NYC Environmental Protection

Vincent Sapienza, P.E.
Commissioner

Angela Licata
Deputy Commissioner
for Sustainability
AngelaL@dep.nyc.gov

59-17 Junction Boulevard
Flushing, NY 11373
T: (718) 595-4418
F: (718) 595-3557

June 30, 2021

Edward Hampston
Director, Bureau of Water Compliance
New York State Department of Environmental Conservation
625 Broadway, 4th Floor
Albany, New York 12233-3506

Re: CSO Order on Consent (DEC Case No. CO2-20110512-25, modification to CO2-20000107-8)
City-Wide Green Infrastructure Implementation – Green Infrastructure Contingency Plan (Section IV.B.3.)
Contingency Plan Submittal

Dear Mr. Hampston:

In accordance with CSO Order on Consent (Order) Section IV.B. 3, the New York City Department of Environmental Protection (DEP) hereby submits a Green Infrastructure Contingency Plan (Contingency Plan).

The enclosed Contingency Plan is for the 4% application rate pursuant to the Order.

Please contact me at (718) 595-4398 should you have any questions regarding this submittal.

Sincerely,

Angela Licata
Deputy Commissioner for Sustainability

Copy to:

Mark Klotz
Director, Division of Water
New York State Department of
Environmental Conservation
625 Broadway, 4th Floor
Albany, New York 12233-3500

Selvin Southwell, P.E.
Region 2 Regional Water Engineer
New York State Department of
Environmental Conservation
47-40 21st Street
Long Island City, New York 11101

Ryan Waldron, P.E.
Section Chief, Municipal Compliance
Division of Water
New York State Department of
Environmental Conservation
625 Broadway, 4th Floor
Albany, NY 12233-3500

Kaitlin Penner, P.E.
New York State Environmental Facility
Corporation
625 Broadway
Albany, New York 12207-2997

Linda Allen, Ph.D., P.E.,
NEIWPCC IEM
625 Broadway, 4th Floor
Albany, New York 12233-3500

William Plache, Esq.
Devon Goodrich, Esq.
New York City Law Department
Office of the Corporation Counsel
100 Church Street
New York, New York 10007

Dena Putnick, Esq.
Kenson Jeffrey, Esq.
Office of General Counsel
New York State Department of
Environmental Conservation
625 Broadway, 4th Floor
Albany, New York 12233-3500

DEP OACE: J. Mueller, K. Mahoney, G. Mayes
DEP BLA: E. Stein Cushman, M. Eckels, E. Callahan
DEP BEPA: P. Balci, M. Enoch, R. Joshi

NYC Green Infrastructure

2020 Contingency Plan

June 30, 2021

I. Green Infrastructure Program Summary

A. Program Goal

The NYC Green Infrastructure Program was launched in 2011 and was incorporated into the 2012 amended Consent Order (the Order)[1] between the NYC Department of Environmental Protection (DEP) and NYS Department of Environmental Conservation (DEC). The goal of the Program is to manage stormwater and reduce Combined Sewer Overflows (CSOs), thereby improving water quality and promoting sustainability. The Order requires DEP to implement green infrastructure to manage the equivalent of stormwater generated by one inch of precipitation on 10% of impervious surfaces in combined sewer system (CSS) areas in the following five-year increments: 1.5% (December 31, 2015), 4% (December 31, 2020), 7% (December 31, 2025), and 10% (December 31, 2030) and establish an equivalency rate for the green infrastructure application to City-wide CSO volume reductions.

In 2016, as required by the Order, DEP developed CSO volume reduction equivalency rates to manage the equivalent of stormwater generated by one inch of precipitation for the 1.5% and 10% green infrastructure application rates through the Performance Metrics Report (PMR), discussed in more detail in Section II A below. The PMR established that DEP can achieve 507 million gallons per year (MGY) of CSO reductions with the initial 1.5% green infrastructure application milestone target for 2015 and 1.67 billion gallons per year (BGY) CSO reductions for the 2030 10% green infrastructure application milestone target as the "City-wide baseline CSO reduction credit." DEC approved the PMR in 2017.

Above and beyond the requirements of the Order, and understanding that green infrastructure has citywide benefits, DEP has also been working to implement green infrastructure in other areas of the city beyond the combined sewered areas. Green infrastructure practices play an important role in other efforts such as reducing the amount of stormwater runoff directly entering NYC waterways in separately sewered or direct drainage areas, helping to alleviate localized flooding in support of resiliency efforts, and furthering urban greening goals and the co-benefits that come along with those. Green infrastructure practices constructed outside of the CSS areas are not reported out in Program metrics but are included in the NYC Green Infrastructure Annual Reports available on DEP's website.

B. Program Implementation Areas

Green infrastructure implementation is focused primarily in the areas described below.

Public Right-of-Way (ROW). The public ROW includes streets, sidewalks, parking lanes, medians and the roadway which accounts for about 30% of impervious cover in New York City. DEP embarked its Green Infrastructure Program in 2011 largely focusing on ROW and utilizing an aggregated area-wide infiltration practice approach in order to achieve CSO reductions efficiently while providing co-benefits such as neighborhood improvements through new sidewalks, landscaping, and heat island effect reductions. DEP works closely with the Department of Parks and Recreation (Parks) and Department of Transportation (DOT) to site green infrastructure within area-wide contracts managed by Department of Design and Construction (DDC) and Economic Development Corporation (EDC). ROW green infrastructure practices include the standard rain garden, rain gardens with "Type D" inlet, concrete or grass top infiltration basins, permeable pavements, stormwater green streets, and new median green infrastructure practices. Most of the NYC Green Infrastructure Program accomplishments to-date have been achieved through implementation of standard ROW green infrastructure practices.

Public On-site. This implementation area includes green infrastructure constructed within the property lines of publicly owned lots. To-date most public on-site implementation is occurring on sites owned by NYC Department of Parks and Recreation (Parks), Department of Education (DOE), and New York City Housing Authority (NYCHA). Other partners include School Construction Authority (SCA), Trust for Public Land, DDC, Taxi and Limousine Commission, public libraries

[1] Order on Consent (DEC Case No. CO2-20110512-25, modification to DEC Case No. CO2-20000107-8) http://www.nyc.gov/html/dep/html/cso_long_term_control_plan/index.shtml

and more. Green infrastructure practices implemented on public lots typically include subsurface retention or detention systems, rain gardens, permeable pavements, turf fields, and stormwater reuse systems.

Private Incentives. DEP has a suite of private property incentives to spur voluntary green infrastructure retrofits. These include the Green Infrastructure Grant Program, which funds green roof retrofits on private property, the Private Incentives Retrofit Program, which provides a contractor incentive for green infrastructure retrofits on large properties, and the Water Reuse Grant Program, which funds water reuse systems on private property. The City also has a Green Roof Tax Abatement, administered by the Department of Finance (DOF), which provides another incentive opportunity for private property owners seeking to implement green roofs.

Stormwater Regulations. Stormwater regulations are another important element for green infrastructure implementation, providing an opportunity to achieve greater on-site stormwater management through green infrastructure as NYC properties redevelop. The 2012 Stormwater Performance Standard, which was promulgated as part of the launch of the NYC Green Infrastructure Program, requires projects in the CSS area that need a sewer certification from DEP to adhere to on-site stormwater management requirements and a stormwater flow rate requirement. The planned Unified Stormwater Rule, anticipated to be in effect in 2022, will update on-site stormwater management volume requirements and flow rates for all sites that connect to the City's sewer system, as well as require a retention-first approach for sites that disturb more than 20,000 SF or more of soil or create 5,000 SF or more new impervious area. Once promulgated, the Unified Stormwater Rule DEP intends that it will supersede the 2012 Stormwater Performance Standard and result in a greater number of green infrastructure practices implemented as part of new and redevelopment.

