-based education accomplishments. • Summary of model forest accomplishments.	Annually, 3/31
Report on CAI evaluation results for the Watershed forest management planning program and landowner education programs.	12/31/2021 Completed 12/31/2026
Report on the status and effectiveness of MyWoodlot.com.	12/31/2024
Report on the status and effectiveness of MAP modifications and improvements.	12/31/2025

4.6 Stream Management Program

The Stream Management Program (SMP) seeks to improve water quality through the protection and restoration of stream stability and ecological integrity for WOH Watershed streams and floodplains. The City will continue to implement the SMP through a series of contractual partnerships with county Soil and Water Conservation Districts (SWCDs) and Cornell Cooperative Extension of Ulster County. Program components include annual action planning for each reservoir basin based on stream assessments and stakeholder input; water quality-driven Stream Projects; stakeholder-driven Stream Management Implementation Program (SMIP) projects; the Catskill Streams Buffer Initiative (CSBI); Flood Hazard Mitigation projects; and Education, Outreach and Training.

Some of the goals for the SMP under the Revised 2017 FAD include:

- Conduct stream feature inventories to support project site prioritization.
- Construct at least 24 Stream Projects.
- Continue stream studies investigating turbidity reduction from stream projects.
- Complete revegetation of at least ten streambank miles in the WOH Watershed.
- Complete Local Flood Analyses (LFAs), and provide funding for the implementation of LFA-recommended projects through SMP and CWC.
- Explore the coordination of CSBI and CREP with local partners to increase riparian buffers on fallow agricultural lands.
- Coordinate in-stream and riparian emergency recovery activities that may become necessary following flooding events with the Statewide Programmatic General Permit for emergency response post-storm recovery activities as jointly issued by NYSDEC and the US Army Corps of Engineers.
- Evaluate the LFHMP for its contribution to the protection of water quality and recommend steps for enhancing this protection in the future.

The City's SMP is described in Section 2.3.6 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to implement the SMP requirements in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
<u>Ashokan Projects</u> As required by the Revised 2007 FAD, complete the construction of 7 stream management projects within the Ashokan basin with a goal of protecting water quality, in particular by reducing turbidity.	11/30/2018 Completed

Execute and register contracts or contract amendments with SMP partners (Delaware County, Greene County, Sullivan County, and Ulster County Soil and Water Conservation Districts and Ulster County Cornell Cooperative Extension) to ensure continuity of funding sufficient to continue all SMP programs for the duration of the 2017 FAD. Funding shall be, at a minimum, equivalent, on an annual basis, to the level of funding provided to the SMP under the Revised 2007 FAD SMP partner contracts (excluding LFHM funding), with the addition of an annual inflation adjustment. Total funding for the 10-year FAD period shall be a minimum of $90 million.	Ongoing
<u>Water-Quality Based Stream Projects and Site Selection</u> • The City and SMP Contract Partners will meet to review water quality analyses to outline the water quality basis for project site selection and to prioritize the main stems and/or sub-basins for stream feature inventories. • Six stream feature inventories will be conducted in the prioritized tributaries/main stems of the major SMP basins (Schoharie, Ashokan, Neversink/Rondout, and Cannonsville/Pepacton) to identify water quality threats and support project site prioritization. • Design and complete construction of at least 24 Stream Projects that have a principal benefit of water quality protection or improvement. A minimum of 3 of the 24 shall be in the Stony Clove watershed (Ashokan) to support the Water Quality Monitoring Study and a total of at least 8 of the 24 projects shall be in the Ashokan watershed. Stream Projects will be selected based on a water quality-based site selection process and in accordance with the review and prioritization of basin-scale water quality priorities described above. Beginning in 2017, projects completed beyond those required for the Revised 2007 FAD will be counted towards this requirement. Stream Projects may be delayed due to flood events, which can change project priorities and temporarily shift the program focus to response and recovery operations, as well as changes in landowner cooperation. • The City will nominate three Ashokan watershed Stream Projects for construction in the next FAD period. • The City will propose projects for FAD approval in November of each year.	12/31/2018 Completed 12/31/2022 12/31/2027 11/30/2027 Annually, 11/30

CSBI Continue implementation of CSBI by providing technical assistance and conservation guidance to riparian landowners according to the following milestones:	
• Convene annual meetings of the Riparian Buffer Working Group.	Annually, 2/28
• Facilitate the supply of native plant materials to the CSBI.	Ongoing
• Implement Education, Outreach, and Marketing Strategy with partners.	Ongoing
• Seek to establish a partnership between the CSBI program and the CREP program to enable CREP to be implemented on fallow agricultural lands through the CSBI in the WOH Watershed.	Ongoing
• Within Delaware County, support the use of funding for a pilot program to be administered by DCSWCD and WAC that will coordinate CSBI and CREP programs to implement CREP on fallow agricultural lands in Delaware County.	Completed
• Establish metrics, agreed upon by NYSDOH, USEPA, NYSDEC, Delaware County SWCD, WAC, and the City, to evaluate the effectiveness of the Delaware County CSBI/CREP pilot program.	11/30/2018 Completed
• Review progress in extending CREP to eligible fallow agricultural lands through CSBI in the WOH Watershed, including progress of the Delaware County CSBI/CREP pilot program.	11/30/2019 Completed
• Submit to NYSDOH recommendations for establishment of a permanent program and estimated funding needs, or discontinuation of the program.	11/30/2019 Completed
• Continue to implement and evaluate the effectiveness of the Delaware County CSBI/CREP pilot program based on established metrics while exploring and assessing other SMP partnership opportunities for extending CREP to eligible fallow agricultural lands through CSBI in the WOH watershed. Submit to NYSDOH a report that recommends establishment of a permanent CSBI/CREP partnership program and estimated funding needs, or discontinuation of the program.	11/30/2025

• If NYSDOH determines the Delaware County CSBI/CREP pilot program is an effective tool for riparian buffer protection, execute and register contracts or contract changes with DCSWCD and WAC, if needed, to fund such a program in Delaware County. The City will ensure adequate funding is available to allow continuity of program activities while contract changes are being implemented.	Within 18 months of determination
• Complete revegetation of a minimum of 10 streambank miles throughout the WOH Watershed. This metric may be adjusted following the determination regarding the Delaware County CSBI/CREP pilot program.	11/30/2027
<u>SMIP</u> • Continue the local funding programs for the enhanced implementation of stream management plan recommendations, including LFA recommended projects, in the Schoharie, Cannonsville, Pepacton, Neversink, Rondout and Ashokan basins.	Ongoing
• Complete commitment of funds for a minimum of 100 SMIP projects throughout the WOH Watershed.	5/31/2027
<u>Local Flood Hazard Mitigation Program (LFHMP)</u> • Complete LFAs and provide funding toward implementation of LFA-recommended projects through both the SMP and the CWC in the WOH Watershed.	12/31/2027
• Execute and register contracts or contract amendments with SMP partners (Delaware County, Greene County, Sullivan County, and Ulster County Soil and Water Conservation Districts and Ulster County Cornell Cooperative Extension) to make $15 million available to support a minimum of 50 LFA-generated projects.	Ongoing, as SMP partner contracts are updated
• Where such projects include relocations of homes and businesses and the corresponding need to relocate sewer infrastructure, the City will support the use of funding either for onsite sewage disposal or for sewer extensions to City-owned WWTPs or to WWTPs not owned by the City, based on what solutions are most cost-effective. If a relocation results in a sewer extension, the City will make funding available to ensure that sewer charges are comparable to what they would be under the New Infrastructure and Community Wastewater Management Programs.	Ongoing

• With NYSDOH, USEPA, and NYSDEC, assess use of $10.1 million committed to the SMP and $17 million committed to the CWC for LFHMPs in accordance with the Revised 2007 FAD, and $15 million committed in 2017 FAD for support of LFA-generated projects, and determine if remaining funding is adequate to meet program needs.	Annually, 11/30 (during FAD annual budget meeting)
• Execute and register a $15 million LFHMP successor contract with CWC.	6/30/2023
• Commit additional LFHMP funding, as needed, to meet program needs.	Within 18 months of determination of need
• Coordinate the LFHMP funding with State and federal flood hazard mitigation agencies to maximize funding to WOH watershed communities and support the preparation of matching grant applications to State and federal programs for implementation of LFA-recommended projects.	Ongoing
• Continue to provide technical support, education, and training to Watershed communities to support their use of Flood Insurance Rate Maps (FIRMs) and their participation in a variety of floodplain management, flood hazard mitigation, and flood preparedness programs.	Ongoing
<u>Water Quality Monitoring Studies</u>	
• Submit the final Esopus Creek Watershed Turbidity/Suspended Sediment Study Design.	1/31/2017 Completed
• Continued collection and analysis of data for the Esopus Creek Watershed Turbidity/Suspended Sediment Study.	Ongoing
• Submit 3 proposed Stony Clove restoration projects for approval.	1/31/2019 Completed
<u>Annual Meeting and Action Plans</u>	
Meet annually with county contracting partners to review progress made in the previous year within each program area (Stream Projects, CSBI, SMIP, LFHMP, Education/Outreach/Training and Water Quality Monitoring Studies) and re-evaluate priorities as the basis for preparing new Action Plans for the coming year, especially after major flood events.	Annually, 2/28
Submit rolling two-year action plans developed by SMP basin partners that outline upcoming projects and program activities. Action plans should place priority on projects that will enhance water quality and restore or protect stream system stability.	Annually, 5/31
.	

