



MASSACHUSETTS WATER RESOURCES AUTHORITY

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August 29, 2022

Mr. Todd Borci
Office of Environmental Stewardship
US EPA Region 1
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Mail Code OES04-4
Boston MA, 02109-3912

Ms. Susannah King, NPDES Section Chief
Division of Watershed Management
Department of Environmental Protection
1 Winter Street - 5th Floor
Boston, MA 02108

**RE: Massachusetts Water Resources Authority NPDES Permit Number MA0103284 –
MWRA Annual Infiltration and Inflow (I/I) Reduction Report for Fiscal Year 2022**

Dear Mr. Borci and Ms. King:

In compliance with the requirements of MWRA's NPDES Permit MA0103284 - Part I, Item 18.bb (ii) "Infiltration/Inflow" (page 28 of 32), the Authority submits this cover letter and the six Attachments listed below that together comprise the MWRA Annual Infiltration and Inflow (I/I) Reduction Report for Fiscal Year 2022.

- Attachment 1 – Overview of MWRA Regional I/I Reduction Plan
- Attachment 2 – MWRA Regional I/I Reduction Plan – FY22 Progress Update and Detailed Implementation Schedule for FY23 Activities
- Attachment 3 – MWRA Actions Taken to Reduce I/I During FY22
- Attachment 4 – Status Update on MWRA's I/I Local Financial Assistance Program
- Attachment 5 – I/I Reduction Status Update for Member Communities
- Attachment 6 – CY21 Community Wastewater Flow Data

Should you require additional information, please contact Stephen Estes-Smargiassi, Director of Planning and Sustainability at Stephen.Estes-Smargiassi@mwra.com.

Sincerely,

David W. Coppes, P.E.
Chief Operating Officer

cc: Betsy Reilley, Director, MWRA, Environmental Quality
Wendy Leo, Senior Program Manager, MWRA, Environmental Quality
Jon Szarek, P.E., Senior Program Manager, MWRA Community Support Program

ATTACHMENT 1
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY22
Reporting Period – July 2021 Through June 2022

OVERVIEW OF MWRA REGIONAL I/I REDUCTION PLAN

The MWRA Board of Directors approved the Regional Infiltration/Inflow (I/I) Reduction Plan on May 23, 2001 and authorized staff to submit the Plan to EPA and MassDEP as required under MWRA's NPDES Permit. The plan was submitted to EPA and MassDEP in June 2001 and MassDEP approved the plan in a letter dated November 19, 2002. A full copy of the Regional I/I Reduction Plan (dated September 2002) was included as Attachment 2 to the August 29, 2003 MWRA Annual I/I Reduction Report for FY03. The Regional I/I Reduction Plan is available at <http://www.mwra.com/comsupport/communitysupportmain.html>.

The Regional I/I Reduction Plan combines recommendations from the I/I Task Force Report (March 2001) with ongoing MWRA I/I reduction initiatives. The updated plan replaces the Authority's 1990 I/I Reduction Policy. Implementation of the Regional I/I Reduction Plan focuses on the cooperative efforts of member communities, MassDEP, EPA and MWRA to develop and implement I/I reduction and sewer system rehabilitation projects.

Under the plan, MWRA has full legal and fiscal responsibility for implementation of operation, maintenance, and I/I reduction programs for the MWRA-owned interceptor system. Each member community retains full legal and fiscal responsibility for implementation of operation, maintenance and I/I reduction programs for community-owned sewers. MWRA will provide technical and financial assistance to member communities and work cooperatively with MassDEP, EPA and other stakeholders to help solve local and regional sewer problems. MWRA's Regional I/I Reduction Plan is organized into five major goals:

1. MWRA will continue its current operation and maintenance program for the MWRA-owned interceptor system leading to the identification, prioritization and rehabilitation of structural and I/I problems.
2. MWRA will work cooperatively with member communities, MassDEP and EPA to eliminate sewer system backups into homes and other buildings and to minimize health and environmental impacts of SSOs related to I/I.
3. MWRA will work cooperatively with member communities, MassDEP and EPA to reduce I/I in the regional collection system with emphasis on the following: (1) inflow reduction in areas tributary to sewer backups and SSOs, (2) private source inflow reduction, (3) infiltration that may impact groundwater or surface water resources, and (4) excessive infiltration as defined in MassDEP regulations or guidance documents.
4. MWRA will work cooperatively with member communities, MassDEP and EPA to expand existing efforts to educate and involve the public regarding regional sewer backup, SSO and I/I reduction issues.
5. MWRA will provide technical assistance and work cooperatively with member communities, MassDEP and EPA regarding guidance on local operation and maintenance and capital improvement programs intended to provide a reasonable level of sewer service to local sewer users/ratepayers.

ATTACHMENT 2
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY22
Reporting Period – July 2021 Through June 2022

**MWRA REGIONAL I/I REDUCTION PLAN -
FY22 PROGRESS UPDATE AND DETAILED
IMPLEMENTATION SCHEDULE FOR FY23 ACTIVITIES**

This document provides a progress update for FY22 accomplishments and a description of the activities to be accomplished during FY23 for each of the I/I reduction strategies in the MWRA Regional I/I Reduction Plan. The update appears in bold type directly below each I/I reduction strategy. This document is intended to satisfy Condition 5 of DEP’s November 19, 2002 letter approving the MWRA Regional I/I Reduction Plan.

Goal 1 under MWRA’s Regional I/I Reduction Plan is:

MWRA will continue its current operation and maintenance program for the MWRA-owned interceptor system leading to the identification, prioritization, and rehabilitation of structural and I/I problems.

Strategy A: Utilize MWRA’s internal TV inspection equipment that currently includes one fully outfitted internal TV inspection vehicles equipped with 6000 feet of multi-conductor cable. MWRA also utilizes an OZ-camera that has a 200X zoom capability. Annual inspection schedules are outlined in MWRA’s Collection System O&M Manual. This strategy has an ongoing schedule that has been initiated.

Strategy B: Utilize MWRA’s sonar camera to inspect siphons and force mains. Annual inspection schedules are outlined in MWRA’s Collection System O&M Manual. This strategy has an ongoing schedule that has been initiated.

Strategy C: Physical inspection of collection system manholes and structures by Operations Division field crews. Annual inspection schedules are outlined in MWRA’s Collection System O&M Manual. This strategy has an ongoing schedule that has been initiated.

Work by MWRA under these three Strategies is ongoing.

During FY22, MWRA properly operated and maintained the MWRA-owned interceptor system. Annual performance targets and ongoing accomplishments are tracked as part of the Authority’s MAXIMO maintenance database and are reported monthly to MWRA senior management. Specific activities undertaken by MWRA for FY22 are detailed in Attachment 3. Additional information on MWRA’s FY22 maintenance activities is provided under separate submittal - NPDES Part I.18.g Annual Maintenance Status Sheets.

During FY23, MWRA will continue to properly operate and maintain the MWRA-owned interceptor system.

Goal 2 under MWRA's Regional I/I Reduction Plan is:

MWRA will work cooperatively with member communities, DEP, and EPA to eliminate sewer system backups into homes and other buildings and to minimize health and environmental impacts of SSOs related to I/I.

Strategy A: MWRA will provide technical assistance to DEP to develop a uniform format for use by communities for reporting wastewater backup and sewer system overflow information. A representative group of communities should be consulted for review. MWRA will provide technical assistance to DEP to develop a system to record the information reported by communities into a usable database format. This database may have the capability to be linked to GIS mapping and the information may be made available to communities, MWRA, DEP, EPA, watershed groups, the general public, etc. upon appropriate request. This strategy has an ongoing schedule that should be initiated in the short-term. Completion of this strategy requires a significant resource commitment by DEP. Collection and recording of sewer backup and SSO information from member community sewer systems is the responsibility of DEP. DEP will be responsible for management of collection and distribution of these records. (Cross-reference this strategy to the I/I Task Force Report recommendations 4.1 Strategy A-2 and 5.2 Strategy B-2)

Work by MWRA under this Strategy is ongoing.

During spring 2001, MWRA provided MassDEP a draft SSO reporting/record keeping electronic database format that was developed by Malcolm-Pirnie, Inc. under contract to MWRA. This work was completed by MWRA as technical assistance to MassDEP. A follow-up letter dated June 20, 2001 requested MassDEP identify the format for finalizing the SSO reporting/record keeping electronic database.

During FY04, MassDEP (in conjunction with staff in the Massachusetts Information Technology Division), developed a revised format SSO electronic database package. This project was part of statewide efforts to upgrade computerized resources and electronic access. The system was demonstrated at an April 8, 2004 MassDEP/MWRA joint community workshop.

In May 2005, MassDEP developed a revised Reporting Form "Sanitary Sewer Overflow/Bypass/Backup Notification Form (rev 05/2005)." This form was made available on the MassDEP web site and reporting was via FAX or by mail. Following development of the web based reporting form by MassDEP, rollout of the SSO reporting/record keeping electronic database was not completed.

In January 2013, MassDEP developed the most recent revised Reporting Form "Sanitary Sewer Overflow (SSO)/Bypass Notification Form" (pdf version - rev 01/2013). As of July 2020, this pdf form is available on the MassDEP web site (a Word version of the form is also available – rev 1/2018) and reporting using the form is via FAX or by mail.

As requested by MassDEP, on August 22, 2011 MWRA provided MassDEP specific SSO site location information for SSO's on MWRA-owned northern system sewers (for events during the period January 2000 through June 2011), including street location, longitude and latitude location, and GIS site maps.

During FY16, MWRA added more specific information on SSOs on the MWRA web site at: <http://www.mwra.com/03sewer/html/sso.html>. This information includes information on what an SSO is, public health impacts, how SSOs can be prevented, and what MWRA does when an SSO occurs. The web site also includes an interactive GIS site map for SSOs that have been reported by MWRA for the following SSO event display selections: currently active, past 2 days, past 30 days, and past 12 months.

In January 2021, Governor Baker signed *An Act Promoting Awareness of Sewage in Public Waters* into law: <https://malegislature.gov/Laws/SessionLaws/Acts/2020/Chapter322>. This law will ensure that the public knows when untreated sewage flows into Massachusetts waters. The regulations apply to owners of outfalls from which there are sewage discharges that either directly or indirectly discharge to a receiving water. MassDEP has twelve (12) months to develop regulations to support the implementation of the law (January 2022). Communities will then have six (6) months thereafter to comply with the regulations (July 2022). MWRA is part of the stakeholder group providing input to MassDEP's development of the regulations.

In FY22, MWRA enhanced its existing CSO public notification program to add notifications of SSOs (in compliance with the new sewage notification regulation 314 CMR 16.00). Additionally, MWRA updated its SSO notification website. In response to a request from MassDEP, MWRA assisted in notifying member communities of their responsibilities under the new regulation. MWRA also provided comment on the draft regulation. MassDEP may determine that the database and portal developed by MassDEP to comply with the Sewage Notification Regulation 314 CMR 16.00 meets the intent of this strategy.

Strategy B: Once a central information database is established (see Strategy A), MWRA will periodically delineate areas which may be “at risk” for backups and SSOs that may be impacted by the MWRA-owned collection system. MWRA will evaluate potential improvements to the MWRA-owned collection system that may reduce the risk of sewer backups and SSOs. This strategy should be completed in the mid to long-term. (Cross-reference this strategy to the I/I Task Force Report recommendations 4.3 Strategy C-2 and 5.5 Strategy E-2)

Work by MWRA under this Strategy is complete as noted below. Some ongoing work performed by MWRA that is associated with this Strategy is also noted.

MWRA utilizes MassDEP's Sanitary Sewer Overflow (SSO)/Bypass Notification Form to report SSOs from MWRA's collection system.

MWRA does not have SSOs related to dry weather sewer system capacity issues. MWRA does not have SSOs related to wet weather sewer capacity issues for rainfall events at or below the MassDEP recommended standard design storm for inflow having a one-year recurrence interval and a duration of six hours (see MassDEP's Guidelines for Performing I/I Analyses and Sewer System Evaluation Surveys – Revised May 2017). The one-year, six-hour storm produces approximately 1.72 inches of rainfall in the Boston area. During extreme storm events that exceed the MassDEP recommended design storm, I/I entering the upstream community-owned collection systems may cause an occasional SSO in the MWRA regional interceptor system.

During FY22, MWRA continued its ongoing priority program to clean and inspect inverted siphons in the MWRA-owned collection system. This program is intended to minimize potential SSOs upstream of siphons and reduce the risk of hydraulic limitations and/or blockage from debris buildup in siphon barrels. The cleaning and inspection program will continue in FY23.

Strategy C: Once a central information database is established (see Strategy A) and member communities have delineated areas which may be “at risk” for backups and SSOs, MWRA - jointly with DEP - will provide technical assistance to member communities to evaluate potential improvements to local infrastructure that may reduce the risk of sewer backups and SSOs. MWRA will assist communities to determine if impacts from the regional collection system are an issue. The schedule for this strategy is dependent on prior actions by DEP and member communities. (Cross-reference this strategy to the I/I Task Force Report recommendations 4.3 Strategy C-1 and 5.5 Strategy E-1)

MassDEP’s roll-out of the SSO reporting/record keeping electronic database was not completed (see Strategy A above). However, the database and portal developed by MassDEP to comply with the Sewage Notification Regulation 314 CMR 16.00 may meet the intent of this strategy.

As part of its ongoing program to support member community I/I reduction and sewer system rehabilitation programs, MWRA offers technical assistance to communities to review local I/I reduction plans and local/regional SSO problems. MWRA also offers member communities financial assistance for I/I reduction projects. During FY23, at the request of member communities, MWRA will continue to provide technical and financial assistance on local sewer system projects.

Strategy D: For the MWRA-owned interceptor system, MWRA will review and analyze the health and environmental impacts of existing SSO sites. SSO sites will be prioritized based on the frequency and duration of activations and the resulting health and environmental impacts, including: potential for human contact, impact to water supply, impact to shellfish beds or other economic resources, impact to animal or aquatic habitat, etc. This strategy will be completed in the short-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 5.3 Strategy C-1)

Work by MWRA under this Strategy is complete. As previously stated, MWRA does not have SSOs related to dry weather sewer system capacity issues. MWRA also does not have SSOs related to wet weather sewer capacity issues for rainfall events at or below the MassDEP recommended standard design storm for inflow having a one-year recurrence interval and a duration of six hours (see MassDEP’s Guidelines for Performing I/I Analyses and Sewer System Evaluation Surveys – Revised May 2017). Since prior SSOs have been eliminated for sewer capacity issues at or below the collection system design standard for inflow, additional work under this strategy is not necessary.

Strategy E: Utilizing the priority ranking to be completed in Strategy D above, as well as system hydraulic analyses, MWRA (for the MWRA-owned interceptor system) - in conjunction with DEP and EPA - will evaluate the potential to eliminate each overflow. Appropriate I/I reduction and/or relief sewer projects that may eliminate (or minimize) SSOs from MWRA-owned interceptors will be evaluated. This strategy will be initiated in the short to mid-term; however, implementation of projects developed from the evaluation may span beyond the long-term time frame as defined within the Regional I/I Reduction Plan. (Cross-reference this strategy to the I/I Task Force Report recommendation 5.3 Strategy C-2)

Work by MWRA under this Strategy is complete as noted below. Some ongoing work that is associated with this Strategy is also noted.

As previously stated, MWRA does not have SSOs related to dry weather sewer system capacity issues. MWRA also does not have SSOs related to wet weather sewer capacity issues for rainfall events at or below the MassDEP recommended standard design storm for inflow having a one-year recurrence interval and a duration of six hours (see MassDEP's Guidelines for Performing I/I Analyses and Sewer System Evaluation Surveys – Revised May 2017). Since prior SSOs have been eliminated for sewer capacity issues at or below the collection system design standard for inflow, additional work under this strategy is not necessary.

During FY14 (as of April 25, 2014), MassDEP revised its Regulation 314 CMR 12.00 Operation, Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Dischargers. The revisions include a requirement for all public entities that own a sewer system to complete an I/I analysis by December 31, 2017 and submit it to MassDEP for review. The analysis also must include an assessment of the risk of SSOs. In FY18, MWRA submitted the required I/I analysis as a chapter in the MWRA Wastewater Collection System Operation & Maintenance Plan (December 2017).

As part of its ongoing program to support member community I/I reduction and sewer system rehabilitation programs, MWRA offers technical assistance to communities to review local I/I reduction plans and local/regional SSO problems. MWRA also offers member communities financial assistance for I/I reduction projects. During FY23, at the request of member communities, MWRA will continue to provide technical and financial assistance on local sewer system projects. MWRA will also continue to work on projects in the MWRA Capital Improvement Program, as summarized in Attachment 3.

Strategy F: For those overflows that are unlikely to be eliminated in the short to mid-term (based on the evaluation from Strategy E, above), MWRA (for the MWRA-owned interceptor system) will consider developing interim measures to relocate or otherwise mitigate the impact of existing overflows on human and natural resources. The priority ranking (from Strategy D, above) will be utilized in development of interim mitigation measures. This strategy has an ongoing schedule that should be initiated in the short-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 5.3 Strategy C-3)

Work by MWRA under this Strategy is ongoing.

As previously stated, MWRA does not have SSOs related to dry weather sewer system capacity issues. MWRA also does not have SSOs related to wet weather sewer capacity issues for rainfall events at or below the MassDEP recommended standard design storm for inflow having a one-year recurrence interval and a duration of six hours (see MassDEP's Guidelines for Performing I/I Analyses and Sewer System Evaluation Surveys – Revised May 2017). The one-year, six-hour storm produces approximately 1.72 inches of rainfall in the Boston area.

During FY22, MWRA continued its ongoing priority program to clean and inspect inverted siphons in the MWRA-owned collection system. This program is intended to minimize potential SSOs upstream of siphons and reduce the risk of hydraulic limitations and/or blockage from debris buildup in siphon barrels. The cleaning and inspection program will continue in FY23.

During extreme storm events that exceed the MassDEP recommended standard design storm for inflow, I/I entering the upstream community-owned collection systems may cause an occasional SSO in the MWRA regional interceptor system. Continued coordination with member communities to reduce I/I from local collection systems will help to minimize SSOs that may occur during extreme storm events. Most recently (beginning in FY19), an additional \$200 million in 75% grants and 25% interest-free loans was added as Phases 11 and 12 (\$100 million for each Phase) of the I/I Local Financial Assistance Program to help fund community I/I reduction projects. MWRA also enhanced the community I/I funding program by adding a \$100 million loan only Phase 13 as an additional resource for the communities most aggressively utilizing the MWRA financial assistance program. MWRA's commitment to fund local sewer rehabilitation projects under the I/I Local Financial Assistance Program totals \$760.75 million. Through FY22, \$510 million in grants and interest-free loans has been distributed to 43 member sewer communities to fund 646 local projects (see details in Attachment 4).

Strategy G: MWRA will assist DEP, member communities, and other regional stakeholders to inform local plumbing inspectors of the regional priority of eliminating sewer system backups. Plumbing inspectors will be requested to work more closely with local DPW staff to identify sewer system backup problem areas and locations where backflow prevention devices may be required. MWRA expects to meet this strategy by distributing a letter to the plumbing inspector in each member community that discusses sewer backups, potential public health impacts, backflow prevention, and coordination with the local DPW to identify problem areas. This strategy will be completed in the short-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 4.2 Strategy B-4)

Work by MWRA under this Strategy is complete as noted below.

On September 26, 2005, MWRA distributed an informational package on Sewer Backups and Sanitary Sewer Overflows to all service area community plumbing inspectors, Health Departments (Boards of Health), DPW Directors, Engineering Departments, and collection system operators. The package included information from fourteen separate sources and provided many web links for additional information. On September 29, 2005, MWRA sent a copy of the informational package to EPA, MassDEP, all MWRA water-only member communities, and local watershed associations. Currently this type of information is widely available via the internet.

Specific information on SSOs and backups into homes is provided on the MWRA web site at: <http://www.mwra.com/03sewer/html/sso.html>. This site includes information on what an SSO is, public health impacts, how SSOs can be prevented, and what MWRA does when an SSO occurs. Links on the site include:

- DEP's Home Care Guide on Flooding and Sewage Backups;
- Cleanup Procedures After a Sewer Backup, from the Boston Water and Sewer Commission; and,
- FEMA and Red Cross Guide on Flooded Property Hazards and Repair.

Goal 3 under MWRA's Regional I/I Reduction Plan is:

MWRA will work cooperatively with member communities, DEP, and EPA to reduce I/I in the regional collection system with emphasis on the following: (1) inflow reduction in areas tributary to sewer backups and SSOs, (2) private source inflow reduction, (3) infiltration that may impact groundwater or surface water resources, and (4) excessive infiltration as defined in DEP regulations or guidance documents.

Strategy A: MWRA will continue to analyze available MWRA wastewater metering data to estimate community infiltration and inflow rates. MWRA will provide this information along with technical assistance to help interpret the information to member communities. This strategy has an ongoing schedule that has been initiated. (Cross-reference this strategy to the I/I Task Force Report recommendations 6.1 Strategy A-1 and 7.1 Strategy A-1).

Work by MWRA under this Strategy is ongoing.

Community wastewater flow data, along with the estimated community wastewater flow components, was not produced for CY21 due to the ongoing MWRA Wastewater Meter Replacement project. As a result, the flow data tables for this report period will detail the most recent year of actual wastewater flow data (CY20) (see Attachment 6). These flow data tables are available to all users on MWRA's website (<https://www.mwra.com/harbor/html/archive.htm#infinf>).

The MWRA Wastewater Meter Replacement project is substantially complete. CY22 community wastewater flow data, along with the estimated community wastewater flow components, is currently being generated. Community wastewater flow rate basis data is distributed to member communities throughout the year on a bimonthly basis.

For the next phases of the wastewater meter replacement/upgrade project, \$6.2 million are included in MWRA's Capital Improvement Program through FY23. The metering system upgrade project was completed at a design cost of \$3,858,154 and an installation cost of \$3,286,114. Installation was completed at the end of 2021. An additional \$9.1 million for future meter equipment asset protection is included within the MWRA CIP after FY28.

During CY22/23, MWRA will continue to estimate community infiltration and inflow rates and make this information available to MWRA member communities. MWRA will provide the information to EPA and MassDEP as part of the annual summary report on actions taken to reduce I/I (submitted annually by September 1 per the Deer Island Treatment Plant NPDES Permit).

Strategy B: MWRA, in cooperation with member communities, will evaluate the feasibility of developing and operating an expanded emergency notification system (ENS). Currently, the MWRA remotely monitors wastewater flow at key locations within the regional collection system before and during wet weather events. Interested communities are notified when sewer system depths reach critical levels. The Authority and member communities use this information to forecast problem areas, predict potential sewer system overflows and deploy work crews. The MWRA's wastewater metering system will be upgraded over the next few years. This upgrade may impact the ENS. MWRA is also investigating, over the next three to five years, the benefits of adding SCADA-type meters at some key locations in the collection system. After completion of the two ongoing projects, MWRA will evaluate whether an ENS system can be used efficiently to provide information at the local level. This strategy will be completed in the long-term or more extended time frame subject to the schedule of the ongoing projects noted above. (Cross-reference this strategy to the I/I Task Force Report recommendation 5.4 Strategy D-1)

Work by MWRA under this Strategy is complete as noted below.

MWRA's first Wastewater Meter Replacement project was completed in FY06. The system continues to be used to monitor wastewater flow at key locations within the regional collection system before and during wet weather events. Interested communities are notified when sewer system depths reach critical levels.

The second MWRA Wastewater Meter Replacement project is substantially complete. The metering system upgrade project was completed at a design cost of \$3,858,154 and an installation cost of \$3,286,114. Installation was completed at the end of 2021. Project work included a complete review of metering equipment and software technologies, review of MWRA's community metering methodologies and subsequent design and construction of upgrades. An additional \$9.1 million for future meter equipment asset protection is included within the MWRA CIP after FY28.

Strategy C: MWRA will provide technical assistance to member communities to establish written infiltration and inflow identification and removal programs as outlined in the I/I Task Force Report. This strategy has an ongoing schedule that will be initiated in the short to mid-term. (Cross-reference this strategy to the I/I Task Force Report recommendations 6.1 Strategy A-1 and 7.1 Strategy A-1)

Work by MWRA under this Strategy is ongoing.

During FY14 (as of April 25, 2014), MassDEP revised its Regulation 314 CMR 12.00 *Operation, Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Dischargers*. The revisions include a requirement for all public entities that own a sewer system to complete an I/I analysis by December 31, 2017 and submit it to MassDEP for review. The analysis also must include an assessment of the risk of SSOs. In FY18, MWRA submitted the required I/I analysis as a chapter in the MWRA Wastewater Collection System Operation & Maintenance Plan (December 2017).

During FY22, MWRA staff continued to meet with community representatives to provide technical assistance and discuss local programs. Communities are often interested in utilizing MWRA wastewater meter data and flow component analyses for local I/I and SSES studies. Communities also discuss what sewer system rehabilitation actions other communities are pursuing. MWRA's Advisory Board Operation Committee meetings, as well as Wastewater Advisory Committee (WAC) meetings, are used as platforms for member communities to share information on projects and lessons learned. All member sewer communities are actively participating in MWRA's \$760.75 million I/I Local Financial Assistance Program (see Attachment 4). Community I/I reduction programs are generally being conducted by local engineering consultants under contract to the communities. These projects generally utilize standards established in MassDEP's May 2017 I/I Guidelines. This work will continue in FY23.

Strategy D: MWRA will provide technical assistance to member communities that seek to emphasize infiltration removal that may impact groundwater and surface water resource areas. MWRA will provide GIS mapping information to member communities that identifies water resource areas, provides an overlay of local and regional sewers, and delineates watersheds. The I/I Task Force Report recommends communities target areas where infiltration reduction will provide the most meaningful benefit for aquifer recharge, stream flow, wetlands and water levels in lakes and ponds. The Task Force also recommends communities coordinate their infiltration reduction efforts with appropriate EOEAs Watershed Teams, local watershed groups and the local conservation commission. Distribution of MWRA mapping information is intended to assist member communities in fulfilling this I/I Task Force recommendation. This strategy has an ongoing schedule that will be initiated in the short to mid-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 7.1 Strategy A-5)

Work by MWRA under this Strategy is complete as noted below. Some ongoing work performed by MWRA that is associated with this Strategy is also noted. Additional community technical assistance is provided upon request as noted under Strategy C, above.

During FY05, MWRA completed a major upgrade to its electronic sewer database and GIS mapping system. Also during FY05, MWRA completed coordination with local communities to more accurately map connection points of local sewers to the MWRA interceptor system and GPS located all wastewater meter sites. Significant GIS mapping upgrades were rolled-out in FY06. In July 2006, MWRA provided GIS maps with detailed water resource information overlaid with the local sewer system to each MWRA member sewer community. In addition, land use mapping was also distributed to the communities. The distribution of this GIS mapping information fulfilled MWRA's work under Strategy D.

Beginning in FY14 and continuing through FY22, MWRA updated prior (or developed new) GIS mapping information partnership agreements with most MWRA member water and sewer communities to share MWRA/community GIS mapping data. Under the partnership agreements, MWRA and member communities have signed nondisclosure agreements that detail security protocols necessary to safeguard water and sewer system data. MWRA continues to coordinate with member communities to add GIS partners and update existing data. This work will continue in FY23.

Strategy E: MWRA, in coordination with the MWRA Advisory Board, will continue to fund the I/I Local Financial Assistance Program to provide grants and loans to member sewer communities to fund local I/I reduction projects. Through September 2002, MWRA has authorized a total budget of \$140.75 million to fund this program. Financial assistance is provided through 45 percent grants and 55 percent interest-free loans for eligible projects. The MWRA Board of Directors has approved the program through FY2010. The I/I Local Financial Assistance Program is fully detailed in the “Program Guidelines” document available from the MWRA Community Support Program. This strategy has an ongoing schedule that has been initiated. (Cross-reference this strategy to the I/I Task Force Report recommendation 10.2 Strategy B-1)

Work by MWRA under this Strategy is ongoing.

In June 2004, the MWRA Board of Directors approved an additional \$40 million (\$18 million in grants and \$22 million in interest-free loans) to increase the total I/I Local Financial Assistance Program budget to \$180.75 million and extended program distribution through FY13. The additional \$40 million (Phase 5) in financial assistance funds became available to the communities in FY05.

In June 2006, the MWRA Board of Directors approved an additional \$40 million (\$18 million in grants and \$22 million in interest-free loans) to increase the total I/I Local Financial Assistance Program budget to \$220.75 million and extended program distributions through FY15. The additional \$40 million (Phase 6) in financial assistance funds became available to the communities in FY07.

In June 2009, the MWRA Board of Directors approved an additional \$40 million (\$18 million in grants and \$22 million in interest-free loans) to increase the total I/I Local Financial Assistance Program budget to \$260.75 million and extended program distributions through FY18. The additional \$40 million (Phase 7) in financial assistance funds became available to the communities in FY10.

In June 2012, the MWRA Board of Directors approved an additional \$40 million (\$18 million in grants and \$22 million in interest-free loans) to increase the total I/I Local Financial Assistance Program budget to \$300.75 million and extended program distributions through FY21. The additional \$40 million (Phase 8) in financial assistance funds became available to the communities in FY13.

In June 2014, the MWRA Board of Directors approved an additional \$160 million (\$120 million in 75% grants and \$40 million in 25% interest-free 10-year loans) to increase the total I/I Local Financial Assistance Program budget to \$460.75 million and extended program distributions through FY25. The additional \$160 million (\$80 million each for Phases 9 and 10) in financial assistance funds became available to the communities in FY15. Note that MWRA enhanced Phase 9 and 10 of its grant/loan community funding program by increasing the grant portion from 45% to 75%. Also, the loan portion repayment period was extended from 5 to 10 years.

In June 2018, the MWRA Board of Directors approved an additional \$200 million (\$150 million in 75% grants and \$50 million in 25% interest-free 10-year loans) to increase the total I/I Local Financial Assistance Program budget to \$660.75 million and extended program distributions through FY30. The additional \$200 million (\$100 million each for Phases 11 and 12) in financial assistance funds became available to the communities in FY19. Also in June 2018, the MWRA Board of Directors approved an additional \$100 million 10-year loan only Phase 13 to be used by communities if their grant/loan funds have all been distributed (prior to the initiation of the next grant/loan funding phase). As of FY22, MWRA's commitment to fund local sewer rehabilitation projects under the I/I Local Financial Assistance Program totals \$760.75 million.

During FY22, MWRA continued to provide grants and loans to member sewer communities to fund local I/I reduction and sewer system rehabilitation projects. A total of \$31.3 million was distributed during FY22. Since program inception in May 1993, \$510 million has been distributed to fund 646 local projects. The Program Guidelines, Financial Assistance Application, and summary of available funds by community are posted on the MWRA Community Support Program web page at <http://www.mwra.com/comsupport/communitysupportmain.html>. A status update on MWRA's I/I Local Financial Assistance Program is included as Attachment 4.

During FY23, MWRA will continue to distribute funds and assist communities in the management of projects under the I/I Local Financial Assistance Program. MWRA's remaining financial assistance funds are authorized for distribution through FY30.

Strategy F: MWRA, in coordination with the MWRA Advisory Board, will continue to provide emergency assistance to member communities for sewer services on local collection systems that are routinely performed by MWRA staff for the MWRA-owned interceptor system. Examples of past community assistance provided by MWRA staff include: emergency response assistance, bypass pumping, internal TV inspection, sewer cleaning, flow metering, engineering technical assistance, etc. This strategy has an ongoing schedule that has been initiated. (Cross-reference this strategy to the I/I Task Force Report recommendations 9.6 Strategy F-2 and 10.2 Strategy B-2)

Work by MWRA under this Strategy is ongoing.

During FY22, MWRA continued to provide emergency assistance to member communities, as requested. These efforts typically included internal TV inspection of local sewers and associated sewer cleaning, as well as other emergency assistance. During FY23, MWRA will continue to provide emergency assistance to member communities.

Goal 4 under MWRA's Regional I/I Reduction Plan is:

MWRA will work cooperatively with member communities, DEP, and EPA to expand existing efforts to educate and involve the public regarding regional sewer backup, SSO, and I/I reduction issues.

Strategy A: MWRA will act as a "clearinghouse" to collect and distribute information on I/I and SSO issues. Other groups, agencies, associations, community representatives, and local citizens wishing to disseminate information on I/I and SSO issues within the region can provide a copy to MWRA that will be copied and distributed. MWRA staff will maintain a database of contacts with Federal, State and community officials, as well as, local associations and individuals that wish to stay informed on I/I and SSO issues. Summary mailings will be made periodically. MWRA, in coordination with the MWRA Advisory Board, will also act as a clearinghouse to inform regional stakeholders about the progress of efforts to increase state and federal funding for I/I reduction and SSO projects. Regional stakeholders will be advised on the most appropriate time to provide input and lobbying efforts. This strategy has an ongoing schedule that will be initiated in the short-term. (Cross-reference this strategy to the I/I Task Force Report recommendations 8.1 Strategy A-1, 10.4 Strategy C-5, and 10.4 Strategy D-2)

Work by MWRA under this Strategy is ongoing including information on both the wastewater and water systems.

During FY22, MWRA distributed technical information to member community Public Works Directors, City/Town Engineers, local wastewater/water system operators, community consultants, and local watershed groups, including:

- **MWRA continued to estimate community infiltration and inflow rates on a bimonthly basis. These flow data tables are available to all users on MWRA's web site (www.mwra.com). Community wastewater flow rate basis data is distributed to member communities throughout the year on a bimonthly basis. It should be noted that community wastewater flow data, along with the estimated community wastewater flow components, was not produced for CY21 due to the ongoing MWRA wastewater meter replacement project. With the MWRA wastewater meter replacement project substantially complete, CY22 community wastewater flow data is currently being generated. Community wastewater flow data for CY20 is included as Attachment 6.**
- **March 2022: Local Water System Assistance Program funding (interest-free 10-year loans) update e-mails were distributed to each member community. Information on MWRA's Lead Service Line Replacement Loan Program was also provided.**
- **March 2022: MWRA staff distributed correspondence to all sewer communities with an update on funds available under the I/I Local Financial Assistance Program (grant/loan funds) with a link to the MWRA Community Support Web page for more information.**
- **March 16, 2022: MWRA staff provided an update presentation on the I/I Local Financial Assistance Program to the MWRA Board of Directors. All Staff Summaries to the MWRA Board of Directors are posted on MWRA web site at www.mwra.com.**

- **March 16, 2022:** MWRA staff provided an update presentation on the Local Water System Assistance Program to the MWRA Board of Directors. All Staff Summaries to the MWRA Board of Directors are posted on MWRA web site at www.mwra.com.
- **June 2022:** Annual community I/I questionnaires were distributed to member sewer communities to acquire information on FY22 local I/I reduction programs for development of MWRA's Annual I/I Reduction Report (see Attachment 5).

During FY23, MWRA will continue to distribute information on I/I and SSO issues, as appropriate.

Strategy B: MWRA will develop and distribute a summary of previous information/technology distributions regarding I/I reduction and SSOs. The summary will be organized by topic and distributed to all regional stakeholders in MWRA's database of contacts. This summary can be used as a tool to help reference previously distributed information. This strategy will be completed in the short-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 8.1 Strategy A-2)

Work by MWRA under this Strategy is complete as noted below.

On August 8, 2007, MWRA distributed a Technical Transfer Summary package that included lists of previously distributed information under five separate topic headings: (1) Reports, Handbooks, and Guidelines; (2) Sewer Back-ups, SSOs, and Flooding; (3) Public Source I/I Reduction; (4) Private Source I/I Reduction; and (5) Brochures and Bill Stuffers. Additional information/technology distributions will continue under Strategy A, above.

Strategy C: MWRA, jointly with DEP (and possibly other regional organizations), will organize periodic demonstration projects and/or workshops to bring together regulators, community representatives, vendors, environmental groups, consultants, contractors, etc. Workshops may cover topics such as: new or revised regulations, I/I reduction technologies, updates/progress on Task Force Report recommendations, etc. MWRA and DEP conducted a joint workshop on private source inflow reduction during November 2001. Lessons learned from this workshop will help shape future efforts under this strategy. Completion of this strategy requires a significant resource commitment by DEP. This strategy has an ongoing schedule that will be initiated in the short-term. (Cross-reference this strategy to the I/I Task Force Report recommendations 8.1 Strategy A-3 and 8.2 Strategy B-6)

Work by MWRA under this Strategy is ongoing. Following-up on the 2001 joint private inflow reduction workshop, additional joint workshops were held in 2002 and 2004.

On April 27, 2011, representatives from MassDEP, EPA, and MWRA met to discuss I/I reduction in the region. The potential for future workshops was noted, but no specific plans have been developed for organizing additional joint workshops.

During FY14 (as of April 25, 2014), MassDEP revised its Regulation 314 CMR 12.00 *Operation, Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Dischargers*. The revisions included a requirement for all public entities that own a sewer system to complete an I/I analysis by December 31, 2017 and submit it to MassDEP for review. The analysis also must include an assessment of the risk of SSOs. In FY18, MWRA submitted the required I/I analysis as a chapter in the MWRA Wastewater Collection System Operation & Maintenance Plan (December 2017).

During FY17 (as of May 2017), MassDEP revised its *Guidelines for Performing Infiltration/Inflow Analyses and Sewer System Evaluation Surveys*.

On October 6, 2017, both MassDEP and MWRA staff provided an update presentations and had discussions with the MWRA Wastewater Advisory Committee.

On November 29, 2017, staff from USEPA, MassDEP, and MWRA met to discuss mutual areas of interest regarding wastewater metering and I/I reduction programs.

On an annual basis, MWRA staff provide an update presentation to the MWRA Board of Directors on both the I/I Local Financial Assistance and Local Water System Assistance Programs.

Periodically, MWRA staff provided update presentations to the MWRA Advisory Board and member community representatives, as well as the Wastewater Advisory Committee and Water Supply Citizens Advisory Committee, on a variety of related topics including: I/I Local Financial Assistance Program, Local Water System Assistance Program, Lead Service Line Replacement Loan Program, water and wastewater metering, water and wastewater flow data, rate assessment methodologies, water and wastewater permitting and regulations, etc.

During FY23, MWRA will continue to work cooperatively with MassDEP on this strategy.

Strategy D: MWRA will develop a summary of available public education material such as local/regional billing inserts, Water Environment Federation (WEF) brochures, “How-To” pamphlets, etc. The summary will provide information on where to obtain the material. A listing of available public education materials will be posted on the MWRA Internet site. MWRA will also make copies of public education material available to communities and local associations. MWRA will pilot this strategy by distributing to member communities sample copies of the “Fat-Free Sewers” brochure developed cooperatively by the Water Environment Federation (WEF) and EPA. MWRA will recommend use of the brochures for public education. This strategy has an ongoing schedule that will be initiated in the short-term. (Cross-reference this strategy to the I/I Task Force Report recommendations 8.2 Strategy B-1 and 8.2 Strategy B-4)

Work by MWRA under this Strategy is ongoing.

MWRA distributed the Fat-Free Sewers brochure to wastewater system operators in July 2003. In conjunction with the Technical Transfer Summary package distributed on August 8, 2007 (see Strategy B, above), MWRA included a separate topic heading for “Brochures and Bill Stuffers” that can be used by local communities as educational materials. Links to educational materials are provided on www.mwra.com.

In FY22, the MWRA School Education Program distributed “It’s a Toilet, Not a Trash Can” brochures and “What To Flush – the 3 Ps Only (Pee, Poop, Paper)” window clings to schools and community groups. The brochure can be downloaded from the School Program page on www.mwra.com and the window clings can be ordered. The MWRA School Program developed a new classroom activity involving reading and designing wet wipe labels to establish which materials are dispersible vs. flushable. The activity has been well received by both teachers and students.

Strategy E: Depending on the outcome of the summary of available information being developed under Strategy D, MWRA (jointly with DEP and possibly other regional organizations) may develop informational materials that will educate the public on I/I and SSO issues. This effort may include “how-to” pamphlets that detail a step-by-step process for disconnecting private inflow sources or similar information. The development of new materials under this strategy will be targeted to fill gaps that are not covered by existing/available public education material. This strategy will be completed in the mid-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 8.2 Strategy B-2)

Work by MWRA under this Strategy is complete as noted below.

As part of the Technical Transfer Summary package distributed on August 8, 2007 (see Strategy B, above), MWRA included a separate topic heading specifically for “Brochures and Bill Stuffers” that can be used by local communities as educational materials. There are sufficient example brochures available so that no additional work is needed under this strategy. Communities actively involved with private inflow removal programs have generally been using available sample brochures and other public education materials to develop public education information related to their specific project. Information already available via local engineering consultants is also utilized.

Strategy F: Upon request from member communities, MWRA will assist member communities in providing a link from the local DPW or community Internet site to the MWRA Internet site. The possibility of a link or reference to other regional bodies that are involved in sewer system issues (such as DEP, EPA, New England Water Environment Association, New England Interstate Water Pollution Control Commission, watershed associations, etc.) will also be investigated. This strategy will be completed in the mid-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 8.2 Strategy B-3)

Work by MWRA under this Strategy is complete as noted below.

Local communities, state agencies, regional associations, etc. all maintain their own web pages with numerous information links. MWRA’s website contains links to the communities’ websites and links to other organizations. Based on current broad use of the web, additional work under this strategy is not needed. MWRA continues to revise and upgrade its website www.mwra.com and the Community Support Program page: <http://www.mwra.com/comsupport/communitysupportmain.html>.

Strategy G: MWRA will integrate information on I/I and SSO issues into existing MWRA school education materials. MWRA's School Education staff will identify what types of materials are appropriate for their programs. This strategy has an ongoing schedule that will be initiated in the mid-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 8.3 Strategy C-1)

Work by MWRA under this Strategy is ongoing. The focus of MWRA's School Education Program is to provide a general understanding of water and wastewater transport and treatment systems with emphasis on water conservation and environmental awareness issues. Educational materials are designed for students from elementary to high school levels.

Strategy H: Upon request from DEP, MWRA will provide technical assistance to DEP to develop and issue DEP press releases prior to and during extreme wet weather events to notify the public of possible sewer system backups and overflow problems. The I/I Task Force Report recommends DEP develop a standardized format that includes a request that system users minimize non-essential water consumption activities and includes a standardized high sewer flow warning. Completion of this strategy is dependent on DEP actions. This strategy has an ongoing schedule that should be initiated in the short to mid-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 5.4 Strategy D-2)

Work by MWRA under this Strategy is ongoing. In FY22, MWRA enhanced its existing CSO public notification program to add notifications of SSOs (in compliance with the new sewage notification regulation 314 CMR 16.00). Additionally, MWRA updated its SSO notification website. In response to a request from MassDEP, MWRA assisted in notifying member communities of their responsibilities under the new regulation. MWRA also provided comment on the draft regulation. MassDEP may determine that the database and portal developed by MassDEP to comply with the Sewage Notification Regulation 314 CMR 16.00 meets the intent of this strategy.

Strategy I: Upon request from member communities, MWRA will provide technical assistance to communities to provide residents with information on I/I reduction, SSOs and backups using local cable stations or other media outlets. This strategy has an ongoing schedule that will be initiated in the mid to long-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 8.2 Strategy B-7)

Work by MWRA under this Strategy is ongoing. MWRA is prepared to send notifications to media outlets (notifications to begin in FY23). Along with Cambridge and Somerville, MWRA held a public meeting on CSO control in the Charles and Mystic/Alewife Rivers that included discussion of flooding, system capacity and I/I reduction requirements. This was the first meeting in a series that will continue over the next year and a half. MWRA also conducted outreach and education efforts with local Boards of Health in preparation for the new sewage notification regulation.

Goal 5 under MWRA's Regional I/I Reduction Plan is:

MWRA will provide technical assistance and work cooperatively with member communities, DEP, and EPA regarding guidance on local operation and maintenance and capital improvement programs intended to provide a reasonable level of sewer service to local sewer users/ratepayers.

Strategy A: MWRA will provide all member communities a copy of the I/I Task Force Report (which includes recommendations for sewer system operation and maintenance). MWRA will maintain a supply of I/I Task Force Reports and will provide additional copies to MWRA member communities and regional stakeholders, as requested. This strategy has an ongoing schedule that has been initiated.

Work by MWRA under this Strategy is complete as noted below.