C. Green Infrastructure Technology

Green infrastructure practices are designed to protect, restore, or mimic the natural water cycle within built environments by retaining, detaining, and/or treating stormwater runoff. Green infrastructure generally includes practices such as rain gardens, infiltration basins, green or blue roofs, porous pavements, subsurface stormwater storage systems, and stormwater reuse systems.

Stormwater runoff that enters a green infrastructure practice is typically managed via one or more of the following physical processes:

- Infiltration – water is captured and infiltrated into the underlying soils (sometimes referred to as exfiltration).
- Evapotranspiration (ET) – water is captured and evaporated or transpired back into the atmosphere.
- Reuse – water is captured and reused for purposes other than irrigation (which can reduce water storage potential of other practices).
- Filtration – water passes through a filtration medium to remove various pollutants.
- Detention – water is temporarily stored and released at a lower flow rate.

Among the five primary functions, infiltration, ET, and reuse green infrastructure practices are considered retention-based practices because they aim to eliminate or reduce the total volume of stormwater runoff leaving the site. The other two functions, filtration, and some extended detention practices, are considered treatment-based practices because they aim to remove pollutants from runoff before it ultimately leaves the site. The distinction between retention-based practices, detention-based and treatment-based practices is important when selecting a green infrastructure practice to meet water quality.

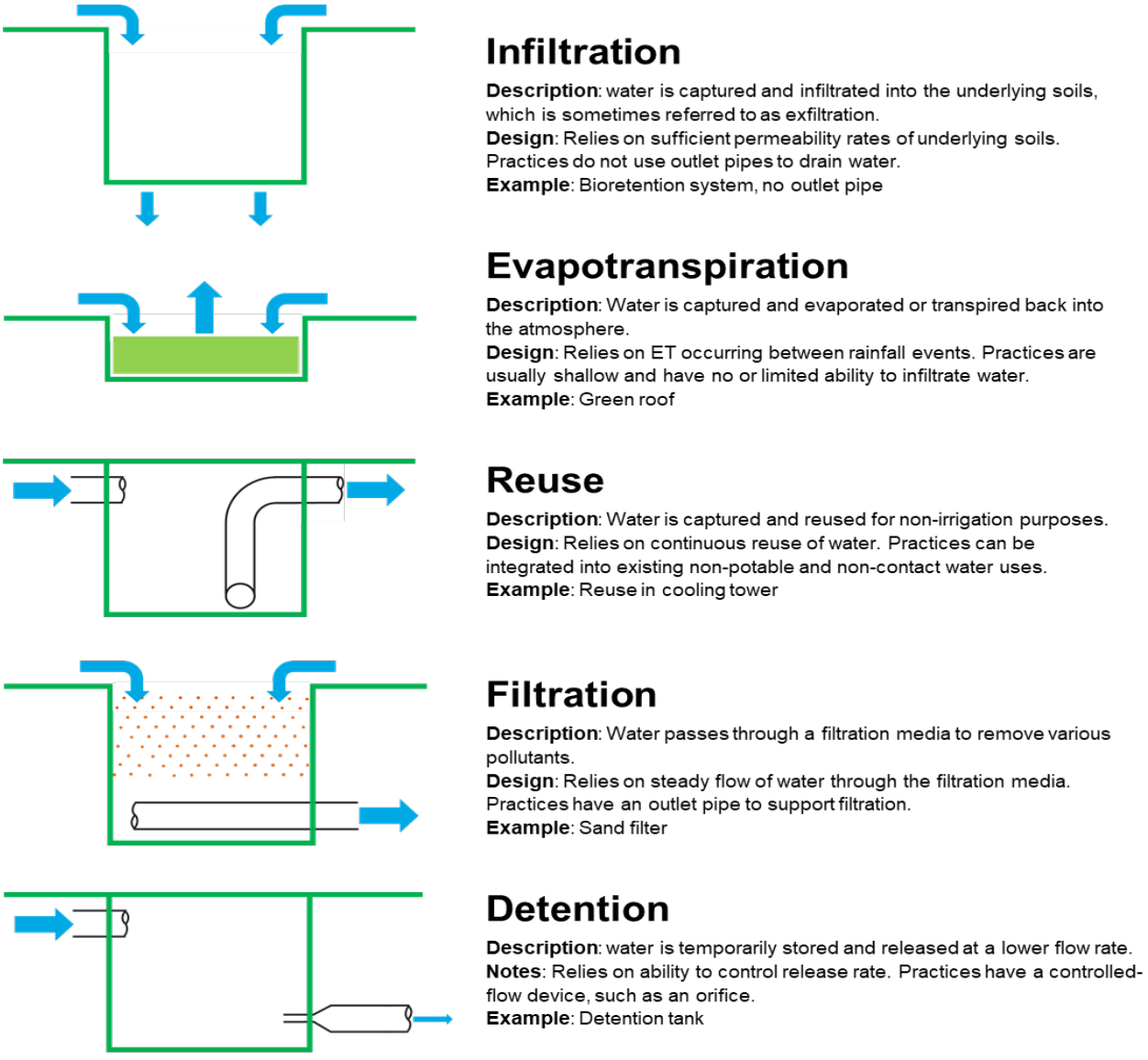
For CSO volume reduction goals, retention-based practices provide the most benefit because they lead to an overall reduction of stormwater leaving the site by infiltrating stormwater into soils or reusing it on the site, reducing the amount of stormwater that ultimately enters the City's sewer system[2]. Slow-release detention practices, detention

[2] Retention-based practices also provide the most benefit for water quality treatment objectives in separately sewered areas by aiming to reduce the amount of stormwater runoff entering the City's sewer system and ultimately entering NYC waterbodies.

systems that include a controlled-flow device to slowly release stormwater back to the sewer system, also perform well for CSO volume reduction goals because of their ability to reduce peak flow rates allowing the sewer system to operate more efficiently.

An illustration of the physical process for each function type is shown in Figure 1, along with a brief description and example green infrastructure practice.