Addendum A Coordinate with NYSDEC regarding the implementation of Addendum A to the 1993 Memorandum of Understanding between NYSDEC and the City as it pertains to the review of Article 15 Stream Disturbance Permits, to enhance coordination between the agencies with the goal of ensuring consistency with the recommendations in stream management plans and implementation of stream management projects.	As Needed
Education/Outreach/Training Continue to implement the Education/Outreach/Training strategy for municipal officials with program partners and maintain base education and outreach existing programming in the SMP basin programs, including emergency stream intervention training.	Ongoing
Progress Meeting Convene progress meetings with NYSDOH, USEPA, and NYSDEC. An office-based meeting shall be held by 8/30, and a field-based meeting shall be held following the construction season by 10/31.	Twice per year, by 8/30 and 10/31

Report Description	Due Date
Water Quality Based Stream Projects and Site Selection Submit brief basin specific reports outlining the water quality basis for Stream Project Site Selection in the basin during the FAD period and that prioritize main stem and/or sub-basins for stream feature inventories.	6/30/2019 Completed
Submit descriptions of proposed stream projects to be considered toward the required 24 Stream Projects.	Annually, 11/30
CSBI • Report on metrics that have been established to evaluate the effectiveness of the Delaware County CSBI/CREP pilot program. • Report on progress in extending CREP to eligible fallow agricultural lands through CSBI in the WOH Watershed, including progress of the Delaware County CSBI/CREP pilot program. Report will include recommendations for establishment of a permanent program and estimated funding needs, or discontinuation of the program.	11/30/2018 Completed 11/30/2019 Completed

• Report on cumulative progress of the Delaware County CSBI/CREP pilot program and other SMP partnership opportunities for extending CREP to eligible fallow agricultural lands through CSBI in the WOH watershed. Report will include recommendations for establishment of a permanent program and estimated funding needs, or discontinuation of the program.	11/30/2025
<u>Local Flood Hazard Mitigation Program (LFHMP)</u> Evaluate the LFHMP for its contribution to the protection of water quality and recommend steps for enhancing this protection in the future. • First evaluation • Second evaluation	6/30/2020 Completed 6/30/2023
<u>Water Quality Monitoring Studies</u> • Submit first five-year study findings. • Submit interim research study findings. • Submit final study findings.	11/30/2022 Completed 3/31/2024 11/30/2027
<u>Action Plans</u> Each year, submit a rolling two-year Action Plan for each basin that outlines the upcoming projects in the program areas (Stream Projects, CSBI, SMIP, Education/Outreach/Training, LFHMP).	Annually, 5/31
<u>Report on program implementation in the FAD Annual Report:</u> • Site selection of water quality based projects and status of projects. • CSBI, including miles of streambank revegetated. • Stream Management Implementation Projects, including number of projects funded. • Local Flood Hazard Mitigation Program, including number of LFHM and LFA-generated projects funded, funding amounts, and number of completed projects. • Water Quality studies. • Watershed emergency stream response activities.	Annually, 3/31

4.7 Riparian Buffer Protection Program

The Riparian Buffer Protection Program, initiated under the 2007 FAD, now consists of several separate efforts undertaken by different City units, including the Land Acquisition, Watershed Agricultural, Stream Management, and Forestry Programs. The multi-program approach to protecting and restoring buffers ensures buffers on both public and private land are protected, managed and in many cases restored.

The Riparian Buffer Protection Program is enhanced by the City's Streamside Acquisition Program (SAP) which is currently piloting the acquisition of riparian buffers in designated areas within the Schoharie Watershed. The requirement to acquire riparian buffers is included in both this section and the LAP section.

The goals for the Riparian Buffer Protection Program under the Revised 2017 FAD are to:

- Continue existing programs that are protective of riparian buffers.
- Continue implementation of the Pilot SAP and expand this program to other parts of the WOH watershed if directed by NYSDEC and NYSDOH, and in accordance with the authorizations required under the City's WSP.
- Explore options for synergies between CREP and CSBI to increase riparian buffers on fallow agricultural lands.

The City's Riparian Buffer Protection Program is described in Section 2.3.7 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to implement the Riparian Buffer Protection Program in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
Continue existing programs that are protective of riparian buffers including, but not limited to, Watershed regulations, agricultural programs, land acquisition, stream management, and land management.	Ongoing
Continue implementation of CREP.	Ongoing

CSBI Continue implementation of CSBI by providing technical assistance and conservation guidance to riparian landowners according to the following milestones:	
• Convene annual meetings of the Riparian Buffer Working Group.	Annually, 2/28
• Facilitate the supply of native plant materials to the CSBI.	Ongoing
• Implement Education, Outreach, and Marketing Strategy with partners.	Ongoing
• Seek to establish a partnership between the CSBI program and the CREP program to enable CREP to be implemented on fallow agricultural lands through the CSBI in the WOH Watershed.	Ongoing
• Within Delaware County, support the use of funding for a pilot program to be administered by DCSWCD and WAC that will coordinate CSBI and CREP programs to implement CREP on fallow agricultural lands in Delaware County.	Completed
• Establish metrics, agreed upon by NYSDOH, USEPA, NYSDEC, Delaware County SWCD, WAC, and the City, to evaluate the effectiveness of the Delaware County CSBI/CREP pilot program.	11/30/2018 Completed
• Review progress in extending CREP to eligible fallow agricultural lands through CSBI in the WOH Watershed, including progress of the Delaware County CSBI/CREP pilot program.	11/30/2019 Completed
• Submit to NYSDOH recommendations for establishment of a permanent program and estimated funding needs, or discontinuation of the program.	11/30/2019 Completed
• Continue to implement and evaluate the effectiveness of the Delaware County CSBI/CREP pilot program based on established metrics while exploring and assessing other SMP partnership opportunities for extending CREP to eligible fallow agricultural lands through CSBI in the WOH watershed. Submit to NYSDOH a report that recommends establishment of a permanent CSBI/CREP partnership program and estimated funding needs, or discontinuation of the program.	11/30/2025

• If NYSDOH determines the Delaware County CSBI/CREP pilot program is an effective tool for riparian buffer protection, execute and register contracts or contract changes with DCSWCD and WAC, if needed, to fund such a program in Delaware County. The City will ensure adequate funding is available to allow continuity of program activities while contract changes are being implemented.	Within 18 months of determination
• Complete revegetation of a minimum of 10 streambank miles throughout the WOH Watershed. This metric may be adjusted following the determination regarding the Delaware County CSBI/CREP pilot program.	11/30/2027
• Continue to seek enhanced management agreements (voluntary 10-year or purchased perpetual) for all current and future stream restoration projects.	Ongoing
<u>SAP</u>	
• Continue implementation of a $5 million Pilot SAP.	Ongoing, in accordance with the 2010 WSP
• Based on the requirements of the 2010 WSP, submit a written evaluation of the SAP, making recommendations as to whether the program should be continued, modified, or terminated, as well as any proposed improvements to the program.	Completed
• The City shall execute and register a contract or contract amendment to make an additional $3 million available to the Catskill Center to continue to implement the SAP through at least 2022.[1]	6/30/2019 Completed
• Submit a status report on the SAP.	12/15/2020 Completed
• If, in accordance with the City's 2010 WSP, a written determination is made by NYSDEC, in consultation with NYSDOH, the City, and other agencies or local governments, to authorize that a streamside acquisition program be continued and expanded beyond the Schoharie Reservoir Basin, execute and register a contract to make a minimum of $8 million available to the Catskill Center to implement or continue to implement such a program for the remainder of the 2017 FAD.[1] Consistent with the WSP, such written determination will include addressing the City's recommendations for the program.	Within 18 months of such written determination

• If such determination is issued by NYSDEC, the City shall submit a status report of the expanded SAP in consultation with the Catskill Center. • If authorization is not given to continue the program, all unused funds, with any earnings there on, are to be returned to the City to be deposited in the LAP-segregated account for use by the LAP. • If NYSDOH determines that additional funding is required for acquisitions under the SAP or other streamside acquisition program, funds may be drawn from the City's LAP-segregated account.	6/30/2025 As needed
The City shall convene a working group of stakeholders to explore payment approaches and incentives that might increase participation by landowners in SAP. • Convene stakeholder group to develop incentive payments for certain types of properties. • Submit to NYSDOH, USEPA, and NYSDEC for review and NYSDOH approval a proposed approach to provide payment or incentives to increase participation in SAP. If a WSP modification is required to implement this new approach, submit a request to NYSDEC to modify the WSP. • Convene stakeholder subcommittee to develop (1) a proposed subdivision ordinance for towns to consider adopting that would provide waivers for certain SAP configurations and (2) a mechanism to allow third parties to own land acquired through SAP. • Submit proposals on the above two items. • Complete mechanism(s) to allow third parties to own land acquired through SAP. If a WSP modification is required to implement this new approach, submit a request to NYSDEC to modify the WSP.	2/28/2018 Completed 3/31/2019 Completed 6/1/2021 Completed 12/15/2021 Completed Upon issuance of a successor WSP
• Make incentives available to increase participation in SAP	Ongoing

The City shall convene a working group of stakeholders to explore issues related to the expansion of SAP outside of the Schoharie Basin, including an evaluation the proposed Delaware County riparian buffer lease/rental pilot program. • Convene stakeholder group • Submit to NYSDOH, USEPA, and NYSDEC for review and NYSDOH approval a proposed approach to modify SAP implementation. If a WSP modification is required to implement this new approach, submit a request to NYSDEC to modify the WSP.	1/31/2023 12/31/2023
Continue to support the Croton Trees for Tribs Program, enhancing program efforts to promote and install riparian plantings in the Kensico, West Branch, and Boyd's Corner Reservoir basins, with a goal of completing six (6) projects per year in the EOH Watershed.	Ongoing

[1] The requirement to allocate funding for purchases beyond 2025 is contingent upon re-issuance of a NYSDEC WSP authorizing continuation of the LAP beyond 2025. Funding amounts may be re-assessed by NYSDOH based upon the 2023-2033 Long-Term Land Acquisition Plan. The City will not be required to allocate additional funds for this program unless and until such acquisitions are also authorized under a NYSDEC WSP.

Report Description	Due Date
<u>CSBI</u> • Report on metrics that have been established to evaluate the effectiveness of the Delaware County CSBI/CREP pilot program. • Report on progress in extending CREP to eligible fallow agricultural lands through CSBI in the WOH Watershed, including progress of the Delaware County CSBI/CREP pilot program. Report will include recommendations for establishment of a permanent program and estimated funding needs, or discontinuation of the program. • Report on cumulative progress of the Delaware County CSBI/CREP pilot program and other SMP partnership opportunities for extending CREP to eligible fallow agricultural lands through CSBI in the WOH Watershed. Report will include recommendations for establishment of a permanent program and estimated funding needs, or discontinuation of the program.	11/30/2018 Completed 11/30/2019 Completed 11/30/2025
Submit a status report on the SAP.	12/15/2020 Completed
The FAD annual report will reference the other FAD programs where the completed Riparian Buffer Protection Program details will be described.	Annually, 3/31

4.8 Ecosystem Protection Program

The City owns over 174,000 acres of forests, fields, transitional lands, wetlands, and reservoirs within the watersheds of the Croton, Catskill, and Delaware reservoir systems. Well-functioning, intact natural ecosystems are critical for maintaining and enhancing water quality. The City provides multifaceted programming for the protection of wetlands and fisheries along with stewardship of forests and management of invasive species through a combination of research, inventories, assessment, and outreach programs. The Ecosystem Protection Program combines goals and activities from three principle areas, consisting of forestry, wetlands, and invasive species.

The primary goals of the Ecosystem Protection Program under the Revised 2017 FAD are as follows:

- Continue silvicultural activities to increase diversity of species and age structure where needed to promote forest resiliency.
- Conduct forest inventories on newly acquired lands and adopt appropriate management strategies.
- Assess management strategies to foster adequate forest regeneration in lands heavily browsed by deer.
- Maintain data collection and analysis for the Continuous Forest Inventory (CFI) Project.
- Expand the pilot LiDAR wetland mapping and stream connectivity assessment to the entire Watershed.
- Enhance the Reference Wetland Monitoring Program.
- Implement key aspects of the Invasive Species Management Strategy to promote sustainable native communities.
- Collaborate with watershed, regional, and statewide partners on invasive species management and planning.