MWRA provided all member communities and all interested parties copies of the I/I Task Force Report in April 2001, shortly after the Report was completed. MWRA continues to maintain a supply of I/I Task Force Reports and provides additional copies to MWRA member communities and regional stakeholders, as requested. In July 2003, all member communities were provided a copy of the MWRA Regional I/I Reduction Plan. Both the I/I Task Force Report and MWRA Regional I/I Reduction plan are posted on MWRA's Community Support Program web page at: <http://www.mwra.com/comsupport/communitysupportmain.html>.

Strategy B: MWRA will request member communities provide a copy of their existing local Sewer Use Regulations to MWRA, will review those local Regulations that are submitted, and will make recommendations for improvements. MWRA may utilize a committee representing a cross-section of sewer system stakeholders to assist in accomplishing this strategy. This strategy will be completed in the mid-term. (Cross-reference this strategy to the I/I Task Force Report recommendation 9.1 Strategy A-2)

Work by MWRA under this Strategy is complete as noted below.

MWRA did not proceed with work under this strategy pending issuance of EPA's SSO Rule, including CMOM Regulations that were likely to impact local sewer use regulations. EPA's draft SSO Rule was not promulgated. During FY04, MassDEP distributed a new guideline document – "Optimizing Operation, Maintenance and Rehabilitation of Sanitary Sewer Collection Systems" dated August 2003. This manual was developed by New England Interstate Water Pollution Control Commission (NEIWPCC) under a grant from EPA. The Guideline Document was written by a committee consisting of NEIWPCC member state environmental agencies, EPA, and wastewater consultants. The manual is available at www.neiwpcc.org. Chapter 4 of the manual "Optimizing Legal Authority" includes sections on Sewer Use Ordinances; therefore, additional work by MWRA under this strategy is not necessary. Web links to information provided by MassDEP, USEPA, and NEIWPCC are posted on MWRA's Community Support Program web page at: <http://www.mwra.com/comsupport/communitysupportmain.html>.

Strategy C: MWRA will develop a Member Community Collection System Operation and Maintenance Manual Guidance Document and Overflow Response Plan. This guidance document will be provided to all member communities. This strategy will be completed in the short-term.

Work by MWRA under this Strategy is complete as noted below.

A Member Community Collection System Operation and Maintenance Manual Guidance Document and Overflow Response Plan was developed and submitted to EPA and MassDEP for review in June 2001. This guidance document was made available to member communities. During FY04, MassDEP distributed a new guideline document – “*Optimizing Operation, Maintenance and Rehabilitation of Sanitary Sewer Collection Systems*” dated August 2003. This manual was developed by New England Interstate Water Pollution Control Commission (NEIWPCC) under a grant from EPA. It was written by a committee consisting of NEIWPCC member state environmental agencies, EPA, and wastewater consultants. The manual is available at www.neiwpcc.org. MWRA provided its collection system O&M manual and the community collection system guidance document to the NEIWPCC committee for review. With the publication of the NEIWPCC manual, further efforts on the Member Community Collection System Operation and Maintenance Manual Guidance Document are not required.

During FY14 (as of April 25, 2014), MassDEP revised its Regulation 314 CMR 12.00 *Operation, Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Dischargers*.

During FY17 (as of May 2017), MassDEP revised its *Guidelines for Performing Infiltration/Inflow Analyses and Sewer System Evaluation Surveys*.

ATTACHMENT 3
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY22
Reporting Period – July 2021 Through June 2022

MWRA ACTIONS TAKEN TO REDUCE I/I DURING FY22

The MWRA Field Operations Department's Technical Inspection program staff have internally inspected approximately 31 miles of Authority-owned interceptors, internally inspected 35 inverted siphon barrels with sonar inspection equipment, and physically inspected 814 sewer manholes and other structures (diversion chambers, siphon headhouses, tide gates, etc.) during FY22. During the internal inspection process, problems such as physical defects, manhole frame and cover defects, infiltration/inflow, sediment, grease deposits, etc. are noted and stored in MWRA's electronic maintenance (MAXIMO) database. Maintenance work is then scheduled based on the identified problem.

During FY22, MWRA's maintenance work included hydraulic/mechanical cleaning of 38 miles of Authority-owned sewers, cleaning of 47 siphon barrels, and replacement of 84 manhole frames and covers. In addition, 49 sewer manholes were rehabilitated via cement mortar lining under MWRA's annual manhole rehabilitation contract. Potential structural problems and infiltration sources identified during the inspection process are referred to engineering staff for follow-up review and analysis of cost-effective repairs.

The MWRA is undertaking a number of significant capital projects to rehabilitate portions of Authority-owned interceptors and provide additional hydraulic capacity. Updates on these projects are included below:

1. During FY22, MWRA continued rehabilitation of sewer interceptors under the Interceptor Renewal/Asset Protection Program. Evaluation and design of interceptor rehabilitation began in FY09. The program includes a series of twelve interceptor renewal projects to be phased over multiple years at a cost of over \$200 million. Each of these projects will provide structural repairs for existing pipelines and reduce I/I entering the MWRA interceptor system. MWRA's Interceptor Renewal/Asset Protection Projects #1 through #7 for rehabilitation construction of a variety of Sewer Sections are programmed in the proposed FY23 CIP at a cost of nearly \$131 million. Interceptor Renewal/Asset Protection Projects #1 through #7 include:
 - Interceptor Renewal/Asset Protection Project #1: Rehabilitation design and construction of 12,240 linear feet of the Reading Extension Sewer Sections 75, 74, 73, primarily in Stoneham, with short reaches in Wakefield and Woburn. Also, included was rehabilitation of 2,280 linear feet of Metropolitan Sewer Section 46 in Stoneham, as well as, rehabilitation of 62 manholes and structures along the pipeline route. Construction began in FY17 and was completed during FY19. Total design, construction, and construction services costs were approximately \$2.9 million.

- Interceptor Renewal/Asset Protection Project #2: Rehabilitation design and construction of Sections 4, 5, 6, and 186 on the North Metropolitan Sewer in Winthrop (just upstream of the Deer Island Treatment Plant). Work will include rehabilitation of approximately 3,700 linear feet of 108-inch brick sewer. Portions of this sewer were previously rehabilitated using a shotcrete process in the 1990s. A preliminary design study for this project was completed in April 2018. The design/construction/construction services phases are scheduled to begin in FY24 at a cost estimate of \$9.4 million.
- Interceptor Renewal/Asset Protection Project #3: Rehabilitation design and construction of the Dorchester Interceptor Sewer Sections 240, 241, and 242. Design for this project began in FY18. Construction/construction services phases completed December 2021. The overall design, construction and construction services costs are estimated at \$6.3 million.
- Interceptor Renewal/Asset Protection Project #4A: Rehabilitation design and construction of the Cambridge Branch Sewer Sections 26 and 27 in Charlestown, Somerville, and Cambridge. A preliminary design study for Cambridge Branch Sewer Sections 23 - 24 and 26 - 27 was completed in FY18. The design phase scheduled to begin in FY24 with a design/construction budget of \$36 million.
- Interceptor Renewal/Asset Protection Project #4B: Rehabilitation design and construction of the Cambridge Branch Sewer Sections 23 and 24 in Everett and Charlestown. A preliminary design study for Cambridge Branch Sewer Sections 23 - 24 and 26 - 27 was completed in FY18. Design phase scheduled to begin in FY26 with a design/construction budget of \$36 million.
- Interceptor Renewal/Asset Protection Project #5: Rehabilitation design and construction of portions of New Neponset Valley Sewer Sections 607, 609, and 610 in Milton. Design phase scheduled to begin in FY24 with a design/construction budget of \$16.2 million.
- Interceptor Renewal/Asset Protection Project #6: Rehabilitation design and construction of portions of Sections 12, 14, 15, and 62 in Chelsea. Design scheduled to begin in FY25 with a design/construction budget of \$13.2 million.
- Interceptor Renewal/Asset Protection Project #7: Rehabilitation design and construction of portions of Sections 41, 42, 49, 54, and 65 in Malden and Melrose. Design Notice To Proceed issued August 2020 with a design cost of \$2.6 million. Construction budget estimated at \$8.1 million. Anticipated Construction Notice To Proceed is April 2023.

ATTACHMENT 4
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY22
Reporting Period: July 2021 Through June 2022

**STATUS UPDATE ON MWRA'S
I/I LOCAL FINANCIAL ASSISTANCE PROGRAM**

Financial Assistance Update

All 43-member sewer communities are participating in MWRA's \$760.75 million Infiltration/Inflow (I/I) Local Financial Assistance (grant/loan) Program. The program began in May 1993 and, through FY22, \$510 million has been distributed to fund 646 local I/I reduction and sewer system rehabilitation projects. The program budget of \$760.75 million includes the most recent addition of \$300 million approved by the MWRA Board of Directors for distribution beginning in FY19, including: Phase 11 (\$100 million in grant/loan funds), Phase 12 (\$100 million in grant/loan funds), and Phase 13 (\$100 million in loan only funds). For new Phases 11 and 12, the grant component remains as 75% of the eligible project costs. The table on page 2 provides a summary of funding allocations, distributions, and funds remaining for each MWRA sewer community. Distribution of grant and loan financial assistance to member communities has been approved through FY30. The table on page 3 provides a summary of funding distributions by fiscal quarter since Program inception.

Program Background

MWRA's I/I Local Financial Assistance Program was initiated to provide funding to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned collection systems. Following recommendations from the MWRA Advisory Board, the MWRA Board of Directors has approved a total program budget of \$760.75 million. The funds have been allocated among the 43 MWRA sewer communities based on respective share of MWRA's wholesale sewer charge. Financial assistance for Phases 1 and 2 (total of \$63.75 million) was distributed for approved projects as a 25 percent grant and a 75 percent interest-free loan. The grant/loan split was revised for distribution of the Phase 3 through 8 funds (total of \$237 million) to a 45 percent grant and a 55 percent interest-free loan. The interest-free loan portion for Program Phases 1 through 8 has been repaid to MWRA over a five-year period beginning one year after the date the funds are distributed. The grant/loan split was again enhanced for distribution of Phases 9 through 12 funds (total of \$360 million) to a 75 percent grant and a 25 percent interest-free loan. The interest-free loan repayment period for Program Phases 9 through 12 has been extended to ten years from the previous five (again beginning one year after the date the funds are distributed). Phase 13 is a \$100 million loan-only phase also with a ten-year repayment. Phase 13 loan funds are to be used by communities if their grant/loan funds have all been distributed (prior to the initiation of the next grant/loan funding phase).

MWRA funding is provided to a community following execution of a standard agreement that stipulates the project scope, schedule, and loan repayment requirements. Communities are required to provide periodic schedule and expenditure progress reports to MWRA. For planning and design projects, the work products (reports, plans, specifications, and bidding documents) are reviewed and approved by MWRA. During construction, MWRA staff perform site visits to document progress.

**MWRA // LOCAL FINANCIAL ASSISTANCE PROGRAM
FUNDING SUMMARY AS OF JULY 2022**

Community	Total Allocations (Phases 1 - 13)	Total Distributions (Phases 1 - 13)	Percent Distributed	Funds Remaining
Arlington	\$13,703,000	\$11,455,900	84%	\$2,247,100
Ashland	\$3,818,500	\$2,020,060	53%	\$1,798,440
Bedford	\$5,654,600	\$2,843,600	50%	\$2,811,000
Belmont	\$8,255,100	\$5,135,100	62%	\$3,120,000
Boston	\$218,001,200	\$121,596,909	56%	\$96,404,291
Braintree	\$14,419,000	\$10,379,000	72%	\$4,040,000
Brookline	\$21,355,200	\$13,666,200	64%	\$7,689,000
Burlington	\$8,432,800	\$7,322,800	87%	\$1,110,000
Cambridge	\$39,250,100	\$28,830,100	73%	\$10,420,000
Canton	\$6,635,900	\$3,126,850	47%	\$3,509,050
Chelsea	\$11,760,100	\$11,760,100	100%	\$0
Dedham	\$9,220,000	\$8,060,000	87%	\$1,160,000
Everett	\$13,381,500	\$11,611,500	87%	\$1,770,000
Framingham	\$20,375,000	\$13,671,000	67%	\$6,704,000
Hingham	\$2,802,500	\$2,412,500	86%	\$390,000
Holbrook	\$2,779,600	\$896,562	32%	\$1,883,038
Lexington	\$12,125,300	\$10,565,300	87%	\$1,560,000
Malden	\$20,683,900	\$6,725,900	33%	\$13,958,000
Medford	\$19,637,600	\$7,961,600	41%	\$11,676,000
Melrose	\$10,126,300	\$8,657,300	85%	\$1,469,000
Milton	\$9,014,500	\$9,014,500	100%	\$0
Natick	\$9,332,600	\$6,832,600	73%	\$2,500,000
Needham	\$9,977,600	\$4,018,600	40%	\$5,959,000
Newton	\$34,937,400	\$34,937,400	100%	\$0
Norwood	\$11,589,400	\$6,879,400	59%	\$4,710,000
Quincy	\$32,780,000	\$28,450,000	87%	\$4,330,000
Randolph	\$10,070,800	\$4,971,058	49%	\$5,099,742
Reading	\$7,749,100	\$6,709,100	87%	\$1,040,000
Revere	\$16,940,900	\$5,802,900	34%	\$11,138,000
Somerville	\$25,955,800	\$12,116,900	47%	\$13,838,900
Stoneham	\$7,829,900	\$6,859,900	88%	\$970,000
Stoughton	\$7,902,900	\$6,842,900	87%	\$1,060,000
Wakefield	\$9,806,900	\$8,526,900	87%	\$1,280,000
Walpole	\$6,110,000	\$4,490,000	73%	\$1,620,000
Waltham	\$22,282,400	\$19,214,560	86%	\$3,067,840
Watertown	\$10,155,800	\$7,335,800	72%	\$2,820,000
Wellesley	\$9,249,700	\$4,739,700	51%	\$4,510,000
Westwood	\$4,302,300	\$2,591,300	60%	\$1,711,000
Weymouth	\$19,100,900	\$12,590,900	66%	\$6,510,000
Wilmington	\$4,232,000	\$2,462,000	58%	\$1,770,000
Winchester	\$6,793,000	\$5,923,000	87%	\$870,000
Winthrop	\$5,553,400	\$5,083,400	92%	\$470,000
Woburn	\$16,665,500	\$14,675,500	88%	\$1,990,000
Totals	\$760,750,000	\$509,766,599	67%	\$250,983,401

MWRA I/I Local Financial Assistance Program - Fiscal Year Breakdown

FY	Distribution Cycle	Distribution Amount	Distribution Cycle	Distribution Amount	Distribution Cycle	Distribution Amount	Distribution Cycle	Distribution Amount	FY Total
FY93	Aug 1992	\$0	Nov 1992	\$0	Feb 1993	\$0	May 1993	\$2,714,883	\$2,714,883
FY94	Aug 1993	\$3,096,468	Nov 1993	\$4,096,133	Feb 1994	\$3,191,032	May 1994	\$251,494	\$10,635,127
FY95	Aug 1994	\$354,126	Nov 1994	\$976,700	Feb 1995	\$1,894,030	May 1995	\$6,489,891	\$9,714,747
FY96	Aug 1995	\$0	Nov 1995	\$504,100	Feb 1996	\$2,921,600	May 1996	\$3,902,426	\$7,328,126
FY97	Aug 1996	\$1,682,061	Nov 1996	\$1,581,266	Feb 1997	\$395,100	May 1997	\$3,530,758	\$7,189,185
FY98	Aug 1997	\$1,066,300	Nov 1997	\$1,157,260	Feb 1998	\$909,350	May 1998	\$2,001,608	\$5,134,518
FY99	Aug 1998	\$1,521,100	Nov 1998	\$2,464,263	Feb 1999	\$1,481,700	May 1999	\$5,758,077	\$11,225,140
FY00	Aug 1999	\$1,315,767	Nov 1999	\$1,847,900	Feb 2000	\$1,679,000	May 2000	\$1,070,100	\$5,912,767
FY01	Aug 2000	\$1,148,400	Nov 2000	\$388,000	Feb 2001	\$1,640,931	May 2001	\$804,800	\$3,982,131
FY02	Aug 2001	\$4,480,735	Nov 2001	\$704,040	Feb 2002	\$1,804,200	May 2002	\$5,002,691	\$11,991,666
FY03	Aug 2002	\$1,962,600	Nov 2002	\$4,461,768	Feb 2003	\$7,955,752	May 2003	\$1,836,600	\$16,216,720
FY04	Aug 2003	\$2,021,940	Nov 2003	\$1,306,200	Feb 2004	\$1,770,760	May 2004	\$3,295,400	\$8,394,300
FY05	Aug 2004	\$2,756,659	Nov 2004	\$6,013,436	Feb 2005	\$4,054,060	May 2005	\$2,636,700	\$15,460,855
FY06	Aug 2005	\$5,377,487	Nov 2005	\$4,589,600	Feb 2006	\$1,519,463	May 2006	\$6,489,676	\$17,976,226
FY07	Aug 2006	\$0	Nov 2006	\$4,947,414	Feb 2007	\$8,789,300	May 2007	\$8,121,023	\$21,857,737
FY08	Aug 2007	\$3,915,500	Nov 2007	\$4,355,750	Feb 2008	\$1,392,400	May 2008	\$4,436,600	\$14,100,250
FY09	Aug 2008	\$4,196,399	Nov 2008	\$352,000	Feb 2009	\$1,990,300	May 2009	\$4,872,400	\$11,411,099
FY10	Aug 2009	\$5,462,736	Nov 2009	\$616,600	Feb 2010	\$2,679,600	May 2010	\$4,845,000	\$13,603,936
FY11	Aug 2010	\$723,700	Nov 2010	\$3,183,250	Feb 2011	\$4,123,100	May 2011	\$4,258,900	\$12,288,950
FY12	Aug 2011	\$3,695,100	Nov 2011	\$2,417,378	Feb 2012	\$848,300	May 2012	\$7,010,324	\$13,971,102
FY13	Aug 2012	\$21,299,965	Nov 2012	\$1,004,610	Feb 2013	\$2,460,000	May 2013	\$2,675,000	\$27,439,575
FY14	Aug 2013	\$7,550,310	Nov 2013	\$0	Feb 2014	\$2,929,700	May 2014	\$2,271,852	\$12,751,862
FY15	Aug 2014	\$4,053,000	Nov 2014	\$7,647,400	Feb 2015	\$10,128,648	May 2015	\$4,803,450	\$26,632,498
FY16	Aug 2015	\$3,983,100	Nov 2015	\$5,783,000	Feb 2016	\$7,195,116	May 2016	\$5,483,000	\$22,444,216
FY17	Aug 2016	\$2,352,100	Nov 2016	\$6,553,210	Feb 2017	\$2,918,900	May 2017	\$10,434,030	\$22,258,240
FY18	Aug 2017	\$8,085,900	Nov 2017	\$10,311,545	Feb 2018	\$1,377,800	May 2018	\$1,909,730	\$21,684,975
FY19	Aug 2018	\$4,107,370	Nov 2018	\$12,150,449	Feb 2019	\$19,027,200	May 2019	\$11,067,748	\$46,352,767
FY20	Aug 2019	\$14,287,100	Nov 2019	\$10,990,840	Feb 2020	\$9,635,048	May 2020	\$5,454,250	\$40,367,238
FY21	Aug 2020	\$6,087,196	Nov 2020	\$9,789,250	Feb 2021	\$9,642,573	May 2021	\$11,878,316	\$37,397,335
FY22	Aug 2021	\$5,582,842	Nov 2021	\$7,692,520	Feb 2022	\$4,149,000	May 2022	\$13,903,765	\$31,328,127
Total		\$122,165,961		\$117,885,882		\$120,503,963		\$149,210,792	\$509,766,599

Program Goals

The I/I Local Financial Assistance Program is a critical component of MWRA's Regional I/I Reduction Plan. Specifically, local sewer system rehabilitation projects are intended to at least offset ongoing collection system deterioration to prevent a net increase in regional I/I. In the long-term, system rehabilitation should result in lower I/I, which will allow for future increases in sanitary (residential, commercial, industrial, and institutional) flow without a net increase in total wastewater flow to the Deer Island Treatment Plant.

A second goal of the program is to assist member communities in implementing effective annual local collection system maintenance programs to assure efficient operation and ongoing collection system repair/replacement.

Type of Local Projects Receiving Funding

Funding has been provided to local communities for eligible I/I reduction projects including planning, design, construction, and engineering services during construction. These projects generally take one to three years to complete. Eighty percent of funds distributed to date have financed local construction projects. The table below details funds distributed by project phase for both completed and ongoing projects.

<u>PROJECT PHASE</u>	<u>COMPLETE PROJECTS (\$ millions)</u>	<u>ONGOING PROJECTS (\$ millions)</u>	<u>TOTAL (\$ millions)</u>
Planning/Study:	\$ 50.9	\$ 6.9	\$ 57.8 (11%)
Design:	16.1	4.5	20.6 (4%)
Construction:	287.5	120.4	407.9 (80%)
Eng. Services During Const.:	19.6	3.9	23.5 (5%)
TOTAL	\$ 374.1 (73%)	\$ 135.7 (27%)	\$ 509.8 (100%)

Program Results

The I/I Local Financial Assistance Program began in May 1993. Through FY22, a total of 646 local I/I reduction and sewer system rehabilitation projects have been funded through the MWRA's grant/loan program. During FY22, MWRA distributed a total of \$31.3 million in grants and loans to member communities to help fund 17 local I/I reduction projects (see Section Pages 4-9 to 4-37 for community project details). Cumulative results for the program are summarized below.

Results for all projects (FY93 through FY22) for planning/inspection include the following:

- 2,378 miles of sewer TV inspected
- 1,634 miles of sewer flow isolated
- 1,433 miles of sewer smoke tested
- 65,819 sewer manholes inspected
- 78,232 buildings inspected

Results for all projects (FY93 through FY22) targeting infiltration reduction include the following:

- 80 miles sewer replaced
- 310 miles sewer CIPP lined
- 189 miles sewer tested/chemically sealed
- 3,184 sewer spot repairs
- 18,359 service connection repairs
- 4.8 miles underdrains sealed

Results for all projects (FY93 through FY22) targeting inflow reduction include the following:

- 1,108 catch basins disconnected
- 49 miles of new or replaced storm drains
- 22,973 manholes rehabilitated/sealed
- 3,903 manhole covers replaced or inflow seals installed
- 551 sump pumps redirected
- 5,799 downspouts/area drains disconnected

Stormwater and Infiltration/Inflow Impacts to the Collection System

Wastewater discharged by member sewer communities to MWRA is influenced by seasonal and wet-weather conditions related to stormwater in combined sewer systems, groundwater infiltration, and stormwater and tidal inflow. Infiltration/Inflow (I/I) is extraneous water that enters all wastewater collection systems through a variety of sources.

Infiltration is groundwater that enters the collection system through physical defects such as cracked pipes/manholes or deteriorated joints. Typically, many sewer pipes and sewer service laterals are below the surrounding groundwater table. Therefore, leakage into the sewer (infiltration) is a broad problem that is difficult and expensive to identify and reduce.



Infiltration in a Sanitary Sewer

Inflow is extraneous flow entering the collection system through point sources and may be directly related to storm water run-off from sources such as roof leaders, yard and area drains, basement sump pumps, ponded manhole covers, cross connections from storm drains or catch basins, leaking tide gates, etc. Inflow causes a rapid increase in wastewater flow that occurs during and continuing after storms and extreme high tides. The volume of inflow entering a collection system typically depends on the magnitude and duration of rainfall, as well as related impacts from snowmelt, flooding, and storm surge.



Inflow into a Manhole

Stormwater in Combined Sewers is, by design, collected in the combined sewer system to be transported to a downstream treatment facility. Additional system capacity is available via combined sewer overflow (CSO) storage facilities and outfalls that may be active during rainfall events.

Regional Wastewater Flow Trends

Wastewater Flow Graph 1 (page 7) provides long-term regional flow data for the Deer Island Treatment Plant collection system and annual rainfall. The long-term average daily flow for the total system is about 350 mgd (last 33 years from 1989-2021) and the average annual rainfall is 43.7 inches (Boston Logan Airport Data). Wastewater Flow Graph 2 (page 8) shows the five-year running averages (flow and rainfall) as a means of smoothing the annual variability in the long-term data displayed in Wastewater Flow Graph 1. The five-year running average daily flow has declined from approximately 391 mgd to approximately 327 mgd, a reduction of 64 mgd or 16% of wastewater flow tributary to the Deer Island Treatment Plant.

During dry summer months, total system minimum flows drop to as low as 220 mgd. Few problems exist within local and regional sewer systems during dry weather or as a result of small and medium storm events. In contrast, peak wet-weather flow, during occasional periods of significant rainfall, exceeds the 1,270 mgd plant capacity, more than 3.5 times the average flow due to the influence of combined sewer flow, as well as, infiltration and inflow. The collection system has additional capacity available at combined sewer overflow (CSO) storage facilities and outfalls. Extreme storm events that occur during periods of high groundwater, may cause sewer system surcharging and sanitary sewer overflows (SSOs).

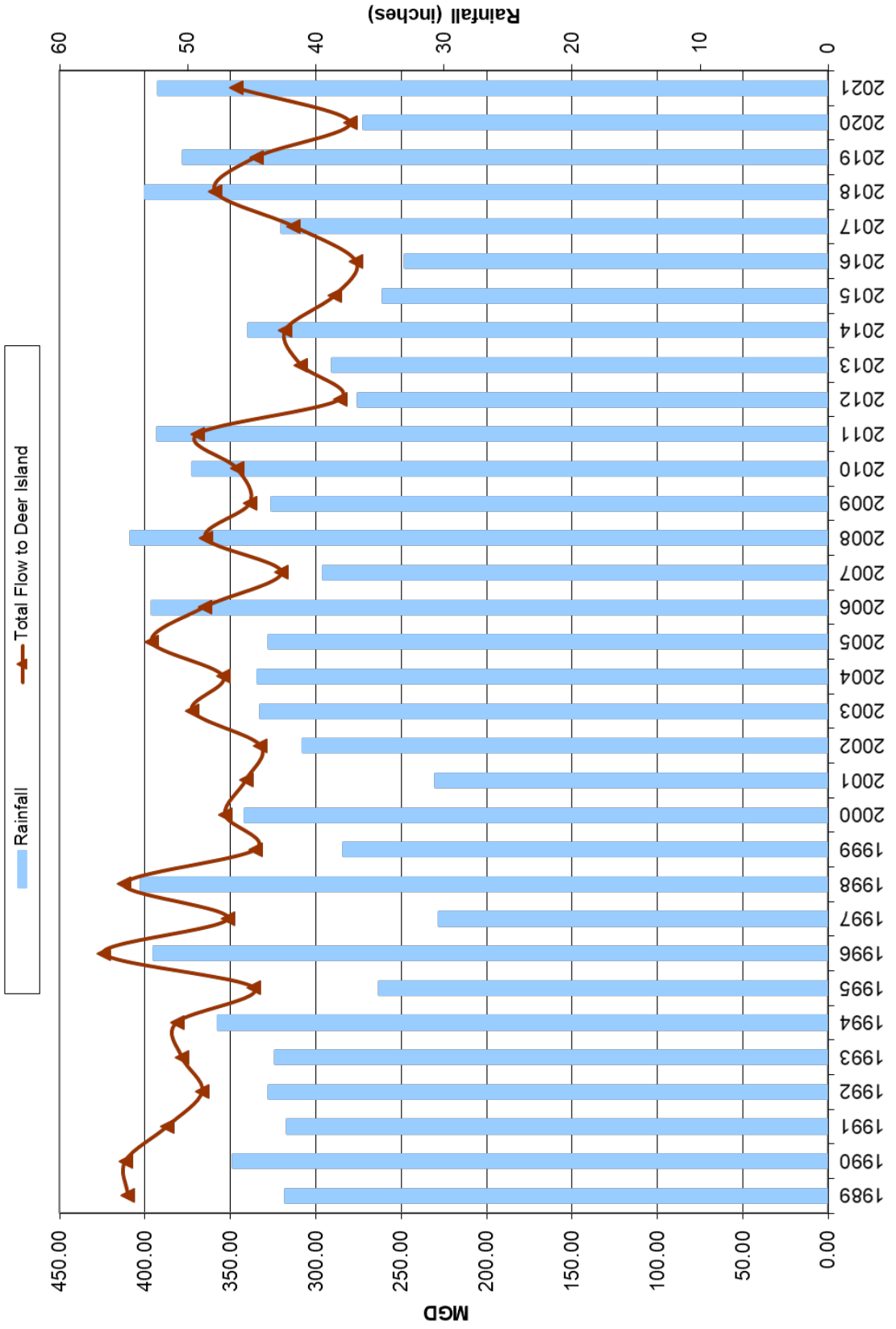
Over the last five years (2017-2021), MWRA's average daily flow of 327 mgd has been about 7% below the long-term average of 350 mgd. The five-year average rainfall of 44.7 inches is consistent with the long-term average of 43.7 inches.

The estimated average daily flow reduction associated with completed local I/I reduction projects that have received MWRA financial assistance is about 101 million gallons per day (mgd). This flow reduction "ballpark" figure is based on the communities' (or their consultants') peak I/I reduction estimates, which have been prorated by MWRA staff to estimate an annual average I/I reduction. The estimated I/I reduction represents groundwater and stormwater that no longer enter the collection system at the point of sewer repair.

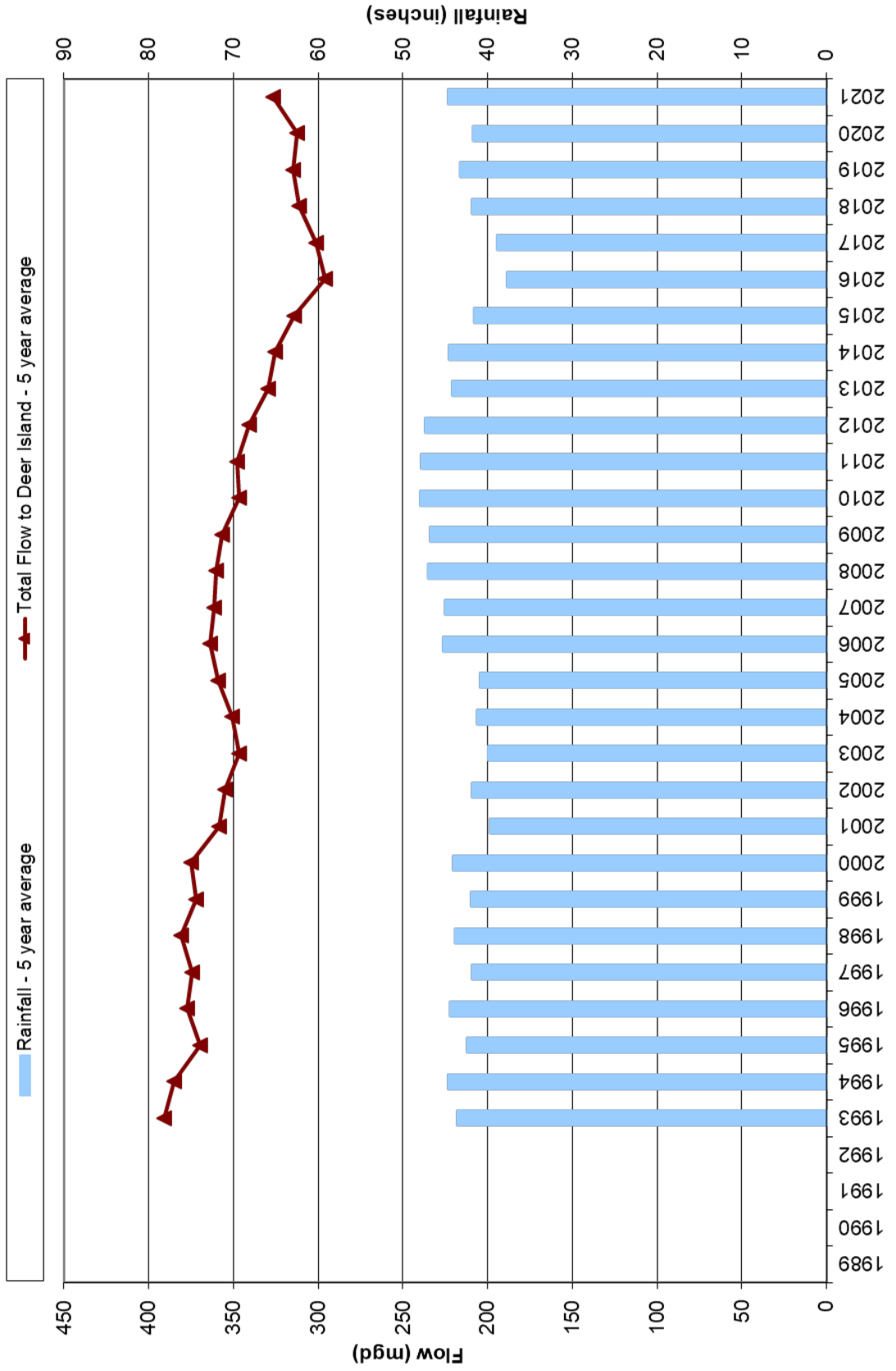
Regional wastewater flow trends are influenced by many factors, including:

- MWRA's financial assistance for local I/I reduction and sewer rehabilitation projects provide gradual improvements to the regional collection system reducing I/I and stormwater. However, each year the regional collection system gets older and continues to deteriorate, which increases I/I.
- Sewer capacity gained by elimination of I/I in one subsystem may allow additional I/I to enter the collection system at a different location (known as infiltration migration), resulting in less net flow reduction at the end of the collection system;
- CSO separation projects reduce stormwater tributary to the combined sewer system leading to decreased flows. However, MWRA's pumping and interceptor relief upgrades, as well as CSO optimization projects, are intended to maximize sewer flow to the treatment plant leading to increased flows.
- Wastewater flows within the collection system vary dramatically due to changes in precipitation. For example, annual average daily flow for MWRA's system varies up to 100 mgd from year to year (from a low of less than 300 mgd to a high of more than 400 mgd). Small flow reductions for individual projects are dwarfed by regional flow fluctuations; and,
- Over the last 20 years, the decline in per capita indoor water use within the MWRA service area could account for about 20 mgd in wastewater flow reduction after the increase in wastewater flow from increased sewer population is accounted for.

Wastewater Flow Graph 1
MWRA Long-Term Regional Flow Data
NOAA Annual Rainfall at Logan Airport



Wastewater Flow Graph 2
 MWRA Long-Term Regional Flow Data
 5-year Running Averages
 5 year running NOAA Rainfall Average at Logan Airport



Community Projects Funded During FY22

During FY22, MWRA distributed a total of \$31.3 million in grants and loans to member communities to help fund 17 local I/I reduction projects. Community projects are funded quarterly under the MWRA I/I Local Financial Assistance Program. Attached (following this page) are funding summaries for the four quarterly funding distributions during FY22:

- First Quarter FY22 - August 2021 Funding Cycle with \$5,582,842 distributed to six communities: Arlington, Bedford, Chelsea, Milton, Natick, and Westwood (see Section Pages 4-10 to 4-17);
- Second Quarter FY22 - November 2021 Funding Cycle with \$7,692,520 distributed to four communities: Boston, Revere, Stoneham, and Winthrop; (see Section Pages 4-18 to 4-24);
- Third Quarter FY22 - February 2022 Funding Cycle with \$4,149,000 distributed to three communities: Arlington, Brookline, and Weymouth (see Section Pages 4-25 to 4-31); and
- Fourth Quarter FY22 - May 2022 Funding Cycle with \$13,903,765 distributed to four communities: Boston, Braintree, Canton, and Everett (see Section Pages 4-32 to 4-37).

MWRA I/I Local Financial Assistance Program Funding Summary

August 2021 Funding Cycle

Community	Funding Allocation
Arlington	\$ 648,900
Bedford	\$ 403,942
Chelsea	\$ 1,630,000
Milton	\$ 1,150,000
Natick	\$ 1,250,000
Westwood	\$ 500,000
Total	\$ 5,582,842

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF ARLINGTON
PHASE #13 SANITARY SEWER REHABILITATION CONSTRUCTION AND
PHASE #11 POST-CONSTRUCTION FLOW EVALUATION
MWRA PROJECT NO. WRA-P11-01-3-1177
SCOPE OF SERVICES**

The Town of Arlington requests funding for the following projects which are part of the Town’s Sewer System Capital Improvement Program, which is designed to reduce Inflow and Infiltration. Each phase of the Program includes the most cost-effective repairs remaining within the Town. The work included in the Phase #13 Design and Rehabilitation Construction projects (Task 1 & 2) will be located in various portions of Investigation Area #1 through Area #11.

Task 1 - Phase #13 Design, Bid, & Award:

The goal of the Phase #13 Design, Bid & Award project is to design the removal of cost-effective sources of infiltration and inflow (I/I) and produce contract documents suitable for public bidding in the investigation areas outlined above.

Task 2 - Phase #13 Rehabilitation Construction & Construction Services:

The goal of the Phase #13 Construction project is to rehabilitate and repair sewer infrastructure and remove sources of I/I identified during previous Sewer System Investigation Projects and included in the Phase #13 Design, Bid & Award project, within the study areas stated above.

Task 3 - Phase #11 Post Construction Flow Evaluation:

The Phase #11 Post-Construction Flow Evaluation will compare pre and post rehabilitation ground water levels and flow isolation data to estimate the quantity of peak infiltration removed from the sewer system from the Phase #11 Construction project. A draft & Final Report will be prepared evaluating the pre and post construction flows.

The above work will be performed pursuant to the terms and conditions detailed within the Agreement For Engineering Services By and Between the Town of Arlington and Weston & Sampson Engineers, Inc. and the approved MWRA I/I Local Financial Assistance Project Application received July 14, 2021. Total project cost is estimated at \$648,900. Eligible MWRA I/I Local Financial Assistance is \$648,900. (Eligible Phase #13 Design, Bid, & Award Cost = \$73,900; Eligible Phase #13 Construction Cost = \$440,000; Eligible Phase #13 Construction Services Cost = \$120,000; Eligible Phase #11 Post Construction Flow Evaluation Cost = \$15,000). Upon contract completion, this work will result in an estimated removal of 0.04 MGD of peak I/I flows from the sanitary sewer system.

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Phase #13 Design, Bid & Award	January 2021	July 2021
Phase #13 Const. Rehabilitation	August 2021	November 2021
Phase #13 Const. Warranty Retest	May 2022	June 2022
Phase #11 Post-Const. Flow Evaluation	June 2021	July 2021

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
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**TOWN OF BEDFORD
PHASE #6 SMOKE TESTING / SEWER MAIN AND MANHOLE
REHABILITATION DESIGN & CONSTRUCTION
MWRA PROJECT NO. WRA-P11-03-3-1176**

SCOPE OF SERVICES

The purpose of this project is to reduce I/I through identifying, designing and rehabilitating sewer system infrastructure in specific community sewer areas. The project is part of an ongoing effort by the Town of Bedford to reduce infiltration and inflow. This project is part of a multi-phased sewer rehabilitation program for the Town and will include, but not be limited to, the following:

The Phase #6 Smoke Testing project which will identify sources of public and private inflow such as catch basins, driveway drains, roof leaders, and other sources improperly connected to the sanitary sewer system.

The Phase #6 Sewer Rehabilitation Design project will create documents suitable for public bidding to repair structural defects and remove infiltration and inflow from the sanitary sewer system.

The Phase #6 Sewer Rehabilitation Construction project will repair structural defects and remove I/I from the sanitary sewer system included in the Phase #6 Design project.

The above work will be performed pursuant to the terms and conditions detailed within the Agreement for Engineering Services By and Between the Town of Bedford and Weston & Sampson Engineers, Inc. and the approved MWRA I/I Local Financial Assistance Project Application received July 9, 2021.

Total project cost is estimated at \$669,500. Eligible MWRA I/I Local Financial Assistance is \$403,942 (Eligible Study cost = \$254,500 / Design & Bid cost = \$70,000 / Phase #6 Construction cost = \$79,442). An I/I reduction estimate will be provided upon completion of the Phase #6 SSES and Design (Fall/Winter 2021).

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Smoke Testing	September 2021	January 2022
Design, Bid & Award	November 2021	March 2022
Rehabilitation Construction	April 2022	May 2023

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
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**CITY OF CHELSEA
WILLOW STREET / WATTS STREET / CENTRAL AVENUE
INFRASTRUCTURE IMPROVEMENTS
MWRA PROJECT NO. WRA-P11-11-3-1175**

SCOPE OF SERVICES

The objective of this project is to reduce infiltration and inflow within the project area, reduce the risk of flooding in the area and continue the City’s strategic efforts towards separating the sewer and drain systems and eliminating CSOs. Significant inflow reduction is expected as a result of the project construction. This project is part of a larger project associated with water, sewer and drain improvements. The eligible portion is being limited to the sewer replacement and drain improvement portions of this project. The project includes utility and roadway improvements on Willow Street, Watts Street, and Central Avenue. In 2019, the City completed the City-Wide Sewer Separation Master Plan (Master Plan). This plan recommended sewer separation and flood mitigation conceptual-level improvements for each of the fourteen sewersheds across Chelsea. The City’s below-grade infrastructure improvement priorities include the primary goal of eliminating existing CSOs and achieving full sewer separation citywide in the long-term, while resolving existing flooding issues during heavy rainstorms in vulnerable areas.

Eligible I/I Project work will include, but not be limited to, the following:

1. Install 2750 LF of new storm drainpipe;
2. Perform 80 LF of sewer main spot repairs;
3. Install 170 LF of new sewer main;
4. Install 25 new manholes;
5. Install 15 new catch basins; and
6. Perform 1700 LF of cleaning & CCTV inspections.

Work will also include dewatering, handling of existing flows, temporary paving, test pit excavation, and mobilization. The project will also integrate potable water system improvements (not funded through the MWRA I/I program). The above work will be performed pursuant to the terms and conditions detailed within the Agreement For Engineering Services By and Between the City of Chelsea and Dewberry Engineers, Inc. and the approved MWRA I/I Local Financial Assistance Project Application received July 9, 2021. Eligible MWRA I/I Local Financial Assistance is \$1,630,000 (Phase 13 Distribution). The estimated removal of annual I/I after the completion of this rehabilitation project is 0.02 mgd.

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Design/Bid & Award	April 2021	November 2021
Construction	December 2021	November 2022
Warranty Re-Testing	Fall 2023	Fall 2023

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11

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TOWN OF MILTON, MASSACHUSETTS

**SEWER & STORM DRAIN REHABILITATION - CONSTRUCTION
CIP PROJECT 2 INFILTRATION REHABILITATION - DESIGN / CONSTRUCTION
CIP PROJECT 3 I/I INVESTIGATION AND REPORTING - STUDY
CIP PROJECT 4 I/I INVESTIGATION AND REPORTING - STUDY**

MWRA PROJECT NO. WRA-P11-21-3-1178

SCOPE OF SERVICES

The purpose of this project is to identify and rehabilitate community subareas that contribute excessive I/I, evaluate rehabilitation options and rehabilitate the sewer system on a continuous set schedule. Project work will include, but not be limited to, the following:

1. **Sewer & Storm Drain Rehabilitation - Construction (Milton Contract No. D21-1):** Construction of cost-effective and value-effective sewer/storm drain rehabilitations in Subareas G-12D / G-12E. Rehabilitation work includes: 3100 LF of cleaning and television inspection; performing eight (8) sewer main spot repairs; installing 68 LF of CIP drain short liners; and installing 368 LF of CIP drain pipe. (Construction Cost = \$600,000 / Eligible Construction Cost = \$257,000).
2. **CIP Project 2 Infiltration Rehabilitation - Design/Construction:** Design/construction of cost-effective and value-effective sewer rehabilitations in Subareas G-08A / G-11C. Work includes preparing construction rehabilitation drawings and specifications for public bidding; and preparing a final cost estimate for the designed rehabilitations. (Design Services Cost = \$70,000 / Eligible Design Services Cost = \$70,000) (Eligible Construction Cost = \$750,000 / Eligible Construction Cost = \$423,745).
3. **CIP Project 3 I/I Investigation and Reporting:** Clean, TV inspect, videotape and record 43,200 LF of sewer; conduct flow isolation on 39,800 LF of sewer; and perform topside manhole inspections of 260 sewer manholes in Subareas G-05 / G-12D / G-12E / G-15 / G-24 / S-15. (Investigation Services Cost = \$204,255 / Eligible Investigation Services Cost = \$204,255).
4. **CIP Project 4 I/I Investigation and Reporting:** Clean, TV inspect, videotape and record 45,000 LF of sewer; conduct flow isolation on 40,000 LF of sewer; and perform topside manhole inspections of 300 sewer manholes in Subareas G-09B / G-10A / G-11A / G-12A / S-17. (Investigation Services Cost = \$195,000 / Eligible Investigation Services Cost = \$195,000).

