



MASSACHUSETTS WATER RESOURCES AUTHORITY

Charlestown Navy Yard
100 First Avenue, Building 39
Boston, MA 02129

Frederick A. Laskey
Executive Director

Telephone: (617) 242-6000
Fax: (617) 788-4899
TTY: (617) 788-4971

August 26, 2021

Todd Borci
Office of Environmental Stewardship
US EPA Region 1
5 Post Office Square, Suite 100
Mail Code OES04-4
Boston MA, 02109-3912

Kevin Brander, P.E.
Municipal Services Section
Department of Environmental Protection
Northeast Regional Office
205B Lowell Street
Wilmington, MA 01887

**RE: Massachusetts Water Resources Authority NPDES Permit Number MA0103284 –
MWRA Annual Infiltration and Inflow (I/I) Reduction Report for Fiscal Year 2021**

Dear Mr. Borci and Mr. Brander:

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 2021.

- Attachment 1 – Overview of MWRA Regional I/I Reduction Plan
- Attachment 2 – MWRA Regional I/I Reduction Plan – FY21 Progress Update and Detailed Implementation Schedule for FY22 Activities
- Attachment 3 – MWRA Actions Taken to Reduce I/I During FY21
- 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 – CY20 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: James Barsanti, MassDEP, NERO
Betsy Reilley, Director, MWRA, Environmental Quality
Wendy Leo, Senior Program Manager, MWRA, Environmental Quality
Jon Szarek, P.E., Project Manager, MWRA Community Support Program

ATTACHMENT 1
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY21
Reporting Period – July 2020 Through June 2021

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 FY21
Reporting Period – July 2020 Through June 2021

**MWRA REGIONAL I/I REDUCTION PLAN -
FY21 PROGRESS UPDATE AND DETAILED
IMPLEMENTATION SCHEDULE FOR FY22 ACTIVITIES**

This document provides a progress update for FY21 accomplishments and a description of the activities to be accomplished during FY22 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 FY21, 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 FY21 are detailed in Attachment 3. Additional information on MWRA's FY21 maintenance activities is provided under separate submittal - NPDES Part I.18.g Annual Maintenance Status Sheets.

During FY22, 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.

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 FY21, 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 FY22.

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).

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 FY22, 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.

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 FY22, 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 FY21, 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 FY22.

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 FY21, \$478 million in grants and interest-free loans has been distributed to 43 member sewer communities to fund 629 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.

During FY21, MWRA continued to estimate community infiltration and inflow rates on a bimonthly basis. Community wastewater flow data for CY20 is included as Attachment 6. These flow data tables are available to all users on MWRA's web site. Community wastewater flow rate basis data is distributed to member communities throughout the year on a bimonthly basis. \$7.7 million in funds for the next phases of the wastewater meter replacement/upgrade project are programmed in MWRA's Capital Improvement Program through FY22. An additional \$9.1 million for meter equipment asset protection is programmed in the CIP after FY28.

During FY22, unless the metering system is down during equipment replacement, 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 Wastewater Meter Replacement project is ongoing. The Wastewater Metering System Replacement Equipment Purchase and Install Contract 7191 was awarded on October 14, 2020. Contract bid amount totaled \$3,286,114. Project work includes a complete review of metering equipment and software technologies, review of MWRA's community metering methodologies, and subsequent design and construction of upgrades. Replacement of 174 existing wastewater flow meters to be complete by the end of CY21. A total of \$21.9 million in funds for the wastewater meter replacement/upgrade project are programmed in MWRA's Capital Improvement Program.

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.

During FY21, 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 FY22.

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 FY21, 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 FY22.

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 FY21, MWRA's commitment to fund local sewer rehabilitation projects under the I/I Local Financial Assistance Program totals \$760.75 million.

During FY21, 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 \$37.4 million was distributed during FY21. Since program inception in May 1993, \$478 million has been distributed to fund 629 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 FY22, 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 FY21, 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 FY22, 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 wastewater and water systems.

During FY21, 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. Community wastewater flow data for CY20 is included as Attachment 6. These flow data tables are available to all users on MWRA's web site. Community wastewater flow rate basis data is distributed to member communities throughout the year on a bimonthly basis.**
- **February 2021, 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 included.**
- **March 2021, 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 17, 2021, 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 17, 2021, 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 2021, annual community I/I questionnaires were distributed to member sewer communities to acquire information on FY21 local I/I reduction programs for development of MWRA’s Annual I/I Reduction Report (see Attachment 5).**

During FY22, 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 joint workshop in 2001, 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.