The City's Ecosystem Protection Program is described in section 2.3.8 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to implement the Ecosystem Protection Program in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
<u>Forestry</u>	
• Implement the Watershed Forest Management Plan.	Ongoing
• Continue to conduct forest inventories on City-owned lands, including long-term CFI plots.	Ongoing
• Continue to assess and mitigate deer impacts on forest regeneration on City-owned lands.	Ongoing
• Update the Watershed Forest Management Plan.	Completed
• Revise Watershed Forest Management Plan.	3/31/2027
<u>Wetlands</u>	
• Update Wetland Protection Strategy.	3/31/2018 Completed
• Update the wetland GIS data for the Watershed using LiDAR derived data and high-resolution photography.	3/31/2022 Completed
• Continue reference wetland monitoring.	Ongoing
• Review federal, State, and local wetland permit applications.	Ongoing
<u>Invasive Species</u>	
• Continue to implement the Invasive Species Management Strategy.	Ongoing
• Engage Watershed partners and residents to coordinate efforts in invasive species prevention and control.	Ongoing
• Collaborate with partners to ensure coordination of invasive species management efforts across watershed protection programs.	Ongoing
• Update the Invasive Species Management Strategy	3/31/2022 Completed

Report Description	Due Date
Submit updated Watershed Forest Management Plan.	Completed
Submit updated Wetlands Protection Strategy.	3/31/2018 Completed
Submit summary of wetland mapping and connectivity assessment results for the Watershed.	3/31/2022 Completed
Submit updated Invasive Species Management Strategy.	3/31/2022 Completed
Submit revised Watershed Forest Management Plan.	3/31/2027
Report on program implementation in the FAD Annual Report: • Forest inventories • Forest Management and regeneration • Wetland protection • Wetland mapping • Wetland permit reviews • Invasive species management	Annually, 3/31

4.9 East-of-Hudson Nonpoint Source Pollution Control Program

The East-of-Hudson Nonpoint Source (NPS) Pollution Control Program has been developed to reduce inputs of pathogens and nutrients from sanitary sewers, septic systems, and stormwater to the EOH FAD Basins (Boyd Corners, West Branch, Cross River, and Croton Falls Reservoirs). The program addresses this concern through the continued implementation of the WR&Rs, involvement in project reviews, and inspection and maintenance of existing stormwater management facilities. The City also supports a grant program to fund the design and construction of stormwater retrofits in the EOH FAD basins.

The goals for the EOH NPS Pollution Control Program under the Revised 2017 FAD are to:

- Maintain EOH Stormwater Facilities.
- Complete construction of two stormwater remediation retrofits remaining from the Revised 2007 FAD.
- Support the EOH Stormwater Retrofit Grant Program.
- Facilitate the preliminary planning of community wastewater solutions for areas in the EOH FAD basins where poorly functioning individual septic systems have the potential to impact water quality.
- Support the EOH Septic Repair Program in the four EOH FAD Basins, Lake Gleneida basin, and the basins upstream/hydrologically connected to Croton Falls Reservoir, as program capacity allows.
- Inspect sanitary sewers.

The City's EOH NPS Pollution Control Program is described in Section 2.3.9 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to implement the EOH NPS Pollution Control Program in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
Maintenance of DEP's EOH Stormwater Facilities.	Ongoing
Complete construction of two stormwater retrofit projects: • Maple Avenue (Cross River) • Drewville Road (Croton Falls)	9/30/2020 Completed

<u>EOH Stormwater Retrofit Grant Program</u> Execute and register a contract or contract amendment with the EOH Watershed Corporation to provide $22 million to support the design and construction of stormwater retrofits in the EOH FAD Basins and in basins upstream and hydrologically connected to the Croton Falls Reservoir. A total of $7 million shall be specifically committed to support stormwater retrofits within EOH FAD basins and $15 million shall be specifically committed to support stormwater retrofits within basins upstream and hydrologically connected to the Croton Falls Reservoir or within EOH FAD basins.	9/30/2019 Completed
Continue to make City lands available for stormwater retrofit projects constructed by the EOH Watershed communities so long as the City determines that the projects will not pose a threat to water quality or City operations related to the water supply.	Ongoing
<u>EOH Community Wastewater Planning Assistance Grants</u> Execute and register a contract NEIWPCC to develop and administer a grant program that will provide $3 million for preliminary planning for community wastewater solutions for areas in the EOH FAD basins where poorly functioning individual septic systems have the potential to impact water quality. The grant program will require that municipalities who apply for this funding will complete preliminary planning studies within four years from issuance of the 2017 FAD. Based on preliminary studies conducted by NYSDEC, wastewater planning assistance grants will be made available to municipalities ("identified municipalities") in which the following areas have been identified to have the potential to impact water quality from septic systems: areas surrounding Lake Waccabuc, Lake Truesdale, and Lake Kitchawan in the Cross River Reservoir basin; and Palmer Lake, Lake Gilead, Lake Casse, Lake View Road, and Mud Pond Brook in the Croton Falls Reservoir basin. Funds may be used by identified municipalities to finance engineering studies and report generation to assist those municipalities in evaluating wastewater treatment options/solutions that they could undertake to mitigate water quality impacts. The generated reports are intended to be used by the municipalities to appropriately plan and determine costs for the identified wastewater solution project so that municipalities may seek financing through State or federal funding sources, including but not limited to the 2017 Clean Water Infrastructure Act. Prepare a summary report of the preliminary planning studies from the identified municipalities that participated in the grant program.	12/31/2019 Completed 6/30/2022 Completed

<u>EOH Septic Repair Program (SRP)</u> • The City shall provide funding to support the repair, replacement, or connection to a WWTP for at least 35 residential septic systems per year in the four EOH FAD basins, including Lake Gleneida basin, either through a contract with NYS Environmental Facilities Corporation (EFC) or NEIWPCC, or directly with homeowners.	Ongoing
• Revise contract with EFC for the EOH SRP to allow eligibility of septic systems located within basins upstream or hydrologically connected to Croton Falls Reservoir. Implementation of the program will be prioritized, with priority given to septic systems in the EOH FAD basins, including Lake Gleneida basin, and expanding within the basins upstream or hydrologically connected to Croton Falls Reservoir as program rules dictate and program capacity allows.	12/31/2018 Completed
• Continue to provide technical assistance in support of EOH septic management programs.	Ongoing
• Review strategies used to inform potential SRP participants of the program's availability. Propose ways to improve education and outreach to enhance participation in the program.	3/31/2018 Completed
• Conduct an assessment of the SRP to determine whether funding for at least 35 systems per year is appropriate to meet demand from eligible septic systems in the four EOH FAD Basins, Lake Gleneida basin, and the basins upstream or hydrologically connected to Croton Falls Reservoir. . Funding made available for this program may be increased or decreased based on this assessment.	3/31/2022 Completed
<u>Video Sanitary Sewer Inspection</u> • Video Sanitary Sewer Inspection of four EOH CAT/DEL basins. • Complete mapping of new sewer areas (if any). • Complete inspection of targeted areas. • Identify potential defects. • Notify entities responsible for remediation of identified deficiencies.	3/31/2021 Revised 12/30/2021 Completed

Report Description	Due Date
Report on implementation of two EOH stormwater retrofit projects (Maple Avenue and Drewville Road).	Completed
Report on review of strategies used to inform potential SRP participants of the program's availability.	3/31/2018 Completed
Report on assessment of funding for the SRP.	3/31/2022 Completed
Report on program implementation in the FAD Annual Report: • Maintenance of EOH Stormwater Facilities • EOH NPS Stormwater Retrofit Grant Program • EOH Community Wastewater Planning Assistance Program • EOH Septic Repair Program, including education and outreach efforts • Video Sanitary Sewer Inspection (until completed)	Annually, 3/31

4.10 Kensico Water Quality Control Program

The Kensico Reservoir, located in Westchester County, is the terminal reservoir for the City's Catskill/Delaware water supply. Because it provides the last impoundment of Catskill/Delaware water prior to entering the City's distribution system, protection of this reservoir is critically important to maintaining water quality for the City. The primary goal of the Kensico Water Quality Control Program is to reduce non-point source pollution in the reservoir through implementation of various stormwater and wastewater projects. In addition, the City may conduct wildlife scat surveys around Kensico Reservoir in advance of storm events. These surveys include the recording, collecting, and disposing of wildlife latrines. Updates on the City's project to construct the Kensico-Eastview Connection (KEC), including any potential dredging of effluent chambers, are provided via the City's progress reports on KEC project implementation.

The objectives of the Kensico Water Quality Control Program under the Revised 2017 FAD are to:

- Continue proper operation and adequate maintenance through regular inspections of the existing stormwater management facilities and identification of repair needs to maximize pollutant removal efficiency.
- Reduce the risk of water contamination with pathogens through implementation of the Septic Repair Reimbursement Program, monitoring the early warning sanitary sewer overflow protection system, and inspection of targeted sanitary sewers.
- Minimize turbidity levels at effluent chambers by completion of the shoreline stabilization project at Shaft 18.

The City's Kensico Water Quality Control program is described in Section 2.3.10 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to implement the Kensico Water Quality Control Program in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
Inspect and maintain non-point source management facilities within the Kensico Reservoir Basin: • Stormwater management facilities • Turbidity curtains • Spill containment measures	Ongoing
Oversee remote monitoring system at Westlake Sewer Extension.	Ongoing
Implement Septic Repair Reimbursement Program.	Ongoing

Conduct the Video Sanitary Sewer Inspection Program to: • Complete mapping of new sewer areas. • Complete reinspection of targeted areas. • Identify potential defects. • Notify entities responsible for remediation of identified deficiencies.	3/31/2021 Revised 12/30/21 Completed
Complete Shaft 18 shoreline stabilization project.	12/31/2022
Perform an evaluation of unsewered areas of the Kensico drainage basin to prioritize parcel locations for connection to an existing centralized sewage collection system.	12/31/2023
In cooperation with local communities, develop the prioritization of parcel connections, evaluate the feasibility of implementation, and submit a schedule for sewer extension construction.	12/31/2026

Report Description	**Due Date**
Report on program implementation in the FAD Annual Report, including: • Operation and maintenance of non-point source management facilities • Westlake sewer monitoring program • Shaft 18 shoreline stabilization • Septic Repair Program • Video Sanitary Sewer Inspection • Kensico Wildlife Scat Sanitary Survey • Westchester County Airport (including capped landfills), as needed	Annually, 3/31
Submit evaluation report for centralized sewer system prioritized parcels in the Kensico drainage basin.	12/31/2023
Submit schedule for sewer extension construction	12/31/2026

4.11 Catskill Turbidity Control

The underlying geology of the Catskill System portion of the NYC Watershed makes its streams naturally prone to periods of elevated turbidity when large runoff events destabilize stream banks, mobilize streambeds, and suspend the glacial clays that underlie the streambed armor. The design of the Catskill System accounts for this effect, and provides for settling within Schoharie Reservoir, Ashokan West Basin, Ashokan East Basin, and the upper reaches of Kensico Reservoir. Under most circumstances, the extended detention time in these reservoirs is sufficient to allow the turbidity-causing clay solids to settle out, and the system easily meets the SWTR turbidity standard (5 NTU) at the Kensico Reservoir effluent.