The above work will be performed pursuant to the terms and conditions detailed within the March 18, 2021 Agreement(s) For Engineering Services By and Between the Town of Milton and Weston & Sampson Engineers, Inc. and the approved MWRA Phase 11 I/I Local Financial Assistance Project Application received July 23, 2021. Total project cost is estimated at \$1,819,255. Eligible MWRA I/I Local Financial Assistance is \$1,150,000 (Phase 13 Allocation Limit) (Design = \$70,000 / Construction = \$680,745 / Investigation Services = \$399,255). As a result of the above work, an estimated 0.08 mgd of peak infiltration will be removed from the collection system.

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
ATTACHMENT B
FINANCIAL ASSISTANCE AGREEMENT**

TOWN OF MILTON, MASSACHUSETTS

**SEWER & STORM DRAIN REHABILITATION - CONSTRUCTION
CIP PROJECT 2 INFILTRATION REHABILITATION - DESIGN / CONSTRUCTION
CIP PROJECT 3 I/I INVESTIGATION AND REPORTING - STUDY
CIP PROJECT 4 I/I INVESTIGATION AND REPORTING - STUDY**

MWRA PROJECT NO. WRA-P11-21-3-1178

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
<u>Sewer & Storm Drain Rehabilitation</u>		
Rehabilitation Construction	October 2021	December 2021
Warranty Retesting	October 2022	November 2022
<u>CIP Project 2 Infiltration Rehabilitation</u>		
Design	October 2021	December 2021
Advertise	January 2022	January 2022
Bid Opening	February 2022	February 2022
Contract Award	March 2022	March 2022
Rehabilitation Construction	May 2022	July 2022
Warranty Retesting	May 2023	June 2023
<u>CIP Project 3 I/I Investigation and Reporting</u>		
Investigation	March 2021	May 2021
Data Review/Report Preparation	June 2021	December 2021
<u>CIP Project 4 I/I Investigation and Reporting</u>		
Investigation	March 2022	May 2022
Data Review/Report Preparation	June 2022	December 2022

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
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**TOWN OF NATICK, MASSACHUSETTS
THREE YEAR SEWER REHABILITATION
(NATICK CONTRACT NO. S-162)
MWRA PROJECT NO. WRA-P11-22-3-1161**

SCOPE OF SERVICES

Project I/I rehabilitation work will be performed in Natick Basins 4 / 11 / 14 / 16 and will include, but not be limited to, the following: perform 2000 LF of sewer main heavy cleaning; CCTV inspect 8000 LF of sewer main; perform service lateral or chimney cleaning (with CCTV inspection) at 475 locations; perform service lateral lining (up to 25 feet) at 450 locations and service chimney lining at 25 locations; install 25,150 LF of CIPP within 8 to 18-inch sewer main; perform CIPP point repair lining at 37 locations; test & seal joints within 800 LF of 8 to 12-inch sewer main; test 100 lateral service connections; seal 80 lateral service connections; remove & replace existing sewer main (8-inch through 12-inch; 0'-8' deep) up to 10 LF at nine (9) locations; remove & replace 600 LF of existing sewer main (8-inch through 12-inch; 0'-8' deep) beyond 10 LF; remove & replace existing sewer main (8-inch through 12-inch; >8'-12' deep) up to 10 LF (including chimney point repairs) at three (3) locations; remove & replace 150 LF of existing sewer main (8-inch through 12-inch; >8'-12' deep) beyond 10 LF; remove & replace existing sewer main (8-inch through 12-inch; >12'-16' deep) up to 10 LF (including chimney point repairs) at one (1) location; and remove & replace 50 LF of existing sewer main (8-inch through 12-inch; >12'-16' deep) beyond 10 LF. Additional project work includes the second phase of wastewater flow monitoring and development of the final I/I analysis report. Design work for this project was completed under MWRA Project No. WRA-P9-22-3-912.

The above work will be performed pursuant to the terms and conditions detailed within the Agreement For Professional Services By and Between the Town of Natick and Haley and Ward, Inc. and the approved MWRA Phase 11 I/I Local Financial Assistance Project Application received October 27, 2020.

Total project cost is estimated at \$4,408,764 [Engineering (Bid Services/Construction Administration/Resident Services = \$333,850) / Construction = \$3,885,914 / Flow Monitoring & I/I Analysis = \$189,000]. Eligible MWRA I/I Local Financial Assistance is \$1,250,000 (Program Phase 11 Funding Total). Additional construction phase funding (\$969,000) for this project was previously provided under MWRA Project No. WRA-P9-22-3-990.

As a result of the above sewer rehabilitation work, an estimated 0.14 mgd of peak infiltration will be removed from the collection system upon contract completion.

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Public Bidding	August 2020	August 2020
Rehabilitation Construction	November 2020	October 2023

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
ATTACHMENT A
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**TOWN OF WESTWOOD, MASSACHUSETTS
PHASE 3 I/I REHABILITATION**

MWRA PROJECT NO. WRA-P11-38-3-1179

SCOPE OF SERVICES

The purpose of this project is to identify and rehabilitate community subareas that contribute excessive I/I, evaluate rehabilitation options and rehabilitate the sewer system on a continuous set schedule. Project work will include, but not be limited to, the following:

Phase 3 I/I Rehabilitation Construction: Sewer rehabilitation work includes approximately: cleaning 1300 LF of sewer main; installing 3400 LF of 8-inch CIP sewer main; repairing (via full wrap) 44 lateral connections; rehabilitating 200 LF of lateral connections; performing five (5) sewer main spot repairs; rehabilitating 55 sewer manholes (via cementitious sealing); mortaring 17 sewer manhole chimneys; rebuilding three (3) sewer manhole benches & inverts; replacing four (4) sewer manhole frames & covers; raising & resetting four (4) sewer manhole frames & covers; and performing 3400 LF of post-construction CCTV inspection. Project work will be performed on the following streets: Arcadia Road / Deerfield Avenue / Westwood Glen Road / Hartford Street / Fisher Street / Washington Street / Gay Street / Thatcher Street / Lake Shore Drive / Westview Terrace / Evergreen Avenue. (Eligible Construction Cost = \$500,000).

The above work will be performed pursuant to the terms and conditions detailed within the December 1, 2020 Agreement For FY21 Infiltration Rehabilitation Program Engineering Services (Contract # DPW-21-C-022) By and Between the Town of Westwood and Environmental Partners Group, Inc. and the approved MWRA I/I Local Financial Assistance Project Application received July 28, 2021.

Total project cost is estimated at \$606,000 (Construction Cost = \$515,000 / Construction Services Cost = \$91,000). Eligible MWRA I/I Local Financial Assistance is \$500,000 (Eligible Construction Cost = \$500,000). As a result of the above work, an estimated 0.06 mgd of peak infiltration will be removed from the collection system.

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
I/I Investigations	March 2021	July 2021
Rehabilitation Design	July 2021	August 2021
Rehabilitation Construction	October 2021	June 2022

MWRA I/I Local Financial Assistance Program Funding Summary

November 2021 Funding Cycle

Community	Funding Allocation
Boston	\$ 6,172,520
Revere	\$ 300,000
Stoneham	\$ 970,000
Winthrop	\$ 250,000
Total	\$ 7,692,520

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM – PHASE 11
ATTACHMENT A
MWRA PROJECT NO. WRA-P11-05-3-1180**

**BWSC INSTALLATION OF NEW STORM DRAINS AND SANITARY SEWERS
IN EAST BOSTON
EAST BOSTON SEWER SEPARATION - PHASE III
BWSC CONTRACT NO. 19-309-002**

SCOPE OF SERVICES

The East Boston Sewer Separation Phase III Project encompasses approximately 44 acres within the following streets: Bremen Street / Cottage Street / Everett Street / Falcon Street / Frankfort Street / Haynes Street / Lexington Street / Marion Street / Maverick Street / Meridian Street / Murray Court / Orleans Street / Paris Street / Saratoga Street / Sumner Street / Westbrook Street / West Eagle Street. Project work entails separating the area’s combined sewers by installing new storm drains and converting or installing new sanitary sewers. Separation of the area’s building roofs drains will also be performed. The separation of sewers in conjunction with regulator modifications will reduce the frequency and magnitude of CSO events at specific overflows that currently discharge to the Boston Inner Harbor and the Mystic River. This will enable MWRA to improve system performance and approach the compliance limits of the Long Term CSO Control Plan.

Work to be performed under this Phase III project includes, but is not necessarily limited to: contracted replacement of approximately 3950 LF of combined sewer; installation of 7295 LF of 12 to 36-inch storm drain; installation 3945 LF of 10 to 30-inch sanitary sewer; structurally lining 2300 LF of 10 to 24-inch sewer/drain pipe; installation of 68 manholes and one (1) catch basin; installation of 69 sewer frames & covers; dye testing 14 downspouts; disconnecting 129 downspouts; rehabilitating 24 sewer manholes; cleaning and CCTV inspecting 8050 LF of 8 to 48-inch sewer/drain conduits; and the performance of all other work pursuant to the terms and conditions detailed within the plans and specifications of BWSC Contract No. 19-309-002 [Installation of New Storm Drains, Sanitary Sewers and Water Mains in East Boston (East Boston Sewer Separation - Phase III)] and the approved MWRA I/I Local Financial Assistance Project Application received July 20, 2021.

The design storm peak hour inflow rate reduction is 19.8 MGD, design storm inflow volume reduction is 1.60 MG and the average annual inflow reduction is 0.12 MGD. Total project cost is estimated at \$12,256,797. Eligible MWRA I/I Local Financial Assistance is \$6,172,520 (Separation Construction = \$6,172,520).

PROJECT SCHEDULE

<u>Description of Work</u>	<u>Start Date</u>	<u>Completion Date</u>
Design	March 2020	March 2021
Contract Bid / Award	June 2021	August 2021
Construction	October 2021	December 2023

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**CITY OF REVERE, MASSACHUSETTS
PHASE 12 DESIGN OF RECOMMENDED SEWER REAHABILITATIONS
MWRA PROJECT NO. WRA-P11-29-2-1183**

SCOPE OF SERVICES

The scope of work for this project includes the design of several projects, all of which have been developed based on recommendations from previous SSES-type investigations that are performed annually in the City, including CCTV, flow monitoring, public and private inflow investigations (sump pump inspections, smoke testing, dye testing, etc.). The City of Revere has been actively conducting corrective actions as necessary to meet the City's regulatory obligations of the 2010 issued Consent Decree. The City is currently in the 12th year of its phased rehabilitation construction program. The designs that will be performed under this project are part of the overall Program Management Contract with CDM-Smith. The Program Management Contract includes activities that are both eligible and ineligible through the MWRA I/I Program. The ineligible items will be funded through the City's Water and Sewer Enterprise Fund.

The eligible MWRA I/I portions of the project will include the following activities:

Design of Phase 12 CIPP Lining: This project will involve the design of the recommended sewer rehabilitations which will include but not be limited to: cured-in-place pipe lining of approximately 40,000 linear feet of sewer; spot repair by excavation and replacement of 50 linear feet of pipe; rehabilitation of 212 sewer manholes; and service lateral lining of approximately 600 services. The majority of this project will be performed in Subareas FM-4 and FM-11 of the City.

Design of Service Lateral Connection CIPP Lining: This project will involve the design of CIPP Lining of service laterals and service lateral connections in locations with high groundwater or tidal influence. These locations will be based on previously performed flow metering. The majority of this project will be performed in Subarea FM-1 of the City.

Design of Public and Private Inflow Removal: This Project will involve redirecting approximately 30 sources of both public (catch basins and storm drain cross-connections) and private sources (roof drains, yard drains driveway drains, sump pumps) of inflow from the sewer to the storm drain. In order to adequately redirect the inflow sources from the sewer to the storm drain, additional drainage piping, manholes, and catch basins may need to be constructed. This project will be Citywide, and will address a variety of inflow types. The resultant construction associated with the design of these I/I reduction projects will be funded by the Massachusetts State Revolving Fund (SRF) Loan Program.

The above work will be performed pursuant to the terms and conditions detailed within the Agreement For Engineering Services By and Between the City of Revere and CDM-Smith and the approved MWRA I/I Local Financial Assistance Project Application received November 3, 2021. Overall project costs are estimated at \$600,000. Eligible MWRA I/I Local Financial Assistance is \$300,000.

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**CITY OF REVERE, MASSACHUSETTS
PHASE 12 DESIGN OF RECOMMENDED SEWER REAHABILITATIONS
MWRA PROJECT NO. WRA-P11-29-2-1183**

PROJECT SCHEDULE

<u>Description of Work</u>	<u>Start Date</u>	<u>Completion Date</u>
CIPP Lining Design	Fall 2021	Spring 2022
CIPP Lateral Lining Design	Winter 2022	Summer 2022
Public/Private Inflow Removal Design	Spring 2022	Summer 2022

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF STONEHAM, MASSACHUSETTS
PHASE 8 SEWER SYSTEM I/I REHABILITATION
MWRA PROJECT NO. WRA-P11-31-3-1182**

SCOPE OF SERVICES

The objective of the project is I/I identification and removal, and sewer system rehabilitation for structural deficiencies, through pipeline and manhole rehabilitation and replacement. Phase 8 Sewer System I/I rehabilitation work will be conducted primarily in Stoneham Study Area 4.

Investigations conducted in 2018 and 2019 included CCTV inspection of approximately 40,000 LF of 6 to 15-inch diameter sewer main and inspection of approximately 250 sewer manholes. Rehabilitation recommendations from these inspections included:

1. CIP lining of approximately 17,000 LF of sewer main;
2. Grouting sewer service connections;
3. Cutting of protruding service connections;
4. Rehabilitation of defective manhole drop connections;
5. Performing approximately 5 excavation point repairs;
6. Cementitious lining of approximately 40 sewer manholes; and
7. Conduct limited CCTV inspections on Main Street to determine I/I removal rehabilitation needs.

For the Phase 8 Rehabilitation contract, these recommendations will be reviewed holistically with past rehab recommendations and additional discussions with the Town regarding problem I/I areas, and final rehabilitation will be designed based on the severity of defects, their associated I/I contribution, and the cost effectiveness of rehabilitation for I/I removal. Pipeline rehabilitation methods will consist primarily of cured-in-place pipe lining, but may also include: testing and sealing of pipe joints and service connections, cured-in-place spot repairs, and open cut excavation repairs. Manhole rehabilitation methods may include lining of manhole chimneys; chemical sealing of walls and joints, pipe connections, and bench and invert; as well as cementitious lining and epoxy lining of manholes.

The above work will be performed pursuant to the terms and conditions detailed within the Agreement For Engineering Services By and Between the Town of Stoneham and Arcadis U.S., Inc. and the approved MWRA I/I Local Financial Assistance Project Application received October 14, 2021. Total project cost is estimated at \$1,250,000. Eligible MWRA I/I Local Financial Assistance is \$970,000 (Study / Planning / Design = \$70,000 / Construction Engineering = \$180,000 / Construction = \$720,000). For the Phase 8 Sewer Rehabilitation, estimated I/I reductions will be determined during pre-rehabilitation CCTV investigations, manhole inspections and engineering condition assessment.

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF STONEHAM, MASSACHUSETTS
PHASE 8 SEWER SYSTEM I/I REHABILITATION
MWRA PROJECT NO. WRA-P11-31-3-1182**

PROJECT SCHEDULE

<u>Description of Work</u>	<u>Start Date</u>	<u>Completion Date</u>
Planning / Design	November 2021	February 2022
Bidding / Award	February 2022	March 2022
Construction	Spring 2022	Fall 2022

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF WINTHROP, MASSACHUSETTS
PHASE 3 SSES
MWRA PROJECT NO. WRA-P11-42-1-1181**

SCOPE OF SERVICES

The objective of this project is to determine sources of I/I and further quantify extraneous flows in the collection system. Data collected during the project will be reviewed and analyzed to determine where I/I can be cost effectively removed. The resulting deliverable will be a report that summarizes locations of defects causing I/I and recommendations to rehabilitate the affected sewers using trenchless technologies and conventional excavation.

The Phase 3 Sewer System Evaluation Survey (SSES), is the next phase in the Town’s I/I program. This work was recommended in the Town’s Infiltration/Inflow Analysis report dated October 2019. The I/I project work will include, but not be limited to the following: flow isolation, manhole inspections, CCTV inspections and smoke testing to identify inflow and infiltration in subareas of the Town’s collection system.

The Phase 3 SSES work will identify sources of I/I in subareas: 1D, 2, 2A, 2B, 6, 8, 1C and 3. Data collected during the project will be reviewed and analyzed to determine where I/I can be cost effectively removed. The resulting deliverable will be a report that summarizes locations of defects causing I/I and recommendations to rehabilitate the affected sewers using trenchless technologies and conventional excavation.

The above work will be performed pursuant to the terms and conditions detailed within the Agreement For Engineering Services By and Between the Town of Winthrop and Woodard & Curran, Inc. and the approved MWRA I/I Local Financial Assistance Project Application received July 22, 2021. The total cost of this project is estimated at \$250,000 (Study = \$250,000). Eligible MWRA I/I Local Financial Assistance is \$250,000 (Phase 13 Distribution). This project will not directly remove infiltration/inflow from the collection system but will lead into design and sewer rehabilitation work that will later reduce I/I.

PROJECT SCHEDULE

<u>Description of Work</u>	<u>Start Date</u>	<u>Completion Date</u>
Flow Isolation, Manhole Inspections, CCTV Inspections & Smoke Testing	July 2021	November 2021
SSES Report	December 2021	November 2022

MWRA I/I Local Financial Assistance Program Funding Summary

February 2022 Funding Cycle

Community	Funding Allocation
Arlington	\$ 784,000
Brookline	\$ 3,000,000
Weymouth	\$ 365,000
Total	\$ 4,149,000

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

MWRA PROJECT NO. WRA-P11-01-3-1186

TOWN OF ARLINGTON

**PHASE #14 SANITARY SEWER REHABILITATION CONSTRUCTION /
PHASE #12 POST-CONSTRUCTION FLOW EVALUATION**

SCOPE OF SERVICES

The Town of Arlington requests funding for the following projects which are part of the Town's Sewer System Capital Improvement Program, which is designed to reduce Inflow and Infiltration. Each phase of the Program includes the most cost-effective repairs remaining within the Town. The work included in the Phase #14 Design and Rehabilitation Construction projects (Task 1 & 2) will be located in various portions of Investigation Area #1 through Area #11.

Task 1 – Phase #14 Design, Bid, & Award:

The goal of the Phase #14 Design, Bid & Award project is to design the removal of cost-effective sources of infiltration and inflow (I/I) and produce contract documents suitable for public bidding in the investigation areas named above.

Task 2 – Phase #14 Rehabilitation Construction & Construction Services:

The goal of the Phase #14 Construction project is to rehabilitate and repair sewer infrastructure and remove sources of I/I identified during previous Sewer System Investigation Projects and included in the Phase #14 Design, Bid & Award project, within the investigation areas stated above.

Task 3 – Phase #12 Post Construction Flow Evaluation:

The Phase #12 Post-Construction Flow Evaluation will compare pre- and post-rehabilitation ground water levels and flow isolation data to estimate the quantity of peak infiltration removed from the sewer system from the Phase #12 Construction project. A draft & Final Report will be prepared evaluating the pre- and post-construction flows.

The above work will be performed pursuant to the terms and conditions detailed within the Agreement For Engineering Services By and Between the Town of Arlington and Weston & Sampson Engineers, Inc. and the approved MWRA I/I Local Financial Assistance Project Application received January 14, 2022. Total project cost is estimated at \$784,000. Eligible MWRA I/I Local Financial Assistance is \$784,000 (Eligible Phase #14 Design, Bid, & Award Cost = \$89,000 / Eligible Phase #14 Construction Cost = \$540,000 / Eligible Phase #14 Construction Services Cost = \$140,000 / Eligible Phase #12 Post Construction Flow Evaluation Cost = \$15,000). Upon contract completion, this work will result in an estimated removal of 0.06 MGD of peak I/I flows from the sanitary sewer system.

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
ATTACHMENT B
FINANCIAL ASSISTANCE AGREEMENT**

MWRA PROJECT NO. WRA-P11-01-3-1186

TOWN OF ARLINGTON

**PHASE #14 SANITARY SEWER REHABILITATION CONSTRUCTION /
PHASE #12 POST-CONSTRUCTION FLOW EVALUATION**

PROJECT SCHEDULE

<u>Description of Work</u>	<u>Start Date</u>	<u>Completion Date</u>
Phase #14 Design, Bid & Award	January 2022	June 2022
Phase #14 Construction Rehabilitation	August 2022	November 2022
Phase #14 Construction Warranty Retest	May 2023	June 2023
Phase #12 Post-Const. Flow Evaluation	June 2022	July 2022

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

MWRA PROJECT NO. WRA-P11-07-3-1184

TOWN OF BROOKLINE

**DESIGN & CONSTRUCTION OF RECOMMENDED SEWER REHABILITATIONS IN
SEWER SUBAREAS NI-7 AND NI-8 (SOUTH)**

SCOPE OF SERVICES

The purpose of this project is to identify and rehabilitate community subareas that contribute excessive I/I, evaluate rehabilitation options and rehabilitate the sewer system on a continuous set schedule. This project is a combination of investigation, design, and construction. In 2018, Brookline initiated a sewer system capital improvement program with the goal of rehabilitating all non-CIPP lined sanitary sewer mains and their associated manholes throughout Town from the period of 2018-2026 through sixteen (16) capital improvement projects.

The investigation work includes but is not limited to the following: closed-circuit television (CCTV) inspections for all sewer mains within Sewer Subareas NI-7 and NI-8 (South); review of the CCTV inspections in these subareas; and field inspections of all sewer manholes within these subareas and completing field investigations.

The design component of the project involves the preparation of biddable construction documents based on the investigation work completed. Separate construction contracts will be administered for the CIPP lining of sewers in the project areas, sewer manhole rehabilitation in the project areas, and point repairs (dig and replace) of sewers needing replacement in project areas.

The construction component of the project involves the construction of measures outlined in the biddable construction documents and construction administration. The construction of the recommended sewer rehabilitations will include but is not limited to: performing approximately 31,000 LF of cured-in-place (CIPP) lining of sanitary sewers, performing rehabilitation of approximately 194 manholes, and performing approximately 12 dig and replace point repairs.

The above work will be performed pursuant to the terms and conditions detailed within the Agreement For Engineering Services By and Between the Town of Brookline and BETA Group, Inc. and the approved MWRA I/I Local Financial Assistance Project Application received November 9, 2021. The total project cost is estimated at \$3,000,000. Eligible MWRA I/I Local Financial Assistance is \$3,000,000 (Planning/Design = \$370,000; Construction = \$2,630,000). At the completion of this project, it is estimated that 0.07 mgd of annual average I/I will be reduced from the collection system.

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
ATTACHMENT B
FINANCIAL ASSISTANCE AGREEMENT**

MWRA PROJECT NO. WRA-P11-07-3-1184

TOWN OF BROOKLINE

**DESIGN & CONSTRUCTION OF RECOMMENDED SEWER REHABILITATIONS IN
SEWER SUBAREAS NI-7 AND NI-8 (SOUTH)**

PROJECT SCHEDULE

<u>Description of Work</u>	<u>Start Date</u>	<u>Completion Date</u>
I/I Planning & Investigations	January 2022	April 2022
Design of Sewer Rehabilitations	April 2022	July 2022
Construction of Sewer Rehabilitations	August 2022	December 2022

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF WEYMOUTH, MASSACHUSETTS
I/I INVESTIGATION & REHABILITATION PROGRAM
MWRA PROJECT NO. WRA-P11-39-2-1185**

SCOPE OF SERVICES

The purpose of this project is to identify and rehabilitate community subareas that contribute excessive I/I, evaluate rehabilitation options and rehabilitate the sewer system on a continuous set schedule. Project work will include, but not be limited to, the following:

Town-Wide Sewer System Investigation Program - Year 11 (Estimated Cost = \$275,000):

1. Flow isolate as much as 54,580 LF of 6 to 12-inch sewer in Subarea B-3 to quantify infiltration amounts within manhole-to-manhole segments of sewer. The inspection will be conducted between the hours of 12AM and 6AM when groundwater levels are typically at their highest and sanitary flows are at a minimum.
2. Light clean, TV inspect, videotape and record as much as 60,320 LF of sewer in Subarea B-3. The TV inspection will be performed to locate problem areas and I/I sources within manhole-to-manhole segments of sewer. The inspection will be conducted in Spring 2022 when groundwater levels are typically at their highest.
3. Conduct topside physical survey of as many as 325 sewer manholes in Subarea B-3 for defects and I/I sources. A written log will be furnished for each manhole inspected.
4. Prepare a letter report that details areas in which work was performed, summarizes work completed to date and includes recommendations, a cost-effectiveness analysis and prioritization analysis for rehabilitation of pipeline/manhole defects and I/I sources identified during this investigation. Estimated construction costs will also be provided.

Year 9 & 10 Infiltration Rehabilitation Design / Bid & Award (Estimated Cost = \$90,000):

Project work will include the design of public sewer rehabilitations and replacements based on the results of the November 9, 2021 Town-Wide Sewer Investigation and Rehabilitation Program - Year Ten Letter Report. The design of the Year 9 & 10 I/I Rehabilitations shall include approximately: 12,000 LF feet of cleaning, inspecting, testing, and sealing of sewers; 6420 LF feet of light cleaning and television inspection; 5513 LF of heavy cleaning and television inspection; 9500 LF of cured-in-place pipe and structural cure-in-place pipe; installation of short liners and structural short liners at 23 locations; testing and grouting of 28 service laterals; cutting and grouting of three service laterals; installing lateral liners at one location; open cut point repair at two locations; manhole cementitious lining at 48 locations; root treatment of manholes at eight manholes; and installing eight manhole inflow dishes.

Total project cost is estimated at \$365,000. Eligible MWRA I/I Local Financial Assistance is \$365,000. Project work will be performed pursuant to the terms and conditions detailed within the approved MWRA I/I Local Financial Assistance Project Application (received January 13, 2022) and the Agreements For Engineering Services By And Between The Town of Weymouth, MA And Weston & Sampson Engineers, Inc. (dated January 13, 2022).

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
ATTACHMENT B
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF WEYMOUTH, MASSACHUSETTS
I/I INVESTIGATION & REHABILITATION PROGRAM
MWRA PROJECT NO. WRA-P11-39-2-1185**

PROJECT SCHEDULE

<u>Description of Work</u>	<u>Start Date</u>	<u>Completion Date</u>
Town-Wide Sewer System Investigation Program - Year 11:		
Flow Isolation	March 2022	May 2022
TV Inspection	March 2022	May 2022
Manhole Inspection	March 2022	May 2022
Data Review / Letter Report	June 2022	November 2022
Years 9 & 10 Infiltration Rehabilitation Design / Bid & Award:		
Design	March 2022	May 2022
Bid and Award	June 2022	June 2022
2022 Infiltration Construction	July 2022	December 2022
Warranty Retesting	May 2023	June 2023

MWRA I/I Local Financial Assistance Program Funding Summary

May 2022 Funding Cycle

Community	Funding Allocation
Boston	\$10,827,958
Braintree	\$ 347,257
Canton	\$ 178,350
Everett	\$ 2,550,200
Total	\$13,903,765

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM
ATTACHMENT A
MWRA PROJECT NO. WRA-P11-05-3-1189**

**BWSC INSTALLATION OF NEW STORM DRAINS AND SANITARY SEWERS
IN ROXBURY
UPPER ROXBURY AREA SEWER SEPARATION - PHASE III
BWSC CONTRACT NO. 17-309-011**

SCOPE OF SERVICES

The area included in the sewer separation project is part of a larger 250 acre residential, commercial and industrial area in Roxbury bounded by Blue Hill Avenue, Warren Street, Gerard Street, Melnea Cass Boulevard and the Washington Park area. The area being separated by this project encompasses approximately 58 acres. This is the final contract of a three-phase plan for sewer separation in the Upper Roxbury area.

Project work entails separating the area’s combined sewers by installing new storm drains and converting or installing new sanitary sewers. Separation of the area’s building roofs drains will also be performed. The separation of sewers in conjunction with regulator modifications will reduce the frequency and magnitude of CSO events at specific overflows that currently discharge to the Boston Inner Harbor. This will enable MWRA to improve system performance and approach the compliance limits of the Long Term CSO Control Plan.

Work to be performed under this Phase III project includes, but is not necessarily limited to: contracted replacement of approximately 7615 LF of combined sewer / sanitary sewer; installation of 8395 LF of 12 to 42-inch storm drain; structurally lining 4890 LF of 12 and 15-inch sewer/drain pipe; performing three (3) point repairs; installation of 97 manholes and 19 catch basins; installation of 69 sewer frames & covers; dye testing 65 downspouts; disconnecting 231 downspouts; rehabilitating 25 sewer manholes; cleaning and CCTV inspecting 6060 LF of 8 to 30-inch sewer/ drain conduits; and the performance of all other work pursuant to the terms and conditions detailed within the plans and specifications of BWSC Contract No. 17-309-011 [Installation of New Storm Drains, Sanitary Sewers and Water Mains in Roxbury (Upper Roxbury Area Sewer Separation - Phase III)] and the approved MWRA I/I Local Financial Assistance Project Application received March 25, 2022.

The design storm peak hour inflow rate reduction is 26 MGD, design storm inflow volume reduction is 2.17 MG and the average annual inflow reduction is 0.15 MGD. Total project cost is estimated at \$16,128,818. Eligible MWRA I/I Local Financial Assistance is \$10,827,958 (Separation Construction = \$10,827,958). In addition, \$4,288,843 in unspent MWRA funds from BWSC Contract No. 16-309-011 (Upper Roxbury Sewer Separation Phase II) will be applied to this project.

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Design	March 2016	December 2021
Contract Bid / Award	January 2022	March 2022
Construction	April 2022	December 2023

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF BRAINTREE, MASSACHUSETTS
I/I REHABILITATION PROGRAM - YEAR 9
MWRA PROJECT NO. WRA-P11-06-3-1191**

SCOPE OF SERVICES

The purpose of this project is to identify and rehabilitate community sewer subareas that contribute excessive I/I, evaluate rehabilitation options and rehabilitate the sewer system on a continuous set schedule. Project work will include, but not be limited to, the following:

Year 9 I/I Rehabilitation - Construction (Est. Cost = \$ 347,257)

Construction of cost-effective and value-effective sewer rehabilitations in Braintree Sewer Subareas A1 / B1 / G1 / KG1 / N1 / R1 including the installation of 4200 LF of 18 to 30-inch cured-in-place pipe (CIPP) and cured-in-place (CIP) lateral liners at 26 locations.

Total project cost is estimated at \$347,257. Eligible MWRA I/I Local Financial Assistance is \$347,257 (Program Phase 11 Allocation Balance). Additional Year 9 I/I Rehabilitation Construction funding (\$880,000) was provided under MWRA Project No. WRA-P11-06-3-1142.

Project work will be performed pursuant to the terms and conditions detailed within the approved MWRA I/I Local Financial Assistance Project Application (received April 26, 2022) and the Agreement For Engineering Services By And Between The Town of Braintree, MA And Weston & Sampson Engineers, Inc. As a result of the above work, an estimated 0.40 mgd of peak I/I will be removed from the collection system upon contract completion.

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Year 9 I/I Rehabilitation:		
Design	January 2022	May 2022
Bid and Award	June 2022	August 2022
Construction	October 2022	December 2022
Warranty Retesting	October 2023	November 2023

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11

**ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF CANTON, MASSACHUSETTS
FLOW ISOLATION TESTING AND CCTV INSPECTION
MWRA PROJECT NO. WRA-P11-10-2-1188**

SCOPE OF SERVICES

The purpose of this project is to identify and quantify community sub-areas that contribute excessive I/I and evaluate sewer system rehabilitation options.

Based upon findings from the 2021 Town of Canton I/I Study (MWRA Project No. WRA-P11-10-1-1162), a continued assessment of identified priority areas will be undertaken. Six (6) of the twenty-eight (28) community metered sub-areas showed moderate to excessive levels of I/I (as defined by MassDEP). This investigation project will target the six (6) prioritized areas with flow isolation testing and CCTV inspections.

Task 1. Flow Isolation Testing: This task will include development of the flow isolation workplan, field work (flow isolation of approximately 112,000 LF of gravity sewer within priority Sub-areas 7 / 16 / 18 / 22 / 24 / 27) and resulting data analysis with the intention of recommending those assets that need further assessment under Task 2 - CCTV Inspection and Cleaning.

Task 2. CCTV Inspection and Cleaning: Task 2 will include development of the CCTV inspection and cleaning workplan, field work (light cleaning and CCTV inspection of 23,000 LF of gravity sewer) and resulting data analysis with the intention of recommending those assets that should be considered for rehabilitation/repair.

Task 3. Summary Report and Recommendations: Task 3 will develop a summary report and recommendations from the results of the above work. The report will include the recommended methodology for asset rehabilitation/repair as well as a preliminary cost estimate for each asset rehabilitation/repair activity (along with a design/construction schedule for each recommended project).

The above work will be performed pursuant to the terms and conditions detailed within the Agreement For Professional Engineering Services By and Between the Town of Canton and Kleinfelder Northeast, Inc. (dated March 1, 2022) and the approved MWRA I/I Local Financial Assistance Project Application (received March 22, 2022).

Total project cost is estimated at \$178,350. Eligible MWRA I/I Local Financial Assistance is \$178,350.

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Flow Isolation Testing	March 2022	May 2022
CCTV Inspection	April 2022	June 2022
Summary Report	June 2022	September 2022

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**CITY OF EVERETT, MASSACHUSETTS
PARIS STREET SEWER SEPARATION PROJECT
MWRA PROJECT NO. WRA-P11-13-3-1192**

SCOPE OF SERVICES

The objective of this project is to disconnect catch basins connected to the sewer system and install new drain infrastructure in the Paris Street area of the City of Everett, in order to remove inflow from the sewer system. The construction design is based upon a BETA Engineering Group report entitled 'Draft Evaluation Memo - Inflow/Infiltration Project Approach' (dated October 2015).

Construction of eligible sewer separation work for this project will include, but not be limited to, the following:

- Install 300 LF of 12-inch CLDI drain pipe;
- Install 50 LF of 16 to 20-inch CLDI drain pipe;
- Install 300 LF of 24-inch CLDI drain pipe;
- Install 250 LF of 12-inch RCP drain pipe;
- Install 400 LF of 15-inch RCP drain pipe;
- Install 175 LF of 18-inch RCP drain pipe;
- Install 70 LF of 21 to 24-inch RCP drain pipe;
- Install 900 LF of 36-inch RCP drain pipe;
- Install 22 four to five-foot diameter drain manholes;
- Install 22 four-foot diameter catch basins;
- Install 22 frames & covers;
- Install 22 frames & grates;
- Install 22 hoods;
- Remove and dispose of 2000 LF of existing pipe (up to 12-inch);
- Remove and dispose of 16 existing structures;
- Seal 6 drain lines / sewer lines with brick and mortar;
- Install 800 LF of 8-inch SDR 35 sewer pipe;
- Install 10 four-foot diameter sewer manholes;
- Relocate 15 sewer services;
- Connect 10 new sewer pipes to existing structures;
- Relocate 2 water mains under or over drain pipe; and
- Relocate 26 water services.

The above work will be performed pursuant to the terms and conditions detailed within the Agreement For Engineering Services By and Between the City of Everett and BETA Group Inc. and the approved MWRA I/I Local Financial Assistance Project Application received April 13, 2022. Total eligible project cost is estimated at \$3,268,007. Eligible MWRA I/I Local Financial Assistance is \$2,550,200 (Program Phase 11 and 12 funding). Approximately 4.33 mgd of peak inflow is estimated to be removed from the collection system upon contract completion.

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
ATTACHMENT B
FINANCIAL ASSISTANCE AGREEMENT**

**CITY OF EVERETT, MASSACHUSETTS
PARIS STREET SEWER SEPARATION PROJECT
MWRA PROJECT NO. WRA-P11-13-3-1192**

PROJECT SCHEDULE

<u>Description of Work</u>	<u>Start Date</u>	<u>Completion Date</u>
Design	January 2022	May 2022
Bid/Award	June 2022	July 2022
Construction	July 2022	November 2022
Warranty/Retesting	October 2022	November 2023

ATTACHMENT 5
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY22
Reporting Period: July 2021 Through June 2022

I/I REDUCTION STATUS UPDATE FOR MEMBER COMMUNITIES

The MWRA is working cooperatively with member communities to develop phased I/I reduction programs throughout the service area. The Authority will encourage continuing community efforts in I/I reduction as detailed in the MWRA Regional I/I Reduction Plan. Many community I/I projects are funded through MWRA's I/I Local Financial Assistance Program. This \$760.75 million grant/loan program was established to provide funding to member sewer communities to perform I/I reduction and sewer system rehabilitation projects within their locally-owned collection systems. Through FY22, MWRA has distributed \$510 million to fund local projects. A detailed update on MWRA's I/I Local Financial Assistance Program is included as Attachment 4 to this report.

The Authority has instituted a computer-based questionnaire format for communities to submit annual status reports on their I/I reduction programs. All 43 member sewer communities have submitted information to MWRA for FY22. Community information is summarized below:

1. ARLINGTON: North System

Background Information:

- Miles of Sewer: 106
- Sewered Population: 46,271
- Three Year (CY18 - CY20) Annual Average I/I: 2.43 mgd
- MassDEP Administrative Actions Since 2010: ACOP-NE-10-1N006 (August 2010)

Latest I/I or SSES Reports:

- Area #8 Sewer System Investigation Report (August 2014)
- Area #9 Sewer System Investigation Report (August 2015)
- Area #10 Sewer System Investigation Report (August 2016)
- Phase #7 Sanitary Sewer Rehabilitation - Post Rehabilitation Flow Evaluation (July 2017)
- Area #11 Sewer System Investigation Report (August 2017)
- Phase #8 Sanitary Sewer Rehabilitation Report - Post Rehabilitation Flow Evaluation (July 2018)
- Area #8, 9, 10 & 11 Smoke Testing Report (January 2019)
- Phase #9 Sanitary Sewer Rehabilitation - Post Rehabilitation Flow Evaluation (July 2019)
- Phase #10 Sanitary Sewer Rehabilitation - Post Rehabilitation Flow Evaluation (July 2020)
- Phase #11 Sanitary Sewer Rehabilitation - Post Rehabilitation Flow Evaluation (July 2021)

Private Source Inflow Removal Program: The Water Meter Replacement and Building Inspection Program was substantially complete in June 2019. At the time of a water meter replacement, a building inspection was performed. The building inspections have continued to progress past substantial completion. As of March 2021, 8015 building inspections have been completed. Remaining building inspections are expected to be complete in March 2023. The Town developed a Private Inflow Removal Program that was submitted to DEP in April 2022.

I/I Rehabilitation Projects in Design or Construction: The Phase #13 Sanitary Sewer Rehabilitations (Bid No. 21-34) was substantially complete in May 2022. Project work included: root treatment of 878 LF of sewer and one (1) manhole; installation of 6599 LF of cured-in-place pipe (CIPP) lining; grouting 122 service connections; cutting 20 protruding service connections; cementitious lining of 280 VF feet of sewer manholes; grouting and patching 10 sewer manholes; installing one (1) manhole inflow dish; building six (6) manhole benches and inverts; and cleaning and inspecting 3602 LF of sewer main. The project's warranty inspections will be completed in Fall 2022 or Spring 2023 (pending groundwater conditions). The Phase #14 Sanitary Sewer Rehabilitations (Bid No. 22-34) will be bid on August 10, 2022. The project is expected to be substantially complete by November 2022 with warranty inspections completed by November 2023.

Reporting Period Activity: The warranty inspection for the Phase #12 Sanitary Sewer Rehabilitations (Bid No. 20-32) was completed in April 2021. The Phase #12 Post Construction Flow Evaluation Report was completed in July 2022. In March 2022, funds (\$784,000) were distributed for the Phase 14 Sewer System Rehabilitation Construction Project and Phase 12 Post Construction Flow Evaluation (MWRA Project No. WRA-P11-01-3-1186). In September 2021, funds (\$648,900) were distributed for the Phase 13 Sewer System Rehabilitation Construction Project and Phase 11 Post Construction Flow Evaluation (MWRA Project No. WRA-P11-01-3-1177). Project details are included in Attachment 4.

MWRA I/I Local Financial Assistance Program: The community has financed twenty-six (26) I/I reduction projects through the Authority's funding assistance program. Of the \$13,703,000 allotted through the Program's Phases 1 - 13, the community has \$2,247,100 remaining in funding assistance.

2. ASHLAND: South System

Background Information:

- Miles of Sewer: 66
- Sewered Population: 147,717
- Three Year (CY18 - CY20) Annual Average I/I: 0.47 mgd
- MassDEP Administrative Actions Since 2010: None

Latest I/I or SSES Report: SSES Analysis of Flow Metering Data: May 2019
I/I Analysis Report: July 2020
SSES Initial Phase Report: July 2020
Smoke & Dye Testing Report: August - October 2020

Private Source Inflow Removal Program: Sump pump/roof leader investigations (via DPW personnel) by sub-basin during CY21/22 (home entries during this period were limited by COVID-19 restrictions):

Sub-Basin 1: 5 inspections	Sub-Basin 2: 5 inspections
Sub-Basin 3: 1 inspections	Sub-Basin 4: 3 inspections

I/I Rehabilitation Projects in Design or Construction: The Town contracted internal CCTV inspection of 199,500 LF of sewer main in Ashland Sewer System Sub-Basins 1 / 2. The sewer main investigation work has been completed. An Investigations Summary Report was prepared and addressed sewer main rehabilitation options.

Reporting Period Activity: The Town is currently developing sewer system rehabilitation contract documents. The rehabilitation program will be bid in Fall 2022 (MWRA Project No. WRA-P11-02-3-1168). Also, the Town is in the process of purchasing a portable mainline sewer camera crawler (MWRA Project No. WRA-P11-02-3-1168). The mainline sewer camera crawler features a 10-inch touchscreen on the 600 foot motorized reel and a pan-tilt camera head. The crawler only takes two operators to run this system and is transportable using a pickup truck or all-terrain vehicle.

In March 2021, MWRA funds were distributed for an I/I Identification & Rehabilitation Project in Ashland Sub-Basins 1/2/3/4 (MWRA Project No. WRA-P11-02-3-1168). Project work is ongoing. Town-wide wastewater flow metering and I/I identification project (MWRA Project No. WRA-P9-02-1-957) began in March 2017. Flow Metering (20 meters) was performed 3/28/17 - 6/30/17. Metering / infiltration analysis / flow isolation and CCTV inspection work completed. Wastewater data analysis and report preparation completed May 2019. Sewer manhole inspections (with GIS locations) began in 2019 and are complete. Smoke & Dye Testing work performed August - October 2020. Sewer repair work was completed Summer 2019. Thirteen (13) short liner spot repairs were installed within Town sewer mains. Town forces continue to jet problematic and high grease areas. The Town is also in the process of upgrading the Chestnut Street Sewer Pump Station. Upgrades include replacing pumps, electronics, SCADA system and drives.

MWRA I/I Local Financial Assistance Program: The community has financed nine (9) I/I reduction projects through the Authority's funding assistance program. Of the \$3,818,500 allotted through the Program's Phases 1 - 13, the community has \$1,798,440 remaining in funding assistance.

3. BEDFORD: North System

Background Information:

- Miles of Sewer: 78
- Sewered Population: 13,947
- Three Year (CY18 - CY20) Annual Average I/I: 1.14 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report: Phase #3 Sewer System Investigation (October 2016)
Phase #4 Sewer System Investigation (October 2016)
Phase #5 Sewer System Investigation (May 2018)
Phase #6 Sewer System Investigation (Ongoing)

Private Source Inflow Removal Program: The Town identified 50 sump pumps during their Phase #5 Sewer System Investigation and plan on designing a project for removing the sump pumps connected to the sewer system.

I/I Rehabilitation Projects in Design or Construction: See Reporting Period Activity below.