Figure 1: Green Infrastructure Practice Function Diagrams



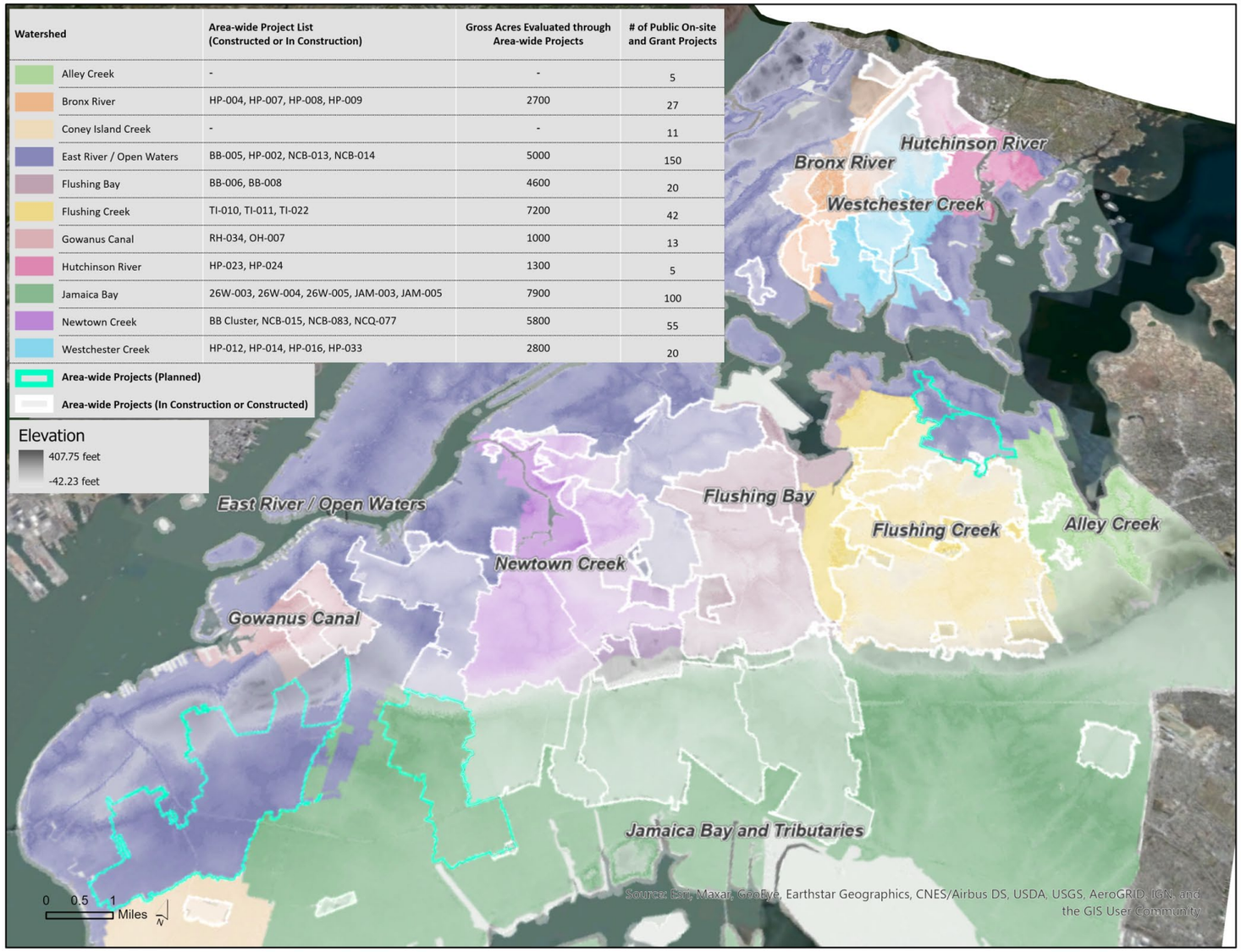
D. Program Status

As of the 2020 Green Infrastructure Annual Report, published on April 30, 2021, the Program is tracking 11,050 assets constructed or in construction, managing 1,504 Greened Acres. To-date DEP has encumbered over $1 billion in capital funding toward these accomplishments, with another $600 million budgeted through 2031.

DEP is on track to certify achievement of the 2015 1.5% milestone of 1,181 Greened Acres and 507 MGY by December 31, 2021. The 1.5% milestone projects include projects entirely led by DEP (i.e., no Stormwater Performance Standard projects are included).

As described in the Green Infrastructure Annual Reports, DEP initially focused on the area-wide projects to saturate the ROW with green infrastructure through standardized designs. The map in Figure 2 shows the extents of all the area-wide projects which DEP has identified to-date – most have finished construction or are currently in construction. Through these area-wide projects, DEP has saturated nearly all the CSS areas of the priority CSO waterbodies as well as select areas in the East River / Open Water tributaries that drain to confined waterways. In addition, DEP has worked to implement green infrastructure on public and private lots in all CSS areas to promote social benefits for the community even in the tributaries which were not prioritized for area-wide ROW green infrastructure implementation. These non-ROW projects, which are being implemented through public on-site partnerships and grants to private property owners, are also summarized in Figure 2.

Figure 2. Citywide Program Status Map



II. Green Infrastructure Program Combined Sewer Overflow (CSO) Reduction

A. Summary highlights from the Green Infrastructure Performance Metrics Report

In addition to the funding spent, encumbered, and budgeted, Green Infrastructure Program Annual Reports include a count of green infrastructure assets constructed and in construction and their corresponding Greened Acres managed for primary reporting metrics. A Greened Acre is equal to the impervious acre tributary to a green infrastructure asset multiplied by a rainfall depth, which for the New York City Green Infrastructure program, is specified for the 1" depth equivalent under the Order. For a given tributary area, green infrastructure assets designed to manage larger rainfall events yield higher Greened Acres. Greened Acres convey the volume capacity of green infrastructure for managing stormwater and do not translate directly to CSO volume reduction, which is dependent on the sewer pipe network capacity and configuration. The Order required DEP to establish this relationship between implementation and CSO volume reduction, which DEP did through the 2016 PMR[3]. The PMR was approved by DEC on July 5, 2017.

The PMR presents equivalency rates for annual CSO volume reduction associated with stormwater captured through green infrastructure implementation for the initial 1.5% green infrastructure implementation milestone as well as for a projected 10% implementation, as shown in Table 1 below.

Table 1: PMR Equivalency Rates

Milestone	Greened Acres	CSO Volume Reduction	Citywide Equivalency Rate (Annual CSO Volume Reduction per Greened Acre)
1.5%	1,181	507 MG/year	0.4
10%	7,875	1,677 MG/year	0.2

The equivalency rate for the 1.5% milestone incorporates data for specific existing and planned green infrastructure projects, which primarily consists of DEP-led retention-based rain gardens in the ROW. By contrast, the equivalency rate for the projected 10% milestone is based on an aggregated estimation of future projects assuming a hybrid of City-led and predominantly retention-based green infrastructure technologies and detention-based green infrastructure technologies based on private development compliance with the 2012 Stormwater Performance Standard.

The modeling work for the PMR utilized the NYC InfoWorks models used for Long Term Control Plan (LTCP) efforts and incorporates actual rainfall data which is translated to stormwater runoff based on sewershed-specific hydrologic parameters which then ties into a hydraulic module representing NYC's existing sewer network and baseline dry weather flows with outputs as CSO flows. The annual CSO volume reduction was derived by calculating the total difference in the model outputted CSO flows with and without the green infrastructure projects. The equivalency rates presented in the PMR are averaged across the different sewersheds and green infrastructure implementation on a citywide scale. As noted in the PMR, on a smaller scale looking at individual green infrastructure practices or even individual sewersheds, equivalency rates vary depending on the local hydrologic and sewer hydraulic conditions, as well as the function type (see again Figure 1 above) and penetration rate of green infrastructure.

Table 2 below shows a range of equivalency rates and equivalent acres that could achieve the Program goal of 1.67 BGY CSO volume reduction dependent upon the practices implemented. These equivalency rates were developed in the modeling process conducted for the PMR. The lowest equivalency rate presented in the table of 0.06 MG/acre is a citywide average associated with detention practices implemented under the 2012 Stormwater Performance Standard, which slow, but ultimately release, managed stormwater runoff into the CSS. The highest equivalency rate of 0.44

[3] NYC Green Infrastructure Performance Metrics Report, June 2016
https://www1.nyc.gov/assets/dep/downloads/pdf/water/stormwater/green-infrastructure/gi-performance-metrics-report-2016.pdf

MG/acre is a citywide average associated with ROW retention practices, which remove managed stormwater runoff from the CSS by infiltrating it into the underlying soils.