The City's ability to meet this turbidity standard is occasionally threatened after extreme rain and runoff events. Historically, elevated turbidity has been addressed through the addition of the coagulant aluminum sulfate (alum) near the end of the Catskill Aqueduct. This increases the settling of suspended clays as Catskill water enters Kensico Reservoir. However, concern for potential negative environmental impacts of this practice has compelled the City to seek other turbidity management strategies. The City will continue to maintain its ability to use alum in the event other management alternatives are unable to adequately protect Kensico water quality.

Over the past two decades, the City has undertaken a number of studies and implemented significant changes to its operations to better manage turbidity in the Catskill System, while minimizing potentially negative local environmental impacts associated with the operation of the Shandaken Tunnel and the use of alum. The City determined that the most effective measures for controlling turbidity while minimizing alum use were: modification of reservoir operations using an Operations Support Tool (OST), interconnection of the Delaware and Catskill Aqueducts at Delaware Aqueduct Shaft 4, and improvements to stop shutters in the Catskill Aqueduct. The system-wide OST allows the City to optimize reservoir releases and diversions to balance between maximizing water supply storage, optimizing water quality, and achieving other environmental objectives. The City's Multi-Tiered Water Quality Modeling Program makes use of this tool to evaluate a variety of operational and water quality scenarios that are used to help support operational decisions. The interconnection between the Catskill Aqueduct and the Delaware Aqueduct at Shaft 4 was established to allow the increased use of Delaware System water during Catskill turbidity events and improve overall system flexibility. Structural improvements made to the Catskill Aqueduct stop shutter facilities help maintain adequate water depths near the intakes of the wholesale community customers with connections to the Catskill Aqueduct during periods when flows are minimized between Ashokan and Kensico Reservoirs.

In addition to the structural and operational changes listed above, DEP's multi-tiered water quality modeling program provides support to the program to control turbidity in the Catskill System. Water quality models are an integral part of OST and provide valuable information to guide the operation of the water supply to minimize the impact of turbidity events while considering longer-term system operating requirements.

Catalum SPDES Permit and Environmental Review

The Catalum SPDES Permit sets forth the conditions under which the City is allowed to treat Catskill Aqueduct water with alum prior to entering Kensico Reservoir. On October 4, 2013, NYSDEC executed an Order on Consent (DEC Case No.: D007-0001-11) (CO) with the City in connection with the Catalum SPDES permit. The CO was modified in 2018 and 2020. Incorporated into the CO is a modified version of an interim operating protocol for use of the

Ashokan Release Channel (ARC), to which the City and NYSDEC had agreed in October 2011. The ARC provides a mechanism for water to be released from the Ashokan Reservoir to the lower Esopus Creek for environmental or economic benefit, flood mitigation, or to mitigate the impacts of turbidity on water diverted to Kensico Reservoir. In June 2012, consistent with the then proposed Catalum CO, the City requested a modification to the Catalum SPDES Permit to incorporate measures to control turbidity in water sent from the Ashokan Reservoir to the Kensico Reservoir via the Catskill Aqueduct, and to postpone dredging of alum floc at Kensico Reservoir until completion of certain infrastructure projects. This proposed modification to the Catalum SPDES permit required that an Environmental Impact Statement (EIS) be conducted under the State Environmental Quality Review Act (SEQRA).

NYSDEC is lead agency for this review and issued the final scope of work for the EIS on March 22, 2017. Under the CO, the City is required to prepare a draft EIS (DEIS) and a draft Final EIS (FEIS), which will analyze the potential environmental and socioeconomic impacts resulting from the proposed modifications of the SPDES Permit. DEP submitted a draft DEIS to NYSDEC on May 30, 2019 and requested a revised modification to the SPDES Permit that reflected the analysis in the DEIS. NYSDEC released the DEIS for public comment on December 16, 2020 and the public comment period for the DEIS closed on June 16, 2021. On February 9, 2022 NYSDEC announced that the agency would require the City to undertake additional analyses and prepare a Supplemental DEIS. The additional analyses include impacts on Hudson River public water systems, a detailed Alternatives Analysis, climate change, and methods to ensure an adequate water supply “safe yield.” The EIS will evaluate a suite of alternatives that could be executed at Ashokan Reservoir, along the Catskill Aqueduct, and at Kensico Reservoir, as well as implementation of the City’s turbidity control measures as a whole. Where potential adverse impacts are indicated, reasonable and practicable measures that have the potential to avoid, mitigate, or minimize these impacts will be identified.

OST Expert Panel Review

As required by the Revised 2007 FAD, the City contracted with the National Academies of Sciences, Engineering, and Medicine (NASEM, formerly known as the National Research Council) to conduct an expert panel (“OST Expert Panel”) review of the City’s use of OST. The NASEM is in a unique position to bring together a group of experts with the breadth of experience and expertise needed to undertake this independent study and to ensure a comprehensive and scientifically objective product.

The goals of the OST Expert Panel were to:

- Evaluate the effectiveness of the City’s use of OST for water supply operations, and identify ways in which the City can more effectively use OST to manage turbidity.
- Evaluate the performance measures and criteria that the City uses to assess the efficacy of the Catskill Turbidity Control Program, and recommend additional performance measures, if necessary.
- Review the City’s proposed use of OST in evaluating the proposed modification to the Catalum SPDES Permit as well as the alternatives to be considered in the environmental review of those proposed modifications.
- Review the City’s existing studies of the potential effects of climate change on the City’s water supply to help identify and enhance understanding of areas of potential future concern regarding the use of OST.

The OST Expert Panel issued its final report in 2018. The City used the recommendations in the report to update the performance measures and criteria for evaluating the Catskill Turbidity Control Measures. Implementation of these recommendations continues.

The general goals of Catskill Turbidity Control under the Revised 2017 FAD are to:

- Continue to use OST to manage water system operations to reduce turbidity levels in the Catskill System water entering Kensico Reservoir, while minimizing adverse environmental impacts and alum use.
- Continue to update OST to account for future climate scenarios as needed.
- Keep NYSDOH informed on plans to manage Catskill turbidity during the planned shutdown of the Rondout-West Branch Tunnel (RWBT) section of the Delaware Aqueduct for repairs.
- Continue to implement the OST Expert Panel recommendations.
- Propose, as necessary, alternative measures for achieving turbidity control based on the Catalum EIS.

The City's Catskill Turbidity Control measures are described in Section 2.3.11 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to implement the Program in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
Continue to utilize and update OST.	Ongoing
Conduct the Expert Panel review of the City's use of OST. • Provide the final report to NYSDOH, USEPA, and NYSDEC and the Watershed Inspector General (WIG).	Anticipated release by 10/31/2018 Completed 9/25/2018
• Submit final revised performance measures and criteria for evaluating the efficacy of Catskill Turbidity Control measures, taking into consideration the Expert Panel recommendations, for review and approval by NYSDOH, USEPA, and NYSDEC.	Six months after the submission of the Expert Panel report Completed 3/25/2019

Annually convene a progress meeting with NYSDOH, USEPA, NYSDEC, and the WIG to provide a forum for discussion of the status of the Catskill Turbidity Control measures, management of turbidity events reported in the March Annual Report and subsequent events, use of performance measures to assess program efficacy, status/results of the Supplemental DEIS and FEIS, and other matters related to turbidity control. In addition, the City will facilitate discussion of the following items: • The OST expert panel report: Ongoing discussion on implementation of OST Expert Panel recommendations. • The Supplemental DEIS. This discussion may occur at the next annual meeting after the Supplemental DEIS is issued by NYSDEC, or NYSDOH may, at its option, request that the City convene a separate meeting to discuss the Supplemental DEIS, in addition to the annual meetings. • The Catskill Turbidity Control measures report that is due 3 months after issuance of the FEIS. This discussion may occur at the next annual meeting more than three months after issuance of the FEIS or NYSDOH may, at its option, request that the City convene a separate meeting to discuss this report, in addition to the annual meetings.	Annually, 10/31

Report Description	Due Date
Report on program implementation in the FAD Annual Report.	Annually, 3/31
Provide the final report of OST Expert Panel to NYSDOH, USEPA, NYSDEC, and the WIG.	Anticipated release by 10/31/2018 Completed 9/25/2018
Report on final revised performance measures/criteria for evaluating the efficacy of Catskill Turbidity Controls.	6 months after submission of Expert Panel report Completed 3/25/2019
Report on Catskill Turbidity Control Rondout-West Branch Tunnel (RWBT) Shutdown Management Plan, including consideration of maintaining water quality during the RWBT repair and shutdown.	1 year prior to the planned RWBT shutdown Completed 9/30/2021
Report on whether, based on the conclusions of the FEIS, the City intends to modify its use of turbidity control measures identified in the Phase III Catskill Turbidity Control Implementation Plan, and/or implement any other turbidity control measures. If so, the City shall submit a modification of the Phase III Plan, proposing alternative measures for achieving turbidity control and a timeline for implementing those alternative measures.	3 months after NYSDEC issuance of FEIS

4.12 Sand and Salt Storage

This program was concluded under the Revised 2007 FAD.

5. Watershed Monitoring, Modeling, and GIS Programs

5.1 Watershed Monitoring Program

The City conducts extensive water quality monitoring throughout the Watershed. Programmatic goals are defined in the 2018 Watershed Water Quality Monitoring Plan, which describes the data gathering protocols for regulatory purposes, FAD program evaluation, modeling, and surveillance (including pathogen surveillance). Significant alterations in the monitoring plan require the City to submit the proposed changes to NYSDOH for review and approval prior to implementation. Changes to the plan are documented using addenda.

Water quality results collected from routine monitoring of reservoirs, streams, and aqueducts throughout the Watershed are stored in a database. The database serves both short- and long-term objectives. The daily results are used for regulatory compliance and operational decisions, and are compiled by the City each year into the Watershed Water Quality Annual Report. Over the longer term, the data generated through the City's monitoring program, in conjunction with other defensible scientific findings, are used to assess water quality status, water quality trends, and the overall effectiveness of the Watershed protection program. This evaluation is described in the Watershed Protection Program Summary and Assessment Report, which is produced every five years. The last submission occurred on March 31, 2021, and the next assessment report shall be submitted by March 31, 2026.