Reporting Period Activity: The Phase #6 Sewer System Investigation is ongoing. Cleaning and CCTV inspections were completed in Summer 2021. An estimated I/I quantity removed will be identified upon investigation review. The Phase #6 Construction Project is expected to begin in Fall 2022. In September 2021, funds were distributed for the Sewer and Manhole Rehabilitations (Phase #6) Project. Project details are included in Attachment 4.

MWRA I/I Local Financial Assistance Program: The community has financed nine (9) I/I reduction projects through the Authority's funding assistance program. Of the \$5,654,600 allotted through the Program's Phases 1 - 13, the community has \$2,811,000 remaining in funding assistance.

4. BELMONT: North System

Background Information:

- Miles of Sewer: 78
- Sewered Population: 26,932
- Three Year (CY18 - CY20) Annual Average I/I: 1.69 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report: Manhole Cover Insert Pilot Study (March 2020)
Sewer System Rehabilitation Inflow/Infiltration Removal (May 2020)
Private Sector Sump Pump Removal & Sewer System Rehabilitation (March 2021)

Private Source Inflow Removal Program: As part of the 2021 Private Sector Sump Pump Removal & Sewer System Rehabilitation Project, 24 of the 28 identified sump pumps connected to the sewer system have been removed and redirected to a separate drain service to the storm drain. The remaining sump pumps are to be relocated Summer/Fall 2022.

I/I Rehabilitation Projects in Design or Construction: The Private Sector Inflow Removal Project began August 2021. The project included disconnecting from the sewer system 28 confirmed sewer sump pumps and relocating them to the storm drain system or the ground surface. Additionally, 16,500 LF of sewer main will be CIP lined. This project is now 80% complete with substantial completion scheduled for December 2022. Estimated I/I removed will be determined upon completion of project work. The Mainline CIPP Lining Project was completed in FY21. An estimated 30,200 gpd of infiltration was removed. The Manhole Cover Insert Inflow Study was completed and submitted to MWRA in March 2020.

Reporting Period Activity: The Town has inspected approximately 17,100 LF of sewer and storm drain associated with the Town's 2022 Pavement Management Program (PMP). Point repairs, service and manhole replacement will be conducted on structural defects within the PMP limits in Summer 2022. Additional trenchless repairs will be conducted to complete the recommended repairs. The Grinder Pumping Station rehabilitation work (Common Street) has been bid/awarded and is scheduled for substantial completion in December 2022.

MWRA I/I Local Financial Assistance Program: The community has financed eight (8) I/I reduction projects through the Authority's funding assistance program. Of the \$8,255,100 allotted through the Program's Phases 1 - 13, the community will have \$3,120,000 remaining in funding assistance.

5. BOSTON: North and South Systems

Background Information:

- Miles of Sewer: 858
- Sewered Population: 673,957
- Three Year (CY18 - CY20) Annual Average I/I: 33.59 mgd
- MassDEP Administrative Actions: None (Cooperative Agreement Exists)

Boston North is one of MWRA's five combined sewer service communities (Boston North, Brookline, Cambridge, Chelsea, Somerville). Portions of Boston North are impacted by projects under MWRA's CSO Control Plan.

Latest I/I or SSES Reports: Allston-Brighton SSES; Mattapan SSES; City-Wide I/I Analysis; Roslindale SSES; Dorchester SSES; West Roxbury Low Level Sewer I/I Study; Roxbury Canal Sewer Separation Study; Upper Neponset Valley Sewer Inflow Survey; Granite Avenue I/I Survey; Dorchester High Level Sewer I/I Survey; Lower Dorchester Brook Sewer Study; and Longwood Medical Area I/I Survey.

Private Source Inflow Removal Program: Since 1994, the Downspout Disconnection Program has conducted approximately 38,000 building surveys and 10,520 dye water tests. Approximately 26,329 downspouts have been disconnected. From CY05 - CY22, a total of seventy-five (75) large impervious areas were surveyed to identify inflow sources. All seventy-five (75) areas have been dye tested.

I/I Rehabilitation Projects in Design or Construction: BWSC has both completed and is currently working on a wide variety of separation and I/I identification/rehabilitation projects. To date, eighty-six (86) projects have received funding through the MWRA I/I Local Financial Assistance Program. From FY07 - FY22, BWSC completed the following MWRA-financed rehabilitation projects: East Boston Sewer Separation Phase I; Upper Roxbury Area Sewer Separation Phase 2; Dudley Square Sewer Separation; Fairfield Street Sewer Rehabilitation; Rehabilitation of Sewers in the Fenway (Audubon Circle / St. Mary's Street Area); A Street Area Sewer Separation (South Boston Gillette Headquarters); Mass Ave - Dorchester Separation (New Market Square Area); East Boston (Border/ Meridian Street Area) Sewer Separation; Sewer Rehabilitation in Back Bay/Kenmore/Hyde Park/Mattapan; Albany Street Sewer Separation; Sewer Rehabilitation in Dorchester/Mattapan/West Roxbury/Brighton; Talbot Avenue High Level Sewer Area Sewer Replacement/Manhole Rehabilitation; South End Sewer Rehabilitation; Marginal Street Sewer Separation; St. Botolph Street Sewer Separation; Maverick Street Sewer Separation; West Side Interceptor and Public Garden Lining; Back Street Sewer Separation and Chester Park Area Sewer Separation.

Ongoing rehabilitation projects (funded through the MWRA I/I Local Financial Assistance Program) include: Upper Roxbury Area Sewer Separation Phase III (MWRA Project No. WRA-P11-05-3-1189), South Boston Sewer Separation Phase I (MWRA Project No. WRA-P11-05-3-1171), East Boston Sewer Separation Phase II (MWRA Project No. WRA-P11-05-3-1121) and East Boston Sewer Separation Phase III (MWRA Project No. WRA-P9-05-3-1180).

BWSC entered into an I/I reduction agreement with the MassDEP in January 1986. As provided in the agreement, BWSC has performed a Phase II SSES on separated sewer areas within the City. BWSC also has an ongoing tide gate/regulator inspection and repair program and performs separation projects on pockets of combined sewers tributary to separated sewer areas.

Reporting Period Activity: BWSC is required to report to the EPA on I/I reduction measures under their NPDES permit. This reporting requirement coincides with the MWRA's required submittal dates; therefore, please refer to the BWSC NPDES report for a summary of activities during this period.

MWRA I/I Local Financial Assistance Program: The Commission has financed eighty-six (86) I/I identification/reduction projects through the Authority's funding assistance program. Of the \$218,001,200 allotted through the Program's Phases 1 - 13, the Commission has \$96,404,291 remaining in funding assistance.

6. BRAINTREE: South System

Background Information:

- Miles of Sewer: 140
- Sewered Population: 39,049
- Three Year (CY18 - CY20) Annual Average I/I: 4.38 mgd
- MassDEP Administrative Actions: ACO Docket No. CWA-AO-R01-FY21-16 (July 2021)

Latest I/I or SSES Report: Main Interceptor Investigation (June 2021)
Annual I/I Removal Program - Year 9 I/I Investigation (September 2021)
2020 Annual Wastewater Flow Monitoring (November 2021)
Smoke Testing 2021 (April 2022)
Interceptor Modeling 2022 (Ongoing)
Annual I/I Removal Program - Year 10 I/I Investigation (Ongoing)

Private Source Inflow Removal Program: The Town continues to perform building inspections in conjunction with water meter changeouts. The Town has performed multiple building inspections over the past two years. One (1) private inflow source was removed from the sewer system and redirected.

Sump pump removal program is ongoing. Ten (10) private source sump pump removal contracts have redirected 296 sump pumps to date. The Developer Flow Reduction Program is now 6 to 1 per MassDEP ACO. During CY13/14, a sump pump amnesty letter was sent out with the Town's annual water report to all users. The letter resulted in 31 customer calls to have their sump pump connections checked. To date, 27 inspections have taken place and nine (9) sump pumps have been identified for removal. Actual removal/rerouting of the sump pumps has not yet taken place.

I/I Rehabilitation Projects in Design or Construction: The Year 9 I/I Investigation (Study/Design) and Rehabilitation (Construction) Project is ongoing (MWRA Project Nos. WRA-P11-06-3-1142/1191). Year 9 I/I Investigation (Study) work began February 2021 and was completed in June 2021. Summary Report completed September 2021. Year 9 Rehabilitation Design substantially complete. Year 9 Rehabilitation Construction to be bid Fall/Winter 2022.

Year 8 I/I Investigation (Study) work in Subareas E3 / K1 / L2 / L4 / W1 began March 2019 and was completed in June 2019. Summary Report was completed January 2020. Year 8 rehabilitation design complete September 2020. Year 8 rehabilitation was bid October 2020. Rehabilitation construction is complete. The Year 8 project removed an estimated 0.05 mgd of peak infiltration from the Town's sewer system (MWRA Project Nos. WRA-P11-06-3-1104/1165).

Reporting Period Activity: The Annual I/I Removal Program, Year 10 is ongoing. The Interceptor Modeling 2022 project is ongoing. The Smoke Testing 2021 project was completed April 2022 (MWRA Project No. WRA-P11-06-3-1142). The Annual I/I Removal Program - Year 9 was completed September 2021 (MWRA Project No. WRA-P11-06-3-1142). Approximately 0.10 mgd of peak infiltration was observed during CCTV inspections and 0.04 mgd of peak infiltration and 0.01 mgd of peak inflow was identified during manhole inspections. Main Interceptor Investigation completed June 2021 (MWRA Project No. WRA-P11-06-3-1165). The 2020 Annual Wastewater Flow Monitoring began January 2020 and was completed December 2020 (MWRA Project No. WRA-P11-06-3-1129). Summary Report completed November 2021.

MWRA I/I Local Financial Assistance Program: The community has financed seventeen (17) I/I reduction projects through the Authority's funding assistance program. Of the \$14,419,000 allotted through the Program's Phases 1 - 13, the community has \$4,040,000 remaining in funding assistance.

7. BROOKLINE: North and South Systems

Background Information:

- Miles of Sewer: 111
- Sewered Population: 63,084
- Three Year (CY18 - CY20) Annual Average I/I: 4.17 mgd
- Mass DEP Administrative Actions: None

Brookline is one of MWRA's five combined sewer service communities (Boston North, Brookline, Cambridge, Chelsea, Somerville). Portions of Brookline are impacted by projects under MWRA's CSO Control Plan.

Latest I/I or SSES Report:

- Sewer Evaluation Survey in Subareas NI-7, NI-8 & NI-12 Final Report (May 2012)
- Results for Condition Survey - Subareas NI-7, NI-8 & NI-12 Technical Memo (August 2012)
- Eliot Street Smoke Testing Technical Memo (January 2013)
- Englewood Avenue/Kilsyth Road Sewer Alternative Evaluation Technical Memo (February 2013)
- Wastewater Master Plan Update (December 2013)
- Results for Sewer Condition Survey in Subareas NI-9, NI-10 & NI-11 Technical Memo (September 2014)

Private Source Inflow Removal Program: The Town is in the process of developing a Private Flow Source Identification and Removal Program. A 4:1 Flow Reduction is enforced for large residential and commercial projects. The community is continuing its public outreach for private inflow identification/removal. Engineering Division personnel check for illicit sump pumps during inspections.

The Town is working on the policy for removal of private inflow sources in their sewer use regulations that still needs Town meeting approval. The Town's long term plan is to CIPP all the public sewer mains and epoxy line all public sewer manholes. After the Town has completely rehabilitated its sewer system in a particular basin, it will then address suspected private inflow sources.

I/I Rehabilitation Projects in Design or Construction: Contract PW/21-04 Sewer System Rehabilitation is substantially complete. Project work included rehabilitating approximately 30,000 LF of 8 to 24-inch sanitary sewer. Contract PW/21-06 Epoxy Lining of Sewer Manholes is also substantially complete. Project work included epoxy lining 2100 VF of manholes. Contract PW/21-05 Sewer System Repairs is complete. This contract included six (6) sewer spot repairs.

The Town has also closed the following contracts: PW/19-10 Epoxy Lining of Sewer Manholes and PW/19-09 Sanitary Sewer Improvements. PW/19-10 project work included installing 2574 VF of epoxy liner in 260 sewer manholes and replacing 26 defective sewer manholes frames and covers. PW/19-09 project work involved the replacement of 375 LF of collapsed sanitary 8-inch sewer pipe and performing six (6) sanitary sewer spot repairs. In February 2022, funds (\$3,000,000) were distributed for the Design & Construction of Recommended Sewer Rehabilitations in Sewer Subareas NI-7, NI-8 (South) (MWRA Project No. WRA-P11-07-3-1184). Project details are included in Attachment 4.

Reporting Period Activity: See above information in the Private Source Inflow Removal Program and I/I Rehabilitation Projects in Design or Construction paragraphs.

MWRA I/I Local Financial Assistance Program: The community has financed ten (10) I/I reduction projects through the Authority's funding assistance program. Of the \$21,355,200 allotted through the Program's Phases 1 - 13, the community has \$7,689,000 remaining in funding assistance.

8. BURLINGTON: North System

Background Information:

- Miles of Sewer: 115
- Sewered Population: 25,790
- Three Year (CY18 - CY20) Annual Average I/I: 1.68 mgd
- MassDEP Administrative Actions Since 2010: ACO-NE-15-1N001 (October 2015)

Latest I/I or SSES Reports:

Project 7 - Evaluation of Localized Flooding Areas Final Report (February 2014)
Project 7 - Building Inspections Final Report (March 2014)
Project 7 - Sewer System Evaluation Survey Final Report (March 2014)
Evaluation of Sewer Flows Based On SCADA Pump Station Data & Water Use Data - Project 7 (December 2014)
Project 8 Sewer System Evaluation Survey (January 2019)
Project 9 SSES (September 2019)
Project 10 SSES (February 2021)
Project 11 SSES (December 2021)

Private Source Inflow Removal Program: The Town attempted to inspect 38 Amnesty List properties to identify improper connections to the sanitary sewer system. Twenty (20) of the 38 house-to-house inspections were performed. A work summary memorandum (dated December 2, 2021) details the results of the inspections. The Town's sewer connection fund balance (5 for 1 sewer connection fee) is \$1,816,142.

I/I Rehabilitation Projects in Design or Construction: Project 11 SSES was completed December 2021 and identified 21,309 gpd of cost effective, value effective, and non-excessive recommended removable peak infiltration.

Project 10 and 11 Rehabilitations are scheduled to begin Summer 2022.

Project 10 SSES was completed February 2021 and identified 16,818 gpd of cost effective, value effective, and non-excessive recommended removable peak infiltration.

Project 8 and 9 Rehabilitations were completed Fall 2021. The project removed an estimated 64,188 gpd of cost effective, value effective, and non-excessive recommended peak infiltration.

In November 2020, MWRA funds were distributed for the design and construction of sanitary sewer rehabilitations in the Project 10 & 11 Areas and the Project 11 Area SSES. These projects are a component of Burlington's Capital Improvement Program and part of a multi-phased sewer rehabilitation program (MWRA Project No. WRA-P11-08-3-1156).

Reporting Period Activity: See above information in Private Source Inflow Removal Program and I/I Rehabilitation Projects in Design or Construction paragraphs.

MWRA I/I Local Financial Assistance Program: The community has financed fourteen (14) I/I reduction projects through the Authority's funding assistance program. Of the \$8,432,800 allotted through the Program's Phases 1 - 13, the community has \$1,110,000 remaining in funding assistance.

9. CAMBRIDGE: North System

Background Information:

- Miles of Sewer: 148
- Sewered Population: 118,379
- Three Year (CY18 - CY20) Annual Average I/I: 7.15 mgd
- Mass DEP Administrative Actions Since 2010: None

Cambridge is one of MWRA's five combined sewer service communities (Boston North, Brookline, Cambridge, Chelsea, Somerville). Portions of Cambridge are impacted by projects under MWRA's CSO Control Plan.

Latest I/I or SSES Reports: MassDEP Report on Cambridge I/I Management Program (December 2017)
Ten Year Sewer and Drain Infrastructure Plan (April 2019)
I/I Database (March 2020)
Port Phase II Infrastructure Improvements (In Progress)
I/I Development Program Alewife (In Progress)
Partial Sewer Separation Model Calibration Report (March 2022)
Ten Year Sewer and Drain Infrastructure Plan (April 2022)
Hampshire Street Area Flow Metering (In Progress)

Private Source Inflow Removal Program: The City is in the process of removing illicit connections at 2 Hemlock Street (Sparks Street catchment area) and 255 Main Street (Broad Canal catchment area). Illicit connections at 1640 Cambridge Street (DeWolfe catchment area) were removed in Spring 2021.

The City conducted 96 house inspections and IDDE investigations in the Sparks Street, DeWolfe, Broad Canal, Walden Square, Blanchard, Fainwood and University Road drainage areas over the past year.

Illicit connections were confirmed at 6 Marie Avenue and 64 Highland Avenue (DeWolfe catchment area). The drain and sewer mains serving Healy Street (Sparks Street drainage area) have defects where the sewer appears to be leaking into the drain. Repairs are ongoing for these illicit connections. Additional field investigations are ongoing at Gray Gardens West, Dana Street, Hemlock, Corcoran Lane and Fainwood Circle locations to confirm potential illicit connections. While conducting a test pit on Broadway, a sewer lateral was identified at 55 Broadway that was leaking into the drain. Repairs are ongoing to line the lateral.

The City has completed house-to-house inspections in the Willard Street catchment area. This work was done as part of the design of a new stormwater outfall to the Charles River. As part of the Binney Street Stormwater Project, an IDDE investigation was completed and two (2) illicit connections on York Place were removed. As part of the River Street reconstruction project, the City is doing limited inspections on River Street.

As part of the Port Phase II Infrastructure Project, the City conduct 16 house-to-house inspections and 27,000 LF of CCTV inspection in the Port neighborhood to identify any private inflow sources to the sanitary sewer. Dry weather sampling was conducted in the Port neighborhood in 2019/2020 to verify that the catchment is clear of illicit connections prior to construction completion of the PL6 Stormwater Storage Tank Project (MWRA Project Nos. WRA-P9-09-3-976/1105). Multiple illicit connections were identified on Worcester, Suffolk, Eaton, and Cherry Streets, along with 134 Pine Street and 352 Washington Street. These sanitary service connections were redirected to a new replacement sanitary sewer constructed under the Port project. Additionally, field investigations identified two catch basins on the northern end of Pine Street connected to the sanitary sewer and also identified that the storm drain on the southern end of Pine Street is directly connected to School Street sanitary sewer. These inflow sources were removed under the Port project.

The City continues to work with developers on I/I removal projects triggered by increased sewer flows greater than 15,000 gpd on new development projects. I/I removal projects and project planning are currently in progress for developments at: MXD Development (Main/Broadway/Binney Streets; Cambridgeside 2.0 (Mall Redevelopment, 60-110 First Street); Volpe Center Redevelopment (55 Broadway); 55 Wheeler Street; 101 Smith Place; 40 Smith Place; Walden Square 2; CHA Jackson Place, 525 Kendall Street (formerly 585 3rd Street) and IQHQ Redevelopment (62-100 Whittemore Avenue).

I/I Rehabilitation Projects in Design or Construction:

- Cambridge Crossing Development: Monsignor O'Brien (MOB) Phase 1 Sewer Separation: Sewer and drain separated with a temporary connection to a combined manhole (connection to be removed in Phase 2b); Work completed Spring 2022.
- Inman Square Improvements: Sewer separation/porous asphalt/pavers installation ongoing. Estimated completion Fall 2022.
- Cambridge Crossing Development: Monsignor O'Brien (MOB) Phase 2a (Lechmere Canal Outfall): completed November 2020.
- Parking Lot 6 (PL6) Stormwater Storage Tank Installation completed December 2020.
- Willard Street Sewer Separation and Re-establishment of the Stormwater Outfall: Project bid in July 2022. Estimated construction completion in 2024.
- River Street Infrastructure Reconstruction Project: Sewer replacement/rehabilitation and Blackstone Street sewer separation. Project bid in July 2022. Estimated construction completion in 2024.
- Port Phase II Infrastructure Improvements: Project work under design and includes sewer rehabilitation/replacement, inflow removal and green infrastructure. Design to be completed in 2023. Estimated construction completion in 2025.
- Inman Square (Upper Hampshire Street) Sewer Separation catchment IDDE completed Spring 2021.
- MXD Development (Main/Broadway/Binney Streets by Boston Properties): Broadway Drain Line Extension/Enlargement. Construction completed June 2022.
- CambridgeSide Redevelopment (600-110 First Street): Land Boulevard/First Street Sewer Separation work in design. Estimated completion 2023.
- Chapter 90 Contract 24 (Elm Street common manhole separation and infiltration and Callender Street common manhole separation): Project work is in design. Estimated construction completion in 2024.
- Ongoing projects by various developers:
 - North Mass Ave Residential Side Street Infiltration Program is ongoing.
 - 50 Cambridge Park Drive: Pemberton, Sargent and Middlesex drywells installation completed 2021.
 - 55 Wheeler Street: Ridge/Haskell/Yerxa infiltration and Peabody School private inflow removal. Project work in design. Estimated construction completion 2023.
 - 101 Smith Place/Walden Square 2/40 Smith Place: Walden Square sewer separation work in design. Construction anticipated to begin in Fall 2022 with estimated completion 2023.

Reporting Period Activity: In FY22, the City performed CCTV inspections on approximately 65,933 LF of sewer main and drain pipe. In addition, the City lined 900 LF of 48-inch brick combined sewer on Sherman Street. Also, the City's FY22 Remedial Repair Contractor made various repairs to the City's sewer and drain system at 244 locations. These repairs consisted primarily of spot repairs on mainline pipes, replacing manhole frames and covers and replacement of catch basins.

In November 2017 and March 2019, MWRA I/I Local Financial Assistance was distributed for the construction of the Port Infrastructure Improvement Project: Parking Lot No. 6 Stormwater Storage Tank and Combined Sewer Flow Reduction Project (MWRA Project Nos. WRA-P9-09-3-976 / 1105). Construction was completed December 2020. Over the past year, as part of the PL6 Stormwater Storage Tank Project, the City constructed a portion of the 16-inch sanitary sewer force main between Bishop Allen Drive and Massachusetts Avenue that will service the future Port Sanitary Sewer Tank (Sewer Tank and Pumping Station currently under design). A new sanitary sewer force main will also be constructed on Windsor Street (discharging to Portland Street). Estimated construction completion in 2025.

The Tobin Montessori Vassal Lane Upper School Stormwater Storage Tank Project 2 consists of the construction of a stormwater storage tank (which started this year) with an estimated completion in 2024. The proposed tank is intended to improve storm level of service for the most upstream portion of the former CAM004 catchment (approximately 200 acres), especially at the Standish Street/Vassal Lane intersection and low-lying areas near Concord Avenue.

As part of the River Street Infrastructure Reconstruction Project, a new drain extension will be constructed on River Street between Mass Avenue and Cottage Street.

MWRA I/I Local Financial Assistance Program: The community has financed eleven (11) I/I reduction projects through the Authority's funding assistance program. Of the \$39,250,100 allotted through the Program's Phases 1 - 13, the community has \$10,420,000 remaining in funding assistance.

10. CANTON: South System

Background Information:

- Miles of Sewer: 62
- Sewered Population: 17,201
- Three Year (CY18 - CY20) Annual Average I/I: 1.71 mgd
- MassDEP Administrative Actions Since 2010: None

Latest I/I or SSES Report: I/I Five Year Management Plan Update (December 2014)
I/I Management Plan (MassDEP) (June 2018)
I/I Study (Ongoing)

Private Source Inflow Removal Program: No additional inspections were reported during this period. Town has established an I/I Mitigation Fee for all new connections. Fee is paid based upon MassDEP flow rates at a 4 to 1 ratio.

I/I Rehabilitation Projects in Design or Construction: Sewer System Rehabilitation was performed within Sewer Subsections 1-12 / 17 and included sewer manhole sealing/restoration, sewer pipe testing and sealing, CIPP lining and joint testing/sealing. Project work is complete.

Reporting Period Activity: I/I Study project work is complete (MWRA Project No. WRA-P11-10-1-1163). Project work included: (1) development of the flow metering program, including meter and gauge placement; (2) flow meters being placed into the community system in March/April 2021 (flow meters were removed in June 2021); (3) sewer manhole inspections; and (4) flow meter data analysis. I/I Report / Recommendations completed June 2022.

Flow Isolation and CCTV Inspection Program work ongoing (MWRA Project No. WRA-P11-10-2-1188). Field work was completed in June 2022 and included flow isolation of approximately 112,000 LF of gravity sewer within priority Canton sewer sub-areas 7 / 16 / 18 / 22 / 24 / 27 and CCTV inspection of approximately 23,000 LF of gravity sewer. Summary Report recommendations to be complete Fall 2022.

MWRA I/I Local Financial Assistance Program: The community has financed eight (8) I/I reduction projects through the Authority's funding assistance program. Of the \$6,635,900 allotted through the Program's Phases 1 - 13, the community has \$3,509,050 remaining in funding assistance.

11. CHELSEA: North System

Background Information:

- Miles of Sewer: 41
- Sewered Population: 40,787
- Three Year (CY18 - CY20) Annual Average I/I: 2.82 mgd
- MassDEP Administrative Actions since 2010: NON #00004520 – May 10, 2018 Failed to submit I/I Analysis due 12/31/17.
- EPA Clean Water Act Administrative Order: EPA Docket No. 09-008 (March 2009)

Chelsea is one of MWRA's five combined sewer service communities (Boston North, Brookline, Cambridge, Chelsea, Somerville). Portions of Chelsea are impacted by projects under MWRA's CSO Control Plan.

Latest I/I or SSES Report: Investigation into Excessive Infiltration/Inflow & Exfiltration (November 2009)
Everett, Spruce & Second Street Sewer & Drain Evaluation (October 2012)
City-Wide Sewer Separation Master Plan (April 2020)
Broadway Sewer Separation [Preliminary Design Report] (December 2020)
Stormwater Management Plan (SWMP) 2021 (June 2021)

Private Source Inflow Removal Program: The City began collecting Sewer Bank fees for redevelopment projects in CY13. The City has also began a move toward the implementation of Green vs. Gray infrastructure to reduce the amount of stormwater discharged to its combined sewers. Efforts to date have included requiring all redevelopment projects to utilize Low Impact Development and retain/infiltrate stormwater onsite, along with incorporating green infrastructure into municipal projects (e.g., the Rain Garden at the Mace Housing Complex).

I/I Rehabilitation Projects in Design or Construction: Final design of utility and road improvements for Downtown Broadway is ongoing. This project includes comprehensive sewer and drain reconstruction, including sewer separation. Construction planned for CY23/24.

Final design of utility and road improvements for Central Avenue, Willow Street, and Watts Street is complete. This project includes sewer improvements to remove inflow and drain construction that will reduce localized flooding. Construction on this project began in June 2022.

Construction of utility improvements for Upper Broadway is substantially complete. This project includes comprehensive sewer reconstruction for future sewer separation. Future sewer separation work will occur with the construction of new drains during MassDOT-funded road reconstruction in CY24.

Construction of utility improvements for Beacham Street and Williams Street is ongoing. This project includes comprehensive sewer and drain reconstruction that will reduce infiltration in the sewer and promote better street drainage.

Construction of the Essex Street and Highland Street Utility Improvements was completed in CY20. This project included comprehensive sewer reconstruction and sewer separation.

In August 2020, MWRA funds (\$1,630,000) were distributed for the Beacham Street and Williams Street Utility Improvements Project (MWRA Project No. WRA-P11-11-3-1153). In February 2020, funds (\$2,949,000) were distributed for the Broadway and Cary Avenue Utility Improvements Project. (MWRA Project No. WRA-P11-11-3-1141). In August 2021, funds (\$1,630,000) were distributed to support the Central Avenue, Willow Street and Watts Street Utility Improvement Project. Details of this project are included in Attachment 4.

Reporting Period Activity: See above project list.

MWRA I/I Local Financial Assistance Program: The community has financed fifteen (15) I/I reduction projects through the Authority's funding assistance program. The community has used its entire MWRA Phase 1 - 13 funding allocation (\$11,760,100).

12. DEDHAM: South System

Background Information:

- Miles of Sewer: 95
- Sewered Population: 24,507
- Three Year (CY18 - CY20) Annual Average I/I: 2.16 mgd
- MassDEP Administrative Actions Since 2010: None

Latest I/I or SSES Report: 2020 Sewer Manhole Investigations (August 2020)
2021 Sewer Manhole Investigations (August 2021)
2022 Sewer Manhole Investigations (Ongoing)
2022 Town-Wide Flow Monitoring (Ongoing)

Private Source Inflow Removal Program: The Town is finalizing a Private Infiltration Removal Policy that will allow the community to use its Sewer Enterprise Fund to locate and eliminate infiltration observed in private property sewer laterals. The Town adopted a Sewer System Enterprise Fund at its May 2009 Town Meeting. A Municipal Buildings Inspection Program was undertaken to identify inflow sources. Inspections identified approximately 78,231 gpd of peak inflow. The Town removed the 78,231 gpd of peak inflow during CY15-22.

The Town, as part of the 2021 Private Infiltration Removal & Investigations Contract (from 04/21/21 to 12/31/21) (MWRA Project No. WRA-P11-12-3-1166), has completed the installation of approximately 190 LF of CIP lateral liners for seven (7) residential properties and open cut point repairs for two (2) residential properties identified as having infiltration from previous wet weather inspections. The project was estimated to have removed approximately 50,000 gpd of infiltration.

Smoke testing was conducted within approximately 140,000 LF of sewer to identify potential inflow sources. Testing results detected 27 inflow sources contributing approximately 78,231 gpd of peak design storm inflow. Of the 27 defects identified, six (6) were located within the Town's ROW and have been rehabilitated by the Town forces.

A Private Building Inspection was conducted within three of the Town's seven precincts. This program was promoted throughout the community as voluntary. The Town provided penalty amnesty to all residents/commercial property owners who participated. There were 3581 locations within the three precincts. Only 1510 property owners (42%) permitted inspections. Of the 1510 inspections performed, fifty-eight (58) direct and one (1) indirect inflow sources were observed (contributing 418,951 gpd of estimated peak inflow). These sources consisted of thirty-seven (37) sump pumps, one (1) floor drain, nine (9) interior open cleanouts, four (4) exterior open cleanouts, five (5) direct driveway drains, one (1) indirect driveway drain and one (1) roof leader. Due to low program participation, the Town is not going to perform private building inspections within the remaining four precincts at this time. House-to-house inspections still remain on hold for the foreseeable future.

I/I Rehabilitation Projects in Design or Construction: The Town, as part of the 2020 Sewer On-Call Services Contract (from 1/1/21 to 12/31/21) (MWRA Project Nos. WRA-P11-12-3-1130/1166), has completed the installation of approximately 4600 LF of CIPP, 10 LF of short liners and 620 VF of manhole exterior grouting and interior cementitious lining. The project was estimated to have removed approximately 62,000 gpd of infiltration.

Also as part of the 2020 Sewer Rehabilitation On-Call Services Project (MWRA Project No. WRA-P11-12-3-1130/1166), the Town completed the installation of 13,000 LF of CIPP lining, 150 LF of short liners and 1500 VF of manhole exterior grouting and interior cementitious lining. The project was estimated to have removed approximately 142,000 gpd of infiltration.

The Town issued an Order To Correct to Nobles & Greenough School to remove observed infiltration associated with their annual wet weather inspections of the private sewer system that connects to the Town's municipal sewer system. Nobles & Greenough worked with the Town and its current 2020 Sewer On-Call Services Contract to install approximately 1900 LF of CIPP and 63 VF of manhole exterior grouting and interior cementitious lining. The project was estimated to have removed approximately 21,000 gpd of infiltration.

The Town is also nearing completion of its annual sewer system inspection program. Starting in March 2022, the Town began cleaning and inspecting approximately 115,000 LF of sewer main and 58 private laterals that showed signs of infiltration during their mainline inspections and performing top-side manhole inspection of approximately 800 manholes. The Town plans to utilize this data, along with previous year's backlog work, to perform CY22 rehabilitation on the most cost-effective sewer lines/manholes utilizing an on-call rehabilitation contract.

Reporting Period Activity: Approximately 130 LF of sewer main extensions were installed throughout the Town by private developers. Upon completion of the extension projects, the Town took over ownership of the sewer mains.

The Town upgraded the existing 6-inch force main and pump station servicing the Legacy Place section of the community. The upgrade included the installation of a new 10-inch force main and larger capacity pumps at the existing pump station off of Elm Street / Rustcraft Road. The upgrades were performed to accommodate potential future developments in this area that would have to connect to this system. The pump station, as it existed before the upgrades, was at its maximum capacity and could not accept any additional flow.

MWRA I/I Local Financial Assistance Program: The community has financed eighteen (18) I/I reduction projects through the Authority's funding assistance program. Of the \$9,220,000 allotted through the Program's Phases 1 - 13, the community has \$1,160,000 remaining in funding assistance.

13. EVERETT: North System

Background Information:

- Miles of Sewer: 57
- Sewered Population: 49,075
- Three Year (CY18 – CY20) Annual Average I/I: 2.45 mgd
- MassDEP Administrative Actions Since 2010: None
- EPA Clean Water Act Administrative Order: EPA Docket No. 09-026 (August 2009)

Latest I/I or SSES Report: I/I Investigation (August - September 2013)
IDDE Citywide Report (February 2015)
Sewer Flow Monitoring Report (October 2016)
EPA Administrative Order Compliance Report (January 2017)
Lower Broadway I/I Investigation (November 2018)
2018 Sewer I/I Investigation (December 2018)

Private Source Inflow Removal Program: A Sewer and Drain Ordinance was adopted in Fall 2018. To date, the City has collected fees from developments totaling approximately \$1.65 million. Fees are used to fund future I/I identification/removal projects.

I/I Rehabilitation Projects in Design or Construction: In June 2022, funds (\$2,550,200) were distributed for the Paris Street Sewer Separation Project (MWRA Project No. WRA-P11-13-3-1192). The objective of this project is to disconnect catch basins connected to the sewer system and install new drain infrastructure in the Paris Street area, in order to remove sewer system inflow. The construction design is based the ‘Draft Evaluation Memo - Inflow/Infiltration Project Approach’ report (dated October 2015). Project details are included in Attachment 4.

In February 2021, (\$2,410,800) funds were distributed for the Village I/I Rehabilitation Project (MWRA Project No. WRA-P11-13-3-1162). The purpose of this project is to perform I/I rehabilitation in the Village and Main Street areas in order to reduce I/I sources and repair sewer defects. Construction rehabilitation work for this project includes: CIPP lining, lateral grouting, dig and replace sewer rehabilitation, manhole rehabilitation, and point repairs. Approximately 0.14 mgd of peak infiltration and 0.11 mgd of peak inflow is anticipated to be removed.

Reporting Period Activity: Please see section on I/I Rehabilitation Projects above.

MWRA I/I Local Financial Assistance Program: The community has financed eleven (11) I/I reduction projects through the Authority’s funding assistance program. Of the \$13,381,500 allotted through the Program’s Phases 1 - 13, the community has \$1,770,000 remaining in funding assistance.

14. FRAMINGHAM: South System

Background Information:

- Miles of Sewer: 275
- Sewered Population: 69,727
- Three Year (CY18 - CY20) Annual Average I/I: 2.32 mgd
- MassDEP Administrative Actions Since 2010: None

Latest I/I or SSES Report: Citywide I/I Study / SSES Phase 1 / CWMP (Complete)
SSES Phase 2 (Complete); SSES Phase III (Complete)
SSES Phase IV / V (Complete); Blackberry Lane SSES (Complete);
SSES Phase VI (Complete); SSES Phase VII (Scheduled)

Private Source Inflow Removal Program: The City’s capital improvements plan now includes multiple phases of inflow removal projects. The first phase was financed in the FY17 budget cycle. The City is currently developing capital projects that will incorporate the removal of the illicit connections identified during the field reconnaissance efforts of the SSES programs. The capital project program will include the redirection of illicit flows as well as the extension of storm drain systems to remove flow from the sewer system. During this year’s capital project development cycle, the City will determine the proposed rehabilitation areas and improvements required in order to further refine the costs and timing of the actual inflow removal projects.

The City has submitted an updated inflow removal scope of work and schedule to MassDEP for their review and approval. The plan includes working with City government to develop and initiate a program for sump pump and other inflow source (i.e., roof and area drains) removal. This work was included as part of the FY20 capital budget request for the City's Phase 6 SSES project. The Phase 6 SSES FY20 appropriation was approved by the City Council in June 2019.

The Phase 6 SSES (MWRA Project No. WRA-P11-14-1-1149) began in July 2019. Initial study work included performing 58 dye tests of suspect inflow sources and undertaking flow/rainfall/groundwater monitoring from March 16, 2020 to June 8, 2020 within fifteen (15) subcatchments within the Phase 6 SSES tributary area. Phase 6 manhole inspections (700 total) were completed in April 2021. Flow isolation and CCTV inspection work (20,000 LF) was completed in May 2021. Smoke testing (49,700 LF) was completed September 2021. A project summary memorandum is currently being reviewed.

From the Phase 6 SSES findings, design contract documents were developed for the Private Inflow Removal Pilot Project. The Project is currently awaiting approval for bidding from the City's administration. This Pilot Project calls for the removal of sump pumps at six (6) locations. These locations have been visually observed to be connected to the sewer.

I/I Rehabilitation Projects in Design or Construction: The Union Avenue & Pearl Street Sewer System Rehabilitation Project (Contract PW-407 / MWRA Project No. WRA-P11-14-3-1148) is complete. Project work included replacement of 650 LF of 8-inch sewer main; replacement of 250 LF of 10-inch sewer main; installation of 575 LF of 10-inch CIP sewer main liner; installation of 575 LF of 12-inch CIP sewer main liner; replacement of 800 LF of sewer service laterals; and replacement of 11 sewer manholes. The limits of the project area were Union Avenue (between Proctor Street and Beech Street) and Pearl Street (between Lincoln Street and Franklin Street).

The Worcester Road Wastewater Infrastructure Improvements Project: Phase II Design - Westbound (MWRA Project No. WRA-P11-14-3-1113) is ongoing. Phase II of the project is located along the westbound side of Worcester Road (adjacent to the Natick border). The Phase II final design phase involves the installation of approximately 1950 LF of new gravity sewer piping along Concord Street and Worcester Road.

The Worcester Road Wastewater Infrastructure Improvements Project: Phase III Design - North-South Sewer Connector (MWRA Project No. WRA-P11-14-3-1113) is ongoing. Phase III of the project is located along a cross-country alignment off Worcester Road, adjacent to the Natick border, from the Burr Street Extension to Cochituate Road. The Phase III final design phase involves the installation of approximately 4200 LF of new gravity sewer piping along this cross-country alignment.

The Worcester Road Wastewater Infrastructure Improvements Project: Phase I - Eastbound (Contract PW-402 / MWRA Project Nos. WRA-P11-14-3-1112/1113) is complete. Project work included contracted wastewater infrastructure replacement along Worcester Road. Phase I work was located along the eastbound side of Worcester Road (Concord Street to Natick Town Line) and included residential work along Pierce Street and Dinsmore Avenue. Project work included installation of 600 LF of 8-inch PVC and DI gravity sewer piping; installation of 930 LF of 10-inch PVC gravity sewer piping; installation of 710 LF of 12-inch PVC gravity sewer piping; installation of 6-inch PVC gravity sewer piping for sewer service connections; installation of 12 sewer manholes; and cleaning and CCTV inspection of 5820 LF of storm drain.

The Sewer Defects Repairs (Phase 2) Project (Contracts PW-375 & 379 / MWRA Project No. WRA-P11-14-3-1102) is complete. Project work included contracted sewer main/manhole rehabilitation and replacement throughout the City. Phase 1 repairs (implemented in late 2017) corrected defects at and south of Waverly Street. Phase 2 addressed repairs between Worcester Road (Route 9) and Waverly Street to the southerly City limits and in the vicinity of Concord Street to the City limits in East Framingham. Project work included cleaning and CCTV inspection of 55,000 LF of sewer main; root treatment of 3000 LF of sewer main; testing and sealing of 140 sewer main joints; CIPP spot repairs within 150 LF of sewer main; CIP lining of 18,621 LF of sewer main; lining 90 LF of sewer service connections; lining 976 VF of sewer manholes; performing 50 spot sewer manhole repairs; rebuilding 10 sewer manhole inverts; and flow isolating 6175 LF of sewer main.

The Union Avenue Area Sewer Improvements (Contract 2) Evergreen Street Sewer Rehabilitation Project (Contract PW-369 / MWRA Project No. WRA-P11-14-3-1101) is complete. Project work included contracted sewer main/manhole rehabilitation and replacement in the Union Avenue area. Project work included replacement of approximately 1550 LF of 8-inch VC sewer main; replacement of approximately 375 LF of sewer service laterals; CIP lining of approximately 475 LF of 8-inch VC sewer main; and replacement of approximately 11 sewer manholes. The project's work area included: Evergreen Street / Learned Street / Myrtle Street / Thurber Street / Lincoln Street.

Reporting Period Activity: City Operations staff performed 380 LF of sewer main replacements at two (2) locations. City Operations staff/ on-call service providers also installed 3381 LF of CIPP linings and rehabilitated 45 sewer manholes.

MWRA I/I Local Financial Assistance Program: The community has financed nineteen (19) I/I reduction projects through the Authority's funding assistance program. Of the \$20,375,000 allotted through the Program's Phases 1 - 13, the community has \$6,704,000 remaining in funding assistance.

15. HINGHAM: South System

Background Information:

- Miles of Sewer: 33
- Sewered Population: 8,128
- Three Year (CY18 - CY20) Annual Average I/I: 0.87 mgd
- MassDEP Administrative Actions Since 2010: None

Latest I/I or SSES Report: FY17 Evaluation Year 1 (December 2017)
2017 Inflow Investigations (December 2017)
Annual I/I Program (FY18) Year 2 Evaluation (December 2018)
Annual I/I Program (FY19) Year 3 Evaluation (August 2019)

Private Source Inflow Removal Program: The house-to-house sump pump inspection and roof leader disconnection programs were suspended this year due to COVID-19 restrictions. Through CY17-21, approximately 500 homes were inspected for sump pumps. One sump pump was identified as being connected to the sanitary system. This sump pump has been removed.

I/I Rehabilitation Projects in Design or Construction: Contract FY17-S2 - Year 3 Annual Sewer Program project work is complete. The Program reviewed CCTV inspection videos of 37,428 LF of sewer (of the targeted 40,172 LF); performed topside manhole inspections of 254 of the 268 targeted sanitary sewer manholes; performed a GIS mapping update; populated database with inspection information; submitted a detailed letter report that described the areas in which work was performed, summarized the work completed to date and included recommendations, a cost-effectiveness analysis, and a prioritization analysis for rehabilitation of those pipeline/manhole defects and I/I sources that have been identified during the investigation. (MWRA Project No. WRA-P11-15-3-1127).

Contract FY17-S2 - Year 2 Annual Sewer Construction Program project work is complete. The Program performed CCTV inspection of 3900 LF of sewer; chemical root treatment of 760 LF of sewer; trenchless sewer repairs including 6200 LF of sewer testing and sealing; installing 1350 LF of structural CIP pipe; installing short liners at five (5) locations; installing structural short liners at seven (7) locations; performing open cut point repairs at two (2) locations; testing & grouting 16 service connections; performing forty (40) manhole rehabilitations; replacing six (6) manhole frames & covers; and furnishing/installing twenty (20) manhole inflow dishes. (MWRA Project No. WRA-P11-15-3-1127).

Reporting Period Activity: Approximately 6346 LF of sewer cleaning and CCTV inspection performed as part of general maintenance activities between December 2021 and July 2022. A dig repair was performed on Planters Field Lane on a defective, leaking service connection (2880 gpd of estimated peak removable infiltration). Work completed May 2022. Exterior grouting and interior epoxy lining of 6-foot diameter wet well, completed in October 2021. Manhole lining (7.5 VF) on Hersey Street completed October 2021. CIP lateral liner installed on Hawthorne Road and completed February 2022. CIPP lining of 168 LF of sewer completed in January 2022. CIPP lining of 162 LF of sewer completed in July 2022. Inspection of 54 sewer laterals was completed (January 2022 - April 2022) as part of preventative maintenance activities.