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 FY22, 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 FY21, 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 is also developing a new classroom activity involving reading and designing wet wipe labels to establish which materials are dispersible vs. flushable.

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 web site contains links to the communities’ web sites 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 upgraded its web site 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. During FY21, no assistance from MWRA was requested by MassDEP. Any future action under this strategy will be initiated jointly with MassDEP.

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. During FY21, no assistance from MWRA was requested under this strategy.

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 FY21
Reporting Period – July 2020 Through June 2021

MWRA ACTIONS TAKEN TO REDUCE I/I DURING FY21

The MWRA Field Operations Department's Technical Inspection program staff have internally inspected approximately 23 miles of Authority-owned interceptors, internally inspected 23 inverted siphon barrels with sonar inspection equipment, and physically inspected 1025 sewer manholes and other structures (diversion chambers, siphon headhouses, tide gates, etc.) during FY21. 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 FY21, MWRA's maintenance work included hydraulic/mechanical cleaning of 31 miles of Authority-owned sewers, cleaning of 7 siphon barrels, and replacement of 48 manhole frames and covers. In addition, 64 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 FY21, 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 FY22 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 5,300 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 scheduled for substantial completion 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 2021. Design/construction budget estimated at \$10.7 million.

ATTACHMENT 4
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY21
Reporting Period: July 2020 Through June 2021

**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 FY21, \$478 million has been distributed to fund 629 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 2021**

Community	Total Allocations (Phases 1 - 13)	Total Distributions (Phases 1 - 13)	Percent Distributed	Funds Remaining
Arlington	\$13,703,000	\$10,023,000	73%	\$3,680,000
Ashland	\$3,818,500	\$2,020,060	53%	\$1,798,440
Bedford	\$5,654,600	\$2,439,658	43%	\$3,214,942
Belmont	\$8,255,100	\$5,135,100	62%	\$3,120,000
Boston	\$218,001,200	\$104,596,431	48%	\$113,404,769
Braintree	\$14,419,000	\$10,031,743	70%	\$4,387,257
Brookline	\$21,355,200	\$10,666,200	50%	\$10,689,000
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	\$2,948,500	44%	\$3,687,400
Chelsea	\$11,760,100	\$10,130,100	86%	\$1,630,000
Dedham	\$9,220,000	\$8,060,000	87%	\$1,160,000
Everett	\$13,381,500	\$9,061,300	68%	\$4,320,200
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	\$7,864,500	87%	\$1,150,000
Natick	\$9,332,600	\$5,582,600	60%	\$3,750,000
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	\$5,502,900	32%	\$11,438,000
Somerville	\$25,955,800	\$12,116,900	47%	\$13,838,900
Stoneham	\$7,829,900	\$5,889,900	75%	\$1,940,000
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	\$2,091,300	49%	\$2,211,000
Weymouth	\$19,100,900	\$12,225,900	64%	\$6,875,000
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	\$4,833,400	87%	\$720,000
Woburn	\$16,665,500	\$14,675,500	88%	\$1,990,000
Totals	\$760,750,000	\$478,438,472	63%	\$282,311,528

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
Total		\$116,583,119		\$110,193,362		\$116,354,963		\$135,307,027	\$478,438,472

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. Seventy-nine 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:	\$ 48.2	\$ 7.8	\$ 56.0 (12%)
Design:	15.5	4.2	19.7 (4%)
Construction:	266.3	113.5	379.8 (79%)
Eng. Services During Const.:	18.7	4.2	22.9 (5%)
TOTAL	\$ 348.7 (73%)	\$ 129.7 (27%)	\$ 478.4 (100%)

Program Results

The I/I Local Financial Assistance Program began in May 1993. Through FY21, a total of 629 local I/I reduction and sewer system rehabilitation projects have been funded through the MWRA's grant/loan program. Cumulative results for the program are summarized below.

Results for all projects (FY93 through FY21) for planning/inspection include the following:

- 2,334 miles of sewer TV inspected
- 1,552 miles of sewer flow isolated
- 1,425 miles of sewer smoke tested
- 64,654 sewer manholes inspected
- 78,232 buildings inspected

Results for all projects (FY93 through FY21) targeting infiltration reduction include the following:

- 78 miles sewer replaced
- 293 miles sewer CIPP lined
- 189 miles sewer tested/chemically sealed
- 3,031 sewer spot repairs
- 17,769 service connection repairs
- 4.8 miles underdrains sealed

Results for all projects (FY93 through FY21) targeting inflow reduction include the following:

- 1,073 catch basins disconnected
- 45 miles of new or replaced storm drains
- 22,243 manholes rehabilitated/sealed
- 3,716 manhole covers replaced or inflow seals installed
- 551 sump pumps redirected
- 5,439 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 runoff 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 31 years from 1989-2020) and the average annual rainfall is 43 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 313 mgd, a reduction of 82 mgd or 21% 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).