The goals for the Watershed Monitoring Program under the Revised 2017 FAD are to:

- Provide water quality results collected through routine programs.
- Use water quality data to evaluate the source and fate of pollutants.
- Assess the effectiveness of Watershed protection efforts and water supply operations.
- Participate in educational forums on Watershed monitoring, research, and management.
- Coordinate a working group on pathogen research.
- Provide after-action reports to NYSDOH and USEPA on all non-routine chemical treatments and other significant or unusual events that could impact water quality.
- Continue to examine various data analysis techniques and, where appropriate, begin to incorporate water quality trends and other findings into the Watershed Water Quality Annual Report.
- Make watershed water quality data publicly available via applicable NYC Open Data policy (NYC Open Data - DEP) and continue to implement a data request protocol for sharing data with government agencies, other researchers, and community groups.

The City's Watershed Monitoring Program is described in Section 2.4.1 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the

City continue to implement the Watershed Monitoring Program in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
Annual participation in educational seminars on Watershed monitoring and management.	Ongoing
Coordinate Pathogen Technical Working Group meeting.	Annually, 5/31
Provide after-action reports on all non-routine chemical treatments and other significant or unusual events that have the potential to impact water quality.	Upon completion as specified by NYSDOH for each action
Conduct testing for emerging contaminants at key watershed monitoring locations as informed by applicable contaminant candidate lists and/or monitoring rules for unregulated contaminants.	12/31/2025

Report Description	Due Date
Submit Watershed Water Quality Annual Report, including comprehensive chapters on: • Kensico Reservoir water quality • Pathogens • Modeling • Educational seminars on Watershed monitoring and management • Ongoing research	Annually, 7/31
Submit the 2021 Watershed Protection Program Summary and Assessment Report.	3/31/2021 Completed
Submit the 2026 Watershed Protection Program Summary and Assessment Report.	3/31/2026
Submit Emerging Contaminant Monitoring Report for monitoring conducted in 2025.	12/31/2026

5.2 Multi-Tiered Water Quality Modeling Program

The City conducts extensive modeling analysis to inform long-term water supply planning, Watershed program evaluation, and day-to-day operations to ensure FAD compliance and overall system reliability. The models developed and applied by the Water Quality Modeling Program fall into four general classes:

- Watershed models that simulate hydrology and stream water quality, including processes associated with agricultural, forested, and urban lands, and with water quality including turbidity, nutrients, organic carbon, and disinfection byproduct (DBP) precursors.
- Reservoir models that simulate the effects of Watershed hydrology, nutrient inputs, and operations on reservoir nutrient and chlorophyll levels, the production and loss of organic carbon.
- System operation models that simulate the demands, storage, transfer, and quality of water throughout the entire NYC reservoir system.
- Stochastic weather generators, which generate synthetic time series of weather variables such as precipitation and air temperature; which, when combined with Watershed, reservoir, and system models, allows evaluation of the impacts of climate change and extreme events on supply system operation and water quality.

These models encapsulate the key processes and interactions that control generation and transport of water, sediment, organic carbon and nutrients from the land surface, through the watersheds and reservoirs, and the supply system. Research and development is an integral component of the Water Quality Modeling Section's mission that leads to improvements to existing models, adaptation of new models and development of model applications to support water supply planning and operations by evaluating the impacts of changing and evolving management and protections programs, climate, land use, population, reservoir operations, and regulatory requirements.

The goals for the Multi-Tiered Water Quality Modeling Program under the Revised 2017 FAD are the development and application of models in the following areas:

- Prediction of turbidity transport in the Catskill system, and Kensico and Rondout Reservoirs, and to provide guidance for reservoir operations to minimize the impact of turbidity events.
- Integration of the Rondout turbidity model into the OST.
- Development and testing of turbidity models for other Delaware system reservoirs, beginning with Neversink.
- Evaluation of the effectiveness between and within Watershed management programs implemented through the FAD and MOA on maintenance and improvement of water quality.
- Continuation of model development and application to forecast the effects of climate change on water supply quantity and quality.
- Development and testing of models to simulate Watershed sources, and reservoir fate and transport, of organic carbon, disinfection byproduct precursors, and surrogates of precursors.

- Evaluation of impacts of infrastructure improvements (both during and following), including the RWBT repair project.

The City's Multi-Tiered Modeling Program is described in Section 2.4.2 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to implement the Multi-Tiered Water Quality Modeling Program in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
Update and enhance data describing land use, Watershed programs, meteorology, stream hydrology and water quality, reservoir quality and operations data to support modeling.	Ongoing
Provide modeling and technical support for Catskill Turbidity Control measures including the applications of OST.	Ongoing
Use reservoir turbidity models and OST to support operational decisions in response to episodes of elevated turbidity.	Ongoing
Explore use of models and applications coupled with statistical analysis of monitoring data to evaluate, optimize, and integrate management and protections programs based on the recommendations of the 2020 NASEM expert panel.	Ongoing
Develop and test fate and transport models for organic carbon, disinfection byproduct precursors, and surrogates of precursors in Cannonsville and Neversink Reservoirs.	Ongoing
Develop future climate scenarios for use as inputs to the City's Watershed and reservoir models. Scenarios may be based on: (a) historic time series, and (b) synthetic weather generators.	Ongoing
Develop model applications that simulate the impacts of future climate change on Watershed hydrology, reservoir water quality, and water system operations.	Ongoing
Hold an annual progress meeting with regulators to present and discuss modeling results.	Annually, 11/30

Report Description	Due Date
Submit program Status Report, including updates on the modeling activities described above in the Watershed Water Quality Annual Report.	Annually, 7/31
Report every five years on modeling analysis of FAD programs as either a supplement to the Watershed Protection Program Summary and Assessment Report or a separate report.	3/31/2021 Completed 3/31/2026

5.3 Geographic Information System Program

The City's upstate Geographic Information System (GIS) is used to manage the City's interests in the lands and facilities of the upstate water supply system, and to display and evaluate the potential efficacy of Watershed protection programs, through maps, queries, and spatial analyses. The GIS is also used to support Watershed and reservoir modeling of water quantity and quality, as well as modeling of water supply system operations. GIS resources are utilized by staff at offices throughout the Watershed, directly and via the Watershed Lands Information System (WaLIS). WaLIS is the City's custom database application used for managing information about watershed lands and resources owned by the City and its neighbors. This includes data analysis, mapping, and report generation. The GIS will continue to be a useful tool in four primary areas:

- Inventory and track water supply lands and facilities.
- Perform analyses of land use and terrain to map development, agriculture, forest and hydrography.
- Provide estimation of the effects of Watershed management programs on long-term water quality.
- Support Watershed and reservoir modeling of water quantity and quality, and modeling of system operations.

The goals for the GIS Program under the Revised 2017 FAD are to:

- Continue to provide GIS technical support for protection programs, monitoring programs, and modeling applications.
- Continue to develop and update GIS data and metadata, including acquisition of high-resolution aerial data and their derived products.
- Continue to improve and maintain GIS infrastructure to evolve with changing technology and growing database needs.
- Continue to fulfill requests for GIS data from other agencies and Watershed stakeholders.

The City's GIS program is described in Section 2.4.3 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to implement the Geographic Information System Program in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
Continue to provide GIS technical support for protection programs, monitoring programs, and modeling applications.	Ongoing
Continue to develop and update GIS data and metadata, including acquisition of high-resolution aerial data and their derived products as needed.	Ongoing
Continue to improve and maintain GIS infrastructure to evolve with changing technology and growing database needs.	Ongoing
Continue to fulfill requests for DEP BWS-specific GIS data from other agencies and Watershed stakeholders.	Ongoing

Report Description	Due Date
Report on program implementation in the FAD Annual Report, including: • GIS technical support for protection programs, monitoring programs, and modeling applications • Completion or acquisition of new GIS data layers and aerial products in the DEP BWS GIS spatial data libraries • GIS infrastructure improvement • GIS data dissemination summaries	Annually, 3/31

6. Regulatory Programs

6.1 Watershed Rules and Regulations and Other Enforcement/Project Review

The City administers and enforces the City's Watershed Rules and Regulations (WR&Rs), including the regulations and standards incorporated by reference in these regulations. The City also participates in environmental reviews under SEQRA for projects in the Watershed. The majority of the regulated activities reviewed by the City involve subsurface sewage treatment systems or stormwater pollution prevention plans to prevent the discharge of sediment, turbidity, nutrients, and pathogens from entering the reservoirs.

The program is coordinated through a Memorandum of Understanding (MOU) between NYSDEC and the City. The MOU established the Watershed Enforcement Coordination Committee (WECC) which meets quarterly to address non-compliance with stormwater pollution prevention plans through formal enforcement and compliance assistance under specific agency protocols. The WECC process is designed to address instances of significant non-compliance in a timely and appropriate manner.

The City, in accordance with Public Health Law Section 1104 and the MOA, is obligated to pay for capital replacement of Watershed Equipment and Methods at all public wastewater treatment plants (WWTPs), as well as all (public or nonpublic) WWTPs that existed or were under construction as of November 2, 1995, and that are required by the WR&Rs and not otherwise required by federal or State law.

In 2019, the City revised the WR&Rs to provide for greater consistency with the State's regulatory program for stormwater and wastewater. Revisions have also been proposed in response to concerns raised by stakeholders in WOH communities, in particular related to noncomplying regulated activities, subsurface sewage treatment systems, holding tanks, SWPPPs, and variances.

The goals for Watershed Rules and Regulations and Other Enforcement/Project Review under the Revised 2017 FAD are to:

- Facilitate optional pre-application meeting requests, receive applications for approval of regulated activities, perform a review of SEQR notices and new projects in accordance with the WR&Rs, and monitor construction activity.
- Investigate possible violations of the WR&Rs, Environmental Conservation Law, and Clean Water Act. Document system failures, illicit discharges, and construction site non-compliance; issue Notices of Violation as necessary, and review corrective action plans for all violations. Observe and document remediation efforts and perform close-out actions.
- Enforce environmental and public health requirements, including petroleum/chemical spills, and hazardous and solid waste dumping.
- Continue the City's commitment to pay for Capital Replacement of Watershed Equipment and Methods at eligible WWTPs.