Three (3) new sewer connections were added to the municipal sewer system. One (1) new NV3 pump installed at the Walton Cove Pumping Station. Two (2) new Barnes pumps and rails were installed at the Bel Air Pumping Station. Bolted frame and cover installed on SMH 1564. Manhole inspections performed at various locations to inspect for Fats, Oils, and/or Greases (FOG) build up. Microbe treatment for FOG prevention performed at SMHs 269 / 1059 and Greenbush Pump Station, Mill Street Pump Station and Bayberry Pump Station. Repaired broken services at 1 Holly Street and 9 Sycamore Road.

MWRA I/I Local Financial Assistance Program: The community has financed nine (9) I/I reduction projects through the Authority's funding assistance program. Of the \$2,802,500 allotted through the Program's Phases 1 - 13, the community has \$390,000 remaining in funding assistance.

16. HOLBROOK: South System

Background Information:

- Miles of Sewer: 31
- Sewered Population: 10,359
- Three Year (CY18 - CY20) Annual Average I/I: 0.41 mgd
- MassDEP Administrative Actions Since 2010: None

Latest I/I or SSES Report: CWSRF No. 2919 Contract No. 1 (October 2009)

Private Source Inflow Removal Program: House-to-House inspections continue. All new home construction is inspected by DPW personnel and the Town Plumbing Inspector. During this reporting period, twelve (12) home inspections were completed during water meter replacements. No private inflow was discovered. New development requires a \$12 per gallon mitigation payment on all flow added. The mitigation funds collected are used to finance the Town's I/I identification & rehabilitation program.

I/I Rehabilitation Projects in Design or Construction: The Annual I/I Control Plan (Year 1) (MWRA Project No. WRA-P11-16-3-1195) is ongoing. Project work includes I/I identification planning, investigation and reporting: (1) Design and development of a work plan that outlines the I/I metering program to collect wastewater flow, rainfall and groundwater data; (2) Install, calibrate, maintain and monitor field instrumentation equipment. The quantity of the instrumentation and duration of their installation shall be based upon the MassDEP I/I Analysis Guidelines. The field program shall be installed for up to ten (10) weeks and will be implemented Town-wide in approximately eleven (11) sewer subareas. A field investigation data summary will be provided by the subcontractor. Project work will also include a Town-wide groundwater analysis to identify high groundwater/low elevation areas that may contribute private inflow and a limited sewer manhole inspection program (approximately 200 manhole inspections); (3) Quantitative analysis of data collected from the flow metering and field investigation program and will include quantifying the rate of infiltration and volume of inflow into each of the metered sewer subareas; and (4) Develop a report and recommendations from the results of the overall I/I study. The report will include recommendations for further field investigations to isolate and identify specific I/I sources.

Reporting Period Activity: Approximately 800 LF of 8-inch sewer was added to the community system via a new subdivision off South Street. Approximately 1500 LF of 8-inch sewer was added to the community system via a new subdivision off South Franklin Street. No active connections at this time.

MWRA I/I Local Financial Assistance Program: The community has financed two (2) I/I reduction projects through the Authority's funding assistance program. Of the \$2,779,600 allotted through the Program's Phases 1 - 13, the community has \$1,883,038 remaining in funding assistance.

17. LEXINGTON: North System

Background Information:

- Miles of Sewer: 170
- Sewered Population: 33,856
- Three Year (CY18 – CY20) Annual Average I/I: 3.05 mgd
- MassDEP Administrative Actions since 2010: ACO-NE-11-015 (July 2011)
- EPA Clean Water Act Administrative Order: EPA Docket No. 11-015 (July 2011)

Latest I/I or SSES Reports: Sewer System Evaluation Survey - Phase 8: Sewer Basin 01 (January 2018)
Sewer System Evaluation Survey - Phase 9: Sewer Basins 06 & 07 (August 2018)
Town-Wide Flow Metering (November 2019)
Sewer System Evaluation Survey - Phase 10: Sewer Basin 10 (January 2020)
SSES Phase 11: Sewer Basin 09 (March 2021)
SSES Phase 12: Sewer Basin 02 (November 2021)
SSES Phase 13: Sewer Basins 04 & 14 (Ongoing)

Private Source Inflow Removal Program: The Town is using the February 2012 *Lexington Sewer Use Code Review* to update their current regulations to incorporate a sewer bank or other funding options. A private inflow identification program based on the February 2012 Private Inflow Removal Program Letter Report is currently on hold.

I/I Rehabilitation Projects in Design or Construction: The Sewer System Evaluation Survey for Sewer Basin 02 (Phase 12) was completed in November 2021. The project identified approximately 30,000 gpd of cost-effective removable peak I/I within 51,000 LF of sewer main. The Phase 7 Sewer System Improvements project was substantially complete in October 2021. Work included a change order for lateral liners in Lexington Center (Sewer Basin 09).

The Phase 8 Sewer System Improvements construction started in March 2022 and is scheduled to be substantially complete August 2022. The project's goal is to remove I/I primarily in Sewer Basin 11. The Sewer System Evaluation Survey for Sewer Basin 09 (Phase 11) was completed in March 2021. The project identified approximately 35,000 gpd of cost-effective removable peak I/I within 55,000 LF of sewer main.

Reporting Period Activity: New sewer services [including five (5) septic system abandonments] were installed at 28 locations.

The following change to the Sewer Use Code has been implemented. This proposed change was approved on February 25, 2019, by the Board of Selectmen.

Section 181-44 (G)

Capacity Fee

All new connections greater than 15,000 gpd to the municipal sanitary system shall be charged a one-time Capacity Fee in accordance with the following fee schedule:

Required Fee

Applicant must remove four (4) gallons of I/I from the sewer system for each one gallon of permitted wastewater flow requested (Title V (310 CMR 15) shall be used to determine flow rates). If there are no sources of I/I which, at the discretion of the town, are appropriate for removal at the time of the permit, a monetary fee may be required.

The fee shall be calculated based on Title V flows and a cost of the Town of Lexington's existing transportation and treatment (T&T) cost per gallon of flow per day (gpd). This transportation and treatment cost is calculated yearly and must be approved by the Town Engineer. Please contact the Town Engineer to confirm the current transportation and treatment cost.

For example, if a development has an associated Title V flow of 15,000 gpd, the fee for this connection is 15,000 gpd x T&T Cost x 4). All dollar values shall be rounded up to the nearest fifty dollars (\$50).

A combination of I/I removal and monetary fees may also be negotiated at the discretion of the town. Any I/I removed from the sewer system as part of this program shall be the property of the Town of Lexington and may not be applied to future removal requirements without the written authorization of the Town.

MWRA I/I Local Financial Assistance Program: The community has financed thirteen (13) I/I reduction projects through the Authority's funding assistance program. Of the \$12,125,300 allotted through the Program's Phases 1 - 13, the community has \$1,560,000 remaining in funding assistance.

18. MALDEN: North System

Background Information:

- Miles of Sewer: 100
- Sewered Population: 65,969
- Three Year (CY18 - CY20) Annual Average I/I: 3.92 mgd
- MassDEP Administrative Actions: NON #00004556 - May 9, 2018 (Failed to submit I/I Analysis due 12/31/17)
- EPA Clean Water Act Administrative Order: EPA Docket No. 09-002 (January 2009)

Latest I/I or SSES Report: Malden Sewer System Evaluation Survey (Phase III) Final Report (December 2011)
Hydraulic Model and Capacity Assessment Draft Report (June 2012)
Hydraulic Model and Capacity Assessment Final Report (December 2012)
Phase IV I/I Assessment Program (April 2020)

Private Source Inflow Removal Program: The City is planning to perform a community-wide smoke testing program to identify roof runoff connections and other illicit discharges. The City's DPW Commission voted to approve a revised Water & Sewer Fee Schedule on October 9, 2018. This revised schedule includes a new sewer connection fee of \$500 plus an I/I fee of \$8.50/gpd for new connections with a design flow over 15,000 gpd.

I/I Rehabilitation Projects in Design or Construction: The City put Contract 2022-S-1 out to bid in August 2022, as part of its 2022 Sewer Lining Program. The City has compiled a list of approximately 28,000 LF of sewer lines that will be initially cleaned and videoed. As the videos are completed, the City will review the tapes and select the sewer mains to be CIP lined. For bidding purposes, the City anticipates approximately 19,000LF of sewer main will be CIP lined. The City has completed a five-year plan of sewer collection system rehabilitation contracts based on study results and recommendations.

Reporting Period Activity: See above information in Private Source Inflow Removal Program and I/I Rehabilitation Projects in Design or Construction paragraphs. In June 2021, MWRA funds (\$1,084,000) were distributed to continue the City-wide SSES and Sewer Improvements - Design / Construction Projects (MWRA Project No. WRA-P11-18-3-1174).

MWRA I/I Local Financial Assistance Program: The community has financed seven (7) I/I reduction projects through the Authority's funding assistance program. Of the \$20,683,900 allotted through the Program's Phases 1 - 13, the community has \$13,958,000 remaining in funding assistance.

19. MEDFORD: North System

Background Information:

- Miles of Sewer: 113
- Sewered Population: 59,624
- Three Year (CY18 - CY20) Annual Average I/I: 3.35 mgd
- MassDEP Administrative Actions Since 2010: None
- EPA Clean Water Act Administrative Order: EPA Docket No. 09-027 (August 2009)

Latest I/I or SSES Report: Continuation of Sewer System Evaluation Survey of North Medford/Heights Area (October 2016)
Continuation of Mini-System P SSES (October 2016)
City-Wide I/I Control Plan Metering Program (April 2018)
IICP Update Phase 1 (February 2021)

Private Source Inflow Removal Program: Suspected inflow locations were found during Phase 1 inspections. Two (2) additional locations found in FY22. Removal plans are to be developed.

I/I Rehabilitation Projects in Design or Construction: The Mini-System P Sewer Rehabilitation project is approximately 50% complete. Additional IICP Phase II work is being done in select areas within Mini-System D. A summary report is due in early FY23. A City-wide CIPPL and Testing & Sealing contract is set to bid in Fall 2022.

Reporting Period Activity: See above project list.

MWRA I/I Local Financial Assistance Program: The community has financed nine (9) I/I reduction projects through the Authority's funding assistance program. Of the \$19,637,600 allotted through the Program's Phases 1 - 13, the community has \$11,676,000 remaining in funding assistance.

20. MELROSE: North System

Background Information:

- Miles of Sewer: 74
- Sewered Population: 29,784
- Three Year (CY18 - CY20) Annual Average I/I: 2.51 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report:

2017 Sewer Rehabilitation Project - CIPP Lining (Winter 2017)
2018 Sewer Rehabilitation Project - Open Cut Repairs (Fall 2018)
2019 Phase 2 SSES Project (CCTV / Flow Isolation / Smoke Testing / SMH Inspections) (Spring 2019)
2020 Phase 3 SSES Project (CCTV / Flow Isolation / Smoke Testing / SMH Inspections) (Spring 2020)
2020 Sewer Rehabilitation Project - CIPP Lining (Summer 2020)
2019 Phase 2 SSES Summary Report (Spring 2021)
2020 Phase 3 SSES Summary Report (Summer 2021)
2022 Sewer Manhole Frame and Covers Replacement Project (Summer 2022)

Private Source Inflow Removal Program: Smoke testing was performed in the six (6) subareas where investigations were done as part of the 2020 SSES - Phase 3. All findings from Phase 1-3 SSES will be investigated in the near future. The City, as part of its water main replacement projects, continued performing basement inspections for illicit connections.

I/I Rehabilitation Projects in Design or Construction: The 2020 Sewer Rehabilitation Project (CIPP Lining) was completed in May 2021. Post-construction flow isolation was completed in Spring 2022. The I/I removal was approximately 0.07 mgd or an approximate 84% infiltration reduction based on the pre-construction flow isolation estimates. Approximately 6100 LF of 6 to 12-inch sewer main received root treatment. Approximately 21,000 LF of CIPP liners were installed in 6 to 20-inch sewer mains. The City also commenced with the removal and replacement of sewer manhole frames and covers that were identified with multiple holes in their manhole covers during the Phase 1-3 SSES projects. To date, eighty (80) manhole frames and covers have been replaced. The approximate inflow removal will be determined upon completion of the 2022 Sewer Manhole Frame and Covers Replacement Project.

Reporting Period Activity: During FY22, the City collected \$139,881 in I/I mitigation fees. The fees are stored in a dedicated fund and are only used for work related to I/I reduction. This fund fully covered the costs of the eighty (80) sewer manhole frame and cover replacements, plus other open-cut sewer repairs and additional CCTV investigations. The sewer enterprise fund fully covered the costs of sewer system operations, maintenance, debt service and other expenses. The City maintains reserves equal to at least 10% of the operating budget.

MWRA I/I Local Financial Assistance Program: The community has financed ten (10) I/I reduction projects through the Authority's funding assistance program. Of the \$10,126,300 allotted through the Program's Phases 1 - 13, the community has \$1,469,000 remaining in funding assistance.

21. MILTON: South System (Small Portion Tributary to the North System)

Background Information:

- Miles of Sewer: 83
- Sewered Population: 27,963
- Three Year (CY18 - CY20) Annual Average I/I: 1.99 mgd
- MassDEP Administrative Actions Since 2010: None

Latest I/I or SSES Report: I/I Town-Wide Sewer Evaluation – Year 14 (November 2018)
Wastewater Capital Improvement Plan Priority Evaluation (December 2018)
CIP Program 1 Investigation (January 2020)
CIP Program 2 Investigation (January 2021)
CIP Program 3 Investigation (December 2021)
CY2022 Sewer Investigation (Ongoing)

Private Source Inflow Removal Program: The Town is continuing to pursue the removal of sump pumps and other private inflow sources identified through a previously completed building inspection program. All new connections to the municipal sanitary sewer system will be charged a one-time I/I mitigation fee. Connection applicants must remove four gallons of I/I from the sewer system for each one gallon of new wastewater flow requested in the connection permit. If there are not sources of I/I that, at the discretion of the DPW Director, are appropriate for removal at the time of the permit, a monetary fee may be required (at a cost of \$3.00 per gallon of flow per day to be removed). Also, a building inspection is performed during the final water meter reading when a house is being sold. If the building inspection identifies an illegally connected sump pump, a fine is issued and the residence cannot be sold until the sump pump has been rerouted and inspected. Additionally, during the water meter replacement program, Town inspectors have been trained to identify sump pumps and note whether they are: (a) connected to the sewer, (b) daylighted to the outside, or (c) unknown. The Town's Engineering Department then performs follow-up inspections as needed.

I/I Rehabilitation Projects in Design or Construction: The Drain and Sewer Improvements Project (Milton Contract No. DS21-1) began in November 2021 and reached substantial completion in April 2022 (MWRA Project No. WRA-P11-21-3-1178). It is estimated this project removed 3168 gpd of infiltration through comprehensive sewer pipeline and manhole repairs.

The CIP Project 1 Sewer Rehabilitations work is complete. Warranty retesting completed Spring 2021 (Milton Contract No. S20-1 / MWRA Project No. WRA-P11-21-3-1154). Work was performed in Subareas G-04 / G-06 / G-07 / G-11B / G-11E / PS-02 / PS-03 / S-17A / S-18 and included 12,520 LF of cleaning and CCTV inspection; testing 3000 sewer joints and sealing 1500 sewer joints; installing 11,760 LF of CIP pipe; installing 111 LF of CIP short liners; grouting 200 reinstated service connections; installing 14 CIP lateral liners; performing six (6) open cut point repairs; testing and grouting 27 service connections; rehabilitating 47 sewer manholes; installing six (6) manhole frames & covers; installing three (3) manhole inflow dishes; topside inspection of 17 sewer manholes; and performing 20,600 LF of post-construction flow isolation. It is estimated that CIP Project 1 removed 57,853 gpd of peak infiltration and 2592 gpd of peak design storm inflow from the Town's sewer system.

The Year 14 Sewer System Infiltration Rehabilitation [MWRA Project No. WRA-P11-21-3-1123 / Milton Contract No. S19-1] is complete. Warranty retesting completed Fall 2020. Work was performed in Subareas G-04 / G-06 / G-07 / G-11B / G-11E / PS-02 / PS-03 / S-17A / S-18 and included 15,900 LF of cleaning and television inspection; testing 3380 sewer joints and sealing 1690 sewer joints; installing 10,900 LF of CIP pipe; installing 169 LF of CIP short liners; grouting 209 reinstated service connections; installing seven (7) CIP lateral liners; performing two (2) open cut point repairs; cutting four (4) protruding service connections; testing and grouting 46 service connections; rehabilitating 44 sewer manholes; topside inspection of 24 sewer manholes; and performing 22,350 LF of post-construction flow isolation. It is estimated that the Year 14 project removed 66,456 gpd of infiltration from the Town's sewer system.

Reporting Period Activity: The CY2022 Sewer Investigation was completed Spring 2022 (MWRA Project No. WRA-P11-21-3-1178). Data review and reporting is ongoing.

CIP Project 3 Investigation was completed Spring 2021 (MWRA Project No. WRA-P11-21-3-1178). Approximately 34,128 gpd of peak infiltration was observed during television inspections and 10,224 gpd of peak infiltration and 7700 gpd of peak inflow was identified during manhole inspections.

CIP Project 2 Investigation was completed Spring 2020 (MWRA Project No. WRA-P11-21-3-1154). Work included cleaning, TV inspection, videotaping and recording 48,500 LF of sewer; conducting flow isolation on 43,000 LF of sewer; and performing topside manhole inspections of 300 sewer manholes in Subareas G-08A / G-11C. Approximately 80,208 gpd of peak infiltration was observed during television inspections and 20,160 gpd of peak infiltration and 25,024 gpd of peak inflow was identified during manhole inspections.

CIP Program 1 Investigation was completed Spring 2019 (MWRA Project No. WRA-P11-21-3-1123). Data review and reporting was completed January 2020. Work included cleaning, TV inspection, videotaping and recording 51,400 LF of sewer; conducting flow isolation on 50,100 LF of sewer; and performing topside manhole inspections of 300 sewer manholes in Subareas DI-02 / G-05A / G-05B / G-05C. Approximately 87,840 gpd of peak infiltration was observed during television inspections and 38,592 gpd of peak infiltration was identified during manhole inspections.

Approximately 70 LF of 8-inch sewer was extended on Highland Street as part of a private property endeavor. The Highland Street extension was accepted by the Town in May 2022.

MWRA I/I Local Financial Assistance Program: The community has financed twenty-three (23) I/I reduction projects through the Authority's funding assistance program. The community has used its entire MWRA Phase 1 - 13 funding allocation (\$9,014,500).

22. NATICK: South System

Background Information:

- Miles of Sewer: 146
- Sewered Population: 32,803
- Three Year (CY18 - CY20) Annual Average I/I: 1.13 mgd
- MassDEP Administrative Actions Since 2010: None

Latest I/I or SSES Report: Town-Wide SSES (Ongoing)
I/I Study (Ongoing)

Private Source Inflow Removal Program: The Town-Wide SSES (MWRA Project No. WRA-P5-22-1-523) included a house-to-house inspection component. Home inspections are also conducted in conjunction with the water meter replacement program. The Town has prepared an informational handout on eliminating sump pump connections to the wastewater system, which is distributed to targeted/suspect areas of the community. Home inspections were suspended this year due to COVID-19 restrictions.

I/I Rehabilitation Projects in Design or Construction: Sewer inspection work (MWRA Project No. WRA-P9-22-3-912), which included CCTV and chimney inspection programs, is complete. CCTV inspection of 145,000 LF of sewer main and 766 sewer manhole inspections have been performed in Sewer Basins 6 / 11/ 14 / 16. Recommended findings from this inspection work were incorporated into the Town's 3-Year Sewer Rehabilitation Project (Natick Contract No. S-162 / MWRA Project Nos. WRA-P9-22-3-990/1161). The rehabilitation project was bid in July 2020. Project works includes CIP lining of 26,000 LF of mainline sewer and 475 service laterals, testing and sealing of 5000 LF of mainline sewer and services, rehabilitation of 204 sewer manholes for infiltration removal/prevention and rehabilitation of 123 sewer manholes for inflow removal. Estimated peak infiltration removal is 215,000 gpd based on review of the inspection reports for the structures being rehabilitated. Estimated inflow removal, using MassDEP's design storm characteristics (0.29 in/hr average rainfall intensity for 6-hour period), is 48,000 gpd.

Reporting Period Activity: The Town has completed the purchase of the CCTV inspection vehicle (MWRA Project No. WRA-P9-22-1-966). Training on the equipment has been completed. The vehicle (with Town personnel) performed a portion of the above CCTV inspection work.

Extensions of the Collection System: McHugh Farms: 33 unit cluster development included 115 bedrooms which would yield 12,650 gpd (based upon Title V). Approximately 2645 LF of 8-inch PVC gravity sewer and 14 manholes were installed as part of this project. The entire main has been installed. There are currently fourteen connections to the main. Also, the developer added a cluster development that attaches to the new sewer on Wayside Road. This new development will consist of 536 LF of 8-inch PVC sewer, five manholes and fourteen connections (twelve connections for six duplexes and two connections for future connections by abutters). Permits were granted but no physical connections have been made to date. Windy Lo Subdivision: This sixteen unit subdivision includes 64 bedrooms which would yield 7040 GPD (based upon Title V). Approximately 1246 LF of 8-inch PVC gravity sewer, 10 manholes and 16 services were installed. The entire main

has been installed. One (1) service connection has been installed to the main to date. 7 Hovey: Service connection for the Rivers Country Day School. A \$141,600 entrance fee was assessed. Fox Hill Drive [1386 LF of 8-inch sewer, one (1) pump station, and 732 LF of 4-inch force main]. The entire gravity and force main has been installed, but no connections have been made to date. There are a total of 23 sewer connection stubs installed (three connections have been permitted with the Town, but not installed). 119-125 East Central Street: 107 bed Senior Living Facility tied into the existing sewer main on East Central Street via sewer service. A \$171,218 entrance fee was assessed. Facility construction is on-going. No flow is associated with this connection to date.

MWRA I/I Local Financial Assistance Program: The community has financed eleven (11) I/I reduction projects through the Authority's funding assistance program. Of the \$9,332,600 allotted through the Program's Phases 1 - 13, the community has \$2,500,000 remaining in funding assistance.

23. NEEDHAM: South System

Background Information:

- Miles of Sewer: 132
- Sewered Population: 30,757
- Three Year (CY18 - CY20) Annual Average I/I: 1.95 mgd
- MassDEP Administrative Actions Since 2010: None

Latest I/I or SSES Report: Phase II I/I Investigation Report (August 2016)
CCTV Inspection: Beech / Webster Street Area (April 2017)
CCTV Inspection (2018)
Continuous Flow Monitoring (12 subareas) (Ongoing)

Private Source Inflow Removal Program: A private source identification program, using Town-owned CCTV inspection equipment, is ongoing. The Town continues to enforce 4:1 I/I removal prior to issuing occupancy permits. I/I mitigation funds forthcoming from the Muzi Ford property redevelopment and Boston Children's Hospital development.

I/I Rehabilitation Projects in Design or Construction: 2019 I/I Removal Construction Contract design completed Summer 2019. Project bid August 2019. Rehabilitation construction (Needham Contract No. 20DPW022C / MWRA Project No. WRA-P11-23-3-1128) was substantially complete in March 2020. Additional defects/infiltration areas were noted during the post-CCTV inspection and warranty inspection of the contract work. Three (3) additional sewer manholes were rehabilitated in August/September 2021. An estimated 0.47 mgd of peak infiltration was removed from the sanitary system upon contract completion.

Site access improvements to the MWRA Sewer Interceptor at Route 128 were made. As part of this project, a large rock obstruction was removed from the sewer system. This obstruction was preventing CCTV inspection work from being performed. The remaining CCTV inspection work was subsequently completed and the interceptor sewer evaluation report was submitted in December 2021. The remaining portion of the sewer site access project involves rehabilitating a sewer manhole in the breakdown lane of Route 128 with a new frame and cover. The Town has plans to relocate the sections of sewer away from the highway.

The Alden Road Pump Station Wet Well Replacement Project (MWRA Project No. WRA-P9-23-3-985) design was completed June 2018. Project bid August 2018. Construction completed Summer 2019. Project work is estimated to have eliminated 3206 gpd of peak infiltration.

Reporting Period Activity: Twelve meters (ten permanent and two portable area velocity flow modules) have been installed for continued I/I monitoring. The Lake Drive Sewer Pump Station Replacement Design & Construction Project bid process has been completed. Pump Station reconstruction to begin pending mobilization and material delivery.

Town is currently performing an evaluation of the I-95 interceptor to assess influent flows and the condition of the interceptor. Approximately 500 LF of sewer extension on Walker Lane was completed. Town anticipates four homes to connect to the sewer extension. Three (3) properties have subsequently abandoned their septic systems and connected to the sewer. In addition, an existing 50-foot section of AC pipe was removed and replaced as part of the project.

MWRA I/I Local Financial Assistance Program: The community has financed eleven (11) I/I reduction projects through the Authority's funding assistance program. Of the \$9,977,600 allotted through the Program's Phases 1 - 13, the community has \$5,959,000 remaining in funding assistance.

24. NEWTON: North and South Systems

Background Information:

- Miles of Sewer: 271
- Sewered Population: 88,190
- Three Year (CY18 - CY20) Annual Average I/I: 7.05 mgd
- MassDEP Administrative Actions Since 2010: None

Latest I/I or SSES Reports:

- Smoke Testing in Subareas B066 & B071 (March 2016)
- CIP - Project 1 Post Construction Flow Evaluation (April 2016)
- CIP - Project 6 Inspection and Assessment Report (June 2017)
- CIP - Project 7 Inspection and Assessment Report (April 2018)
- CIP - Project 8 Inspection and Assessment (March 2019)
- CIP - Project 3 and 4 Flow Evaluation (January 2019)
- CIP - Project 5 Post Construction Flow Evaluation (November 2019)
- CIP - Project 9 Inspection and Assessment (April 2020)
- CIP - Project 10 Inspection and Assessment (Ongoing)
- CIP - Project 11 Inspection and Assessment (Ongoing)

Private Source Inflow Removal Program: No work undertaken during this reporting period.

I/I Rehabilitation Projects in Design or Construction: CIP Project 6 Rehabilitations are complete. The estimated I/I removal is 299,399 gpd of peak infiltration, 64,224 gpd of peak rain-induced infiltration and 501,408 gpd of peak inflow.

CIP Project 7 Rehabilitations are substantially complete. The estimated I/I removal is 165,051 gpd of peak infiltration, 71,784 gpd of peak rain-induced infiltration and 102,112 gpd of peak inflow.

Completed CIP Project 8 Inspection and Assessment, which included investigating 138,354 LF of sewer and 854 sewer manholes. The estimated I/I removal is 658,788 gpd of peak infiltration and 92,967 gpd of peak inflow. CIP Project 8 is currently being designed and is scheduled to be bid following completion of the CIP Project 7 Rehabilitations.

Completed CIP Project 9 Inspection and Assessment, which included investigating 132,489 LF of sewer and 852 sewer manholes. The estimated I/I removal is 329,145 gpd of peak infiltration and 38,192 gpd of peak inflow.

CIP Project 10 Inspection and Assessment is ongoing and includes investigating 121,166 LF of sewer and 714 manholes.

CIP Project 11 Inspection and Assessment is ongoing and includes investigating 106,266 LF of sewer and 740 manholes.

In December 2020, MWRA funds were distributed for the Design & Construction of CIP Project 8 Sewer Rehabilitations Project (MWRA Project No. WRA-P11-24-3-1158). In August 2019, MWRA funds were distributed for the Design & Construction of CIP Project 7 & 8 Sewer Rehabilitations Project (MWRA Project No. WRA-P11-24-3-1126).

MWRA I/I Local Financial Assistance Program: The community has financed thirty (30) I/I reduction projects through the Authority's funding assistance program. The community has used its entire MWRA Phase 1 - 13 funding allocation (\$34,937,400).

25. NORWOOD: South System

Background Information:

- Miles of Sewer: 83
- Sewered Population: 31,458
- Three Year (CY18 - CY20) Annual Average I/I: 3.74 mgd
- MassDEP Administrative Actions Since 2010: None

Latest I/I or SSES Report: I/I Assessment and GIS Tracking Program (2019)

Private Source Inflow Removal Program: As part of the Meadowbrook Area Sewer Inspection, ten buildings were identified with various illicit connections and eleven sources have been removed to date. Within the Hawes Brook sewer tributary area, eight property owners have been notified to redirect sump pumps.

I/I Rehabilitation Projects in Design or Construction: Meadowbrook Priority Area 5 Rehabilitation Construction (MWRA Project No. WRA-P9-25-3-974 / Town Bid No. NPW-19-03) bid September 2018. Rehabilitation work is substantially complete. Project work included CIPP lining of 7515 LF of sewer main, installation of 600 LF of 8-inch PVC sewer main, lining 38 sewer manholes and CIPP lining of 123 house service connections.

Area 3 and Area 4 Sewer Rehabilitation Project is complete. Rehabilitation work included CIPP lining 8245 LF of sewer main, CIPP lining of 217 service connections, manhole rehabilitation and installation of 605 LF of 8-inch PVC sewer main.

Underdrain Manhole Rehabilitation Project (MWRA Project No. WRA-P9-25-3-917) is complete. Hawes Brook-Westover Parkway Area Sewer Rehabilitation Construction is complete.

Reporting Period Activity: Design and permitting of the Airport Sewer Manhole Replacement Project is complete. Project will be bid in August 2022. I/I Assessment and GIS Tracking Program (MWRA Project No. WRA-P9-25-1-919) work is complete.

MWRA I/I Local Financial Assistance Program: The community has financed twenty-one (21) I/I reduction projects through the Authority's funding assistance program. Of the \$11,589,400 allotted through the Program's Phases 1 - 13, the community has \$4,710,000 remaining in funding assistance.

26. QUINCY: South System

Background Information:

- Miles of Sewer: 230
- Sewered Population: 101,636
- Three Year (CY18 - CY20) Annual Average I/I: 5.34 mgd
- MassDEP Administrative Actions Since 2010: None
- EPA Administrative Actions: Consent Decree (June 2021)

Latest I/I or SSES Report: SSES & I/I Identification Plan (July 2016)
Sewer System Evaluation Survey Phase III (March 2018)
Wollaston Beach Sewer System Evaluation Phase 1 (March 2018)
Fall 2018 Sewer Investigation (April 2019)
CMOM Self-Assessment Program (April 2019)
2020 SSES and Update Project (February 2020)

Private Source Inflow Removal Program: The City has partnered with the plumbing inspector on its FOG Program. As part of this program, the plumbing inspector visits CV License Holders for Grease Trap Inspections. While inspecting for grease traps, the inspector also observes the property for illegal inflow connections. Although this program directly addresses FOG discharges, it has been successful in identifying direct private inflow sources for removal.

The City continues its opportunistic residential and business inspections to identify sump pumps and private drain infrastructure connected to the sewer system. The City's Storm Water Discharge Ordinance forbids non-sanitary connections. A new fee structure was made effective July 1, 2013. Part II, Chapter 270, Article II 270-5 of the City's Ordinance outlines penalties for illegal connections and discharges to the sanitary sewer system: <https://ecode360.com/29090773>. The fee structure remains in effect and has resulted in improvements to the system.

Developers contribute one percent of their proposed total project value to the Quincy Sewer and Drain Rehabilitation Fund (QSDRF). Additionally, as part of the site plan review process, the City engages in mitigation negotiations and requires I/I removal at 4:1 by applicants whose flow exceeds 15,000 gpd. Through July 1, 2022, the QSDRF had a balance of \$3,622,225.

The City owns a CCTV sewer inspection vehicle. The vehicle provided significant input towards the development of the Coastal Structures I/I Evaluation / Identification Study. Also, many of the open cut and rehabilitation repairs on the Phase IIB Coastal Structures I/I Reduction Project were identified via the City's CCTV vehicle during I/I investigative efforts in the Houghs Neck area.

I/I Rehabilitation Projects in Design or Construction: The FY21 CIPP Sewer Improvements Project (MWRA Project Nos. WRA-P11-26-3-1159 / 1172) began June 2021 was complete June 2022. Warranty Inspections scheduled for CY23. Project work included: 39,500 LF of CIPP lining for 8-inch, 10-inch, 12-inch, 15-inch, and 20-inch sewer pipe on Parke Avenue, East Squantum Street, Huckins Avenue, Airport Road, Alstead Street, Williams Street, Ocean Street, Pope Street, Ardell Street, Small Street, Albion Road, Ridgeway Street, Randlett Street, Copley Street, Waterston Avenue, Mears Avenue, Manet Avenue, Babcock Street, Stoughton Street, Hull Street to Lakeside Avenue Easement, Winthrop Street, Darrow Street, Marine Street, Rhoda Street, Shed Street, Doane Street, Morgan Road, Sturtevant Road, Dimmock Street, Bent Terrace to Elm Street Easement, Elm Street, McGrath Highway, Shea Street, Baxter Avenue, Mound Street to Cove Way Easement, Willard Street, Thurston Avenue, Wesson Avenue and Ames Street. Work also included rehabilitating 122 sewer manholes. Approximately 300,000 gpd of infiltration is estimated to be removed by this project based on flow isolation observations.

The FY21 Sewer Open Cut Design Project (MWRA Project No. WRA-P11-26-3-1159) was complete March 2021. FY21 Sewer Open Cut construction was substantially complete in July 2022. I/I reduction work included installation of approximately 2800 LF of new 8 to 10-inch gravity sewer main on Quincy Shore Drive and sewer main spot repairs on Manet Avenue, Dahlgren Street, Barham Avenue, Adams Circle and Landsdowne Street. Barham Avenue, Adams Circle and Landsdowne Street are scheduled to be CIPP lined as part of the FY2022 Sewer CIPP Projects.

The FY22 Sewer CIPP Project Contract 1 Design Project (MWRA Project No. WRA-P11-26-3-1159) was complete March 2022. The FY22 Sewer CIPP Project Contract 1 construction began June 2022. Work includes approximately 24,500 LF of CIPP lining for 6-inch, 8-inch, 10-inch and 12-inch sewer pipe on Standish Road, Mayflower Road, Lansdowne Street, Deerfield Street, Heath Street, Phillips Street, Marlboro Street, Wayland Street, West Squantum Street, John Street, Montclair Avenue, Sagamore Avenue, Vershire Street, Sterling Street, Ruthven Street, Evans Street, Harvard Street, Barham Avenue, Hilma Street, Clement Terrace, Elliot Avenue, Hamilton Avenue, Wilson Avenue and Sherman Street, Pratt Road, Commander Shea Boulevard, Sagamore Street, Prospect Street, Blackwell Street, Edwin Street, Hollis Avenue, Hancock Street, Cummings Avenue, Landers Street, Sachem Street, Wendell Avenue, Sewall Street, Newport Avenue, Holbrook Road, Fayette Street and North Central Avenue. Work also includes improvements at 156 manholes and three (3) sewer main spot repairs on Holbrook Road, Wendell Avenue and West Squantum Street. Project is anticipated to be complete in December 2022 (except for Warranty Inspections).

The FY22 Sewer CIPP Project Contract 2 Design Project (MWRA Project No. WRA-P11-26-3-1159) was complete March 2022. The FY22 Sewer CIPP Project Contract 2 construction began in June 2022. Work includes approximately 24,500 LF of CIPP lining for 8-inch, 10-inch, 12-inch, 15-inch and 18-inch sewer pipe on Hull Street to Lakeside Avenue Easement, Avalon Avenue, Murdock Avenue, Edinboro Road, Arnold Street, Fifth Avenue, Ring Avenue, Edwards Street, Hyde Street, Forum Road, Phipps Street, Norman Road, Carter Street, Plymouth Street, Cedar Street, Oakland Avenue, Adams Circle, Miles Drive, Joan Drive, Priscilla Lane, Quarry Street, Ernest Avenue, Dunn's Court, Dunn's Hill Road, Filbert Street, Sunnyside Road, Stedman Street, Mullin Avenue, Calvin Road, Calvin Road to Sea Street Easement, Avalon Beach Easement, School Street, Hancock Street, Quincy Avenue, Faxon Park Road, Blanchard Road and Faxon Lane. Work also includes improvements at 146 manholes. Project is anticipated to be complete in December 2022 (except for Warranty Inspections).

The City began work on the Areas 1&2 Supplemental SSES, the FY23 sewer design project/sewer flow analysis/sewer hydraulic model refinements, and the Area 3 SSES in Summer 2022 (MWRA Project No. WRA-P11-26-3-1190).

The FY19 Sewer Open Cut Improvements Project (MWRA Project Nos. WRA-P9-26-3-992 / 1140) was complete March 2021. Project work included: installation of 2750 LF of new 8 to 18-inch gravity sewer main on Island Avenue, Peterson Road, Belmont Street, Clement Terrace Easement, Sherman Street, Elmwood Park, Ocean Street and Ardell Street; CIPP lining of 1060 LF of 8 to 18-inch gravity sewer main on Island Avenue and Peterson Road; and rehabilitating 22 sewer manholes.

Reporting Period Activity: In December 2019, project work began on the 2020 SSES and Update Project (MWRA Project No. WRA-P11-26-3-1140). Project work included inspection and evaluation of approximately 221,000 LF of sewer main and 1760 sewer manholes (including inspection completed since the prior SSES in 2018); flow monitoring at key locations throughout the City; and collection of groundwater data at select manholes. This project also included additional analysis of data collected for the two 2018 SSES projects. SSES Field Investigation work performed March 2020 to June 2020. SSES Analysis and Report Documentation performed June 2020 to February 2021.

In August 2018, the City submitted a Clean Water State Revolving Fund (CWSRF) Project Evaluation Form (PEF) for the FY20 Sewer Improvements Project. In June 2020, project work began on the FY20 Open Cut Sewer & Drainage System Repairs (CWSRF #4515) - Contract A. Project work included: installing 1650 LF of new 8 to 12-inch gravity sewer main, CIPP lining 2150 LF of 8 and 12-inch gravity sewer main and rehabilitating five sewer manholes. Project work was located on Assabet Road, Shennen Street, Highfield Road, Copley Street, Dickens Street, Saint Anns Road, Hunt Street, Lafayette Street and Trescott Street. Project substantially complete March 2021. Approximately 18,000 gpd of infiltration is estimated to be removed based on flow isolation observations.

Also in June 2020, project work began on the FY20 CIPP Sewer Improvements (CWSRF #4515) - Contract B. Project work included: 21,295 LF of CIPP lining of 8-inch, 10-inch, 15-inch, 20-inch, and 24-inch x 36-inch sewer main on Papile Lane, Bent Terrace, Washington Street, Fowler Street, Alden Street, Lowe Street, James Street, Avalon Avenue, Washington Court, Hughes Street, Arthur Street, Nelson Street, Carlmark Street, Quarry Street, Woodward Avenue, Marginal Road, Belmont Street, Winthrop Avenue, Waterson Avenue, Wendell Avenue, Ebbett Avenue, Perry Road, London Avenue, Clement Terrace, Oxenbridge Road, Dunbarton Road, Ellington Road, Ferndale Road, Rawson Road, Hamden Circle, Ocean Street and Squanto Road. Project work also included rehabilitating 56 sewer manholes. Project substantially complete June 2021. Approximately 300,000 gpd of infiltration is estimated to be removed based on flow isolation observations.

In August 2018, the City submitted a CWSRF PEF for the Strand Sewer Pump Station Upgrades Project. In July 2020, the Strand Pump Station Improvements Project (CWSRF #4508) contract was awarded. Project work included construction of a new dual wastewater/stormwater pump station and installation of 600 LF of 6-inch wastewater force main. Project work substantially complete August 2021 (Final completion scheduled for Summer/Fall 2022). The intent of this project is to provide a resilient asset with a higher wastewater capacity (by nearly twice) than the current pump station.

Emergency Sewer Repairs/Replacements during this reporting period included: (1) Emergency sewer repairs on Piermont Street, and (2) the lining of three sewer laterals on Wampatuck Road and two laterals on Division Street in response to ongoing IDDE efforts.

MWRA I/I Local Financial Assistance Program: The community has financed eighteen (18) I/I reduction projects through the Authority's funding assistance program. Of the \$32,780,000 allotted through the Program's Phases 1 - 13, the community has \$4,330,000 remaining in funding assistance.

27. RANDOLPH: South System

Background Information:

- Miles of Sewer: 101
- Sewered Population: 34,920
- Three Year (CY18 - CY20) Annual Average I/I: 1.79 mgd
- MassDEP Administrative Actions Since 2010: None

Latest I/I or SSES Report: I/I Investigation - March 2010 Storm Events (July 2013)
Wastewater System Metering Program (June 2017)

Private Source Inflow Removal Program: The Town developed a sump pump inspection and amnesty program. As a result of the program, the Town was contacted by 202 homeowners having sump pumps. Internal inspections were completed to determine sump pump locations. One hundred twenty-one homes (121) were determined to have sump pumps connected to the sewer system. Ninety-four (94) of these homes have drainage directly adjacent to the homes. Each of the 94 homes was inspected. Design was completed to redirect these sump pumps to the drainage system. Sump pump redirection construction is complete (Randolph Contract Nos. 08-SP1/2/3) (MWRA Project No. WRA-P6-27-3-655). Total peak flow inflow removed is estimated to be 0.61 mgd.

I/I Rehabilitation Projects in Design or Construction: An I/I Investigation Report (July 2013) was drafted for the community areas affected by the March 2010 storm events. As a result of that report, a rehabilitation contract (Randolph Contract 15-S1/ MWRA Project No. WRA-P8-27-3-820) was designed (March 2015) and bid (April 2015). Rehabilitation construction is complete and included lining of the Vine Street Pump Station wet well, CIPP lining 1600 LF of sewer main, installing seven (7) short liners, grouting of 24 service connections, installing nine (9) manhole liners, digging and replacing two (2) sewer mains, testing and sealing of 5500 LF of sewer main and root removal within 500 LF of sewer main.

A Town-Wide wastewater flow metering program was performed during Spring 2017. Data review/report preparation completed Summer 2018.

Reporting Period Activity: The Town conducted CCTV inspection of approximately 50,000 LF of sewer mains between November 2021 and March 2022. This is part of a larger I/I Design / Rehabilitation Project (MWRA Project No. WRA-P11-27-3-1139). The Martindale Pump Station wet well lining work is substantially complete (Randolph Contract 20-S1 / MWRA Project No. WRA-P11-27-3-1139).

There have been no modifications and/or extensions of the collection over the last year. Approximately eleven (11) single family homes were connected to the system in CY20/21.

MWRA I/I Local Financial Assistance Program: The community has financed eleven (11) I/I reduction projects through the Authority's funding assistance program. Of the \$10,070,800 allotted through the program's Phases 1 - 13, the community has \$5,099,742 remaining in funding assistance.

28. READING: North System

Background Information:

- Miles of Sewer: 96
- Sewered Population: 25,334
- Three Year (CY18 - CY20) Annual Average I/I: 1.66 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report: Infiltration and Inflow (I/I) Investigations Final Report (November 2012)
I/I Investigations Report - Section 2 Supplement (November 2014)

Private Source Inflow Removal Program: The Town is continuing to work with property owners where illicit connections were found during the Building Inspection Program. The Town will be working to set up a removal program over the next year to utilize some of the funds collected under development fees.

I/I Rehabilitation Projects in Design or Construction: The Town recently bid the Collection System Lining Project. The project will consist of approximately 18,000 LF of CIPP lining and 12,000 LF of CCTV inspection. Project work to begin Summer 2022.

Reporting Period Activity: Installed/replaced approximately 2200 LF of service laterals at 60 residences. In FY22, the Town received \$23,295 in sewer I/I connection fees from various developments. In March 2021, MWRA funds were distributed for the Town-Wide Sewer System Rehabilitation: Study / Design / Construction Project (MWRA Project No. WRA-P11-28-3-1164).

MWRA I/I Local Financial Assistance Program: The community has financed eleven (11) I/I reduction projects through the Authority's funding assistance program. Of the \$7,749,100 allotted through the Program's Phases 1 - 13, the community has \$1,040,000 remaining in funding assistance.