Table 2: Citywide Average Equivalency Rates and Greened Acre Scenarios

Equivalency Rate (CSO MG/Acre Managed)	Equivalent Greened Acres to achieve 1.67 BGY CSO volume reduction
0.06	27,833
0.155	10,774
0.250	6,680
0.345	4,841
0.440	3,795

The equivalency rates established in the PMR for the 1.5% and 10% implementation rates are representative for the specific green infrastructure projects and associated stormwater capture attributable to the green infrastructure technologies that were built into those models. However, for the subsequent milestones, including for the 4% implementation, the projects are varied, as is detailed in the next section. The exact hydrologic and hydraulic conditions of these green infrastructure projects cannot be predicted because the location and green infrastructure function type depend on site-specific constraints and may change at any point until they are constructed, however, DEP can project anticipated CSO volume reduction using the equivalency rates described above and best available information regarding the planned projects.

B. 4 % Green Infrastructure Application Rate Contingency Plan - CSO Volume Reduction

Table 3 below shows the CSO volume reduction achieved through the green infrastructure projects that are associated with the 1.5% milestone and that DEP will certify at the end of this year. The table also includes the projected CSO volume reduction from the 4% implementation milestone.

Table 3: Program CSO Volume Reduction Status Summary Table

2015 1.5% Acreage Milestone – CSO Volume Reduction Achieved	507 MGY
2020 4% Acreage Milestone – Projected CSO Volume Reduction	668 MGY

DEP will achieve the projected CSO volume reduction for the 4% implementation milestone through the green infrastructure projects listed in Table 4. These projects are described in more detail in the next several pages.

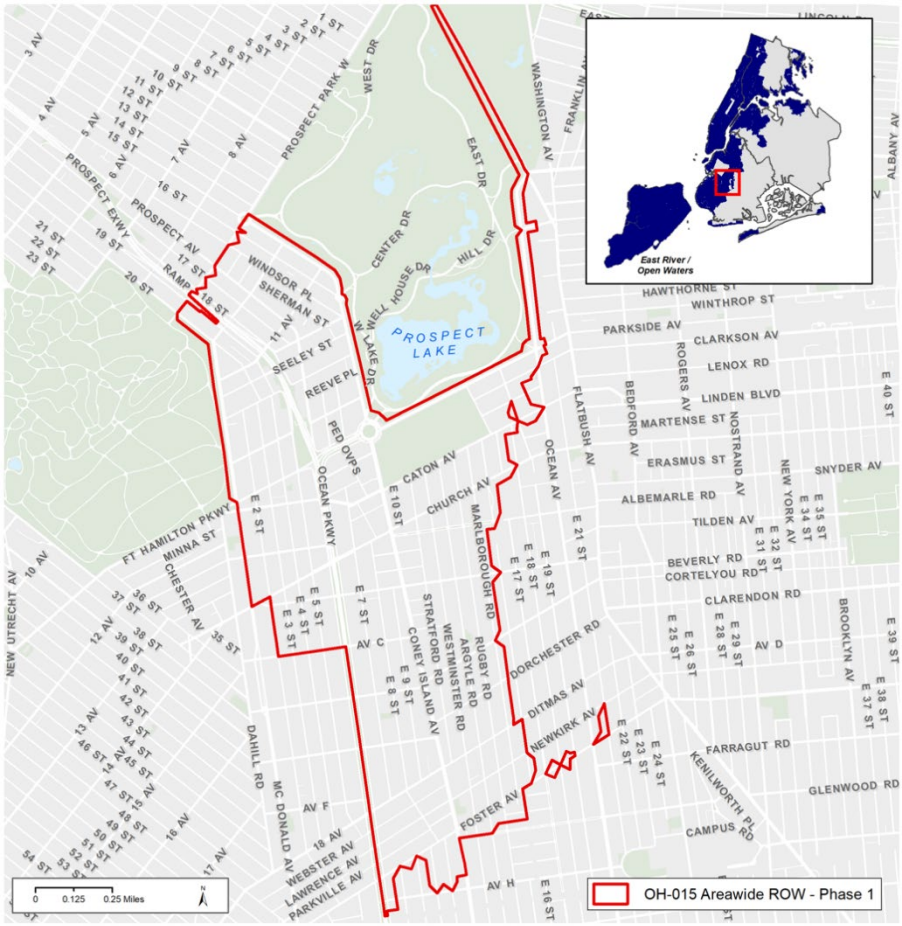
Table 4: 2020 Contingency Plan Projects Table

Priority Waterbody	Project	Current Status	Anticipated Construction Completion Date
EROW	OH-015 Areawide ROW – Phase 1	Geotech and survey	December 31, 2025
EROW	OH-015 Areawide ROW – Phase 3	Geotech and survey	December 31, 2025
EROW	TI-03/23 Areawide ROW	Final design	December 31, 2025
EROW	CI-005 Areawide ROW – Phase 1	90% design	December 31, 2025
Coney Island Creek, EROW, Gowanus, Jamaica Bay	Expanded Public Onsite – GI-CONS-01	Bid procurement	December 31, 2025
Alley Creek, EROW, Gowanus, Jamaica Bay	Expanded Public Onsite – GI-CONS-02	90% design	December 31, 2025
Various	Private Incentives Retrofit Program – Phase 1	Contract registered	December 31, 2025
EROW	Central Park Stormwater Recovery and Reuse	Design initiated	December 31, 2025
EROW	Prospect Park Stormwater Recovery and Reuse	MOU executed	December 31, 2025

Area-wide ROW Green Infrastructure

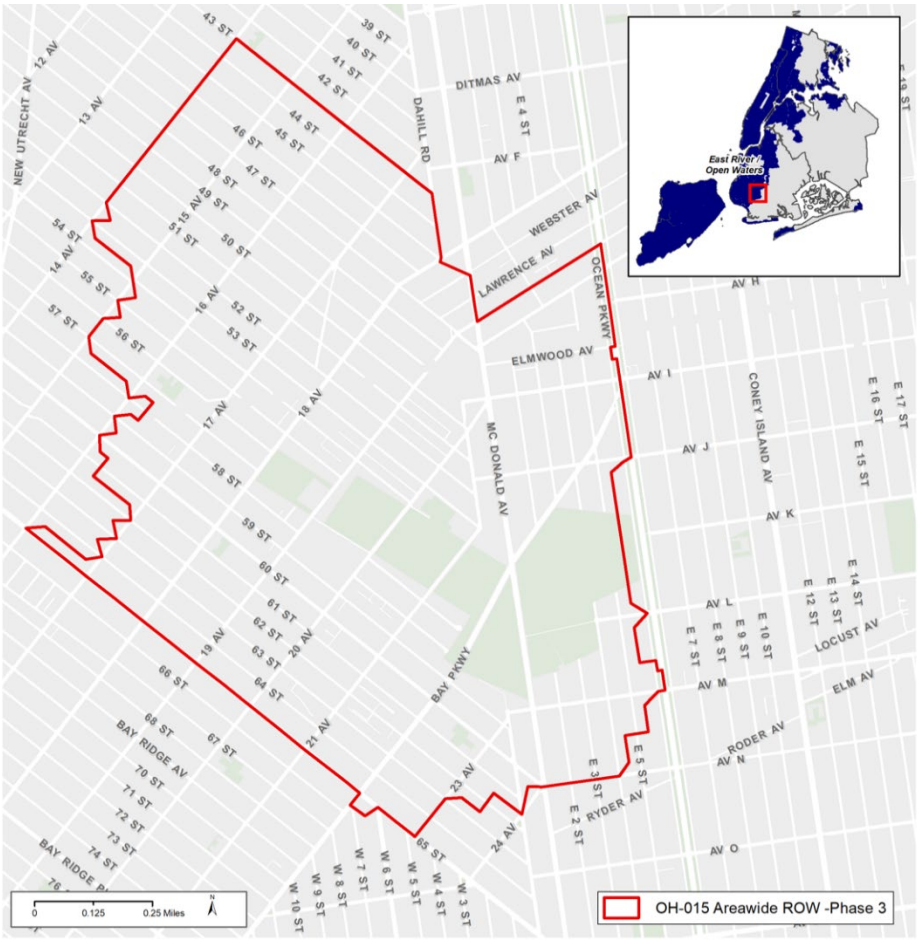
For area-wide ROW green infrastructure projects, DEP investigates an entire drainage area to identify locations suitable for green infrastructure implementation. This work includes desktop analysis of tributary drainage areas, walkthroughs of every street to observe roadway and sidewalk conditions, geotechnical investigations to verify that underlying soils can infiltrate stormwater, surveying work, and coordination with other City agencies and utility companies. DEP has a ROW green infrastructure toolbox from which to select ROW green infrastructure practice types, based on a variety of factors to ensure that the practices will be successful in the selected location. Utilizing standard designs allows DEP to bid out hundreds of locations for construction at a time. Designs are continuously updated incorporating lessons learned during siting, construction and maintenance. The latest Green Infrastructure Standard Designs are available on DEP's website.