The City's WR&Rs program is described in Section 2.5.1of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to implement Watershed Rules and Regulations and Other Enforcement/Project Review in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
Enforce the WR&Rs and other applicable regulations. Continue to promote compliance guidance to applicants seeking approval, through pre-application conferences and providing guidance documents.	Ongoing
Work with NYSDEC, in accordance with Addendum S of the NYCDEP/NYSDEC Memorandum of Understanding, to improve coordination of stormwater enforcement and compliance activities between agencies and with the State Attorney General's Office. Such enforcement and compliance coordination will apply, but not be limited to, all effective NYSDEC general permits for construction activity. Stormwater WECC meetings with involved agencies will be held at least twice per year or more as needed.	Ongoing
Submit the proposed changes to the WR&Rs and a timeline for completing the rulemaking process.	2/28/2018 Completed
Update guidance documents affected by WR&Rs changes to assist applicants undertaking regulated activities in complying with the WR&Rs. Submit the updated guidance documents in accordance with the MOA.	18 months after watershed regulations' effective date 10/18/2021 Completed

Report Description	Due Date
Submit the proposed changes to the WR&Rs and a timeline for completing the rulemaking process.	2/28/2018 Completed
Submit reports consisting of: • Summary table, with corresponding maps, of new project activities that may affect water quality including variance activities and review of new/remediated septic systems in the Catskill/Delaware Watershed basins as well as in the Croton Falls and Cross River basins east of the Hudson River. • Summary table (inventory) of all development projects proposed and their SEQRA status, with corresponding maps. • Summary table of projects under construction, by basin, with corresponding maps.	Semi-annually, 4/30 and 10/31
Submit reports on the status of the City's regulatory enforcement actions in the Catskill/Delaware Watershed basins, including the Croton Falls and Cross River basins.	Semi-annually, 4/30 and 10/31
Submit report on the progress of the proposed changes to the WR&Rs until adopted.	Completed
Submit an update on Capital Replacement of the Watershed Equipment and Methods at eligible WWTPs.	Annually, 3/31
Report on the analyses used to determine the phosphorus-restricted and coliform-restricted status of each reservoir, as part of the Watershed Water Quality Annual Report.	Annually, 7/31

6.2 Wastewater Treatment Plant Compliance and Inspection Program

The goal of the WWTP Compliance and Inspection Program is to prevent degradation of source waters from the threat of contamination from WWTPs discharging in the Watershed. To ensure compliance with the Watershed Regulations and the SPDES permits, the City through the WWTP Compliance and Inspection Group performs onsite inspections, conducts sample monitoring, provides compliance assistance, and takes enforcement actions when needed. The program is coordinated through a Memorandum of Understanding (MOU) between NYSDEC and the City. The MOU established the Watershed Enforcement Coordination Committee (WECC), which meets quarterly to address non-compliance through formal enforcement and/or compliance assistance under specific inter-agency protocols. The WECC process is designed to address instances of significant non-compliance in a timely and appropriate manner. In addition, the City's water quality sampling program regularly monitors the effluent of all treatment plants in the Watershed and uses the results of sampling to assist WWTP operators to meet compliance requirements or to initiate enforcement actions as necessary.

The City's WWTP Compliance and Inspection Program is described in Section 2.5.2 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to implement the Wastewater Treatment Plant Compliance and Inspection Program in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
Perform monitoring at all City-owned WWTPs in accordance with their SPDES permits, and grab sample monitoring monthly at all non-City-owned WWTPs discharging in the Catskill/Delaware Watershed. At least once annually, for the non-City-owned WWTPs, samples shall be collected and analyzed in accordance with the monitoring requirements of each facility's SPDES permit. Continue to provide technical assistance to owner/operators of non-City-owned WWTPs as needed.	Ongoing
Continue to take timely and appropriate enforcement actions against non-City-owned WWTPs for noncompliance with the City's WR&Rs and SPDES discharge permit requirements, in accordance with the WECC enforcement coordination protocol specified in the MOU between NYSDEC and the City.	Ongoing
Conduct at least four on-site inspections for year-round SPDES permitted facilities and at least two on-site inspections per year for all seasonal SPDES permitted facilities per year at all WWTPs in the watershed.	Ongoing

Report Description	Due Date
Report on the WWTP Compliance and Inspection Program, including: • WWTP inspection summary reports • Enforcement actions	Semi-annually, 3/31 (July 1 to Dec 31) 9/30 (Jan 1 to June 30)
Submit WWTP Water Quality Sampling Monitoring Report.	Semi-annually, 3/31 (July 1 to Dec 31) 9/30 (Jan 1 to June 30)
Report by email to NYSDOH all sewage spills exceeding 500 gallons within 24 hours of the City becoming aware of the spill.	Ongoing

7. Catskill/Delaware Filtration Plant Design

The 1997 FAD required the City to produce a Final Design and Final Environmental Impact Statement for filtration facilities for the Catskill/Delaware water supply. The 2002 FAD required the City to provide biennial updates to the preliminary filtration plant design for the Catskill/Delaware system (in addition to constructing an ultraviolet light disinfection facility, which was placed into full service in October 2012). The 2007 FAD maintained the requirement for the City to provide a biennial report that updated the preliminary design for filtration facilities.

In 2013 and 2015, the City proposed, and NYSDOH agreed, that because no design changes to the 2009 preliminary plans for the Catskill/Delaware Filtration Facilities were required or issued, no revisions to the 2009 plans were necessary. In recognition that the work supporting the existing preliminary plans was over 25 years old, the 2017 FAD required the City to contract for a comprehensive review of filtration methods and technologies, resulting in the development of a new conceptual design for a filtration facility or facilities. This will minimize the overall time to commence filtration in the event that the City or NYSDOH determines that filtration is necessary.

The design review process will include:

- bench studies and modeling;
- larger scale pilot studies;
- independent review from water treatment experts;
- conceptual design that incorporates the latest filtration methods and technologies.

The City's Catskill/Delaware Filtration Plant Design program is described in Section 2.6 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to implement the Catskill/Delaware Filtration Plant Design requirements in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
Advertise for Request for Proposals.	12/31/2016 Completed
Issue Notice to Proceed.	1/24/2018 Completed
Complete paper and bench studies.	6/30/2020 Completed
Commence conceptual design and larger scale pilot studies.	12/31/2021 Completed

Complete larger scale pilot studies and submit report.	12/31/2025
Convene a meeting with NYSDOH, USEPA, and NYSDEC to discuss the pilot study results.	6/30/2026
Submit conceptual design.	12/31/2027

Report Description	Due Date
Report on status of design review.	Annually, 3/31
Submit larger scale pilot studies report.	12/31/2025
Submit Final Report on conceptual design.	12/31/2027

8. In-City Programs

8.1 Waterborne Disease Risk Assessment Program

To maintain filtration avoidance, the City must continue to demonstrate that water consumers served by the NYC water supply are adequately protected against waterborne disease. In particular, the City's water must not be identified as a source of outbreaks of giardiasis or cryptosporidiosis.

Since the promulgation of the SWTR in 1989, and the initiation of the City's Waterborne Disease Risk Assessment Program (WDRAP) in 1993, significant changes in water quality regulation and water treatment have occurred. In the City, the Catskill/Delaware UV plant was constructed and began operation in 2012. Also, the Croton Water Filtration Plant began delivering water to areas of the City in 2015. With these treatment facilities now in operation, the City has major additional protection against any risk of waterborne disease due to pathogens such as *Giardia* and *Cryptosporidium*.

Providing an additional level of public health protection, the Revised 2017 FAD continues to require WDRAP program implementation to assess and ensure the safety of the City's water supply. The main goal of WDRAP is to track the incidence of and gather relevant demographic and risk factor data on potentially-waterborne illnesses, in particular giardiasis and cryptosporidiosis, in the population served by the City's water supply. Also, under WDRAP syndromic surveillance programs have been developed and implemented as a means for observing general community gastro-intestinal illness trends in NYC, as an additional assurance of the safety of the water supply.

The City's Waterborne Disease Risk Assessment Program is described in Section 2.7 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to implement the WDRAP in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
Continue to operate the Waterborne Disease Risk Assessment Program.	Ongoing
In relation to any water quality "event" involving the NYC water supply (e.g., increased turbidity levels, pathogen detection, disruption of operations), the City will provide NYSDOH and USEPA with syndromic surveillance system information.	Event based

Notify NYSDOH and USEPA whenever the City is notified by the New York City Department of Health and Mental Hygiene of any signs of community gastrointestinal illness in which public drinking water supply appears to be the source of the illness.	Event based
Perform a quantitative microbial risk assessment that considers the start-up of the Catskill-Delaware Ultraviolet Disinfection Facility in 2012.	6/30/2027
Continue to implement the Turbidity Action Plan and annually review and update the contact information.	Ongoing

Report Description	Due Date
Submit Annual Report on program and program findings, implementation, and analysis.	Annually, 3/31

8.2 Cross Connection Control Program

A cross connection is a physical connection in a drinking water distribution system through which the water supply can become contaminated. By inspections of potential sources of cross connections and follow-up enforcement to ensure backflow prevention devices are installed where necessary, the Cross Connection Control Program is an important tool for preventing contamination of the City's water in distribution system.

Although this program is an important part of the City's drinking water program, NYSDOH, in consultation with USEPA, has determined that it is no longer a necessary component of the Filtration Avoidance Determination. As a requirement of 10 NYCRR Section 5-1.31 and Title 15, Chapter 20 of the Rules of the City of New York, the City will continue to implement a Cross Connection Control Program. As required by New York City Local Law 76/09, the Program will report semi-annually (January and July) to the New York City Council on: the number of facilities for which one or more backflow devices were installed since the last report; the number of facilities that have been newly notified of the need to install devices; and the number of violations issued for failure to install devices. The City will ensure that this information is also posted on its public website (https://www1.nyc.gov/site/dep/about/cross-connection-controls.page) and that NYSDOH and USEPA are copied on the report that is sent to the NYC Council.

9. **Administration**

In order to successfully implement a comprehensive Watershed protection program, dedicated professionals in a variety of fields are needed. The FAD requires the City to maintain the level of staffing, funding, and expertise necessary to support all elements of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021). Annual reporting of staffing, disbursements, and out-year appropriations is important for determining if the City's committed resource levels are sufficient.

In addition to having adequate staffing and funding, the City and its WOH Watershed partners have recognized that the establishment of a physical office in the WOH Watershed would improve implementation of the City's source water protection programs. Providing a central location for certain operations, maintenance, and infrastructure improvement tasks can help ensure the reliable delivery of water to the City from the Catskill/Delaware Watershed. By sharing a work location, centrally located in the Watershed, the City and CWC can further improve coordination and responsiveness to Watershed communities. The City signed a 20-year lease on January 29, 2020 for 16,752 square feet in the Arkville facility and has relocated DEP staff.