29. REVERE: North System

Background Information:

- Miles of Sewer: 98
- Sewered Population: 61,944
- Three Year (CY18 - CY20) Annual Average I/I: 3.08 mgd
- MassDEP Administrative Actions since 2010: None
- EPA Clean Water Act Administrative Order: CD 1:10-cv-11460 (November 16, 2010)

Latest I/I or SSES Reports:

CMOM Program Development (CWSRF 3817) (March 2015)
SSES - Phase VI and IDDE Planning Investigations (CWSRF 3908) (December 31, 2015)
SSES - Phase VII Field Investigations (CWSRF 3956) (December 31, 2016)
Illicit Connection Detection (CWSRF 3957) (December 31, 2016)
SSES - Phase VIII Field Investigations (CWSRF 4054) (December 31, 2017)
Illicit Connection Detection (CWSRF 4055) (December 31, 2017)
SSES - Phase IX Field Investigations (CWSRF 4183) (December 31, 2018)
Illicit Connection Detection (CWSRF 4176) (December 31, 2018)
SSES - Phase X Field Investigations (CWSRF 4387) (April 30, 2020)
Illicit Connection Detection (Phase 5) (CWSRF 4386) (April 30, 2020)
SSES - Phase XI Field Investigations (CWSRF 6648) (April 30, 2021)
SSES - Phase XII Field Investigations (CWSRF 6800) (April 30, 2022)

Private Source Inflow Removal Program: Contract 8A project work will begin Summer/Fall 2022. Work includes redirection of 25 sump pumps and installation of 530 LF of drain extensions. The City continues to maintain a 10:1 I/I removal fee based on development size.

I/I Rehabilitation Projects in Design or Construction: Work completed during FY22 includes: CIPP lining of 21,500 LF of 8-inch sewer; CIPP lining of 2760 LF of 10-inch sewer; CIPP lining of 450 LF of 12-inch sewer; service lateral connection liners at 572 locations; full length service lateral connection liners at 68 locations; 1010 VF cement/epoxy manhole lining; sealing 59 manhole corbels; and performing 12 sewer spot repairs.

Reporting Period Activity: See list of work completed in the I/I Rehabilitation Projects section above. In December 2021, \$300,000 in funds were distributed for Phase 12 Designs of Recommended Sewer Rehabilitations Project (MWRA Project No. WRA-P11-29-2-1183).

MWRA I/I Local Financial Assistance Program: The community has financed seven (7) I/I reduction projects through the Authority's funding assistance program. Of the \$16,940,900 allotted through the Program's Phases 1 - 13, the community has \$11,138,000 remaining in funding assistance.

30. SOMERVILLE: North System

Background Information:

- Miles of Sewer: 128
- Sewered Population: 81,045
- Three Year (CY18 - CY20) Annual Average I/I: 4.29 mgd
- MassDEP Administrative Actions: Unilateral Order (September 2010)

Somerville is one of MWRA's five combined sewer service communities (Boston North, Brookline, Cambridge, Chelsea, Somerville). Portions of Somerville are impacted by projects under MWRA's CSO Control Plan.

Latest I/I or SSES Report: Sewer and Combined Sewer CIP (September 2016)
CIP Project 1 - Manhole Inspection, Assessment and Design (March 2021)
CIP Project 2 - Pipeline Inspection, Assessment, and Design (March 2022)
Ward 2 - Pipeline Inspection, Assessment, Design and Construction (Ongoing)
FY22-23 Pipeline Inspection, Assessment, Design and Construction (Ongoing)

Private Source Inflow Removal Program: The Engineering Division reviewed 75 site construction permits. Each permit enforced the Engineering Site Permit Rules and Regulations. Most involved some amount of redirection of stormwater from the combined sewer system and/or reduced stormwater runoff through groundwater recharge.

I/I Rehabilitation Projects in Design or Construction: The Ward 2 sewer rehabilitation project consists of underground utility repair and specialty trenchless pipe rehabilitation on gravity sewer ranging from 8-inch to 15-inch in diameter. Work includes performing 21 point repairs on the gravity sewer, installing five new 4-foot diameter sewer manholes, relocation of 230 LF of 8-inch and 20 LF of 10-inch gravity sewer; replacing two sewer manholes; and CIPP lining 20 pipe segments (6250 LF of sewer main). The estimated inflow removal will be 0.02 mgd once the project is completed.

The Poplar Street Pump Station design process has proceeded through 60 percent design deliverable. The current concept for the Pump Station includes a 4 million gallon storage tank and 50 mgd pumping capacity. The Pump Station is expected to be online in 2025.

Spring Hill Sewer Separation project construction started in February 2022. To date, approximately 5500 LF of (combined) sewer main has been CIPP lined. Work is progressing with the installation of new mainline drainage and mainline water mains and services. Estimated inflow removal is 2.5 mgd that will be realized once the Poplar Street Pump Station is completed. In addition, there is an estimated inflow removal of 30,000 gpd from the proposed Green Stormwater Infrastructure that will be realized once project construction is complete.

Somerville Avenue Infrastructure and Streetscape Improvement Project: Remaining work includes the completion of a box culvert installation and sewer relocation at the eastern limits of the project. Final completion for this outstanding work is currently scheduled for December 2023. This is due to the additional (out of scope) work to stabilize three bridge piers of elevated McGrath Highway. Estimated inflow removal is 0.4 mgd (inflow) that will be realized once the construction of the Poplar Street Pump Station project is complete.

Reporting Period Activity: Approximately 830 LF of the Marginal Interceptor pipeline has been rehabilitated with spray-in-place cementitious liner. The remainder of the 1300 LF pipeline has been crack-sealed and will be lined within the next month. I/I removal estimates have been reevaluated for this work, estimated at approximately 0.8 mgd.

MWRA I/I Local Financial Assistance Program: The community has financed ten (10) I/I reduction projects through the Authority's funding assistance program. Of the \$25,955,800 allotted through the Program's Phases 1 - 13, the community has \$13,838,900 remaining in funding assistance.

31. STONEHAM: North System

Background Information:

- Miles of Sewer: 63
- Sewered Population: 23,001
- Three Year (CY18 - CY20) Annual Average I/I: 1.99 mgd
- MassDEP Administrative Actions: None
- EPA Clean Water Act Administrative Order: EPA Docket No. 09-028 (August 2009)

Latest I/I or SSES Report: Infiltration/Inflow Analysis Summary Report (December 2017)

Private Source Inflow Removal Program: Town is continuing to investigate and eliminate illicit cross-connections between the sanitary sewer and storm water systems as part of its NPDES Phase 3 & 4 MS4 Permit Investigations and Illicit Discharge Detection and Elimination Program (IDDE).

I/I Rehabilitation Projects in Design or Construction: Phase 7 Sanitary Sewer System Rehabilitation (MWRA I/I Local Financial Assistance Program Project #WRA-P11-31-3-1107) contract awarded June 2021. Work included: pre- and post-rehabilitation closed circuit TV inspection, CIPP lining, lateral connection rehabilitation by grout injection, replacement of gravity sewer and lateral connections, manhole bench reconstruction, manhole frame and cover replacement, and warranty inspections of rehabilitated sanitary sewers. Construction is complete. Fallon Road / Park Street System Rehabilitation (Phase 1) Project work complete.

Reporting Period Activity: The Town is continuing to evaluate options for establishing a 4:1 I/I removal program in accordance with MassDEP Regulations 314 CMR 12. In December 2021, MWRA funds (\$970,000) were distributed for the Phase 8 Sewer System I/I Rehabilitation (MWRA Project No. WRA-P11-31-3-1182).

MWRA I/I Local Financial Assistance Program: The community has financed twelve (12) I/I reduction projects through the Authority's funding assistance program. Of the \$7,829,900 allotted through the Program's Phases 1 - 13, the community has \$970,000 remaining in funding assistance.

32. STOUGHTON: South System

Background Information:

- Miles of Sewer: 89
- Sewered Population: 21,493
- Three Year (CY18 - CY20) Annual Average I/I: 1.76 mgd
- MassDEP Administrative Actions since 2010: None

Latest I/I or SSES Report: Reprioritized Year 5 Spring 2017 I/I Investigation (September 2017)
Reprioritized Year 6 Spring 2018 I/I Investigation (November 2018)
Year 7 (Round 2) I/I Evaluation (September 2019)
Year 8 (Round 2) I/I Evaluation (February 2021)
Year 9 (Round 2) I/I Evaluation (March 2022)
Year 10 (Round 2) I/I Evaluation (Ongoing)
Crescent Ridge I-I Mitigation (Ongoing)

Private Source Inflow Removal Program: The Town has adopted new sewer use regulations which address private inflow removal. TV inspection of service connections / house-to-house inspections was suspended due to COVID-19 restrictions.

Crescent Ridge Private Inflow Identification/Removal: Crescent Ridge Dairy requires identification and removal of inflow sources per MWRA OP#11 requirements. To facilitate this, a private inflow identification and removal program was initiated. Private inflow information letters were sent to approximately 2440 residences. The final round of notification letters was sent out in July 2022. Follow-up building inspections are anticipated to be complete in September 2022. Investigation of suspect sources and evaluation of rehabilitations is ongoing. Source removal totals to be reported upon completion of project.

I/I Rehabilitation Projects in Design or Construction: Years 6 and 7 Construction Design (MWRA Project No. WRA-P11-32-3-1138) complete March 2020. Construction began in June 2020 (Stoughton Contract 20-1 / MWRA Project Nos. WRA-P11-32-3-1138 / 1155). Project work substantially complete December 2020. Warranty retesting work to be complete Fall 2022. Project will remove an estimated 0.09 mgd of peak infiltration and 0.01 mgd of peak inflow.

Reporting Period Activity: Year 10 (Round 2) Spring 2022 I/I Investigation completed Spring 2022. Data review/report preparation ongoing.

Year 9 Spring 2021 I/I Investigation (MWRA Project No. WRA-P11-32-1-1170) completed Summer 2021. Data review/report preparation completed March 2022. Investigation identified 0.02 mgd of peak removable infiltration and 0.01 mgd of peak removable inflow.

Reprioritized Year 8 Spring 2020 I/I Investigation (MWRA Project No. WRA-P11-32-3-1138) completed Spring 2020. Data review/report preparation completed February 2021. Investigation identified 0.03 mgd of peak removable infiltration and 0.02 mgd of peak removable inflow.

Reprioritized Year 7 Spring 2019 I/I Investigation (MWRA Project No. WRA-P9-32-3-995) completed Spring 2019. Data review/report preparation completed September 2019. Investigation identified 0.05 mgd of peak removable infiltration and 0.004 mgd of peak removable inflow.

The third phase of the privately funded Goddard Highlands Development was completed in Spring 2022. Approximately 5000 LF of gravity sewer, 2400 LF of force main and a municipal pump station have been installed.

The 2020 Annual Town Meeting approved \$7.5 million for the construction of the South Stoughton Sewer Extension Project. This project will include the installation of 8700 LF of gravity sewer, a sewer pump station and 4300 LF of pressurized force main. The project will service 28 commercial/industrial properties in the Campanelli Business Park and Park Street area as well as 45 residential properties along Park Street, Turnpike Street and Tenth Street. Construction is ongoing.

MWRA I/I Local Financial Assistance Program: The community has financed eighteen (18) I/I reduction projects through the Authority's funding assistance program. Of the \$7,902,900 allotted through the Program's Phases 1 - 13, the community has \$1,060,000 remaining in funding assistance.

33. WAKEFIELD: North System

Background Information:

- Miles of Sewer: 93
- Sewered Population: 27,001
- Three Year (CY18 – CY20) Annual Average I/I: 2.87 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report: 2014 Smoke Testing Program - Gauging Areas 6 & 7 of Subarea 6 (January 2015)
2015 Smoke Testing Program - Sewer Subarea 2 (June 2016)
TV Inspection & Cleaning of Areas to be Paved (August 2016)
Sewer System Evaluation Survey - Year One (February 2017)
Sewer System Evaluation Survey - Year Two (December 2017)
Sewer System Evaluation Survey - Year Three (January 2019)
Sewer System Evaluation Survey - Year Four (March 2020)
Sewer System Evaluation Survey - Year Five (February 2021)
Sewer System Evaluation Survey - Year Six (Ongoing)

Private Source Inflow Removal Program: The Town is developing a plan to notify residents in the Paon Boulevard area of a potential pilot building inspection program to investigate potential private inflow sources.

I/I Rehabilitation Projects in Design or Construction: Year Five Sewer System Evaluation Survey was completed in February 2021 and included CCTV and manhole inspections for approximately 16,000 LF of sewer main. This project identified 1600 gpd of recommended removable peak I/I and structural defects in select areas that are scheduled to be paved within the next few calendar years. Some of these repairs were completed as part of the Sewer System Infiltration Rehabilitation - Year 4 construction in 2021. The remaining repairs will be incorporated in the Year 5 construction tentatively scheduled for Winter 2022/Spring 2023.

The Sewer System Infiltration Rehabilitation - Year 3 Construction is substantially complete as of February 2021 with a small amount of CCTV inspection of the 48-inch brick interceptor remaining. This work is expected to be completed in Summer/Fall 2022.

The Sewer System Infiltration Rehabilitation - Year 4 Construction began July 2021. Work is expected to be completed August 2022.

Reporting Period Activity: The Town continues to require a 4 to 1 removal of flow from completed subdivisions/developments. Also, the Town implemented a \$500 Sewer Connection Fee in June 2019. In August 2020, MWRA funds were distributed for the Year 4 - Sewer System Infiltration Rehabilitation (Design & Construction) Project (MWRA Project No. WRA-P11-33-3-1150).

MWRA I/I Local Financial Assistance Program: The community has financed twenty-eight (28) I/I reduction projects through the Authority's funding assistance program. Of the \$9,806,900 allotted through the Program's Phases 1 - 13, the community has \$1,280,000 remaining in funding assistance.

34. WALPOLE: South System

Background Information:

- Miles of Sewer: 59
- Sewered Population: 19,449
- Three Year (CY18 - CY20) Annual Average I/I: 1.01 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report: I/I Investigation Program (Round 2): Year 4 (January 2020)
I/I Investigation Program (Round 2): Year 5 (January 2021)
2020 Sewer Investigation (July 2021)
I/I Investigation Program (Round 2): Year 6 (Ongoing)
2022 Flow Metering Program (Ongoing)

Private Source Inflow Removal Program: The Town includes house-to-house private inflow inspection program as part of its water meter replacement program. Effective July 1, 2020, developers are no longer required to remove I/I as a condition of a sewer connection. The I/I removal program remains in place; however, it will now be fully funded by the Town. [Previous Developer Flow Reduction Program: For new connections greater than 15,000 gpd, a 4 to 1 reduction as per 314 CMR 12.04 is required. For new connections less than 15,000 gpd, developers are required to remove I/I at a ratio of 2.3 to 1 (developers may pay the Town \$13.60 per gallon should they so choose)].

I/I Rehabilitation Projects in Design or Construction: The 2020 Sewer System Improvements Project Design (MWRA Project No. WRA-P11-34-3-1135) was completed March 2020. The 2020 Sewer System Improvements Rehabilitation Construction Project (Walpole Contract 2020-18 / MWRA Project Nos. WRA-P11-34-3-1135 / 1146) was bid March 2020. Rehabilitation work was substantially complete in November 2020. Warranty retesting work was completed Fall 2021. This project incorporated four years of I/I investigation report findings (Year 8; Round 2, Year 1; Round 2, Year 2; and Round 2, Year 3) into its rehabilitation construction process. Approximately 35,064 gpd of infiltration was removed from pipelines and 13,752 gpd infiltration was removed from manholes.

Reporting Period Activity: Review and reporting for the Round 2, Year 6 I/I Investigation is ongoing.

The 2020 Sewer Investigation Report (MWRA Project No. WRA-P11-34-3-1146) was based on CCTV inspection of 24,000 LF of sewer main and topside survey of 145 sewer manholes completed as part of the 2020 Sewer System Improvements Contract. Approximately 5328 gpd of infiltration was observed during CCTV inspection and 3024 gpd of infiltration was identified during manhole inspection.

The Year 5 I/I Investigation (Round 2) field work was completed Spring 2020. Data review and report preparation completed January 2021 (MWRA Project No. WRA-P11-34-3-1135). Approximately 31,968 gpd of peak infiltration was observed during television inspection and 24,912 gpd of peak infiltration and 39,130 gpd of peak inflow was identified during manhole inspection.

The Year 4 I/I Investigation (Round 2) field work was completed Spring 2019. Data review and report preparation completed January 2020. Approximately 27,072 gpd of peak infiltration was observed during television inspection and 21,600 gpd of peak infiltration and 35,188 gpd of peak inflow was identified during manhole inspection.

A total of 1310 LF of 8-inch sewer main has been added and accepted to Walpole's system over the past year.

MWRA I/I Local Financial Assistance Program: The community has financed nine (9) I/I reduction projects through the Authority's funding assistance program. Of the \$6,110,000 allotted through the Program's Phases 1 - 13, the community has \$1,620,000 remaining in funding assistance.

35. WALTHAM: North System

Background Information:

- Miles of Sewer: 138
- Sewered Population: 64,375
- Three Year (CY18 - CY20) Annual Average I/I: 3.53 mgd
- MassDEP Administrative Actions: ACOP-NE-10-1N001 (February 2010)

Latest I/I or SSES Report:

Post Flow Metering Report - Area 13/14-A SSO Mitigation Project (June 2016)
Post Flow Metering Report - Area 12-A -2-3 Lakeview (June 2016)
Post Flow Metering Report - Area 6B6 - Pond End Lane (July 2016)
Post Flow Metering Report - Alderwood Road Area (July 2016)
Area 13/14B - Sewer System Evaluation Survey (February 2018)
CMOM Plan and Sewer System Flow Metering (September 2020)
Sewer System Flow Metering and Analysis (February 2022)

Private Source Inflow Removal Program: From January 2022 to June 2022, eighteen (18) sewer laterals were repaired / replaced (main to property line) by City crews. Town conservatively estimated that the relaying the old sewer laterals has removed 126 gpd of I/I based upon the length of sewer laterals (a total of 451 LF of pipe was replaced).

From July 2021 to December 2021, twenty (20) sewer laterals were repaired / replaced (main to property line) by City crews. Town conservatively estimated that the relaying the old sewer laterals has removed 100 gpd of I/I based upon the length of the sewer laterals (a total of 453 LF of pipe was replaced).

I/I Rehabilitation Projects in Design or Construction: Area 13/14B – Bear Hill Valley Sewer Rehabilitation Project is ongoing (MWRA Project No. WRA-P11-35-3-1167). Project work includes: Replacing 1368 LF of existing sewer main with SDR 35 PVC pipe; replacing 30 sewer existing services with 4-inch SDR 35 PVC (main to property line); replacing 10 existing brick sewer manholes with precast concrete structures; replacing seven (7) existing manhole frames and covers; CIPP lining 2573 LF of existing sewer main; and heavy cleaning of 2978 LF of existing sewer main. Average annual I/I removed is 0.21 mgd. The City also completed lining of 1250 LF of 15-inch sewer and lining of five (5) manholes on Second Avenue. Average annual I/I removed is 23,975 gpd.

Reporting Period Activity: Jennings Road - Currently replacing 2400 LF of existing sewer main including existing sewer manholes and sewer services. The Wimbledon Circle Pump Station redesign is expected to be bid Fall 2022. Prospect Street Drainage and Sewer Improvements are ongoing.

MWRA I/I Local Financial Assistance Program: The community has financed ten (10) I/I projects through the Authority's funding assistance program. Of the \$22,282,400 allotted through the Program's Phases 1 - 13, the community has \$3,067,840 remaining in funding assistance.

36. WATERTOWN: North System

Background Information:

- Miles of Sewer: 75
- Sewered Population: 35,329
- Three Year (CY18 - CY20) Annual Average I/I: 1.31 mgd
- MassDEP Administrative Actions Since 2010: None

Latest I/I or SSES Report: Additional TV Inspection Subsystem 7 and Sewer Rehabilitation (2017)
CIP 1 - Sewer Rehabilitation Subareas 1 and 9 (March 2019)
CIP 1 - Sewer Rehabilitation Subareas 6 and 7: Howard Street (March 2019)
CIP 1 - Sewer Rehabilitation Subareas 2, 14, 18 and Arsenal Street (March 2019)
CIP Project 2 Investigation and Evaluation (Ongoing)
CIP Projects 3&4 Investigation and Evaluation (Ongoing)

Private Source Inflow Removal Program: Catch basin connected to sanitary sewer system disconnected and reconnected to the storm drain system on Sexton Street.

I/I Rehabilitation Projects in Design or Construction: CIP Project 1 Rehabilitations (Contract 19-01S) is substantially complete. The project included rehabilitations identified during the CIP Project 1 Inspection and Assessment and included 12,302 LF of sewer and drain inspected as part of Contract 18-01S. The project removed of an estimated 16,128 gpd of infiltration and 38,468 gpd of inflow.

CIP Project 1A Rehabilitations (Contract 20-01S) is complete. The project included rehabilitations identified during the CIP Project 1 Inspection and Assessment. The project removed of an estimated 13,392 gpd of infiltration and 38,468 gpd of inflow.

The CIP Project 1B Rehabilitations began on October 25, 2021. The project is scheduled to be substantially complete in August 2022. The project includes rehabilitations identified during CIP Project 1 Inspection and Assessment and includes various Illicit Discharge Detection and Elimination (IDDE) investigation projects. The project removed of an estimated 14,885 gpd of infiltration and 38,470 gpd of inflow.

Reporting Period Activity: Please see list of work completed in the I/I Rehabilitation Projects section above.

MWRA I/I Local Financial Assistance Program: The community has financed eleven (11) I/I investigation projects through the Authority's funding assistance program. Of the \$10,155,800 allotted through the Program's Phases 1 - 13, the community has \$2,820,000 remaining in funding assistance.

37. WELLESLEY: South System

Background Information:

- Miles of Sewer: 134
- Sewered Population: 28,978
- Three Year (CY18 - CY20) Annual Average I/I: 1.80 mgd
- MassDEP Administrative Actions Since 2010: None

Latest I/I or SSES Report: I/I Analysis and Flow Metering Program (April 2019)
SSES (Ongoing)

Private Source Inflow Removal Program: The Town will pursue illegal sump pump connections identified through this year's water meter change-out program. Based upon previous private source inflow studies, DPW is contacting the owners of identified illegal sump pumps. To date, 18 sump pumps have been removed from the sanitary system.

I/I Rehabilitation Projects in Design or Construction: Using data from the I/I Analysis, the Town will focus on sealing manholes that have been inspected and found to have significant I/I. In Spring 2022, the Town performed a detailed inspection of 550 sewer manholes. A manhole rehabilitation contract is proposed for CY23. The Town also has a plan undertake smoke testing in the upcoming fiscal year.

Sewer System Inspection and Rehabilitation (Contract No. 16C-460-1564 / MWRA Project No. WRA-P11-37-3-1152) work consisted of CCTV inspection of 62,800 LF of sewer; chemical root treatment of 7500 LF of sewer; testing 8800 joints and sealing/retesting 3100 joints; installing 24 LF of CIP short liners; testing & sealing six (6) service connections and sealing 400 VF of manholes. Project work is complete.

Cliff Road Sewer Main Lining (MWRA Project No. WRA-P11-37-3-1152) work consisted of CCTV inspection, installation of CIPP lining within 5260 LF of 8-inch VC sewer main and reinstatement of all active house service connections on Cliff Road. Additional project rehabilitation work consisted of CCTV inspection, installation of CIPP lining within 424 LF of 8-inch VC sewer main and reinstatement of all active house service connections along a sewer easement between Kingsbury Street and Donizetti Street. Project work is complete.

Reporting Period Activity: During FY22, Sewer System Inspection and Rehabilitation work consisted of root treating 1.8 miles of sewer main; sealing 625 VF of sewer manholes; installing 227 LF of short liners at 36 locations; and performing four (4) spot repairs (140 LF of sewer main). The Town also flushed 23 miles of sewer main and rodded 292 sewer laterals.

A wastewater flow metering program (conducted April 11 - June 20, 2018) utilizing 38 flow meters was completed. The *Report for the I/I Analysis and Flow Metering Program* provided an overview of the results for the 2018 Flow Metering Program including recommendations for the next phase of investigations. The I/I Analysis identified approximately 3.40 mgd of total peak infiltration in the community system. Peak design storm inflow (for the 5-year, 24-hour storm) was calculated to be approximately 13.5 mgd. As a follow-up to the I/I Analysis, the Town is now conducting an SSES. The purpose of this study is to identify subareas of I/I throughout Wellesley's sanitary sewer system (MWRA Project No. WRA-P11-37-3-1152).

MWRA I/I Local Financial Assistance Program: The community has financed fourteen (14) I/I reduction projects through the Authority's funding assistance program. Of the \$9,249,700 allotted through the Program's Phases 1 - 13, the community has \$4,510,000 remaining in funding assistance.

38. WESTWOOD: South System

Background Information:

- Miles of Sewer: 77
- Sewered Population: 15,318
- Three Year (CY18 - CY20) Annual Average I/I: 0.92 mgd
- MassDEP Administrative Actions Since 2010: None

Latest I/I or SSES Report: I/I Investigation Program (January 2016)

FY19 Infiltration Rehabilitation Program (January 2019)

FY21 Infiltration Rehabilitation Program (January 2021)

Private Source Inflow Removal Program: A house-to-house inspection survey has been completed. The survey included inspection of 1880 residences and identified 135 suspect sump pumps. Sump pump removal notification letters forthcoming. The Town continues to use contracted services to CCTV inspect sewer mains at various locations for evidence of inflow.

I/I Rehabilitation Projects in Design or Construction: Phase 3 I/I Rehabilitation Program investigation work (CCTV and sewer manhole inspection) began March 2021 and was complete July 2021. Phase 3 I/I Rehabilitation Design work completed November 2021. Phase 3 I/I Rehabilitation (FY22 Sewer System Rehabilitation: Town Bid No. DPW-22-B-009) bid January 2022 (MWRA Project No. WRA-P11-38-3-1179). CIPP lining work was performed in June 2022. Project work scheduled for completion Fall 2022.

FY23 Sewer System Investigations scheduled for January 2023. This work will focus on new investigations by CCTV inspection and visual manhole observations to identify I/I.

FY20 Sewer System Rehabilitation Program removed an estimated 70,000 gpd of infiltration from the sewer system (based upon estimated infiltration quantities observed during the FY19 Sewer Investigations CCTV inspection). The FY19 Sewer Investigations were conducted in November 2018 and included 17,361 LF of CCTV inspections and 99 top-side manhole inspections.

Phase 1 - I/I Rehabilitation Design/Construction (MWRA Project No. WRA-P9-38-3-949): Design cost-effective and value-effective sewer rehabilitations; prepare construction rehabilitation drawings and specifications for public bidding; and prepare a final cost estimate for the designed rehabilitations. Construct cost-effective and value-effective sewer rehabilitations and perform construction public bid/award/resident project representative services. Sewer rehabilitation work included: cleaning and CCTV inspection of 20,000 LF of sewer main; installing 5020 LF of CIP pipe; performing 112 lateral connection repairs; raising 17 manhole frames & covers to grade; replacing three manhole frames & covers and rehabilitating 19 sewer manholes (via cementitious and epoxy lining). Project work was performed in the following areas: Pond Plain Road to Oak Street / Pond Street Fill-in Area / High Street to Oriole Road / Stanford Road to Sunrise Road. Project work is complete.

Phase 2 - I/I Investigation (MWRA Project No. WRA-P9-38-3-949): Cleaning, CCTV inspection, videotaping and recording 15,000 LF of sewer main and performing topside manhole inspections of 75 sewer manholes. Project work performed in the following areas: School Street Area / Hartford Street Fill-in Area / Lake Shore Drive to High Street / Lake Shore Drive to Arcadia Road / Sycamore Drive to Arcadia Road. Project work is complete

Reporting Period Activity: Construction of large retail/residential development on University Avenue is ongoing. The project involves installation of new 6 and 8-inch PVC sewer mains throughout the development.

MWRA I/I Local Financial Assistance Program: The community has financed eight (8) I/I reduction projects through the Authority's funding assistance program. Of the \$4,302,300 allotted through the Program's Phases 1 - 13, the community has \$1,711,000 remaining in funding assistance.

39. WEYMOUTH: South System

Background Information:

- Miles of Sewer: 238
- Sewered Population: 55,061
- Three Year (CY18 - CY20) Annual Average I/I: 5.16 mgd
- MassDEP Administrative Actions Since 2010: None

Latest I/I or SSES Report: Town-Wide Sewer Investigation - Year 8 (October 2019)
Town-Wide Sewer Investigation - Year 9 (March 2021)
Town-Wide Sewer Investigation - Year 10 (November 2021)
Town-Wide Sewer Investigation - Year 11 (Ongoing)

Private Source Inflow Removal Program: The Town continues to pursue the removal of sump pumps and other private inflow sources. The Town has completed the redirection of 330 sump pumps (for an estimated 165,000 gpd of inflow removal).

I/I Rehabilitation Projects in Design or Construction: The Year 9 & 10 I/I Rehabilitation Construction is scheduled to begin Fall 2022 (MWRA Project No. WRA-P11-39-3-1195). Approximately 0.12 mgd of infiltration and 0.009 mgd of peak design storm inflow will be removed through construction. The Year 9 & 10 I/I Rehabilitation Construction Design completed Spring 2022 (MWRA Project No. WRA-P11-39-2-1185).

The Year 8 I/I Investigation was completed in October 2019. The investigation identified approximately 0.51 mgd of infiltration and 0.06 mgd of peak design storm inflow. Rehabilitation design (based on the Year 8 report recommendations) completed February 2021. Year 8 Rehabilitation Construction was completed May 2022 (MWRA Project No. WRA-P11-39-3-1157). Approximately 0.26 mgd of infiltration and 0.006 mgd of peak design storm inflow was removed through construction.

Reporting Period Activity: The 2021 Town-Wide Wastewater Flow Metering Project is complete. Flow from the Town's 31 subareas was monitored with 36 flow meters from March 22 to June 16, 2021. Summary Report completed January 2022.

The Year 11 I/I Investigation is currently ongoing (MWRA Project No WRA-P11-39-2-1185). Field investigations are substantially complete. Data review and reporting are currently ongoing.

The Year 10 I/I Investigation (MWRA Project No WRA-P11-39-3-1157) was completed November 2021.

The Year 9 I/I Investigation was completed in March 2021. The investigation identified approximately 0.21 mgd of infiltration and 0.0004 mgd of peak design storm inflow. Rehabilitation design (based upon the Year 9 report recommendations) is ongoing. Approximately 0.11 mgd of infiltration and 0.004 mgd of peak design storm inflow will be removed through construction.

The Year 8 I/I Investigation was completed in October 2019. The investigation identified approximately 0.51 mgd of infiltration and 0.006 mgd of peak design storm inflow. Rehabilitation design (based upon the Year 8 report recommendations) completed February 2021. Approximately 0.26 mgd of infiltration and 0.006 mgd of peak design storm inflow will be removed through construction.

No sewer extensions were completed in the last year. Gravity sewers were redirected near the Weymouth Landing Pump Station. This pump station has been abandoned.

MWRA I/I Local Financial Assistance Program: The community has financed twenty-one (21) I/I reduction projects through the Authority's funding assistance program. Of the \$19,100,900 allotted through the Program's Phases 1 - 13, the community has \$6,510,000 remaining in funding assistance.

40. WILMINGTON: North System

Background Information:

- Miles of Sewer: 29
- Sewered Population: 4,819
- Three Year (CY18 - CY20) Annual Average I/I: 0.72 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report: Infiltration/Inflow Analysis Report (December 2017)
SSES Sub-Areas 5, 6 and 8 Report (November 2018)

Private Source Inflow Removal Program: The Town is continuing inspections on an as-needed basis. The Town continues to evaluate options for establishing a 4:1 I/I removal program in accordance with MassDEP Regulations 314 CMR 12.

I/I Rehabilitation Projects in Design or Construction: Construction of Sewer System Rehabilitation for I/I in Sub Areas 5 and 8 (MWRA Project No. WRA-P11-40-3-1118) was completed September 2021. Warranty inspections are tentatively scheduled for Fall 2022. It is estimated that an average of 60,000 gpd of I/I will be removed from the system as a result of the sewer rehabilitation. I/I reduction will be further analyzed during the post-construction warranty inspections.

Reporting Period Activity: Construction is set to begin at No. 364 Middlesex Avenue for a new wastewater pump station and a gravity sewer extension and force main along Middlesex Avenue for the Jefferson Road housing development. A capacity assessment and peer review of the design plans and specifications for this project was completed.

There are new developments at No. 635 Main Street and No. 201 Lowell Street that will connect via gravity sewer to the existing sewer system. Prior to the start of construction, a capacity assessment and peer review for each project was completed.

MWRA I/I Local Financial Assistance Program: The community has financed eight (8) I/I reduction projects through the Authority's funding assistance program. Of the \$4,232,000 allotted through the Program's Phases 1 - 13, the community has \$1,770,000 remaining in funding assistance.

41. WINCHESTER: North System

Background Information:

- Miles of Sewer: 83
- Sewered Population: 22,924
- Three Year (CY18 - CY20) Annual Average I/I: 1.26 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report: Stowell & Marshall Road Sewer System Evaluation (January 2014)
Sewer System Evaluation Survey (SSES) Phase II (November 2016)

Private Source Inflow Removal Program: The Town's Private Inflow Source Removal Program is ongoing. One (1) sump pump was removed from the system in FY21/22.

I/I Rehabilitation Projects in Design or Construction: The Phase II Rehabilitations (Part B) Warranty Re-Test Inspection was completed June 2022. The Phase II Sanitary Sewer Rehabilitations (Part B) removed an estimated 62,319 gpd of infiltration and 17,301 gpd of inflow. The East Side CIP Project 1 SSES began in April 2022. Manhole inspections and flow isolation work is complete. CCTV Inspection is on hold until groundwater conditions improve. Evaluation of inspection data will be performed in Fall 2022/Spring 2023.

Reporting Period Activity: Please see list of work completed in the I/I Rehabilitation Projects section above.

MWRA I/I Local Financial Assistance Program: The community has financed eleven (11) I/I reduction projects through the Authority's funding assistance program. Of the \$6,793,000 allotted through the Program's Phases 1 - 13, the community has \$870,000 remaining in funding assistance.

42. WINTHROP: North System

Background Information:

- Miles of Sewer: 36
- Sewered Population: 19,316
- Three Year (CY18 - CY20) Annual Average I/I: 1.14 mgd
- MassDEP Administrative Actions: NON - May 2018 Failed to submit I/I Analysis (due 12/31/17)

Latest I/I or SSES Report: Flow Monitoring Program (March-May 2020)
I/I Analysis Report (October 2019)
Phase 2 Sewer System Evaluation Survey (June 2021)
Phase 3 Sewer System Evaluation Survey (Ongoing)

Private Source Inflow Removal Program: Smoke testing work to be complete Fall 2022. Inspection data will be reviewed and recommendations to remove I/I will be summarized in a report. The DPW, in partnership with the Town's Building and Plumbing Inspectors, continues to actively seek out illegal sump pump connections to the Town's sewer system.

I/I Rehabilitation Projects in Design or Construction: The replacement of approximately 350 LF of gravity sewer on Jefferson Street was added to the Centre Business District project based on unforeseen site conditions observed during construction of drainage improvements on Jefferson Street. The existing 6-inch VC sewer main in Jefferson Street was found to have collapsed in two locations and inspections noted the remaining section of pipe was deteriorating. A new 8-inch SDR 35 PVC sewer main (including two new precast concrete manholes) was installed to replace the existing 6-inch VC sewer main.

Reporting Period Activity: Approximately 31,500 LF of 8-inch through 15-inch sewer main was cleaned and CCTV inspected during Fall 2021. The inspections were reviewed and infiltration observed in each subarea inspected was estimated. A cost-effective analysis was also completed to determine where rehabilitation to remove I/I entering the sanitary sewer system is cost-effective. The Phase 3 SSES report is currently being drafted and is expected to be completed Fall 2022. In December 2021, MWRA funds were distributed for the Phase 3 SSES Project (MWRA Project No. WRA-P11-42-1-1181). Project details are included in Attachment 4.

MWRA I/I Local Financial Assistance Program: The community has financed fifteen (15) I/I reduction projects through the Authority's funding assistance program. Of the \$5,553,400 allotted through the Program's Phases 1 - 13, the community has \$470,000 remaining in funding assistance.

43. WOBURN: North System

Background Information:

- Miles of Sewer: 141
- Sewered Population: 40,080
- Three Year (CY18 - CY20) Annual Average I/I: 2.59 mgd
- MassDEP Administrative Actions Since 2010: None

Latest I/I or SSES Report:

- CIP Project 1 - Sewer Investigation and Evaluation Final Report (March 2014)
- CIP Project 2 - Sewer Investigation and Evaluation Final Report (February 2015)
- CIP Project 3 - Sewer Investigation and Evaluation Final Report (April 2016)
- CIP Project 4 - Sewer Investigation and Evaluation Final Report (March 2017)
- CIP Project 5 - Sewer Investigation and Evaluation (February 2021)
- CIP Smoke Testing - Project 2 (September 2021)

Private Source Inflow Removal Program: No private inflow removal activity occurred during this reporting period.

I/I Rehabilitation Projects in Design or Construction: CIP Project 3 Rehabilitations warranty retest inspections were completed Spring 2022. The project removed an estimated 56,981 gpd of peak infiltration and 9,602 gpd of peak inflow.

CIP Project 4 Rehabilitations began Spring 2022. Project work to be complete Fall 2022. The project is estimated to remove 27,606 gpd of peak infiltration and 17,473 gpd of peak inflow.

Reporting Period Activity: See projects in I/I Rehabilitation Projects above.

MWRA I/I Local Financial Assistance Program: The community has financed fourteen (14) I/I reduction projects through the Authority's funding assistance program. Of the \$16,665,500 allotted through the Program's Phases 1 - 13, the community has \$1,990,000 remaining in funding assistance.

ATTACHMENT 6
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY22
Reporting Period – July 2021 Through June 2022

CY21 COMMUNITY WASTEWATER FLOW DATA

Note: Community wastewater flow data, along with the estimated community wastewater flow components, was not produced for CY21 due to the ongoing MWRA wastewater meter replacement project. As a result, the flow data tables for this report period will detail the most recent year of actual wastewater flow data (CY20). The MWRA wastewater meter replacement project is substantially complete. CY22 community wastewater flow data is currently being generated.

For community billing purposes, community CY21 flow data was estimated based on the average of the community's prior three calendar years of flow data (2018, 2019 and 2020). CY21 monthly flow totals at the MWRA Deer Island Treatment Plant (as reported in the NPDES Operational Performance Summary) have been included in this Attachment (Table 5).

This Attachment contains CY20 wastewater flow data for the 43 MWRA member sewer communities along with CY21 Deer Island Treatment Plant flow totals. There are five separate data tables detailed below:

TABLE 1 (Section Page 6-3) presents the CY20 MWRA Wastewater Metering System Community Flow Estimates. This data is monthly total wastewater flow estimates for each of the 43-member sewer communities derived from MWRA's wastewater metering system. Each community's percent share average daily flow and percent share maximum month flow are used as components of MWRA's annual wholesale sewer charge.

TABLE 2 (Section Page 6-4) presents the CY20 MWRA Community Wastewater Flow Component Estimates. This data is developed through an engineering analysis by MWRA staff to estimate wastewater flow components, including: dry day average daily flow, average daily infiltration, average daily sanitary flow, and average daily inflow. The data in TABLE 2 is annual data. The percent share for each estimated flow component is also presented. The data presented in TABLE 2 is a summary of the more detailed monthly flow component analysis presented in TABLE 4. The estimated average daily sanitary flow (non-I/I flow) includes: residential, commercial, industrial, and institutional flows.

TABLE 3 (Section Page 6-5) presents the CY20 Community Wastewater Flow Component Estimates with additional information based on estimated community inch-diameter-miles of sewer.

TABLE 4 (Section Pages 6-6 through 6-18) presents the Estimated Community Wastewater Flow Components for CY20 by month. This data is developed through an engineering analysis by MWRA staff of each community's monthly wastewater flow (derived from MWRA's wastewater metering system) to estimate flow components, including: dry day average daily flow, average daily infiltration, average daily sanitary flow, and average daily inflow. The data listed as MWRA Estimated Infiltration is a calculated estimate of the infiltration entering MWRA-owned sewers that are upstream of wastewater flow meters within a community. The calculation is a weighted allocation of the Raw Estimated

Infiltration to the portion of the sewer system that is MWRA-owned versus community-owned. The weighted allocation is based on inch-diameter-miles of MWRA-owned and community-owned sewer. The data presented in TABLE 4 is also presented in TABLE 2 as an annual summary.

Note: Flow data for April and May 2020 are not included in Section Tables 1-4 due to the wastewater flow meters being out of service (as a result of reduced non-essential maintenance) at the start of the COVID-19 pandemic. For billing purpose, MWRA estimated the April and May 2020 flow data based on the average of the three prior years, adjusted for 2020 water use.

TABLE 5 (Section Page 6-19) presents CY21 Deer Island Treatment Plant monthly flow totals (as reported in the NPDES Operational Performance Summary). This data was also used to generate the MWRA Long Term Regional Flow Data Graphs in Attachment 4 (Section Pages 4-7 and 4-8).