Area-wide ROW Green Infrastructure in OH-015 – Phase 1



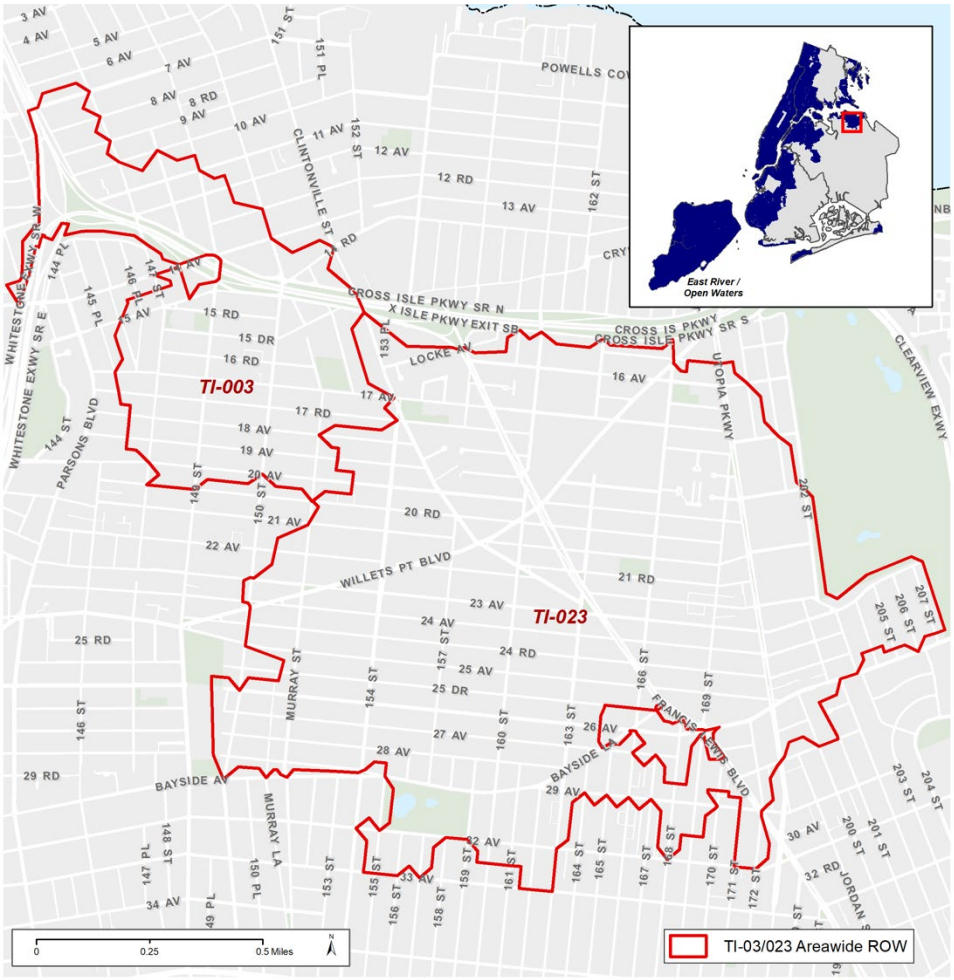
The area-wide OH-015 project has four total phases and will be DEP's first area-wide porous pavement project. Phase 1 is situated in Windsor Terrace, Brooklyn and includes the Prospect Park South Historic District. The area is characterized by large mature trees and zoning is mixed between low-density residential and high-density residential. The project area is 861 acres and drains to the East River. This project is currently in the geotech and survey phase, with construction anticipated to start by spring 2023.

Area-wide ROW Green Infrastructure in OH-015 – Phase 3



The OH-015 Phase 3 area-wide project is located in Borough Park, Brooklyn. The area is characterized by large mature trees and zoning is mixed between low-density residential and high-density residential. The project area totals 854 acres and drain to the East River. This project is currently in the geotech and survey phase, with construction anticipated to start by spring 2023.

Area-wide ROW Green Infrastructure in TI-03/23



CSO tributary areas TI-03 and TI-023 are in Whitestone, Queens. This is a residential area with large mature trees and zoning is low-density residential. Siting restrictions in this area included variable subsoils, mature trees, and driveways. These tributary areas total 1,012 acres and drain to the East River. The ROW green infrastructure practices that will be constructed in this area are mainly rain gardens, with infiltration basins supplemented where rain gardens were not feasible. The practice types were selected based on siting criteria, maintenance requirements, and zoning. This project is currently in final design and construction is anticipated to start by spring 2023.