The 2017 FAD required a new section in the annual report to provide the status of key partnership contracts, such as those with CWC, SWCDs, and WAC. In addition, the City will convene an annual meeting with FAD program partners, to discuss program administrative, contract, and/or funding issues. The goal is to facilitate communication between Watershed partners and City administrative and program staff, maintain continuity in the Watershed protection programs, and prevent the occurrence of funding gaps.

At part of its 2020 report, the expert panel convened by NASEM concluded that the City's source water protection program would benefit from analyses of the vitality of watershed communities. The panel acknowledged that many of City's substantial investments in watershed protection have resulted in benefits to the regional economy. The panel recommended further study of community well-being and the relative contributions of City's various programs elements, with the goal of optimizing the mix of program activities to continue effective source water protection while enhancing the incremental benefits to community vitality. The City will undertake this study and submit a report by December 31, 2024. It is anticipated that the results of this study will help inform decisions about future FAD program activities to be recommended for the 2027 FAD.

The City's Administration Program is described in Section 2.8 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to implement the Administration requirements in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
NYCDEP, in consultation with the City's Office of Management and Budget, will make a presentation to NYSDOH, USEPA, and NYSDEC on the amount of money appropriated and spent for Watershed protection programs and its adequacy to meet program objectives and FAD requirements.	Within 60 Days after submission of the Annual Report
NYCDEP will convene an annual meeting with key watershed partners, NYSDOH, USEPA, and NYSDEC to discuss contract and payment concerns.	Annually, 2/28
Co-location of NYCDEP staff with CWC in new office in Arkville, NY: • Sign a binding commitment to lease office space in Arkville, NY for relocation of NYCDEP program staff. • Assign at least 26 NYCDEP staff to new offices in Arkville, NY. • Assign additional staff, as necessary, to ensure that a total of at least 40 NYCDEP staff are assigned to new offices in Arkville, NY.	 1/29/2020 Completed 12/31/2020 Completed 12/31/2026
Conduct a study of the economic vitality and social character of the communities in the West of Hudson watershed.	12/31/2025

Report Description	Due Date
Report annually on: • The actual filled staff position levels versus available staff positions for each division and section involved in supporting FAD Watershed protection programs, and confirm that resource levels are adequate to ensure that all program goals and FAD requirements are met. Contractor support staff will be noted. • The amount appropriated in the City budget for FAD Watershed protection programs for the upcoming fiscal year, specifically the amount (capital and expense) spent during the previous year, the amount appropriated for the current year, and the amount planned for the year thereafter. The amount spent, appropriated, and planned will be broken down by program, to the extent practicable. The report will also include costs for technical consultant contracts identified in the FAD. • The status of key partnership contracts including contract issues (i.e., change orders, planning for successor contract) and funding projections. • Include an analysis of septic program funding in the 9/30/2025 report.	Annually, 9/30
Report on status of lease details and City approvals, estimated staffing numbers, and timing of occupation of leased space in new offices in Arkville, NY.	Annually, 3/31
Report on economic vitality and social character of the communities in the West of Hudson watershed.	12/31/2025

10. Education and Outreach

The overall goal of the Education and Outreach Program is to raise awareness about the importance of the New York City water supply system and the critical need to protect its sources for current and future generations. Through this collaborative program, the City works with numerous partners in both the Watershed and New York City to educate upstate residents and downstate consumers about the importance of source water protection, and to promote the benefits of environmental protection to public health and quality of life.

Certain elements of the Watershed Education and Outreach Program are achieved through individual Watershed programs and partnerships that target a specific audience, whereas others involve direct stakeholder engagement or active participation in local community events where information can be effectively disseminated to a broad audience. The continued use of websites, press releases, newsletters, publications, and electronic and print media complements all these efforts.

Virtually every Watershed protection program funded or supported by the City accomplishes some degree of public education or outreach, which the City attempts to track and quantify with a focus on characterizing the key target audiences reached. The primary Watershed programs that focus on education and outreach include the CWC Public Education Grants Program, Watershed Agricultural Program, Watershed Forestry Program, Stream Management Program, and Land Management Program (Watershed Recreation).

The goals for the Education and Outreach Program under the Revised 2017 FAD are to:

- Continue to promote environmental stewardship as means of water quality and public health protection.

- Continue to track and document the estimated numbers and types of audiences reached via targeted Watershed education and/or training programs.

- Continue to track and document the diverse range of community public outreach events that are sponsored or attended by the City and its Watershed partners.

The City's Education and Outreach Program is described in Section 2.9 of the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021).

The general milestones set forth in the 2017 FAD remain relevant and form the basis for program implementation during the remaining period. The Revised 2017 FAD requires that the City continue to implement the Education and Outreach Program in accordance with the milestones below.

Activity and Reporting Requirements

Activity	Due Date
Continue to support the following activities: • CWC Public Education Grants Program (through a contract with CWC). • Targeted education and professional training programs for specific adult audiences through the ongoing efforts of existing Watershed protection programs. • School-based education programs for both upstate and downstate audiences (teachers and students). • Watershed community outreach events and public meetings, with participation as needed. • Utilization of websites, press releases, newsletters, publications, social media, and remote learning/online meetings platforms to disseminate information about the water supply and Watershed protection programs.	Ongoing

Report Description	Due Date
Report on program implementation in the FAD Annual Report, summarizing key activities and accomplishments related to education and outreach in the following programs: • CWC Public Education Grants Program • Watershed Agricultural Program • Watershed Forestry Program • Stream Management Program • Watershed Recreation	Annually, 3/31

11. **Reporting**

The Revised 2017 FAD continues to require that the City inform NYSDOH and USEPA of its Watershed protection efforts through submittal of reports designed to assist the regulatory community and Watershed stakeholders in their assessment of the overall progress of the City's Watershed Protection Program. The expected content for these reports is described in more detail in each section of this Revised 2017 FAD and in the *New York City Department of Environmental Protection Long-Term Watershed Protection Plan* (December 2021). This reporting section is not an exhaustive list of all reporting obligations. All FAD reports generated by NYCDEP are posted on the following website: https://www1.nyc.gov/site/dep/about/filtration-avoidance-determination.page. The following tables highlight reports submitted on a periodic as well as one-time only basis.

For informational purposes, the City will also inform NYSDOH and USEPA annually about actions planned and actions taken by the City on water conservation, implementation or revisions to the City's Drought Management Plan, and the elimination of leaks in the Delaware Aqueduct.

The Revised 2017 FAD requires that the City implement the reporting requirements in accordance with the submittal list and schedule below.

Periodic Submittals by FAD Section

Section	Report Topic	Frequency*
2	Continue to meet SWTR filtration avoidance criteria (40 CFR §141.71 and §141.171, and 10 NYCRR §5-1.30) and submit reports and certification of compliance on: • §141.71(a)(1) and §5-1.30(c)(1) – raw water fecal coliform concentrations. • §141.71(a)(2) and §5-1.30(c)(2) – raw water turbidity sampling. • §141.71(b)(1)(i)/§141.72(a)(1) and §5-1.30(c)(3) – raw water disinfection CT values. • §141.71(b)(1)(ii)/§141.72(a)(2) and §5-1.30(c)(4) – operational status of Kensico and Hillview disinfection facilities, including generators and alarm systems. • §141.71(b)(1)(iii)/§141.72(a)(3) and §5-1.30(c)(5) – entry point chlorine residual levels.	Monthly

Section	Report Topic	Frequency*
	• §141.71(b)(1)(iv)/§141.72(a)(4) and §5-1.30(c)(6) – distribution system disinfection levels (the City will include a discussion of any remedial measures taken if chlorine residual levels are not maintained throughout the distribution system). • §141.71(b)(5) and §5-1.30(c)(10) – distribution system coliform monitoring, including a summary of the number of samples taken, how many tested positive for total coliform, whether the required number of repeat samples were taken at the required locations, and which, if any, total coliform positive samples were also *E. coli* positive. For each *E. coli* positive sample, include the investigation of potential causes, problems identified and what has or will be done to remediate problems. Include copies of any public notices issued as well as dates and frequency of issuance. All requirements described in §141.71(b)(6) and §5-1.30(c)(9) must continue to be met. Submit report on disinfection byproduct monitoring results. Report on the operational status of Kensico Reservoir, West Branch Reservoir (on-line or by-pass), Hillview Reservoir, and whether any of these reservoirs experienced unusual water quality conditions.	Quarterly Monthly
3.1	Septic and Sewer Programs implementation: • Septic Remediation and Replacement Program • Expanded Septic Program • Septic Maintenance Program	Annually

3.3	Community Wastewater Management Program implementation: • Halcottsville • New Kingston • Shokan	Annually
3.5	Implementation of the Future Stormwater Controls Programs and the Stormwater Retrofit Program.	Annually
4.1	Summary of Waterfowl Management Program activities at all reservoirs, including wildlife management at Hillview Reservoir (8/1 to 7/31).	Annually (10/31)
4.2	Semi-annual reports on Land Acquisition Program activities and status.	Semi-annually (3/31 and 7/31)
4.3	Land Management Program implementation.	Annually
4.4	Watershed Agricultural Program implementation including: • Number of new and revised WFPs completed and approved, as well as the total number of eligible farms awaiting development of a WFP. • Number, types and dollar amounts of both new BMPs and repaired or replaced BMPs implemented each year. • Number, types, and dollar amounts of both new BMPs and repaired or replaced BMPs designed and scheduled for implementation in the following year. • Cumulative percentage of BMP backlog reduced (designed, implemented, or scheduled for implementation). • Number and percentage of annual status reviews completed on active Whole Farm Plans. • Number of new and updated nutrient management plans completed, as well as the percentage of current plans on all active participating farms that require such a plan.	Annually Annually

	• Number of farms participating in the Nutrient Management Credit Program. • Number of farms participating in the PFM Program and a summary of accomplishments. • Number of new and re-enrolled CREP contracts completed, along with a summary of total enrolled and re-enrolled acres. • Summary of Farmer Education Program accomplishments. • Summary of Economic Viability Program accomplishments.	
4.5	Report on Watershed Forestry Program implementation including: • Number of forest management plans completed and acres of forestland enrolled in New York's forest tax abatement program. • Number and types of MAP projects completed. • Number and types of forestry BMP projects completed. • Number of Croton Trees for Tribs projects completed. • Summary of logger and forester training accomplishments. • Summary of landowner education accomplishments. • Summary of school-based education accomplishments. • Summary of model forest accomplishments.	Annually Annually