TABLE 1 - CY20 MWRA WASTEWATER METERING SYSTEM COMMUNITY FLOW ESTIMATES

Note: Does not include April/May

Community	Total Population	Sewered Population	CY20 Average Daily Flow (ADF) By Calendar Month (MGD)												12 Month Average Daily Flow (MGD)	Percent Average Daily Flow	Max. Month ADF (MGD)	Percent Max. Month ADF
			Jan	Feb	Mar	Apr*	May*	Jun	Jul	Aug	Sep	Oct	Nov	Dec				
Arlington	45,510	45,474	6.09	5.25	5.45			3.63	3.23	2.93	2.95	3.26	4.04	7.63	4.45	1.63%	7.63	1.86%
Ashland	17,706	13,781	1.38	1.33	1.35			1.08	1.01	0.96	0.97	0.98	1.07	1.69	1.18	0.43%	1.69	0.41%
Bedford	14,197	13,700	2.92	2.55	2.54			1.81	1.69	1.57	1.44	1.57	1.77	2.73	2.06	0.75%	2.92	0.71%
Belmont	26,458	26,061	3.47	3.02	3.20			2.17	1.98	1.81	1.71	1.94	2.40	4.85	2.66	0.97%	4.85	1.18%
BWSC	685,094	683,724	89.05	85.53	87.25			72.92	64.98	61.00	61.64	70.11	80.25	103.18	77.60	28.40%	103.18	25.16%
Braintree	37,156	37,052	9.03	7.89	8.03			5.55	4.69	4.06	3.98	4.50	5.88	9.24	6.29	2.30%	9.24	2.25%
Brookline	59,157	58,565	8.50	7.97	8.96			5.79	5.32	4.58	4.49	5.26	6.24	11.82	6.90	2.53%	11.82	2.88%
Burlington	27,176	26,616	4.85	4.44	3.86			2.85	2.66	2.39	2.35	2.36	2.75	4.25	3.27	1.20%	4.85	1.18%
Cambridge	113,630	113,607	17.72	19.32	19.45			16.80	17.00	15.33	13.76	16.82	17.99	23.75	17.80	6.51%	23.75	5.79%
Canton	23,444	16,669	3.24	2.94	3.12			2.61	2.43	2.09	2.08	2.31	2.92	4.38	2.81	1.03%	4.38	1.07%
Chelsea	40,227	40,227	5.43	6.17	7.10			4.86	4.64	4.42	4.34	5.96	6.11	7.21	5.63	2.06%	7.21	1.76%
Dedham	25,364	24,557	4.20	3.89	4.24			3.24	3.18	2.46	2.36	2.51	3.30	6.19	3.56	1.30%	6.19	1.51%
Everett	46,324	46,324	5.20	4.95	4.83			3.72	3.72	3.63	3.37	3.96	4.47	6.29	4.42	1.62%	6.29	1.53%
Frammingham	72,032	69,273	7.22	6.56	6.58			5.16	6.09	5.25	5.31	5.74	6.59	10.20	6.48	2.37%	10.20	2.49%
Hingham	8,175	7,748	1.47	1.34	1.39			1.09	0.78	0.67	0.64	0.78	0.98	1.80	1.09	0.40%	1.80	0.44%
Holbrook	11,026	9,925	0.92	0.88	0.92			0.71	0.72	0.66	0.63	0.67	0.80	1.11	0.80	0.29%	1.11	0.27%
Lexington	33,727	33,154	7.13	6.08	6.01			4.38	3.90	3.05	2.90	3.23	3.90	6.85	4.74	1.74%	7.13	1.74%
Malden	61,246	60,970	9.46	8.93	9.51			7.19	7.01	6.25	6.14	7.41	8.84	11.82	8.26	3.02%	11.82	2.88%
Medford	57,797	57,757	8.39	7.73	8.06			6.01	5.29	4.91	4.62	5.35	6.24	11.01	6.77	2.48%	11.01	2.68%
Melrose	28,367	28,333	4.94	4.19	4.49			3.28	2.59	2.35	2.04	2.44	3.33	7.32	3.70	1.35%	7.32	1.78%
Milton	27,575	26,941	3.89	3.38	3.60			2.14	1.97	1.59	1.54	1.88	2.55	5.17	2.77	1.02%	5.17	1.26%
Natick	36,246	32,324	3.30	3.05	3.03			2.26	1.97	1.81	1.73	1.79	2.17	3.96	2.51	0.92%	3.96	0.97%
Needham	30,999	29,492	4.15	3.74	3.97			2.91	2.42	2.13	2.25	2.39	3.06	6.13	3.32	1.21%	6.13	1.49%
Newton	88,994	88,104	17.49	14.63	15.44			10.33	9.63	7.86	7.31	8.22	10.63	25.77	12.75	4.67%	25.77	6.28%
Norwood	29,195	29,026	6.14	5.76	5.77			4.64	4.71	3.54	3.26	3.71	5.17	9.45	5.22	1.91%	9.45	2.30%
Quincy	94,166	94,166	13.70	12.44	12.80			11.04	10.36	9.51	9.08	10.08	11.69	17.12	11.79	4.31%	17.12	4.17%
Randolph	34,272	34,210	4.03	3.66	3.70			2.87	2.60	2.34	2.26	2.37	3.00	4.83	3.17	1.16%	4.83	1.18%
Reading	26,106	25,850	3.03	2.71	2.94			1.90	1.68	1.53	1.58	1.73	2.20	3.74	2.31	0.84%	3.74	0.91%
Revere	53,993	53,761	6.28	6.44	6.57			5.31	5.11	4.70	4.68	5.92	6.15	8.17	5.94	2.17%	8.17	1.99%
Somerville	81,360	81,360	8.27	9.33	8.21			9.37	7.48	6.26	6.03	7.62	8.81	11.77	8.31	3.04%	11.77	2.87%
Stoneham	22,036	21,816	4.64	3.71	3.54			2.61	2.33	2.11	2.00	2.11	2.68	6.10	3.19	1.17%	6.10	1.49%
Stoughton	28,528	20,472	3.11	2.87	2.92			2.26	2.16	2.05	2.12	2.22	2.65	4.18	2.66	0.97%	4.18	1.02%
Wakefield	27,157	27,067	5.43	4.77	4.83			3.15	2.60	2.24	2.15	2.45	3.27	5.39	3.63	1.33%	5.43	1.32%
Walpole	25,073	18,554	2.16	2.05	2.05			1.82	1.70	1.51	1.47	1.62	1.88	3.21	1.95	0.71%	3.21	0.78%
Waltham	62,442	61,599	9.99	8.90	8.90			7.26	6.86	5.91	5.59	6.09	7.32	11.67	7.85	2.87%	11.67	2.85%
Watertown	35,756	35,756	3.78	3.38	3.57			2.41	2.43	2.10	2.06	2.24	2.54	4.60	2.91	1.07%	4.60	1.12%
Wellesley	29,479	28,801	3.28	4.39	4.94			2.70	2.27	1.84	1.89	2.08	2.62	5.26	3.13	1.14%	5.26	1.28%
Westwood	16,056	15,056	1.82	1.68	2.03			1.56	1.51	1.18	1.14	1.20	1.43	2.68	1.63	0.59%	2.68	0.65%
Weymouth	56,664	55,202	9.44	8.71	9.24			6.65	5.81	5.09	5.03	5.63	7.34	11.16	7.41	2.71%	11.16	2.72%
Wilmington	23,803	4,889	1.76	1.69	1.58			1.37	1.34	1.31	1.21	1.25	1.25	1.43	1.42	0.52%	1.76	0.43%
Winchester	22,838	22,790	2.81	2.48	2.61			1.54	1.29	1.10	1.03	1.11	1.46	3.38	1.88	0.69%	3.38	0.82%
Winthrop	18,625	18,625	2.17	2.04	1.99			1.95	1.99	2.02	1.73	2.10	2.02	2.28	2.03	0.74%	2.28	0.56%
Woburn	39,701	38,867	6.62	6.12	7.89			4.10	3.74	3.11	3.23	3.51	4.21	7.34	4.99	1.83%	7.89	1.92%
Total/Average	2,344,877	2,278,245	327.90	308.89	318.46	0.00	0.00	247.00	226.87	203.21	198.09	226.48	265.97	408.11	273.22	100%	410.10	100%
Logan Airport Monthly Rainfall (in)			1.39	3.30	3.60	4.33	2.21	2.66	1.74	2.28	0.97	4.98	4.20	4.67				

TABLE 2 - 2020 MWRA COMMUNITY WASTEWATER FLOW COMPONENT ESTIMATES (CY20-12 MONTHS)

COMMUNITY	2020 Averages (1)					Components of Average Daily Flow (Estimated) (2)						Peak Month				
	Community Demographics		No. of Connects to MWRA System	Miles of Local Sewers (3)	No. of Meters for Permanent System	Average Daily Flow ADF (MGD)	Percent Average Daily Flow (6)	Selected Dry Day ADF (MGD)	Average Daily Infiltration (MGD)	Infiltration As a % of Average Daily Flow	Average Sanitary Flow (MGD)	Sanitary As a % of Average Daily Flow	Average Daily Inflow (4) (MGD)	Inflow As a % of Average Daily Flow	Peak Month ADF (MGD)	Percent Peak Month ADF (6)
	Total Population	Sewered Population														
Arlington	45,510	45,474	327	106	7	4.45	1.63%	4.15	1.65	37.1%	2.50	56.2%	0.30	6.7%	7.63	1.86%
Ashland	17,706	13,781	2	66	2	1.18	0.43%	1.14	0.34	28.6%	0.80	67.7%	0.04	3.7%	1.69	0.41%
Bedford	14,197	13,700	1	78	4	2.06	0.75%	1.97	0.67	32.6%	1.30	63.1%	0.09	4.2%	2.92	0.71%
Belmont	26,458	26,061	2	78	2	2.66	0.97%	2.39	0.99	37.4%	1.40	52.7%	0.26	9.9%	4.85	1.18%
BWSC (5)	685,094	683,724	255	858	33	77.60	28.40%	66.84	11.93	15.4%	54.91	70.8%	10.76	13.9%	103.18	25.16%
Braintree	37,156	37,052	21	140	8	6.29	2.30%	5.84	2.64	42.0%	3.20	50.9%	0.44	7.1%	9.24	2.25%
Brookline (5)	59,157	58,565	10	111	14	6.90	2.53%	6.02	1.83	26.5%	4.19	60.7%	0.88	12.8%	11.82	2.88%
Burlington	27,176	26,616	1	115	1	3.27	1.20%	3.11	1.11	33.9%	2.00	61.1%	0.16	5.0%	4.85	1.18%
Cambridge (5)	113,630	113,607	127	148	9	17.80	6.51%	15.53	4.03	22.6%	11.50	64.6%	2.27	12.8%	23.75	5.79%
Canton	23,444	16,669	65	62	6	2.81	1.03%	2.55	1.15	41.0%	1.40	49.8%	0.26	9.3%	4.38	1.07%
Chelsea (5)	40,227	40,227	47	41	8	5.63	2.06%	4.48	1.48	26.3%	3.00	53.3%	1.15	20.4%	7.21	1.76%
Dedham	25,364	24,557	30	95	8	3.56	1.30%	3.25	1.45	40.6%	1.80	50.6%	0.32	8.9%	6.19	1.51%
Everett	46,324	46,324	21	57	6	4.42	1.62%	4.06	0.86	19.6%	3.20	72.5%	0.35	8.0%	6.29	1.53%
Frammingham	72,032	69,273	2	275	4	6.48	2.37%	6.13	1.33	20.6%	4.80	74.1%	0.34	5.3%	10.20	2.49%
Hingham	8,175	7,748	1	33	1	1.09	0.40%	1.01	0.51	46.4%	0.50	45.7%	0.09	7.9%	1.80	0.44%
Holbrook	11,026	9,925	2	31	2	0.80	0.29%	0.75	0.25	31.3%	0.50	62.3%	0.05	6.4%	1.11	0.27%
Lexington	33,727	33,154	17	170	6	4.74	1.74%	4.47	2.27	47.8%	2.20	46.4%	0.27	5.8%	7.13	1.74%
Malden	61,246	60,970	242	100	6	8.26	3.02%	7.69	2.65	32.1%	5.04	61.0%	0.57	6.9%	11.82	2.88%
Medford	57,797	57,757	74	113	6	6.77	2.48%	6.10	1.90	28.1%	4.20	62.1%	0.67	9.9%	11.01	2.68%
Melrose	28,367	28,333	188	74	5	3.70	1.35%	3.24	1.44	38.8%	1.80	48.6%	0.47	12.6%	7.32	1.78%
Milton	27,575	26,941	56	83	13	2.77	1.02%	2.46	1.06	38.1%	1.40	50.5%	0.32	11.4%	5.17	1.26%
Natick	36,246	32,324	30	135	4	2.51	0.92%	2.37	0.62	24.6%	1.75	69.8%	0.14	5.6%	3.96	0.97%
Needham	30,999	29,492	21	132	2	3.32	1.21%	3.08	1.18	35.6%	1.90	57.3%	0.24	7.1%	6.13	1.49%
Newton	88,994	88,104	52	271	7	12.75	4.67%	11.73	4.42	34.7%	7.31	57.3%	1.02	8.0%	25.77	6.28%
Norwood	29,195	29,026	31	108	6	5.22	1.91%	4.80	2.40	46.0%	2.40	46.0%	0.42	8.1%	9.45	2.30%
Quincy	94,166	94,166	56	202	6	11.79	4.31%	10.95	2.75	23.3%	8.20	69.6%	0.84	7.1%	17.12	4.17%
Randolph	34,272	34,210	2	101	2	3.17	1.16%	2.98	1.08	34.1%	1.90	60.0%	0.19	5.9%	4.83	1.18%
Reading	26,106	25,850	2	96	2	2.31	0.84%	2.18	0.88	38.3%	1.30	56.4%	0.12	5.3%	3.74	0.91%
Revere	53,993	53,761	3	98	2	5.94	2.17%	5.22	1.72	29.1%	3.50	59.0%	0.71	12.0%	8.17	1.99%
Somerville (5)	81,360	81,360	43	128	8	8.31	3.04%	6.85	1.35	16.2%	5.50	66.2%	1.46	17.6%	11.77	2.87%
Stoneham	22,036	21,816	27	63	7	3.19	1.17%	3.00	1.52	47.8%	1.47	46.1%	0.19	6.0%	6.10	1.49%
Stoughton	28,528	20,472	1	88	2	2.66	0.97%	2.55	1.15	43.4%	1.40	52.7%	0.10	3.9%	4.18	1.02%
Wakefield	27,157	27,067	11	93	2	3.63	1.33%	3.40	1.90	52.3%	1.50	41.3%	0.23	6.3%	5.43	1.32%
Walpole	25,073	18,554	1	59	2	1.95	0.71%	1.85	0.65	33.2%	1.20	61.6%	0.10	5.2%	3.21	0.78%
Waltham	62,442	61,599	5	138	4	7.85	2.87%	7.32	1.86	23.7%	5.46	69.5%	0.53	6.8%	11.67	2.85%
Watertown	35,756	35,756	14	75	3	2.91	1.07%	2.70	0.64	21.9%	2.06	70.7%	0.22	7.4%	4.60	1.12%
Wellesley	29,479	28,801	2	134	3	3.13	1.14%	2.93	1.23	39.3%	1.70	54.4%	0.20	6.3%	5.26	1.28%
Westwood	16,056	15,056	3	77	3	1.63	0.59%	1.52	0.62	38.0%	0.90	55.4%	0.11	6.6%	2.68	0.65%
Weymouth	56,664	55,202	19	238	4	7.41	2.71%	6.95	3.25	43.8%	3.70	49.9%	0.46	6.2%	11.16	2.72%
Wilmington	23,803	4,889	2	20	1	1.42	0.52%	1.39	0.59	41.6%	0.80	56.4%	0.03	2.0%	1.76	0.43%
Winchester	22,838	22,790	102	83	7	1.88	0.69%	1.78	0.73	38.5%	1.05	55.8%	0.11	5.7%	3.38	0.82%
Winthrop	18,625	18,625	22	36	4	2.03	0.74%	1.82	0.65	32.2%	1.17	57.6%	0.21	10.1%	2.28	0.56%
Woburn	39,701	38,867	18	141	13	4.99	1.83%	4.64	1.43	28.6%	3.21	64.3%	0.35	7.1%	7.89	1.92%
Totals/Averages	2,344,877	2,278,245	1,958	5,350		273.22	100.00%	245.17	74.15	27.1%	171.02	62.6%	28.05	10.3%	410.10	100.00%

FOOTNOTES:

- (1) Figures tabulated using data from the MWRA Wastewater Metering System for Calendar Year 2020.
- (2) Wastewater flow components are estimated through engineering analysis by MWRA staff.
- (3) Miles of Local Sewers are from MWRA's regional collection system database or as reported by the Community and do not include service laterals.
- (4) Average Daily Inflow is calculated as a total inflow over the period of January through March, and June through December 2020 divided by 305 days. Actual inflow during a specific storm event must be calculated separately.
- (5) Community with combined sewers. Inflow figures include combined flow during storm events tributary to MWRA's WWTP.
- (6) Percent average Daily Flow and Percent Peak Month ADF are the two flow-based components of MWRA's Wholesale Sewer Rate Methodology.

Column Summations: Average Daily Flow (ADF) Column F = I+K+M Average Dry Day Flow Column H = I+K

TABLE 3 - 2020 Final Community Wastewater Flow Component Estimates

Community	Sewered Population	Miles of Local Sewers	IDM of Local Sewers	Average Daily Flow ADF (MGD)	Average Annual Infiltration (MGD)	Average Annual Inflow (MGD)	Average Sanitary Flow (MGD)	ADF (GPD Per IDM)	I/I (GPD Per IDM)	Infiltration (GPD Per IDM)	Inflow (GPD Per IDM)	Inflow (GPD Per Sewer Mile)	Average Sanitary (GPD Per Sew. Pop.)
Arlington	45,474	106	954	4.45	1.65	0.30	2.50	4,664	2,044	1,730	313	2,819	55
Ashland	13,781	66	594	1.18	0.34	0.04	0.80	1,991	644	570	74	667	58
Bedford	13,700	78	738	2.06	0.67	0.09	1.30	2,791	1,029	911	118	1,118	95
Belmont	26,061	78	708	2.66	0.99	0.26	1.40	3,754	1,777	1,404	373	3,385	54
BWSC	683,724	858	14,024	77.60	11.93	10.76	54.91	5,533	1,618	850	767	12,542	80
Braintree	37,052	140	1,300	6.29	2.64	0.44	3.20	4,835	2,374	2,032	341	3,168	86
Brookline	58,565	111	1,332	6.90	1.83	0.88	4.19	5,180	2,034	1,371	663	7,956	72
Burlington	26,616	115	1,150	3.27	1.11	0.16	2.00	2,847	1,108	965	143	1,430	75
Cambridge	113,607	148	2,368	17.80	4.03	2.27	11.50	7,517	2,660	1,700	960	15,360	101
Canton	16,669	62	567	2.81	1.15	0.26	1.40	4,963	2,494	2,033	461	4,212	84
Chelsea	40,227	41	618	5.63	1.48	1.15	3.00	9,103	4,248	2,390	1,859	28,019	75
Dedham	24,557	95	832	3.56	1.45	0.32	1.80	4,280	2,116	1,737	379	3,319	73
Everett	46,324	57	686	4.42	0.86	0.35	3.20	6,437	1,773	1,260	512	6,166	69
Frammingham	69,273	275	2,750	6.48	1.33	0.34	4.80	2,355	610	485	125	1,250	69
Hingham	7,748	33	297	1.09	0.51	0.09	0.50	3,684	2,001	1,711	290	2,613	65
Holbrook	9,925	31	312	0.80	0.25	0.05	0.50	2,572	969	805	164	1,648	50
Lexington	33,154	170	1,763	4.74	2.27	0.27	2.20	2,691	1,443	1,287	156	1,617	66
Malden	60,970	100	1,000	8.26	2.65	0.57	5.04	8,260	3,220	2,653	567	5,668	83
Medford	57,757	113	1,130	6.77	1.90	0.67	4.20	5,987	2,271	1,680	590	5,903	73
Melrose	28,333	74	641	3.70	1.44	0.47	1.80	5,775	2,967	2,239	728	6,344	64
Milton	26,941	83	747	2.77	1.06	0.32	1.40	3,713	1,839	1,414	425	3,824	52
Natick	32,324	135	1,180	2.51	0.62	0.14	1.75	2,125	642	524	119	1,037	54
Needham	29,492	132	1,232	3.32	1.18	0.24	1.90	2,693	1,151	958	192	1,796	64
Newton	88,104	271	2,710	12.75	4.42	1.02	7.31	4,705	2,008	1,631	377	3,769	83
Norwood	29,026	108	1,091	5.22	2.40	0.42	2.40	4,784	2,585	2,199	385	3,893	83
Quincy	94,166	202	2,020	11.79	2.75	0.84	8.20	5,836	1,777	1,360	417	4,173	87
Randolph	34,210	101	1,138	3.17	1.08	0.19	1.90	2,783	1,114	949	165	1,855	56
Reading	25,850	96	864	2.31	0.88	0.12	1.30	2,668	1,164	1,021	142	1,280	50
Revere	53,761	98	1,434	5.94	1.72	0.71	3.50	4,139	1,698	1,203	495	7,247	65
Somerville	81,360	128	1,920	8.31	1.35	1.46	5.50	4,329	1,464	702	762	11,426	68
Stonham	21,816	63	567	3.19	1.52	0.19	1.47	5,621	3,028	2,689	338	3,046	67
Stoughton	20,472	88	888	2.66	1.15	0.10	1.40	2,991	1,414	1,298	116	1,172	68
Wakefield	27,067	93	888	3.63	1.90	0.23	1.50	4,086	2,397	2,137	259	2,477	55
Walpole	18,554	59	577	1.95	0.65	0.10	1.20	3,377	1,297	1,122	175	1,712	65
Waltham	61,599	138	1,380	7.85	1.86	0.53	5.46	5,691	1,734	1,349	385	3,853	89
Watertown	35,756	75	675	2.91	0.64	0.22	2.06	4,316	1,265	946	320	2,876	58
Wellesley	28,801	134	1,340	3.13	1.23	0.20	1.70	2,333	1,064	917	147	1,473	59
Westwood	15,056	77	693	1.63	0.62	0.11	0.90	2,345	1,046	892	154	1,386	60
Weymouth	55,202	238	2,380	7.41	3.25	0.46	3.70	3,114	1,560	1,365	194	1,945	67
Wilmington	4,889	20	280	1.42	0.59	0.03	0.80	5,067	2,209	2,107	103	1,439	164
Winchester	22,790	83	747	1.88	0.73	0.11	1.05	2,520	1,114	971	144	1,293	46
Winthrop	18,625	36	324	2.03	0.65	0.21	1.17	6,266	2,654	2,021	634	5,703	63
Woburn	38,867	141	1,410	4.99	1.43	0.35	3.21	3,540	1,264	1,013	250	2,503	83
Total	2,278,245	5,350	60,249	273.22	74.15	28.05	171.02						
Average	52,982	124	1,401	6.35	1.72	0.65	3.98	4,285	1,788	1,409	379	4,334	71

Table 4 - Estimated Community Wastewater Flow Components for 2020										1-Feb-21		PAGE 1		Annual Average (MGD)	
Community	Flow Characteristic	Jan	Feb	Mar	Apr*	May*	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Ashland	Average Daily Flow	1.38	1.33	1.35			1.08	1.01	0.96	0.97	0.98	1.07	1.69	1.18	
	Dry Day Average Daily Flow	1.28	1.27	1.24			1.05	0.98	0.94	0.96	0.97	1.02	1.67	1.14	
	Estimated Infiltration	0.48	0.47	0.44			0.25	0.18	0.14	0.16	0.17	0.22	0.87	0.34	
	Estimated Sanitary Flow	0.80	0.80	0.80			0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
	Estimated Inflow	0.10	0.06	0.11			0.03	0.03	0.02	0.01	0.01	0.05	0.02	0.04	
Boston (South Only)	Raw Average Daily Flow	23.99	16.92	17.15			12.04	11.08	7.93	7.92	8.60	18.08	30.82	15.47	
	Raw Dry Day Average Daily Flow	18.26	13.15	13.31			9.93	10.90	7.69	7.81	7.70	16.47	26.90	13.23	
	Raw Estimated Infiltration	9.96	4.85	5.01			1.63	2.60	0.39	0.51	0.40	8.17	18.60	5.23	
	MWRA Estimated Infiltration	3.88	1.89	1.95			0.63	1.01	0.15	0.20	0.16	3.18	7.24	2.04	
	Final Average Daily Flow	20.11	15.03	15.20			11.41	10.07	7.78	7.72	8.44	14.90	23.58	13.43	
	Final Dry Day Average Daily Flow	14.38	11.26	11.36			9.30	9.89	7.54	7.61	7.54	13.29	19.66	11.19	
	Final Estimated Infiltration	6.08	2.96	3.06			1.00	1.59	0.24	0.31	0.24	4.99	11.36	3.20	
	Estimated Sanitary Flow	8.30	8.30	8.30			8.30	8.30	7.30	7.30	7.30	8.30	8.30	8.00	
	Estimated Inflow	5.73	3.77	3.84			2.11	0.18	0.24	0.11	0.90	1.61	3.92	2.24	
Braintree	Raw Average Daily Flow	9.86	8.57	8.68			5.91	4.93	4.20	4.11	4.70	6.27	10.20	6.74	
	Raw Dry Day Average Daily Flow	8.85	7.78	7.63			5.61	4.80	4.16	4.07	4.55	5.83	9.71	6.30	
	Raw Estimated Infiltration	5.65	4.58	4.43			2.41	1.60	0.96	0.87	1.35	2.63	6.51	3.10	
	MWRA Estimated Infiltration	0.83	0.68	0.65			0.36	0.24	0.14	0.13	0.20	0.39	0.96	0.46	
	Final Average Daily Flow	9.03	7.89	8.03			5.55	4.69	4.06	3.98	4.50	5.88	9.24	6.29	
	Final Dry Day Average Daily Flow	8.02	7.10	6.98			5.25	4.56	4.02	3.94	4.35	5.44	8.75	5.84	
	Final Estimated Infiltration	4.82	3.90	3.78			2.05	1.36	0.82	0.74	1.15	2.24	5.55	2.64	
	Estimated Sanitary Flow	3.20	3.20	3.20			3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	
	Estimated Inflow	1.01	0.79	1.05			0.30	0.13	0.04	0.04	0.15	0.44	0.49	0.44	
Brookline (South Only)	Raw Average Daily Flow	6.02	5.53	6.02			3.20	2.95	2.25	2.14	2.77	3.77	8.69	4.34	
	Raw Dry Day Average Daily Flow	4.79	4.82	4.89			2.95	2.68	2.13	2.10	2.20	2.92	6.93	3.64	
	Raw Estimated Infiltration	2.69	2.72	2.79			0.85	0.58	0.13	0.00	0.10	0.82	4.83	1.55	
	MWRA Estimated Infiltration	0.02	0.02	0.02			0.01	0.00	0.00	0.00	0.00	0.01	0.03	0.01	
	Final Average Daily Flow	6.00	5.51	6.00			3.19	2.95	2.25	2.14	2.77	3.76	8.66	4.33	
	Final Dry Day Average Daily Flow	4.77	4.80	4.87			2.94	2.68	2.13	2.10	2.20	2.91	6.90	3.63	
	Final Estimated Infiltration	2.67	2.70	2.77			0.84	0.58	0.13	0.00	0.10	0.81	4.80	1.54	
	Estimated Sanitary Flow	2.10	2.10	2.10			2.10	2.10	2.00	2.10	2.10	2.10	2.10	2.09	
	Estimated Inflow	1.23	0.71	1.13			0.25	0.27	0.12	0.04	0.57	0.85	1.76	0.70	
Canton	Raw Average Daily Flow	3.46	3.14	3.32			2.77	2.55	2.18	2.18	2.42	3.11	4.76	2.99	
	Raw Dry Day Average Daily Flow	3.04	2.93	2.92			2.57	2.33	2.06	2.14	2.24	2.82	4.24	2.73	
	Raw Estimated Infiltration	1.64	1.53	1.52			1.17	0.93	0.66	0.74	0.84	1.42	2.84	1.33	
	MWRA Estimated Infiltration	0.22	0.20	0.20			0.16	0.12	0.09	0.10	0.11	0.19	0.38	0.18	
	Final Average Daily Flow	3.24	2.94	3.12			2.61	2.43	2.09	2.08	2.31	2.92	4.38	2.81	
	Final Dry Day Average Daily Flow	2.82	2.73	2.72			2.41	2.21	1.97	2.04	2.13	2.63	3.86	2.55	
	Final Estimated Infiltration	1.42	1.33	1.32			1.01	0.81	0.57	0.64	0.73	1.23	2.46	1.15	
	Estimated Sanitary Flow	1.40	1.40	1.40			1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	
	Estimated Inflow	0.42	0.21	0.40			0.20	0.22	0.12	0.04	0.18	0.29	0.52	0.26	
Dedham	Average Daily Flow	4.20	3.89	4.24			3.24	3.18	2.46	2.36	2.51	3.30	6.19	3.56	
	Dry Day Average Daily Flow	3.71	3.62	3.60			2.87	2.80	2.42	2.33	2.40	3.06	5.62	3.25	
	Estimated Infiltration	1.91	1.82	1.80			1.07	1.00	0.62	0.53	0.60	1.26	3.82	1.45	
	Estimated Sanitary Flow	1.80	1.80	1.80			1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	
	Estimated Inflow	0.49	0.27	0.64			0.37	0.38	0.04	0.03	0.11	0.24	0.57	0.32	

Table 4 - Estimated Community Wastewater Flow Components for 2020

1-Feb-21

PAGE 2

Annual
Average
(MGD)

Community	Flow Characteristic	Jan	Feb	Mar	Apr*	May*	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)	
Framingham	Average Daily Flow	7.22	6.56	6.58			5.16	6.09	5.25	5.31	5.74	6.59	10.20	6.48	
	Dry Day Average Daily Flow	6.40	6.08	5.74			5.10	5.88	5.15	5.18	5.51	6.22	10.01	6.13	
	Estimated Infiltration	1.60	1.28	0.94			0.30	1.08	0.35	0.38	0.71	1.42	5.21	1.33	
	Estimated Sanitary Flow	4.80	4.80	4.80			4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80
	Estimated Inflow	0.82	0.48	0.84			0.06	0.21	0.10	0.13	0.23	0.37	0.19	0.34	
Hingham	Average Daily Flow	1.47	1.34	1.39			1.09	0.78	0.67	0.64	0.78	0.98	1.80	1.09	
	Dry Day Average Daily Flow	1.28	1.20	1.18			1.08	0.74	0.65	0.63	0.73	0.92	1.67	1.01	
	Estimated Infiltration	0.78	0.70	0.68			0.58	0.24	0.15	0.13	0.23	0.42	1.17	0.51	
	Estimated Sanitary Flow	0.50	0.50	0.50			0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
	Estimated Inflow	0.19	0.14	0.21			0.01	0.04	0.02	0.01	0.05	0.06	0.13	0.09	
Holbrook	Average Daily Flow	0.92	0.88	0.92			0.71	0.72	0.66	0.63	0.67	0.80	1.11	0.80	
	Dry Day Average Daily Flow	0.83	0.84	0.84			0.62	0.68	0.65	0.62	0.65	0.75	1.03	0.75	
	Estimated Infiltration	0.33	0.34	0.34			0.12	0.18	0.15	0.12	0.15	0.25	0.53	0.25	
	Estimated Sanitary Flow	0.50	0.50	0.50			0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
	Estimated Inflow	0.09	0.04	0.08			0.09	0.04	0.01	0.01	0.02	0.05	0.08	0.05	
Milton (South Only)	Average Daily Flow	3.62	3.16	3.37			1.97	1.82	1.44	1.39	1.72	2.37	4.83	2.57	
	Dry Day Average Daily Flow	2.96	2.80	2.80			1.91	1.63	1.42	1.34	1.57	2.11	4.13	2.27	
	Estimated Infiltration	1.71	1.55	1.55			0.66	0.38	0.17	0.09	0.32	0.86	2.88	1.02	
	Estimated Sanitary Flow	1.25	1.25	1.25			1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	
	Estimated Inflow	0.66	0.36	0.57			0.06	0.19	0.02	0.05	0.15	0.26	0.70	0.30	
Natick	Average Daily Flow	3.30	3.05	3.03			2.26	1.97	1.81	1.73	1.79	2.17	3.96	2.51	
	Dry Day Average Daily Flow	2.90	2.83	2.79			2.22	1.94	1.78	1.72	1.75	1.97	3.77	2.37	
	Estimated Infiltration	1.10	1.03	0.99			0.42	0.14	0.08	0.02	0.05	0.27	2.07	0.62	
	Estimated Sanitary Flow	1.80	1.80	1.80			1.80	1.80	1.70	1.70	1.70	1.70	1.70	1.75	
	Estimated Inflow	0.40	0.22	0.24			0.04	0.03	0.03	0.01	0.04	0.20	0.19	0.14	
Needham	Average Daily Flow	4.15	3.74	3.97			2.91	2.42	2.13	2.25	2.39	3.06	6.13	3.32	
	Dry Day Average Daily Flow	3.60	3.38	3.52			2.75	2.38	2.08	2.21	2.34	2.80	5.72	3.08	
	Estimated Infiltration	1.70	1.48	1.62			0.85	0.48	0.18	0.31	0.44	0.90	3.82	1.18	
	Estimated Sanitary Flow	1.90	1.90	1.90			1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	
	Estimated Inflow	0.55	0.36	0.45			0.16	0.04	0.05	0.04	0.05	0.26	0.41	0.24	
Newton (South Only)	Raw Average Daily Flow	11.30	9.26	9.80			6.08	5.74	4.61	4.15	4.59	6.52	16.20	7.84	
	Raw Dry Day Average Daily Flow	9.26	8.43	8.44			5.78	5.41	4.60	4.14	4.52	5.49	14.69	7.09	
	Raw Estimated Infiltration	5.16	4.33	4.34			1.68	1.31	0.50	0.04	0.42	1.39	10.59	2.99	
	MWRA Estimated Infiltration	0.01	0.01	0.01			0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	
	Final Average Daily Flow	11.29	9.25	9.79			6.08	5.74	4.61	4.15	4.59	6.52	16.17	7.83	
	Final Dry Day Average Daily Flow	9.25	8.42	8.43			5.78	5.41	4.60	4.14	4.52	5.49	14.66	7.08	
	Final Estimated Infiltration	5.15	4.32	4.33			1.68	1.31	0.50	0.04	0.42	1.39	10.56	2.98	
	Estimated Sanitary Flow	4.10	4.10	4.10			4.10	4.10	4.10	4.10	4.10	4.10	4.10	4.10	
	Estimated Inflow	2.04	0.83	1.36			0.30	0.33	0.01	0.01	0.07	1.03	1.51	0.75	

Table 4 - Estimated Community Wastewater Flow Components for 2020

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Community	Flow Characteristic	Jan	Feb	Mar	Apr*	May*	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)	
Norwood	Raw Average Daily Flow	6.51	6.11	6.10			4.82	4.91	3.66	3.36	3.84	5.46	10.15	5.50	
	Raw Dry Day Average Daily Flow	5.99	5.79	5.58			4.14	4.32	3.56	3.34	3.70	5.16	9.15	5.08	
	Raw Estimated Infiltration	3.59	3.39	3.18			1.74	1.92	1.16	0.94	1.30	2.76	6.75	2.68	
	MWRA Estimated Infiltration	0.37	0.35	0.33			0.18	0.20	0.12	0.10	0.13	0.29	0.70	0.28	
	Final Average Daily Flow	6.14	5.76	5.77			4.64	4.71	3.54	3.26	3.71	5.17	9.45	5.22	
	Final Dry Day Average Daily Flow	5.62	5.44	5.25			3.96	4.12	3.44	3.24	3.57	4.87	8.45	4.80	
	Final Estimated Infiltration	3.22	3.04	2.85			1.56	1.72	1.04	0.84	1.17	2.47	6.05	2.40	
	Estimated Sanitary Flow	2.40	2.40	2.40			2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40
	Estimated Inflow	0.52	0.32	0.52			0.68	0.59	0.10	0.02	0.14	0.30	1.00	0.42	
Quincy	Average Daily Flow	13.70	12.44	12.80			11.04	10.36	9.51	9.08	10.08	11.69	17.12	11.79	
	Dry Day Average Daily Flow	12.11	11.46	11.21			10.19	9.99	9.20	8.89	9.60	10.74	16.01	10.95	
	Estimated Infiltration	3.91	3.26	3.01			1.99	1.79	1.00	0.69	1.40	2.54	7.81	2.75	
	Estimated Sanitary Flow	8.20	8.20	8.20			8.20	8.20	8.20	8.20	8.20	8.20	8.20	8.20	
	Estimated Inflow	1.59	0.98	1.59			0.85	0.37	0.31	0.19	0.48	0.95	1.11	0.84	
Randolph	Average Daily Flow	4.03	3.66	3.70			2.87	2.60	2.34	2.26	2.37	3.00	4.83	3.17	
	Dry Day Average Daily Flow	3.56	3.41	3.29			2.67	2.48	2.30	2.24	2.31	2.88	4.65	2.98	
	Estimated Infiltration	1.66	1.51	1.39			0.77	0.58	0.40	0.34	0.41	0.98	2.75	1.08	
	Estimated Sanitary Flow	1.90	1.90	1.90			1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	
	Estimated Inflow	0.47	0.25	0.41			0.20	0.12	0.04	0.02	0.06	0.12	0.18	0.19	
Stoughton	Average Daily Flow	3.11	2.87	2.92			2.26	2.16	2.05	2.12	2.22	2.65	4.18	2.66	
	Dry Day Average Daily Flow	2.83	2.70	2.70			2.20	2.06	2.02	2.11	2.18	2.58	4.13	2.55	
	Estimated Infiltration	1.43	1.30	1.30			0.80	0.66	0.62	0.71	0.78	1.18	2.73	1.15	
	Estimated Sanitary Flow	1.40	1.40	1.40			1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	
	Estimated Inflow	0.28	0.17	0.22			0.06	0.10	0.03	0.01	0.04	0.07	0.05	0.10	
Walpole	Average Daily Flow	2.16	2.05	2.05			1.82	1.70	1.51	1.47	1.62	1.88	3.21	1.95	
	Dry Day Average Daily Flow	1.99	1.92	1.91			1.80	1.64	1.45	1.42	1.55	1.71	3.07	1.85	
	Estimated Infiltration	0.79	0.72	0.71			0.60	0.44	0.25	0.22	0.35	0.51	1.87	0.65	
	Estimated Sanitary Flow	1.20	1.20	1.20			1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	
	Estimated Inflow	0.17	0.13	0.14			0.02	0.06	0.06	0.05	0.07	0.17	0.14	0.10	
Wellesley	Average Daily Flow	3.28	4.39	4.94			2.70	2.27	1.84	1.89	2.08	2.62	5.26	3.13	
	Dry Day Average Daily Flow	3.05	4.10	4.59			2.41	2.12	1.81	1.88	2.01	2.32	5.00	2.93	
	Estimated Infiltration	1.35	2.40	2.89			0.71	0.42	0.11	0.18	0.31	0.62	3.30	1.23	
	Estimated Sanitary Flow	1.70	1.70	1.70			1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	
	Estimated Inflow	0.23	0.29	0.35			0.29	0.15	0.03	0.01	0.07	0.30	0.26	0.20	
Westwood	Average Daily Flow	1.82	1.68	2.03			1.56	1.51	1.18	1.14	1.20	1.43	2.68	1.63	
	Dry Day Average Daily Flow	1.62	1.65	1.85			1.44	1.39	1.16	1.13	1.16	1.31	2.46	1.52	
	Estimated Infiltration	0.72	0.75	0.95			0.54	0.49	0.26	0.23	0.26	0.41	1.56	0.62	
	Estimated Sanitary Flow	0.90	0.90	0.90			0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
	Estimated Inflow	0.20	0.03	0.18			0.12	0.12	0.02	0.01	0.04	0.12	0.22	0.11	

Table 4 - Estimated Community Wastewater Flow Components for 2020													1-Feb-21	PAGE 4	Average (MGD)
Community	Flow Characteristic	Jan	Feb	Mar	Apr*	May*	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Weymouth	Average Daily Flow	9.44	8.71	9.24			6.65	5.81	5.09	5.03	5.63	7.34	11.16	7.41	
	Dry Day Average Daily Flow	8.40	8.10	8.17			6.21	5.54	5.07	4.96	5.48	7.01	10.54	6.95	
	Estimated Infiltration	4.70	4.40	4.47			2.51	1.84	1.37	1.26	1.78	3.31	6.84	3.25	
	Estimated Sanitary Flow	3.70	3.70	3.70			3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	
	Estimated Inflow	1.04	0.61	1.07			0.44	0.27	0.02	0.07	0.15	0.33	0.62	0.46	
Subtotal (Southern System)	Raw Average Daily Flow	124.94	109.28	113.60			82.14	76.56	63.73	62.13	68.70	94.16	165.17	96.12	
	Raw Dry Day Average Daily Flow	106.71	98.26	98.20			75.50	72.69	62.30	61.22	65.12	86.09	151.10	87.78	
	Raw Estimated Infiltration	52.86	44.41	44.35			21.65	18.84	9.65	8.47	12.37	32.34	97.35	34.29	
	MWRA Estimated Infiltration	5.33	3.15	3.16			1.34	1.57	0.50	0.53	0.60	4.06	9.34	2.97	
	Final Average Daily Flow	119.61	106.13	110.44			80.80	74.99	63.23	61.60	68.10	90.10	155.83	93.15	
	Final Dry Day Average Daily Flow	101.38	95.11	95.04			74.16	71.12	61.80	60.69	64.52	82.03	141.76	84.82	
	Final Estimated Infiltration	47.53	41.26	41.19			20.31	17.27	9.15	7.94	11.77	28.28	88.01	31.33	
	Estimated Sanitary Flow	53.85	53.85	53.85			53.85	53.85	52.65	52.75	52.75	53.75	53.75	53.49	
Estimated Inflow	18.23	11.02	15.40			6.64	3.87	1.43	0.91	3.58	8.07	14.07	8.33		
South System Pump Station as Reported by NPDES	Average Daily Flow	123.60	112.90	118.20			87.10	78.70	68.00	65.30	72.70	93.60	164.90	98.57	

Table 4 - Estimated Community Wastewater Flow Components for 2020

Community	Flow Characteristic	Jan	Feb	Mar	Apr*	May*	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)
Arlington	Raw Average Daily Flow	6.20	5.35	5.55			3.67	3.25	2.95	2.97	3.29	4.09	7.85	4.52
	Raw Dry Day Average Daily Flow	5.25	4.98	4.87			3.52	3.08	2.91	2.92	3.15	3.78	7.73	4.22
	Raw Estimated Infiltration	2.75	2.48	2.37			1.02	0.58	0.41	0.42	0.65	1.28	5.23	1.72
	MWRA Estimated Infiltration	0.11	0.10	0.10			0.04	0.02	0.02	0.02	0.03	0.05	0.22	0.07
	Final Average Daily Flow	6.09	5.25	5.45			3.63	3.23	2.93	2.95	3.26	4.04	7.63	4.45
	Final Dry Day Average Daily Flow	5.14	4.88	4.77			3.48	3.06	2.89	2.90	3.12	3.73	7.51	4.15
	Final Estimated Infiltration	2.64	2.38	2.27			0.98	0.56	0.39	0.40	0.62	1.23	5.01	1.65
	Estimated Sanitary Flow	2.50	2.50	2.50			2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
	Estimated Inflow	0.95	0.37	0.68			0.15	0.17	0.04	0.05	0.14	0.31	0.12	0.30
Bedford	Average Daily Flow	2.92	2.55	2.54			1.81	1.69	1.57	1.44	1.57	1.77	2.73	2.06
	Dry Day Average Daily Flow	2.62	2.47	2.42			1.70	1.66	1.51	1.42	1.52	1.69	2.71	1.97
	Estimated Infiltration	1.32	1.17	1.12			0.40	0.36	0.21	0.12	0.22	0.39	1.41	0.67
	Estimated Sanitary Flow	1.30	1.30	1.30			1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30
	Estimated Inflow	0.30	0.08	0.12			0.11	0.03	0.06	0.02	0.05	0.08	0.02	0.09
Belmont	Average Daily Flow	3.47	3.02	3.20			2.17	1.98	1.81	1.71	1.94	2.40	4.85	2.66
	Dry Day Average Daily Flow	2.84	2.72	2.73			2.07	1.86	1.81	1.70	1.78	2.11	4.30	2.39
	Estimated Infiltration	1.44	1.32	1.33			0.67	0.46	0.41	0.30	0.38	0.71	2.90	0.99
	Estimated Sanitary Flow	1.40	1.40	1.40			1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
	Estimated Inflow	0.63	0.30	0.47			0.10	0.12	0.00	0.01	0.16	0.29	0.55	0.26
Boston (North Only)														
Boston Charlestown	Raw Average Daily Flow	2.73	3.29	3.79			3.64	3.70	3.45	3.51	3.80	3.61	4.20	3.57
	Raw Dry Day Average Daily Flow	2.51	2.94	3.36			2.86	3.35	3.14	3.15	3.33	2.76	3.29	3.07
	Raw Estimated Infiltration	0.81	1.24	1.66			0.56	1.05	0.84	0.85	1.03	0.46	0.99	0.95
	MWRA Estimated Infiltration	0.11	0.17	0.22			0.08	0.14	0.11	0.11	0.14	0.06	0.13	0.13
	Final Average Daily Flow	2.62	3.12	3.57			3.56	3.56	3.34	3.40	3.66	3.55	4.07	3.45
	Final Dry Day Average Daily Flow	2.40	2.77	3.14			2.78	3.21	3.03	3.04	3.19	2.70	3.16	2.94
	Final Estimated Infiltration	0.70	1.07	1.44			0.48	0.91	0.73	0.74	0.89	0.40	0.86	0.82
	Estimated Sanitary Flow	1.70	1.70	1.70			2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.12
	Estimated Inflow	0.22	0.35	0.43			0.78	0.35	0.31	0.36	0.47	0.85	0.91	0.50
Boston Columbus Park	Raw Average Daily Flow	33.15	31.68	35.37			29.79	23.55	22.70	21.64	26.94	28.99	37.93	29.18
	Raw Dry Day Average Daily Flow	27.69	26.85	28.03			21.49	21.79	20.62	20.40	21.40	22.83	29.88	24.10
	Raw Estimated Infiltration	7.19	6.35	7.53			1.99	2.29	1.12	0.90	1.90	3.33	10.38	4.31
	MWRA Estimated Infiltration	0.20	0.18	0.21			0.06	0.06	0.03	0.03	0.05	0.09	0.29	0.12
	Final Average Daily Flow	32.95	31.50	35.16			29.73	23.49	22.67	21.61	26.89	28.90	37.64	29.06
	Final Dry Day Average Daily Flow	27.49	26.67	27.82			21.43	21.73	20.59	20.37	21.35	22.74	29.59	23.98
	Final Estimated Infiltration	6.99	6.17	7.32			1.93	2.23	1.09	0.87	1.85	3.24	10.09	4.19
	Estimated Sanitary Flow	20.50	20.50	20.50			19.50	19.50	19.50	19.50	19.50	19.50	19.50	19.80
	Estimated Inflow	5.46	4.83	7.34			8.30	1.76	2.08	1.24	5.54	6.16	8.05	5.08
Boston East Boston	Raw Average Daily Flow	5.85	6.77	6.47			5.64	5.81	5.64	5.30	5.51	5.88	7.59	6.05
	Raw Dry Day Average Daily Flow	5.52	5.69	5.78			5.26	5.63	5.27	4.98	4.57	4.59	5.86	5.32
	Raw Estimated Infiltration	2.02	2.19	2.28			1.26	1.63	1.27	0.98	0.57	0.59	1.86	1.47
	MWRA Estimated Infiltration	0.31	0.33	0.35			0.19	0.25	0.19	0.15	0.09	0.09	0.28	0.22
	Final Average Daily Flow	5.54	6.44	6.12			5.45	5.56	5.45	5.15	5.42	5.79	7.31	5.82
	Final Dry Day Average Daily Flow	5.21	5.36	5.43			5.07	5.38	5.08	4.83	4.48	4.50	5.58	5.09
	Final Estimated Infiltration	1.71	1.86	1.93			1.07	1.38	1.08	0.83	0.48	0.50	1.58	1.24
	Estimated Sanitary Flow	3.50	3.50	3.50			4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.85
	Estimated Inflow	0.33	1.08	0.69			0.38	0.18	0.37	0.32	0.94	1.29	1.73	0.73