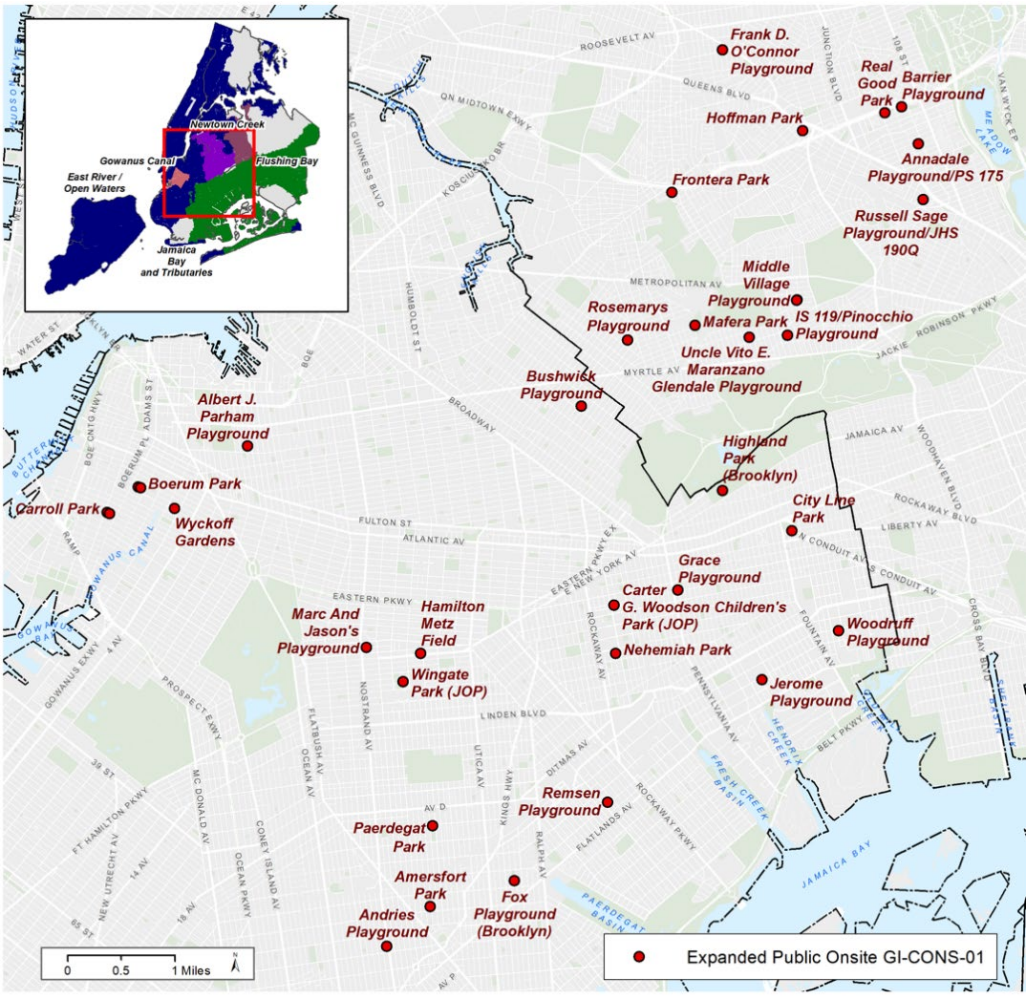
Area-wide ROW Green Infrastructure in CI-005

CI-005 Phase 1 is located in Crown Heights South, Brooklyn. The area is characterized by large mature trees and zoning is mixed between low-density residential and high-density residential. Siting restrictions included mature trees, driveways, and utilities. These tributary areas total 609 acres and drain to Jamaica Bay. The ROW green infrastructure practices that will be constructed in this area are rain gardens and infiltration basins. The majority of rain gardens constructed will utilize the Type D (modified catch basin) inlet. The practice types were selected based on siting criteria, maintenance requirements, and zoning. CI-005 has four phases. Phase 1 is currently at 90% design and construction is anticipated to start by spring 2023.

Expanded Public On-site Retrofits

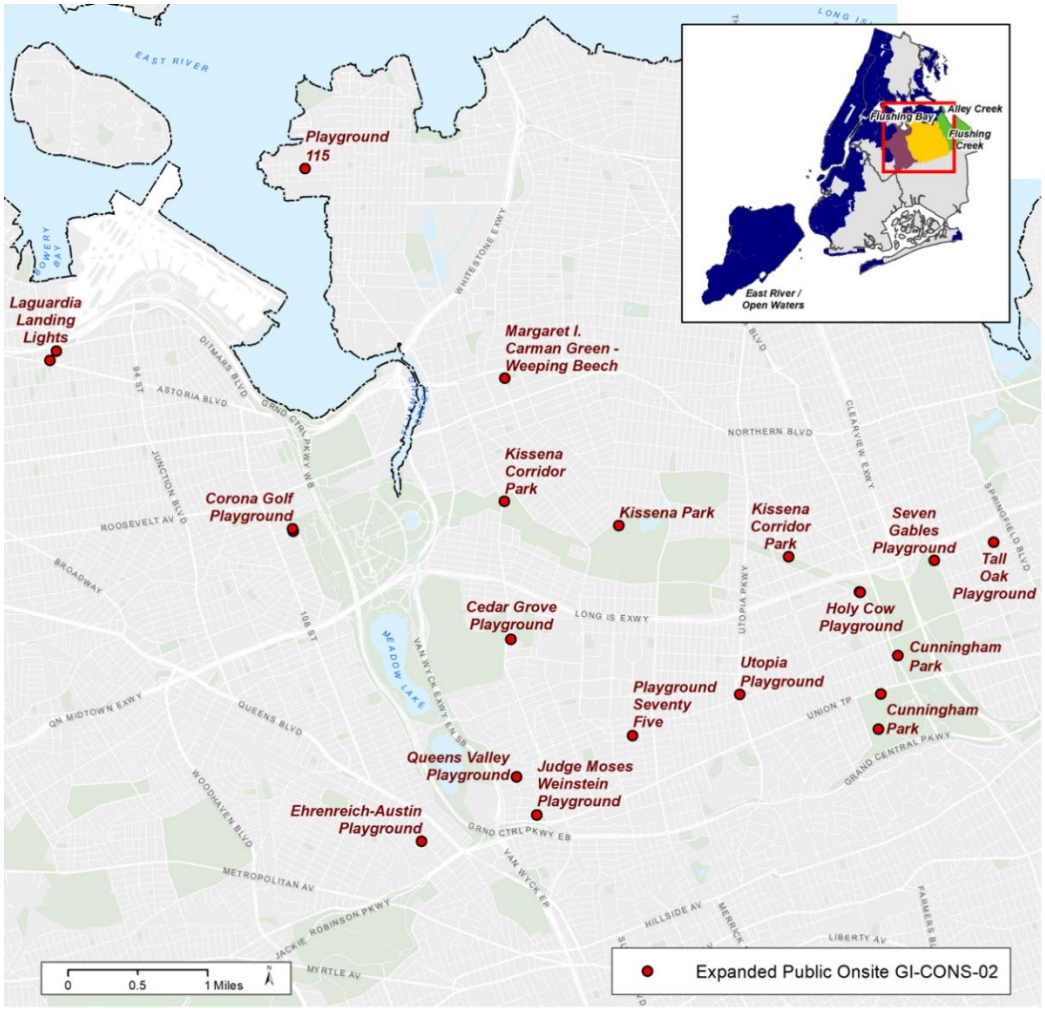
In 2017 DEP launched three agency-specific design contracts to initiate green infrastructure retrofits at all publicly owned parks, schools, and housing properties in combined sewer priority waterbodies with 10,000 SF (5,000 SF at some Parks sites) or more of impervious tributary area and site-level green infrastructure implementation opportunities. While DEP has previously constructed public on-site pilots and initiated designs for several public properties in conjunction with area-wide ROW design contracts, this was the first concentrated effort to evaluate all cost-effective public on-site retrofit opportunities in priority CSO areas. Where feasible, some of these projects also include practices designed to manage additional flow from the ROW, making them more efficient and cost effective.

Expanded Public On-site Retrofits – Construction package 1



This project is the first construction package from this effort and contains 31 Parks-owned properties and 1 NYCHA-owned property, identified in the map above. Green infrastructure practices to be installed on these properties include subsurface retention and detention systems, permeable pavements, rain gardens, and synthetic turf field systems with storage. Working hand-in-hand with Parks, several of the Parks projects incorporate additional state-of-good-repair work to leverage DEP's investment and complete other non-stormwater improvements at the properties while the green infrastructure is in construction. This leveraging reduces overall projects costs and minimizes disruption to the community. As of the date of this report, the package is in bid procurement with an estimated construction start of summer 2022.