4.6	Report on the Stream Management Program implementation including: • Site selection of water quality based projects and status of projects. • Catskill Stream Buffer Initiative, including miles of streambank revegetated. • Stream Management Implementation Projects, including number of projects funded. • Local Flood Hazard Mitigation Program, including number of LFHM and LFA-generated projects funded, funding amounts, and number completed projects. • Water Quality studies.	Annually
	Submit rolling two-year Action Plans for implementing stream management plan recommendations and establishing priorities, by reservoir basin.	Annually (5/31)
	Submit descriptions of proposed stream projects for FAD approval.	Annually (11/30)
	Water Quality Monitoring Studies status reports.	Biennially, beginning 3/31/2019
4.7	Report on Riparian Buffer Protection Program implementation referencing the other FAD programs where the completed Riparian Buffer Protection Program details will be described.	Annually
4.8	Report on Ecosystems Protection Program implementation including: • Forest inventories • Wetland protection • Wetland mapping • Wetland permit reviews • Invasive species management	Annually

4.9	Report on East-of-Hudson Nonpoint Source Pollution Control Program implementation: • Maintenance of EOH Stormwater Facilities • EOH NPS Stormwater Retrofit Grant Program • EOH Community Wastewater Planning Assistance Program • EOH Septic Repair Program, including education and outreach efforts • Video Sanitary Sewer Inspection	Annually
4.10	Report on Kensico Water Quality Control Program implementation: • Operation and maintenance of non-point source management facilities • Westlake sewer monitoring program • Shaft 18 shoreline stabilization • Review timeline for assessing or dredging at the effluent chambers • Septic Repair Program • Video Sanitary Sewer Inspection • Kensico Wildlife Scat Sanitary Survey • Westchester County Airport (including capped landfills), as needed	Annually
4.11	Report on Catskill Turbidity Control Program.	Annually
5.1	Watershed Water Quality Annual Report, including comprehensive chapters on: • Kensico Reservoir water quality • Pathogens • Modeling • Educational seminars on Watershed monitoring and management • Ongoing research	Annually (7/31)

5.2	Status report on Multi-Tiered Water Quality Modeling Program, including updates on modeling activities in the Watershed Water Quality Annual Report.	Annually (7/31)
5.3	Report on Geographic Information System Program implementation, including: • GIS technical support for protection programs, monitoring programs, and modeling applications. • Completion or acquisition of new GIS data layers and aerial products in the City's GIS spatial data libraries. • GIS infrastructure improvement. • GIS data dissemination summaries.	Annually
	Report on WR&Rs consisting of: • Summary table, with corresponding maps, of new project activities that may affect water quality including variance activities and review of new/remediated septic systems in the Catskill/Delaware Watershed basins as well as in the Croton Falls and Cross River basins east of the Hudson River. • Summary table (inventory) of all development projects proposed and their SEQRA status, with corresponding maps. • Summary table of projects under construction, by basin, with corresponding maps.	Semi-annually (4/30 and 10/31)
	WR&Rs Enforcement Report.	Semi-annually (4/30 and 10/31)
	Progress report on proposed revisions to the City's WR&Rs.	Semi-annually until adopted (4/30 and 10/31) Completed
	Submit an update annually on Capital Replacement of the Watershed Equipment and Methods at eligible WWTPs.	Annually

	Analyses used to determine the phosphorus-restricted and coliform-restricted status of each reservoir.	Annually in Watershed Water Quality Report (7/31)
6.2	WWTP Compliance and Inspection Program • WWTP inspection summary reports • Enforcement actions WWTP Water Quality Sampling Monitoring Report.	Semi-annually (3/31 and 9/30) Semi-annually (3/31 and 9/30)
7	Catskill Delaware Filtration Plant Design Review status.	Annually
8.1	Waterborne Disease Risk Assessment Program findings, implementation, and analysis.	Annually
9	Administration Report on: • The actual filled staff position levels versus available staff positions for each division and section involved in supporting FAD Watershed protection programs, and confirm that resource levels are adequate to ensure that all program goals and FAD requirements are met. Contractor support staff will be noted. • The amount appropriated in the City budget for FAD Watershed protection programs for the upcoming fiscal year, specifically the amount (capital and expense) spent during the previous year, the amount appropriated for the current year, and the amount planned for the year thereafter. The amount spent, appropriated, and planned will be broken down by program, to the extent practicable. The report will also include costs for technical consultant contracts identified in the FAD. • The status of key partnership contracts including contract issues (i.e., change orders, planning for successor contract) and funding projections.	Annually (9/30)

10	Education and Outreach Report on program implementation summarizing key activities and accomplishments: • CWC Public Education Grants Program • Watershed Agricultural Program • Watershed Forestry Program • Stream Management Program • Watershed Recreation	Annually
11	Comprehensive FAD Annual Report. NYCDEP Response to NYSDOH On-site Inspection Report.	Annually Annually (within 60 days following receipt of NYSDOH report)

*Monthly means reports for a monthly reporting period must be submitted no later than ten days after the end of each month.
Quarterly means reports for a calendar quarter reporting period must be submitted no later than ten days after the end of each quarter.
Semi-annually means reports for a January-June reporting period must be submitted no later than July 31 and for a July-December reporting period must be submitted no later than January 31, unless otherwise stated in the FAD.
Annually means reports for a calendar year reporting period must be submitted no later than March 31 of the following year, unless otherwise stated in the FAD.

Significant One-Time Submittals Required under the FAD in Chronological Order

Section	Description	Due Date
4.11	Provide the Final Report of the Expert Panel on the City's OST to NYSDOH, USEPA, NYSDEC, and the WIG.	When released by National Academies (9/25/2018) Completed
4.11	Report on final revised performance measures/criteria for evaluating the efficacy of Catskill Turbidity Controls.	6 months after release of National Academies report
4.11	Report on whether, based on the conclusions of the FEIS, the City intends to modify its use of turbidity control measures identified in the Phase III Catskill Turbidity Control Implementation Plan, and/or implement any other turbidity control measures. If so, the City shall submit a modification of the Phase III Plan, proposing alternative measures for achieving turbidity control and a timeline for implementing those alternative measures.	3 months after NYSDEC issuance of FEIS
2	Provide the Final Report of the Expert Panel on the City's Watershed Protection Plan.	Commence Work date + 33 months
2	Convene a public meeting with the regulators and Watershed stakeholders to discuss the major findings and recommendations of the National Academies Expert Panel review.	Date of Final Report + 4 months
4.8	Submit updated Watershed Forest Management Plan.	Completed
6.1	Submit timeline for completing proposed changes to the WR&Rs.	2/28/18 Completed
4.8	Submit updated Wetlands Protection Strategy.	3/31/2018 Completed
4.9	Report on review of strategies used to inform potential EOH Septic Repair Program participants of the program's availability	3/31/2018 Completed
4.2	Based on the requirements of the 2010 WSP, submit first evaluation report on the NYCFFBO Program	6/15/2018 Completed
4.2	Report on progress of workgroup convened to assess opportunities to use LAP-acquired lands to facilitate relocation of development out of floodplain.	6/30/2018 Completed

Section	Description	Due Date
4.6	Report on metrics that have been established to evaluate Delaware County CSBI/CREP pilot program	11/30/2018 Completed
4.6	Report on development of Watershed Emergency Stream Response and Recovery Plan.	12/31/2018 Completed
4.2	Submit proposed approach for providing payments or incentives that might increase participation by landowners in SAP.	3/31/2019 Completed
4.6	Submit brief basin specific reports outlining the water quality basis for Stream Project Site Selection in the basin during the FAD period and that prioritize main stem and/or sub-basins for stream feature inventories.	6/30/2019 Completed
4.6	Report on progress in extending CREP through CSBI, including Delaware County CSBI/CREP pilot program, and submit recommendations for establishment of a permanent program and estimated funding needs, or discontinuation of the program.	11/30/2019 Completed
4.2, 4.7	Submit a status report on the SAP.	6/30/2019 Completed
4.2	Submit a status report on the WAC Forest Conservation Easement acquisition program.	12/15/2020 Completed
4.6	Submit LFHMP first evaluation.	6/30/2020 Completed
5.1	Submit 2021 Watershed Protection Program Summary and Assessment Report.	3/31/2021 Completed
5.2	Report on Modeling Analysis of FAD Programs as a supplement to the Watershed Protection Program Summary and Assessment Report.	3/31/2021 Completed
4.2	Based on the requirements of the 2010 WSP, submit the second program evaluation report on the NYCFFBO Program.	6/15/2021 Completed
2	Submit 2021 Long-Term Watershed Protection Plan.	12/15/2021 Completed
4.4	Report on CAI evaluation results for the Watershed forest management planning program and landowner education programs.	12/31/2021 Completed

Section	Description	Due Date
4.11	Report on Catskill Turbidity Control RWBT Shutdown Management Plan, including consideration of maintaining water quality during the RWBT repair and shutdown.	1 year prior to planned RWBT shutdown Completed
4.8	Submit summary of wetland mapping and connectivity assessment.	3/31/2022 Completed
4.8	Submit updated Invasive Species Implementation Strategy.	3/31/2022 Completed
4.9	Report on assessment of funding for the EOH Septic Repair Program.	3/31/2022 Completed
4.6	Submit Water Quality Monitoring Studies first five-year report.	11/30/2022 Completed
4.2	Submit a Long-Term Land Acquisition Plan for the period 2023-2033.	5/31/2023
4.6	Submit LFHMP second evaluation.	6/30/2023
4.6	Update report on development of Watershed Emergency Stream Response and Recovery Plan.	12/31/2023
4.10	Submit an evaluation report for centralized sewer system prioritized parcels in the Kensico drainage basin.	12/31/2023
4.4	Submit WAP Metrics Assessment and Recommendations Report.	6/30/2024
4.6	Report on cumulative progress of the Delaware County CSBI/CREP pilot program and other SMP partnership opportunities for extending CREP to eligible fallow agricultural lands through CSBI in the WOH watershed.	11/30/2025
7	Submit Catskill Delaware Filtration Plant larger scale pilot studies report.	12/31/2025
9	Report on economic vitality and social character of the communities in the West of Hudson watershed	12/31/2025
4.4	WAP Long-Term Management Plan	3/31/2026
5.1	Submit 2026 Watershed Protection Program Summary and Assessment Report.	3/31/2026

Section	Description	Due Date
5.2	Report on Modeling Analysis of FAD Programs as a supplement to the Watershed Protection Program Summary and Assessment Report.	3/31/2026
2	Submit 2026 Long-Term Watershed Protection Plan.	12/15/2026
4.4	Report on CAI evaluation results for the Watershed forest management planning program and landowner education programs.	12/31/2026
4.10	Submit schedule for sewer extension construction in Kensico drainage basin.	12/31/2026
5.1	Submit Emerging Contaminant Monitoring Report	12/31/2026
7	Submit Final Report on Catskill Delaware Filtration Plant conceptual design.	12/31/2027
4.8	Submit revised Watershed Forest Management Plan.	3/31/2027
4.6	Submit Water Quality Monitoring Studies final study findings report.	11/30/2027

Issued by NYSDOH on 12/23/2022