Table 4 - Estimated Community Wastewater Flow Components for 2020

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Community	Flow Characteristic	Jan	Feb	Mar	Apr*	May*	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)
Boston Ward Street	Raw Average Daily Flow	28.33	30.26	27.62			22.96	22.47	21.82	24.28	26.33	27.95	31.57	26.35
	Raw Dry Day Average Daily Flow	27.40	29.27	26.97			20.62	20.51	19.33	23.03	23.71	24.90	25.80	24.13
	Raw Estimated Infiltration	2.90	4.77	2.47			1.12	1.01	0.33	3.03	3.71	4.90	5.80	2.99
	MWRA Estimated Infiltration	0.50	0.82	0.42			0.19	0.17	0.06	0.52	0.63	0.84	0.99	0.51
	Final Average Daily Flow	27.83	29.44	27.20			22.77	22.30	21.76	23.76	25.70	27.11	30.58	25.83
	Final Dry Day Average Daily Flow	26.90	28.45	26.55			20.43	20.34	19.27	22.51	23.08	24.06	24.81	23.62
	Final Estimated Infiltration	2.40	3.95	2.05			0.93	0.84	0.27	2.51	3.08	4.06	4.81	2.48
	Estimated Sanitary Flow	24.50	24.50	24.50			19.50	19.50	19.00	20.00	20.00	20.00	20.00	21.14
	Estimated Inflow	0.93	0.99	0.65			2.34	1.96	2.49	1.25	2.62	3.05	5.77	2.21
Boston (North Total)	Raw Average Daily Flow	70.06	72.00	73.25			62.03	55.53	53.61	54.73	62.58	66.43	81.29	65.15
	Raw Dry Day Average Daily Flow	63.12	64.75	64.14			50.23	51.28	48.36	51.56	53.01	55.08	64.83	56.63
	Raw Estimated Infiltration	12.92	14.55	13.94			4.93	5.98	3.56	5.76	7.21	9.28	19.03	9.71
	MWRA Estimated Infiltration	1.12	1.50	1.20			0.52	0.62	0.39	0.81	0.91	1.08	1.69	0.98
	Final Average Daily Flow	68.94	70.50	72.05			61.51	54.91	53.22	53.92	61.67	65.35	79.60	64.16
	Final Dry Day Average Daily Flow	62.00	63.25	62.94			49.71	50.66	47.97	50.75	52.10	54.00	63.14	55.64
	Final Estimated Infiltration	11.80	13.05	12.74			4.41	5.36	3.17	4.95	6.30	8.20	17.34	8.73
	Estimated Sanitary Flow	50.20	50.20	50.20			45.30	45.30	44.80	45.80	45.80	45.80	45.80	46.91
	Estimated Inflow	6.94	7.25	9.11			11.80	4.25	5.25	3.17	9.57	11.35	16.46	8.52
Brookline (North Only)	Average Daily Flow	2.50	2.46	2.96			2.60	2.37	2.33	2.35	2.49	2.48	3.16	2.57
	Dry Day Average Daily Flow	2.32	2.30	2.81			2.40	2.35	2.24	2.29	2.19	2.17	2.76	2.38
	Estimated Infiltration	0.22	0.20	0.71			0.30	0.25	0.14	0.19	0.09	0.07	0.66	0.28
	Estimated Sanitary Flow	2.10	2.10	2.10			2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10
	Estimated Inflow	0.18	0.16	0.15			0.20	0.02	0.09	0.06	0.30	0.31	0.40	0.19
Burlington	Average Daily Flow	4.85	4.44	3.86			2.85	2.66	2.39	2.35	2.36	2.75	4.25	3.27
	Dry Day Average Daily Flow	4.17	4.03	3.79			2.80	2.60	2.39	2.33	2.32	2.63	4.05	3.11
	Estimated Infiltration	2.17	2.03	1.79			0.80	0.60	0.39	0.33	0.32	0.63	2.05	1.11
	Estimated Sanitary Flow	2.00	2.00	2.00			2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	Estimated Inflow	0.68	0.41	0.07			0.05	0.06	0.00	0.02	0.04	0.12	0.20	0.16
Cambridge	Raw Average Daily Flow	18.51	20.10	20.23			17.42	17.80	15.75	14.05	17.12	18.53	25.01	18.46
	Raw Dry Day Average Daily Flow	17.10	17.06	17.03			15.89	17.22	14.48	13.55	13.67	15.35	20.44	16.19
	Raw Estimated Infiltration	5.60	5.56	5.53			4.39	5.72	2.98	2.05	2.17	3.85	8.94	4.69
	MWRA Estimated Infiltration	0.79	0.78	0.78			0.62	0.80	0.42	0.29	0.30	0.54	1.26	0.66
	Final Average Daily Flow	17.72	19.32	19.45			16.80	17.00	15.33	13.76	16.82	17.99	23.75	17.80
	Final Dry Day Average Daily Flow	16.31	16.28	16.25			15.27	16.42	14.06	13.26	13.37	14.81	19.18	15.53
	Final Estimated Infiltration	4.81	4.78	4.75			3.77	4.92	2.56	1.76	1.87	3.31	7.68	4.03
	Estimated Sanitary Flow	11.50	11.50	11.50			11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50
	Estimated Inflow	1.41	3.04	3.20			1.53	0.58	1.27	0.50	3.45	3.18	4.57	2.27
Chelsea	Raw Average Daily Flow	5.67	6.37	7.37			5.06	4.79	4.56	4.49	6.15	6.34	7.48	5.83
	Raw Dry Day Average Daily Flow	4.95	4.67	5.17			4.67	4.26	4.18	4.23	4.56	4.89	5.22	4.68
	Raw Estimated Infiltration	1.95	1.67	2.17			1.67	1.26	1.18	1.23	1.56	1.89	2.22	1.68
	MWRA Estimated Infiltration	0.24	0.20	0.27			0.20	0.15	0.14	0.15	0.19	0.23	0.27	0.20
	Final Average Daily Flow	5.43	6.17	7.10			4.86	4.64	4.42	4.34	5.96	6.11	7.21	5.63
	Final Dry Day Average Daily Flow	4.71	4.47	4.90			4.47	4.11	4.04	4.08	4.37	4.66	4.95	4.48
	Final Estimated Infiltration	1.71	1.47	1.90			1.47	1.11	1.04	1.08	1.37	1.66	1.95	1.48
	Estimated Sanitary Flow	3.00	3.00	3.00			3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
	Estimated Inflow	0.72	1.70	2.20			0.39	0.53	0.38	0.26	1.59	1.45	2.26	1.15

Table 4 - Estimated Community Wastewater Flow Components for 2020

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Community	Flow Characteristic	Jan	Feb	Mar	Apr*	May*	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average (MGD)	
Everett	Raw Average Daily Flow	5.21	4.96	4.84			3.72	3.72	3.63	3.37	3.96	4.47	6.30	4.42	
	Raw Dry Day Average Daily Flow	4.65	4.52	4.43			3.63	3.53	3.57	3.32	3.68	3.87	5.47	4.07	
	Raw Estimated Infiltration	1.45	1.32	1.23			0.43	0.33	0.37	0.12	0.48	0.67	2.27	0.87	
	MWRA Estimated Infiltration	0.01	0.01	0.01			0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	
	Final Average Daily Flow	5.20	4.95	4.83			3.72	3.72	3.63	3.37	3.96	4.47	6.29	4.42	
	Final Dry Day Average Daily Flow	4.64	4.51	4.42			3.63	3.53	3.57	3.32	3.68	3.87	5.46	4.06	
	Final Estimated Infiltration	1.44	1.31	1.22			0.43	0.33	0.37	0.12	0.48	0.67	2.26	0.86	
	Estimated Sanitary Flow	3.20	3.20	3.20			3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
	Estimated Inflow	0.56	0.44	0.41			0.09	0.19	0.06	0.05	0.28	0.60	0.83	0.35	
Lexington	Raw Average Daily Flow	7.54	6.45	6.38			4.57	4.04	3.13	2.97	3.33	4.07	7.31	4.98	
	Raw Dry Day Average Daily Flow	6.56	6.13	6.08			4.16	3.73	3.08	2.95	3.27	4.03	7.06	4.71	
	Raw Estimated Infiltration	4.36	3.93	3.88			1.96	1.53	0.88	0.75	1.07	1.83	4.86	2.51	
	MWRA Estimated Infiltration	0.41	0.37	0.37			0.19	0.14	0.08	0.07	0.10	0.17	0.46	0.24	
	Final Average Daily Flow	7.13	6.08	6.01			4.38	3.90	3.05	2.90	3.23	3.90	6.85	4.74	
	Final Dry Day Average Daily Flow	6.15	5.76	5.71			3.97	3.59	3.00	2.88	3.17	3.86	6.60	4.47	
	Final Estimated Infiltration	3.95	3.56	3.51			1.77	1.39	0.80	0.68	0.97	1.66	4.40	2.27	
	Estimated Sanitary Flow	2.20	2.20	2.20			2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	
	Estimated Inflow	0.98	0.32	0.30			0.41	0.31	0.05	0.02	0.06	0.04	0.25	0.27	
Malden	Raw Average Daily Flow	9.83	9.30	9.84			7.36	7.17	6.36	6.24	7.62	9.18	12.42	8.54	
	Raw Dry Day Average Daily Flow	8.82	8.79	8.45			6.92	6.80	6.23	6.18	7.33	8.72	11.44	7.97	
	Raw Estimated Infiltration	3.92	3.89	3.55			1.82	1.70	1.13	1.08	2.23	3.62	6.34	2.93	
	MWRA Estimated Infiltration	0.37	0.37	0.33			0.17	0.16	0.11	0.10	0.21	0.34	0.60	0.28	
	Final Average Daily Flow	9.46	8.93	9.51			7.19	7.01	6.25	6.14	7.41	8.84	11.82	8.26	
	Final Dry Day Average Daily Flow	8.45	8.42	8.12			6.75	6.64	6.12	6.08	7.12	8.38	10.84	7.69	
	Final Estimated Infiltration	3.55	3.52	3.22			1.65	1.54	1.02	0.98	2.02	3.28	5.74	2.65	
	Estimated Sanitary Flow	4.90	4.90	4.90			5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.04	
	Estimated Inflow	1.01	0.51	1.39			0.44	0.37	0.13	0.06	0.29	0.46	0.98	0.57	
Medford	Raw Average Daily Flow	8.75	8.09	8.39			6.19	5.41	4.99	4.63	5.45	6.41	11.78	7.01	
	Raw Dry Day Average Daily Flow	7.31	7.33	7.01			5.78	5.26	4.87	4.29	5.10	5.66	10.82	6.35	
	Raw Estimated Infiltration	3.11	3.13	2.81			1.58	1.06	0.67	0.09	0.90	1.46	6.62	2.15	
	MWRA Estimated Infiltration	0.36	0.36	0.33			0.18	0.12	0.08	0.01	0.10	0.17	0.77	0.25	
	Final Average Daily Flow	8.39	7.73	8.06			6.01	5.29	4.91	4.62	5.35	6.24	11.01	6.77	
	Final Dry Day Average Daily Flow	6.95	6.97	6.68			5.60	5.14	4.79	4.28	5.00	5.49	10.05	6.10	
	Final Estimated Infiltration	2.75	2.77	2.48			1.40	0.94	0.59	0.08	0.80	1.29	5.85	1.90	
	Estimated Sanitary Flow	4.20	4.20	4.20			4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	
	Estimated Inflow	1.44	0.76	1.38			0.41	0.15	0.12	0.34	0.35	0.75	0.96	0.67	
Melrose	Raw Average Daily Flow	5.46	4.65	4.97			3.56	2.72	2.45	2.09	2.55	3.64	8.32	4.05	
	Raw Dry Day Average Daily Flow	4.48	4.20	4.29			3.23	2.48	2.30	2.06	2.38	3.38	6.97	3.58	
	Raw Estimated Infiltration	2.68	2.40	2.49			1.43	0.68	0.50	0.26	0.58	1.58	5.17	1.78	
	MWRA Estimated Infiltration	0.52	0.46	0.48			0.28	0.13	0.10	0.05	0.11	0.31	1.00	0.34	
	Final Average Daily Flow	4.94	4.19	4.49			3.28	2.59	2.35	2.04	2.44	3.33	7.32	3.70	
	Final Dry Day Average Daily Flow	3.96	3.74	3.81			2.95	2.35	2.20	2.01	2.27	3.07	5.97	3.24	
	Final Estimated Infiltration	2.16	1.94	2.01			1.15	0.55	0.40	0.21	0.47	1.27	4.17	1.44	
	Estimated Sanitary Flow	1.80	1.80	1.80			1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	
	Estimated Inflow	0.98	0.45	0.68			0.33	0.24	0.15	0.03	0.17	0.26	1.35	0.47	

Table 4 - Estimated Community Wastewater Flow Components for 2020

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Community	Flow Characteristic	Jan	Feb	Mar	Apr*	May*	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)
Milton (North Only)	Average Daily Flow	0.27	0.22	0.23			0.17	0.15	0.15	0.15	0.16	0.18	0.34	0.20
	Dry Day Average Daily Flow	0.22	0.20	0.20			0.16	0.15	0.15	0.15	0.15	0.17	0.33	0.19
	Estimated Infiltration	0.07	0.05	0.05			0.01	0.00	0.00	0.00	0.00	0.02	0.18	0.04
	Estimated Sanitary Flow	0.15	0.15	0.15			0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
	Estimated Inflow	0.05	0.02	0.03			0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01
Newton (North Only)	Average Daily Flow	6.20	5.38	5.65			4.25	3.89	3.25	3.16	3.63	4.11	9.60	4.92
	Dry Day Average Daily Flow	5.41	5.17	5.27			4.04	3.65	3.23	3.12	3.31	4.07	9.17	4.65
	Estimated Infiltration	1.71	1.47	1.57			1.04	0.65	0.23	0.12	0.31	1.07	6.17	1.44
	Estimated Sanitary Flow	3.70	3.70	3.70			3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.21
	Estimated Inflow	0.79	0.21	0.38			0.21	0.24	0.02	0.04	0.32	0.04	0.43	0.27
Reading	Raw Average Daily Flow	3.04	2.72	2.95			1.90	1.68	1.53	1.58	1.73	2.21	3.76	2.31
	Raw Dry Day Average Daily Flow	2.69	2.53	2.72			1.79	1.66	1.50	1.55	1.70	2.08	3.65	2.19
	Raw Estimated Infiltration	1.39	1.23	1.42			0.49	0.36	0.20	0.25	0.40	0.78	2.35	0.89
	MWRA Estimated Infiltration	0.01	0.01	0.01			0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.01
	Final Average Daily Flow	3.03	2.71	2.94			1.90	1.68	1.53	1.58	1.73	2.20	3.74	2.31
	Final Dry Day Average Daily Flow	2.68	2.52	2.71			1.79	1.66	1.50	1.55	1.70	2.07	3.63	2.18
	Final Estimated Infiltration	1.38	1.22	1.41			0.49	0.36	0.20	0.25	0.40	0.77	2.33	0.88
	Estimated Sanitary Flow	1.30	1.30	1.30			1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30
	Estimated Inflow	0.35	0.19	0.23			0.11	0.02	0.03	0.03	0.03	0.13	0.11	0.12
Revere	Raw Average Daily Flow	6.29	6.45	6.58			5.32	5.12	4.71	4.69	5.93	6.16	8.20	5.95
	Raw Dry Day Average Daily Flow	5.15	5.18	5.28			4.95	4.90	4.50	4.60	5.28	5.37	7.13	5.24
	Raw Estimated Infiltration	1.65	1.68	1.78			1.45	1.40	1.00	1.10	1.78	1.87	3.63	1.74
	MWRA Estimated Infiltration	0.01	0.01	0.01			0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.01
	Final Average Daily Flow	6.28	6.44	6.57			5.31	5.11	4.70	4.68	5.92	6.15	8.17	5.94
	Final Dry Day Average Daily Flow	5.14	5.17	5.27			4.94	4.89	4.49	4.59	5.27	5.36	7.10	5.22
	Final Estimated Infiltration	1.64	1.67	1.77			1.44	1.39	0.99	1.09	1.77	1.86	3.60	1.72
	Estimated Sanitary Flow	3.50	3.50	3.50			3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
	Estimated Inflow	1.14	1.27	1.30			0.37	0.22	0.21	0.09	0.65	0.79	1.07	0.71
Somerville	Raw Average Daily Flow	8.31	9.37	8.24			9.42	7.51	6.26	6.03	7.63	8.85	11.85	8.34
	Raw Dry Day Average Daily Flow	7.25	7.18	6.76			7.81	6.81	5.57	5.59	5.77	7.19	8.89	6.88
	Raw Estimated Infiltration	1.75	1.68	1.26			2.31	1.31	0.07	0.09	0.27	1.69	3.39	1.38
	MWRA Estimated Infiltration	0.04	0.04	0.03			0.05	0.03	0.00	0.00	0.01	0.04	0.08	0.03
	Final Average Daily Flow	8.27	9.33	8.21			9.37	7.48	6.26	6.03	7.62	8.81	11.77	8.31
	Final Dry Day Average Daily Flow	7.21	7.14	6.73			7.76	6.78	5.57	5.59	5.76	7.15	8.81	6.85
	Final Estimated Infiltration	1.71	1.64	1.23			2.26	1.28	0.07	0.09	0.26	1.65	3.31	1.35
	Estimated Sanitary Flow	5.50	5.50	5.50			5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
	Estimated Inflow	1.06	2.19	1.48			1.61	0.70	0.69	0.44	1.86	1.66	2.96	1.46
Stoneham	Raw Average Daily Flow	5.15	4.16	3.90			2.80	2.46	2.22	2.10	2.22	2.88	6.94	3.49
	Raw Dry Day Average Daily Flow	4.49	4.13	3.61			2.64	2.31	2.16	2.10	2.16	2.72	6.61	3.30
	Raw Estimated Infiltration	3.09	2.73	2.21			1.14	0.81	0.66	0.60	0.66	1.22	5.11	1.83
	MWRA Estimated Infiltration	0.51	0.45	0.36			0.19	0.13	0.11	0.10	0.11	0.20	0.84	0.30
	Final Average Daily Flow	4.64	3.71	3.54			2.61	2.33	2.11	2.00	2.11	2.68	6.10	3.19
	Final Dry Day Average Daily Flow	3.98	3.68	3.25			2.45	2.18	2.05	2.00	2.05	2.52	5.77	3.00
	Final Estimated Infiltration	2.58	2.28	1.85			0.95	0.68	0.55	0.50	0.55	1.02	4.27	1.52
	Estimated Sanitary Flow	1.40	1.40	1.40			1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.47
	Estimated Inflow	0.66	0.03	0.29			0.16	0.15	0.06	0.00	0.06	0.16	0.33	0.19

Table 4 - Estimated Community Wastewater Flow Components for 2020

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Community	Flow Characteristic	Jan	Feb	Mar	Apr*	May*	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)	
Wakefield	Raw Average Daily Flow	5.44	4.78	4.84			3.16	2.60	2.24	2.15	2.45	3.28	5.41	3.64	
	Raw Dry Day Average Daily Flow	4.71	4.46	4.37			2.99	2.44	2.21	2.14	2.38	3.05	5.30	3.40	
	Raw Estimated Infiltration	3.21	2.96	2.87			1.49	0.94	0.71	0.64	0.88	1.55	3.80	1.90	
	MWRA Estimated Infiltration	0.01	0.01	0.01			0.01	0.00	0.00	0.00	0.00	0.01	0.02	0.01	
	Final Average Daily Flow	5.43	4.77	4.83			3.15	2.60	2.24	2.15	2.45	3.27	5.39	3.63	
	Final Dry Day Average Daily Flow	4.70	4.45	4.36			2.98	2.44	2.21	2.14	2.38	3.04	5.28	3.40	
	Final Estimated Infiltration	3.20	2.95	2.86			1.48	0.94	0.71	0.64	0.88	1.54	3.78	1.90	
	Estimated Sanitary Flow	1.50	1.50	1.50			1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
	Estimated Inflow	0.73	0.32	0.47			0.17	0.16	0.03	0.01	0.07	0.23	0.11	0.23	
Waltham	Raw Average Daily Flow	10.14	9.03	9.03			7.31	6.91	5.93	5.60	6.11	7.38	11.92	7.94	
	Raw Dry Day Average Daily Flow	8.99	8.53	8.49			6.58	6.50	5.82	5.53	5.86	6.75	11.00	7.41	
	Raw Estimated Infiltration	3.39	2.93	2.89			1.18	1.10	0.42	0.13	0.46	1.35	5.60	1.95	
	MWRA Estimated Infiltration	0.15	0.13	0.13			0.05	0.05	0.02	0.01	0.02	0.06	0.25	0.09	
	Final Average Daily Flow	9.99	8.90	8.90			7.26	6.86	5.91	5.59	6.09	7.32	11.67	7.85	
	Final Dry Day Average Daily Flow	8.84	8.40	8.36			6.53	6.45	5.80	5.52	5.84	6.69	10.75	7.32	
	Final Estimated Infiltration	3.24	2.80	2.76			1.13	1.05	0.40	0.12	0.44	1.29	5.35	1.86	
	Estimated Sanitary Flow	5.60	5.60	5.60			5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	
	Estimated Inflow	1.15	0.50	0.54			0.73	0.41	0.11	0.07	0.25	0.63	0.92	0.53	
Watertown	Average Daily Flow	3.78	3.38	3.57			2.41	2.43	2.10	2.06	2.24	2.54	4.60	2.91	
	Dry Day Average Daily Flow	3.26	3.16	3.12			2.20	2.33	2.03	2.04	2.12	2.34	4.36	2.70	
	Estimated Infiltration	1.06	0.96	0.92			0.20	0.33	0.03	0.04	0.12	0.34	2.36	0.64	
	Estimated Sanitary Flow	2.20	2.20	2.20			2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
	Estimated Inflow	0.52	0.22	0.45			0.21	0.10	0.07	0.02	0.12	0.20	0.24	0.22	
Wilmington	Raw Average Daily Flow	1.77	1.70	1.59			1.38	1.35	1.32	1.21	1.25	1.25	1.44	1.43	
	Raw Dry Day Average Daily Flow	1.72	1.63	1.56			1.34	1.32	1.32	1.20	1.24	1.23	1.41	1.40	
	Raw Estimated Infiltration	0.92	0.83	0.76			0.54	0.52	0.52	0.40	0.44	0.43	0.61	0.60	
	MWRA Estimated Infiltration	0.01	0.01	0.01			0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.01	
	Final Average Daily Flow	1.76	1.69	1.58			1.37	1.34	1.31	1.21	1.25	1.25	1.43	1.42	
	Final Dry Day Average Daily Flow	1.71	1.62	1.55			1.33	1.31	1.31	1.20	1.24	1.23	1.40	1.39	
	Final Estimated Infiltration	0.91	0.82	0.75			0.53	0.51	0.51	0.40	0.44	0.43	0.60	0.59	
	Estimated Sanitary Flow	0.80	0.80	0.80			0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	
	Estimated Inflow	0.05	0.07	0.03			0.04	0.03	0.00	0.01	0.01	0.02	0.03	0.03	
Winchester	Average Daily Flow	2.81	2.48	2.61			1.54	1.29	1.10	1.03	1.11	1.46	3.38	1.88	
	Dry Day Average Daily Flow	2.47	2.38	2.36			1.45	1.24	1.10	1.03	1.07	1.32	3.32	1.78	
	Estimated Infiltration	1.37	1.28	1.26			0.35	0.14	0.10	0.03	0.07	0.32	2.32	0.73	
	Estimated Sanitary Flow	1.10	1.10	1.10			1.10	1.10	1.00	1.00	1.00	1.00	1.00	1.05	
	Estimated Inflow	0.34	0.10	0.25			0.09	0.05	0.00	0.00	0.04	0.14	0.06	0.11	
Winthrop	Average Daily Flow	2.17	2.04	1.99			1.95	1.99	2.02	1.73	2.10	2.02	2.28	2.03	
	Dry Day Average Daily Flow	1.91	1.85	1.82			1.86	1.90	1.93	1.58	1.71	1.71	1.97	1.82	
	Estimated Infiltration	0.81	0.75	0.72			0.66	0.70	0.73	0.38	0.51	0.51	0.77	0.65	
	Estimated Sanitary Flow	1.10	1.10	1.10			1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.17	
	Estimated Inflow	0.26	0.19	0.17			0.09	0.09	0.09	0.15	0.39	0.31	0.31	0.21	

Table 4 - Estimated Community Wastewater Flow Components for 2020

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Annual
Average
(MGD)

Community	Flow Characteristic	Jan	Feb	Mar	Apr*	May*	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)
Woburn	Raw Average Daily Flow	6.95	6.42	8.47			4.23	3.83	3.12	3.25	3.58	4.32	8.03	5.22
	Raw Dry Day Average Daily Flow	6.03	5.84	7.84			3.89	3.62	3.09	3.17	3.48	3.81	7.89	4.87
	Raw Estimated Infiltration	2.33	2.14	4.14			0.89	0.62	0.09	0.17	0.48	0.81	4.89	1.66
	MWRA Estimated Infiltration	0.33	0.30	0.58			0.13	0.09	0.01	0.02	0.07	0.11	0.69	0.23
	Final Average Daily Flow	6.62	6.12	7.89			4.10	3.74	3.11	3.23	3.51	4.21	7.34	4.99
	Final Dry Day Average Daily Flow	5.70	5.54	7.26			3.76	3.53	3.08	3.15	3.41	3.70	7.20	4.64
	Final Estimated Infiltration	2.00	1.84	3.56			0.76	0.53	0.08	0.15	0.41	0.70	4.20	1.43
	Estimated Sanitary Flow	3.70	3.70	3.70			3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.21
	Estimated Inflow	0.92	0.58	0.63			0.34	0.21	0.03	0.08	0.10	0.51	0.14	0.35
Subtotal (Northern System)	Raw Average Daily Flow	213.29	207.87	213.03			168.85	154.34	141.48	138.13	160.55	179.20	260.50	183.78
	Raw Dry Day Average Daily Flow	188.49	186.19	186.62			148.70	144.94	132.54	132.60	140.19	155.17	224.83	164.06
	Raw Estimated Infiltration	66.64	64.34	64.77			33.15	29.39	17.59	16.65	24.24	39.22	108.88	46.54
	MWRA Estimated Infiltration	5.00	5.11	5.01			2.65	2.46	1.50	1.64	2.17	3.33	8.22	3.71
	Final Average Daily Flow	208.29	202.76	208.02			166.20	151.88	139.98	136.49	158.38	175.87	252.28	180.07
	Final Dry Day Average Daily Flow	183.49	181.08	181.61			146.05	142.48	131.04	130.96	138.02	151.84	216.61	160.35
	Final Estimated Infiltration	61.64	59.23	59.76			30.50	26.93	16.09	15.01	22.07	35.89	100.66	42.82
	Estimated Sanitary Flow	121.85	121.85	121.85			115.55	115.55	114.95	115.95	115.95	115.95	115.95	117.53
	Estimated Inflow	24.80	21.68	26.41			20.15	9.40	8.94	5.53	20.36	24.03	35.67	19.71
Total (North and South)	Raw Average Daily Flow	338.23	317.15	326.63			250.99	230.90	205.21	200.26	229.25	273.36	425.67	279.90
	Raw Dry Day Average Daily Flow	295.20	284.45	284.82			224.20	217.63	194.84	193.82	205.31	241.26	375.93	251.85
	Raw Estimated Infiltration	119.50	108.75	109.12			54.80	48.23	27.24	25.12	36.61	71.56	206.23	80.83
	MWRA Estimated Infiltration	10.33	8.26	8.17			3.99	4.03	2.00	2.17	2.77	7.39	17.56	6.68
	Final Average Daily Flow	327.90	308.89	318.46			247.00	226.87	203.21	198.09	226.48	265.97	408.11	273.22
	Final Dry Day Average Daily Flow	284.87	276.19	276.65			220.21	213.60	192.84	191.65	202.54	233.87	358.37	245.17
	Final Estimated Infiltration	109.17	100.49	100.95			50.81	44.20	25.24	22.95	33.84	64.17	188.67	74.15
	Estimated Sanitary Flow	175.70	175.70	175.70			169.40	169.40	167.60	168.70	168.70	169.70	169.70	171.02
	Estimated Inflow	43.03	32.70	41.81			26.79	13.27	10.37	6.44	23.94	32.10	49.74	28.05
North System as Reported by NPDES	Average Daily Flow	215.30	213.50	216.70			171.70	159.20	147.70	146.80	165.30	189.00	264.60	189.01
Total System as Reported by NPDES	Average Daily Flow	338.90	326.40	334.90			258.80	237.90	215.70	212.10	238.00	282.60	429.50	287.58

Table 4 - Estimated Community Wastewater Flow Components for 2020

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Annual Average (MGD)

Community	Flow Characteristic	Jan	Feb	Mar	Apr*	May*	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)
Chelsea Creek	Average Daily Flow	105.10	98.87	100.46			76.62	71.81	64.48	73.11	65.13	70.46	131.30	85.77
	Dry Day Average Daily Flow	91.26	87.16	89.31			69.08	66.94	58.92	71.06	54.56	59.64	122.46	77.08
	Estimated Infiltration	44.36	40.26	42.41			21.98	19.84	11.92	24.06	7.56	12.64	75.46	30.09
	Estimated Sanitary Flow	46.90	46.90	46.90			47.10	47.10	47.00	47.00	47.00	47.00	47.00	46.99
	Estimated Inflow	13.84	11.71	11.15			7.54	4.87	5.56	2.05	10.57	10.82	8.84	8.69
Columbus Park	Average Daily Flow	33.89	32.34	36.20			30.36	23.93	23.12	22.06	27.66	29.98	39.42	29.90
	Dry Day Average Daily Flow	28.11	27.21	28.78			21.74	22.03	20.86	20.63	21.89	23.55	31.10	24.60
	Estimated Infiltration	7.46	6.56	8.13			2.09	2.38	1.21	0.98	2.24	3.90	11.45	4.65
	Estimated Sanitary Flow	20.65	20.65	20.65			19.65	19.65	19.65	19.65	19.65	19.65	19.65	19.95
	Estimated Inflow	5.78	5.13	7.42			8.62	1.90	2.26	1.43	5.77	6.43	8.32	5.31
Ward Street	Average Daily Flow	63.20	63.63	62.18			50.12	49.11	45.30	45.73	50.59	55.18	74.60	55.97
	Dry Day Average Daily Flow	58.79	60.27	59.39			45.79	46.62	41.88	44.34	45.15	49.51	64.67	51.63
	Estimated Infiltration	14.29	15.77	14.89			7.39	8.22	3.98	5.44	6.25	10.61	25.77	11.27
	Estimated Sanitary Flow	44.50	44.50	44.50			38.40	38.40	37.90	38.90	38.90	38.90	38.90	40.37
	Estimated Inflow	4.41	3.36	2.79			4.33	2.49	3.42	1.39	5.44	5.67	9.93	4.33
Winthrop Terminal	Average Daily Flow	18.05	19.15	18.70			15.87	15.85	15.23	14.23	16.81	17.47	25.57	17.70
	Dry Day Average Daily Flow	15.98	17.07	16.50			15.21	14.73	13.62	12.87	15.05	14.58	18.54	15.42
	Estimated Infiltration	6.18	7.27	6.70			4.81	4.33	3.22	2.47	4.65	4.18	8.14	5.19
	Estimated Sanitary Flow	9.80	9.80	9.80			10.40	10.40	10.40	10.40	10.40	10.40	10.40	10.22
	Estimated Inflow	2.07	2.08	2.20			0.66	1.12	1.61	1.36	1.76	2.89	7.03	2.29
Subtotal - Northern Headworks	Average Daily Flow	220.24	213.99	217.54			172.97	160.70	148.13	148.13	160.19	173.09	270.89	188.66
	Dry Day Average Daily Flow	194.14	191.71	193.98			151.82	150.32	135.28	135.28	136.65	147.28	236.77	167.38
	Estimated Infiltration	72.29	69.86	72.13			36.27	34.77	20.33	20.33	20.70	31.33	120.82	49.95
	Estimated Sanitary Flow	121.85	121.85	121.85			115.55	115.55	114.95	114.95	115.95	115.95	115.95	117.43
	Estimated Inflow	26.10	22.28	23.56			21.15	10.38	12.85	12.85	23.54	25.81	34.12	21.27
Headworks as Reported by NPDES	SUM of ADF's	215.30	213.50	216.70			171.70	159.20	147.70	146.80	165.30	189.00	264.60	189.01
Chelsea Creek	Average Daily Flow	103.80	98.80	99.90			75.80	70.90	64.50	65.20	70.50	83.90	128.00	86.16
Columbus Park	Average Daily Flow	30.80	32.20	36.10			30.20	23.80	23.00	21.90	27.50	30.80	38.30	29.46
Ward Street	Average Daily Flow	62.70	63.30	61.90			49.90	48.80	45.00	45.50	50.40	56.40	73.00	55.69
Winthrop Terminal	Average Daily Flow	18.00	19.20	18.80			15.80	15.70	15.20	14.20	16.90	17.90	25.30	17.71
Total System Flow (Southern Collection System Plus Northern Headworks)	Raw Average Daily Flow	345.18	323.27	331.14			255.11	237.26	211.86	210.26	228.89	267.25	436.06	284.77
	Raw Dry Day Average Daily Flow	300.85	289.97	292.18			227.32	223.01	197.58	196.50	201.77	233.37	387.87	255.17
	Raw Estimated Infiltration	125.15	114.27	116.48			57.92	53.61	29.98	28.80	33.07	63.67	218.17	84.25
	MWRA Estimated Infiltration	5.33	3.15	3.16			1.34	1.57	0.50	0.53	0.60	4.06	9.34	2.97
	Final Average Daily Flow	339.85	320.12	327.98			253.77	235.69	211.36	209.73	228.29	263.19	426.72	281.81
	Final Dry Day Average Daily Flow	295.52	286.82	289.02			225.98	221.44	197.08	195.97	201.17	229.31	378.53	252.20
	Final Estimated Infiltration	119.82	111.12	113.32			56.58	52.04	29.48	28.27	32.47	59.61	208.83	81.28
	Estimated Sanitary Flow	175.70	175.70	175.70			169.40	169.40	167.60	167.70	168.70	169.70	169.70	170.92
	Estimated Inflow	44.33	33.30	38.96			27.79	14.25	14.28	13.76	27.12	33.88	48.19	29.61

Table 4 - Estimated Community Wastewater Flow Components for 2020										1-Feb-21			PAGE 12	Annual Average (MGD)
Community	Flow Characteristic	Jan	Feb	Mar	Apr*	May*	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Boston (Total)	Raw Average Daily Flow	94.05	88.92	90.40			74.07	66.61	61.54	62.65	71.18	84.51	112.11	80.62
	Raw Dry Day Average Daily Flow	81.38	77.90	77.45			60.16	62.18	56.05	59.37	60.71	71.55	91.73	69.86
	Raw Estimated Infiltration	22.88	19.40	18.95			6.56	8.58	3.95	6.27	7.61	17.45	37.63	14.95
	MWRA Estimated Infiltration	5.00	3.39	3.15			1.15	1.63	0.54	1.01	1.07	4.26	8.93	3.02
	Final Average Daily Flow	89.05	85.53	87.25			72.92	64.98	61.00	61.64	70.11	80.25	103.18	77.60
	Final Dry Day Average Daily Flow	76.38	74.51	74.30			59.01	60.55	55.51	58.36	59.64	67.29	82.80	66.84
	Final Estimated Infiltration	17.88	16.01	15.80			5.41	6.95	3.41	5.26	6.54	13.19	28.70	11.93
	Estimated Sanitary Flow	58.50	58.50	58.50			53.60	53.60	52.10	53.10	53.10	54.10	54.10	54.91
	Estimated Inflow	12.67	11.02	12.95			13.91	4.43	5.49	3.28	10.47	12.96	20.38	10.76
Brookline (Total)	Raw Average Daily Flow	8.52	7.99	8.98			5.80	5.32	4.58	4.49	5.26	6.25	11.85	6.91
	Raw Dry Day Average Daily Flow	7.11	7.12	7.70			5.35	5.03	4.37	4.39	4.39	5.09	9.69	6.03
	Raw Estimated Infiltration	2.91	2.92	3.50			1.15	0.83	0.27	0.19	0.19	0.89	5.49	1.84
	MWRA Estimated Infiltration	0.02	0.02	0.02			0.01	0.00	0.00	0.00	0.00	0.01	0.03	0.01
	Final Average Daily Flow	8.50	7.97	8.96			5.79	5.32	4.58	4.49	5.26	6.24	11.82	6.90
	Final Dry Day Average Daily Flow	7.09	7.10	7.68			5.34	5.03	4.37	4.39	4.39	5.08	9.66	6.02
	Final Estimated Infiltration	2.89	2.90	3.48			1.14	0.83	0.27	0.19	0.19	0.88	5.46	1.83
	Estimated Sanitary Flow	4.20	4.20	4.20			4.20	4.20	4.10	4.20	4.20	4.20	4.20	4.19
	Estimated Inflow	1.41	0.87	1.28			0.45	0.29	0.21	0.10	0.87	1.16	2.16	0.88
Milton (Total)	Average Daily Flow	3.89	3.38	3.60			2.14	1.97	1.59	1.54	1.88	2.55	5.17	2.77
	Dry Day Average Daily Flow	3.18	3.00	3.00			2.07	1.78	1.57	1.49	1.72	2.28	4.46	2.46
	Estimated Infiltration	1.78	1.60	1.60			0.67	0.38	0.17	0.09	0.32	0.88	3.06	1.06
	Estimated Sanitary Flow	1.40	1.40	1.40			1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
	Estimated Inflow	0.71	0.38	0.60			0.07	0.19	0.02	0.05	0.16	0.27	0.71	0.32
Newton (Total)	Raw Average Daily Flow	17.50	14.64	15.45			10.33	9.63	7.86	7.31	8.22	10.63	25.80	12.76
	Raw Dry Day Average Daily Flow	14.67	13.60	13.71			9.82	9.06	7.83	7.26	7.83	9.56	23.86	11.74
	Raw Estimated Infiltration	6.87	5.80	5.91			2.72	1.96	0.73	0.16	0.73	2.46	16.76	4.43
	MWRA Estimated Infiltration	0.01	0.01	0.01			0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01
	Final Average Daily Flow	17.49	14.63	15.44			10.33	9.63	7.86	7.31	8.22	10.63	25.77	12.75
	Final Dry Day Average Daily Flow	14.66	13.59	13.70			9.82	9.06	7.83	7.26	7.83	9.56	23.83	11.73
	Final Estimated Infiltration	6.86	5.79	5.90			2.72	1.96	0.73	0.16	0.73	2.46	16.73	4.42
	Estimated Sanitary Flow	7.80	7.80	7.80			7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.31
	Estimated Inflow	2.83	1.04	1.74			0.51	0.57	0.03	0.05	0.39	1.07	1.94	1.02

Table 4 - Estimated Community Wastewater Flow Components for 2020

1-Feb-21

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Annual Average (MGD)

Community	Flow Characteristic	Jan	Feb	Mar	Apr*	May*	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)
Subtotal Northern System CSO Communities Only: [Sum of Boston (North), Cambridge, Chelsea, and Somerville]	Raw Average Daily Flow	102.55	107.84	109.09			93.93	85.63	80.18	79.30	93.48	100.15	125.63	97.78
	Raw Dry Day Average Daily Flow	92.42	93.66	93.10			78.60	79.57	72.59	74.93	77.01	82.51	99.38	84.37
	Raw Estimated Infiltration	22.22	23.46	22.90			13.30	14.27	7.79	9.13	11.21	16.71	33.58	17.46
	MWRA Estimated Infiltration	2.19	2.52	2.28			1.39	1.60	0.95	1.25	1.41	1.89	3.30	1.88
	Final Average Daily Flow	100.36	105.32	106.81			92.54	84.03	79.23	78.05	92.07	98.26	122.33	95.90
	Final Dry Day Average Daily Flow	90.23	91.14	90.82			77.21	77.97	71.64	73.68	75.60	80.62	96.08	82.49
	Final Estimated Infiltration	20.03	20.94	20.62			11.91	12.67	6.84	7.88	9.80	14.82	30.28	15.58
	Estimated Sanitary Flow	70.20	70.20	70.20			65.30	65.30	64.80	65.80	65.80	65.80	65.80	66.91
	Estimated Inflow	10.13	14.18	15.99			15.33	6.06	7.59	4.37	16.47	17.64	26.25	13.41
Subtotal Northern System Without North CSO Communities:	Raw Average Daily Flow	110.74	100.03	103.94			74.92	68.71	61.30	58.83	67.07	79.05	134.87	86.00
	Raw Dry Day Average Daily Flow	96.07	92.53	93.52			70.10	65.37	59.95	57.67	63.18	72.66	125.45	79.69
	Raw Estimated Infiltration	44.42	40.88	41.87			19.85	15.12	9.80	7.52	13.03	22.51	75.30	29.07
	MWRA Estimated Infiltration	2.81	2.59	2.73			1.26	0.86	0.55	0.39	0.76	1.44	4.92	1.83
	Final Average Daily Flow	107.93	97.44	101.21			73.66	67.85	60.75	58.44	66.31	77.61	129.95	84.17
	Final Dry Day Average Daily Flow	93.26	89.94	90.79			68.84	64.51	59.40	57.28	62.42	71.22	120.53	77.86
	Final Estimated Infiltration	41.61	38.29	39.14			18.59	14.26	9.25	7.13	12.27	21.07	70.38	27.24
	Estimated Sanitary Flow	51.65	51.65	51.65			50.25	50.25	50.15	50.15	50.15	50.15	50.15	50.62
	Estimated Inflow	14.67	7.50	10.42			4.82	3.34	1.35	1.16	3.89	6.39	9.42	6.31
Subtotal North/South Systems Without North CSO Communities:	Raw Average Daily Flow	235.68	209.31	217.54			157.06	145.27	125.03	120.96	135.77	173.21	300.04	182.12
	Raw Dry Day Average Daily Flow	202.78	190.79	191.72			145.60	138.06	122.25	118.89	128.30	158.75	276.55	167.47
	Raw Estimated Infiltration	97.28	85.29	86.22			41.50	33.96	19.45	15.99	25.40	54.85	172.65	63.37
	MWRA Estimated Infiltration	8.14	5.74	5.89			2.60	2.43	1.05	0.92	1.36	5.50	14.26	4.80
	Final Average Daily Flow	227.54	203.57	211.65			154.46	142.84	123.98	120.04	134.41	167.71	285.78	177.32
	Final Dry Day Average Daily Flow	194.64	185.05	185.83			143.00	135.63	121.20	117.97	126.94	153.25	262.29	162.67
	Final Estimated Infiltration	89.14	79.55	80.33			38.90	31.53	18.40	15.07	24.04	49.35	158.39	58.57
	Estimated Sanitary Flow	105.50	105.50	105.50			104.10	104.10	102.80	102.90	102.90	103.90	103.90	104.11
	Estimated Inflow	32.90	18.52	25.82			11.46	7.21	2.78	2.07	7.47	14.46	23.49	14.64

Table 5

CY21 NPDES Operational Performance DITP Wastewater Flow

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	CY21 Weighted Average
DITP Total Flow (mgd)	331.6	329.4	306.9	346.2	333.0	290.9	490.6	347.1	404.4	358.1	340.0	280.8	346.7