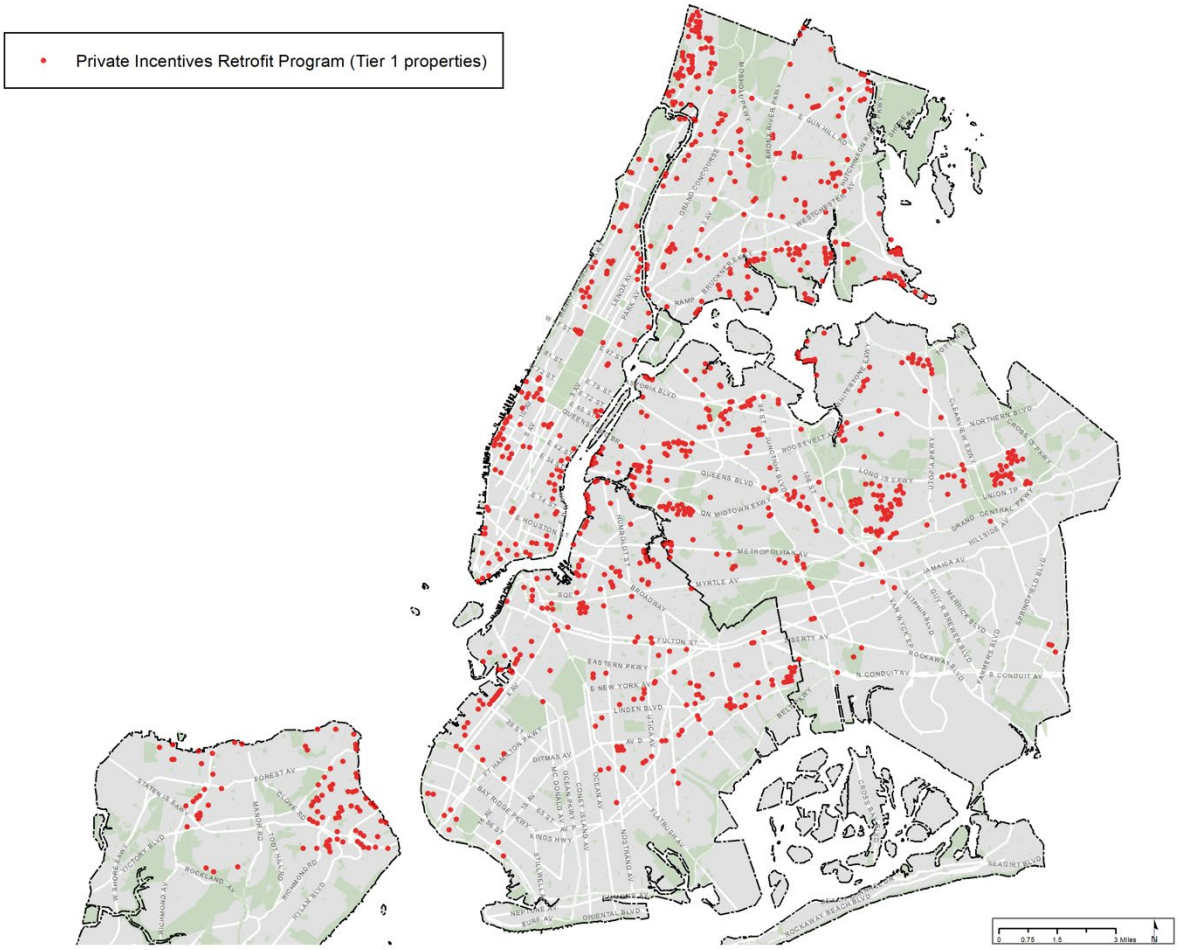
Expanded Public On-site Retrofits – Construction package 2



This project is the second construction bid package coming from the expanded public on-site retrofits initiative discussed on the previous page. This bid package includes 19 Parks-owned sites across Brooklyn and Queens as identified in the map above. Green infrastructure practices to be installed on these properties include subsurface retention and detention systems, porous pavements and rain gardens. As of the date of this plan, the designs are being finalized and the bid package is being assembled for the bid procurement process. Construction is anticipated to begin in spring 2023.

DEP's growing on-site green infrastructure portfolio offers an opportunity for smaller contractors to participate in City construction work. As such, DEP has been working with the Mayor's Office of Small Business Services to engage smaller, Minority and Women-owned Business Enterprises (MWBEs) in this work, holding a contractor industry day in March 2020 to introduce the expanded on-site initiative and a subsequent joint workshop presentation in May 2021 to provide an update on forthcoming bid packages.

Private Incentives Retrofit Program – Phase 1

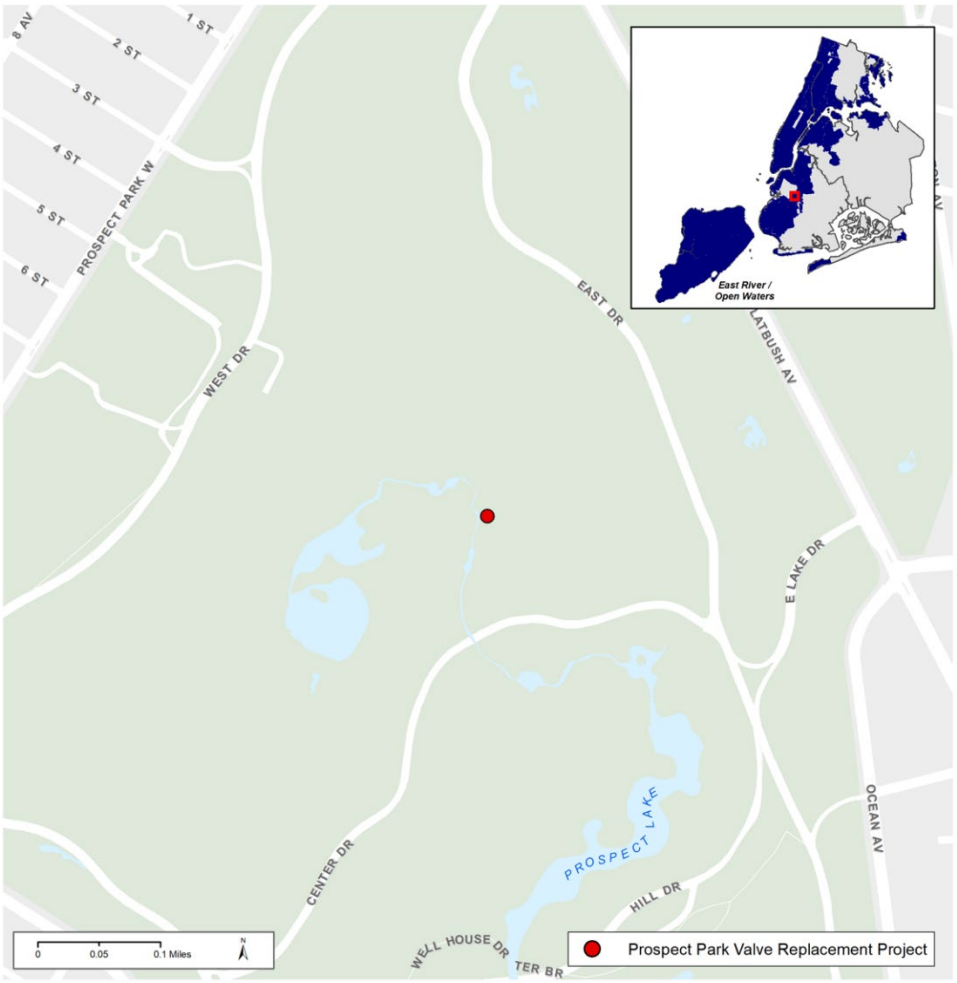


The Private Incentives Retrofit Program, under development for the last several years, has officially kicked off with the award of a $53 million contract to Arcadis who will administer the Program. The new Program uses a third-party administrator approach, incorporating lessons learned over the course of implementing the Green Infrastructure Grant Program, best practices from other cities and outreach with NYC landowners, industry experts and stakeholders. DEP and Arcadis will work together to target large privately owned properties, 50,000 square feet or greater, with large amounts of impervious area that offer a cost-effective opportunity for green infrastructure implementation. The map above shows privately owned parcels in NYC that are 50,000 square feet or larger. The Arcadis contract is 5 years and through it DEP has a goal of implementing green infrastructure to manage 200 Greened Acres. Phase 1, which is included as a project in this Contingency Plan, has a goal of 100 Greened Acres, and projects are anticipated to begin in 2021.

Central Park Stormwater Recovery and Reuse Project

In collaboration with Parks and Central Park Conservancy (CPC), DEP is implementing the North End Recirculation Project in Central Park to achieve a reduction in potable water demand, dry weather flow to the CSS, and CSOs. Under this project, dry weather flow will be diverted from the existing Harlem Meer outflow to a filtration system, from which it will be pumped across the park to an existing manhole structure south of the pool inflow, from which it will flow by gravity to the pool. An automatic stormwater management system will lower the water level of the Harlem Meer (and potentially the pool, depending on the optimization of the system) ahead of forecasted storms, with the water flowing into the combined sewer during the dry weather period ahead of the storm. The waterbodies will refill to normal elevation as stormwater enters the system, after which normal, dry weather recirculation will resume. This project is anticipated to eliminate potable water inputs to the Pool-Loch-Meer system and reduce wet weather discharge to the combined sewer. Project design initiated in fall 2020 and construction is anticipated to commence in 2022.

Prospect Park Valve System Replacement Project



DEP is coordinating with Parks and Prospect Park Alliance (PPA) to replace existing potable water service line valves in Prospect Park to achieve a reduction in potable water demand and a CSO reduction. The existing 8-inch service line supplies potable water to Prospect Park Lake and during rain events, PPA and Parks staff discharge water from the lake into the CSS to avoid flooding the park. Additionally, during summer when evaporation occurs, Prospect Park Lake is supplied with an estimated one million gallons per day or more of potable water, to maintain health and aesthetics. Under this project, the existing valves will be replaced with a new, manually controlled valve system within an underground vault or other accessible structure. This will allow Parks and PPA staff to access and control the flow of water to Prospect Park Lake and the park's water courses. The system will also include a water meter to track flow rate and a reduced pressure zone (RPZ) housing to protect the water supply from backflow. This project is expected to reduce CSOs and result in potable water savings. Design is anticipated to commence in summer 2021 and is expected to conclude in November 2021. Construction is anticipated to commence in 2022.

In addition to the projects above, there are several other DEP-funded and non-DEP funded green infrastructure projects that will contribute to the 2020 CSO volume reduction.

Additional ROW projects coming to completion after 1.5% certification. DEP has active ROW green infrastructure projects in CSO tributary areas JAM-003, BB-005, TI-010 and in JAM-005 in Southeastern Queens. Many of these contract areas were included in the 2015 Green Infrastructure Contingency Plan but include assets above and beyond those required to meet the 2015 1.5% milestone due at the end of 2021. These carryover assets will be counted toward the 2020 4% implementation milestone.

Public Property Retrofits. In addition to the public on-site bid packages mentioned in Table 4, DEP has another 50+ projects that are in construction or are going into construction between 2021 and 2023 on schools, parks and housing sites that were designed previously in conjunction with area-wide ROW green infrastructure or as standalone retrofits. DEP's ongoing partnership with the Trust for Public Land (TPL) for schoolyard retrofits will also result in additional constructed projects. Some of the projects that will be complete in 2021 will be incorporated into the 2015 1.5% milestone, with the remaining majority of the projects coming to completion for the 2020 milestone.

2012 Stormwater Performance Standard projects. The 2012 Stormwater Performance Standard requires projects in the CSS area that need a sewer certification from DEP to adhere to on-site stormwater management and stormwater flow rate requirements. Projects in CSS areas that implement stormwater management practices to meet the requirements are tracked and the CSO volume reduction is included in Green Infrastructure Program reporting.

Unified Stormwater Rule projects. In 2021 DEP will promulgate the new Unified Stormwater Rule, which includes updated onsite stormwater management volume requirements and flow rates for all sites that connect to the City's sewer system, as well as retention-first stormwater management practices for sites that disturb greater than 20,000 SF or more of soil or create 5,000 SF or more new impervious area. The Unified Stormwater Rule will supersede the 2012 Stormwater Performance Standard and is expected to be in place in 2022.

Large Capture Street Medians. DEP's in-house design team is working on a portfolio of median sites where green infrastructure will be implemented to meet stormwater management goals and help to alleviate localized flooding.

Green Infrastructure Grant Program projects. The Green Infrastructure Grant Program, launched in 2011, funds the design and construction of green roof retrofits on private property.

Water Reuse Grant Program projects. The Water Reuse Grant Program was launched in 2016 and funds water reuse projects on private properties. Often these projects provide a CSO volume reduction benefit in addition to their potable water savings benefits.

NYC Green Roof Tax Abatement projects. The Green Roof Tax Abatement is administered by NYC DOF and provides a one-time property tax abatement for properties that install green roofs. The program offers an abatement of $5.23 per square foot and a higher abatement amount of $15 per square foot for rooftops located in parts of the city deemed priority areas by the NYC Mayor's Office of Sustainability.

Local Laws 92 and 94 of 2019 green roof projects. Local Laws 92 and 94 of 2019 require all new buildings and existing buildings where the entire roof deck or roof assembly is being replaced to construct either a solar photovoltaic system, a green roof system or a combination of the two that covers 100% of the roof. DEP will work with the implementing agencies to track constructed green roof projects toward Green Infrastructure Program goals.

External Public or Private projects. DEP has been working with other City agencies and private entities to track green infrastructure projects that were implemented voluntarily without DEP funding and are also unrelated to stormwater incentives or regulations.

III. Greened Acres

The projects identified in Section II above are expected to be the equivalent of 633 Greened Acres, which will bring the cumulative total for the whole program 1,814 Greened Acres. The Order Greened Acre target based on 10% of impervious areas in combined sewer areas citywide for the 2020 4% implementation milestone is 3,150 Greened Acres.

The original Greened Acre application rate targets established by the 2010 Green Infrastructure Plan assumed that CSO volume reduction attributable to individual practices capturing one inch of stormwater would be equally distributed across the City, and were established to ensure a significant level of CSO volume control. The modeling conducted through the 2016 PMR, after DEP had sited, designed, and significantly implemented the practices contributing to the 1.5% application rate, found that by 1) strategically siting green infrastructure practices to maximize stormwater capture and 2) saturating priority CSO tributary areas with these efficient green infrastructure practices, initial green infrastructure implementation has led to a significant CSO volume reduction with less Greened Acres than originally anticipated.

DEP will continue to work towards the 1.67 BGY CSO reduction goal established by the PMR using the most efficient types of green infrastructure practices through publicly funded retrofits and enhanced stormwater regulations in order to maximize CSO reduction. DEP expects to achieve the volume reduction goal with practices resulting in less Greened Acres than projected in the 2010 Green Infrastructure Plan. As discussed in Annual Reports, DEP remains committed to expanding green infrastructure across the city towards the CSO reduction goal as well as green infrastructure implementation through other related initiatives for water quality and community improvement benefits.