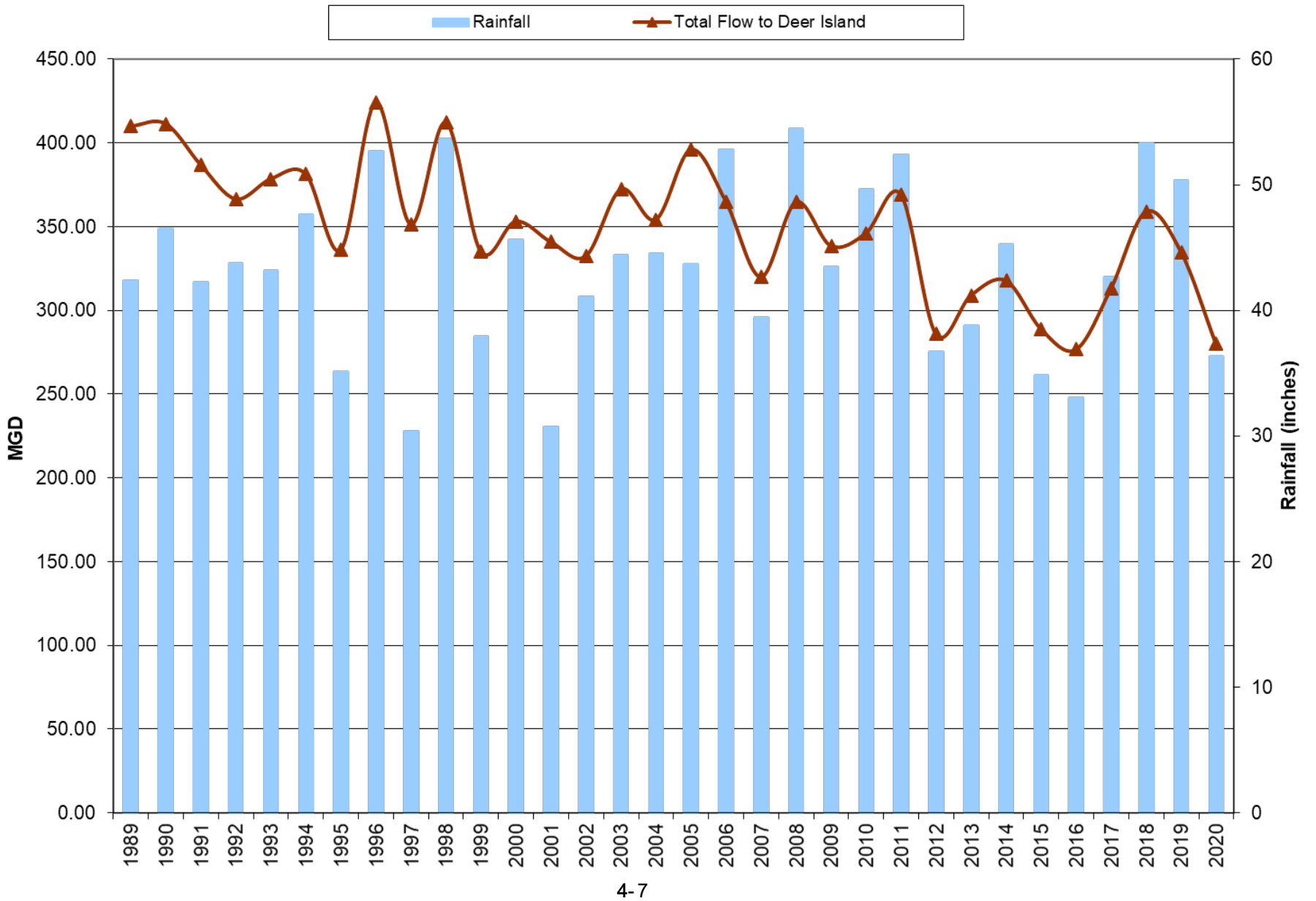
Over the last five years (2016-2020), MWRA's average daily flow of 313 mgd has been about 11% below the long-term average of 350 mgd. The five-year average rainfall of 43 inches is consistent with the long-term average of 43 inches.

The estimated average daily flow reduction associated with completed local I/I reduction projects that have received MWRA financial assistance is about 100 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.

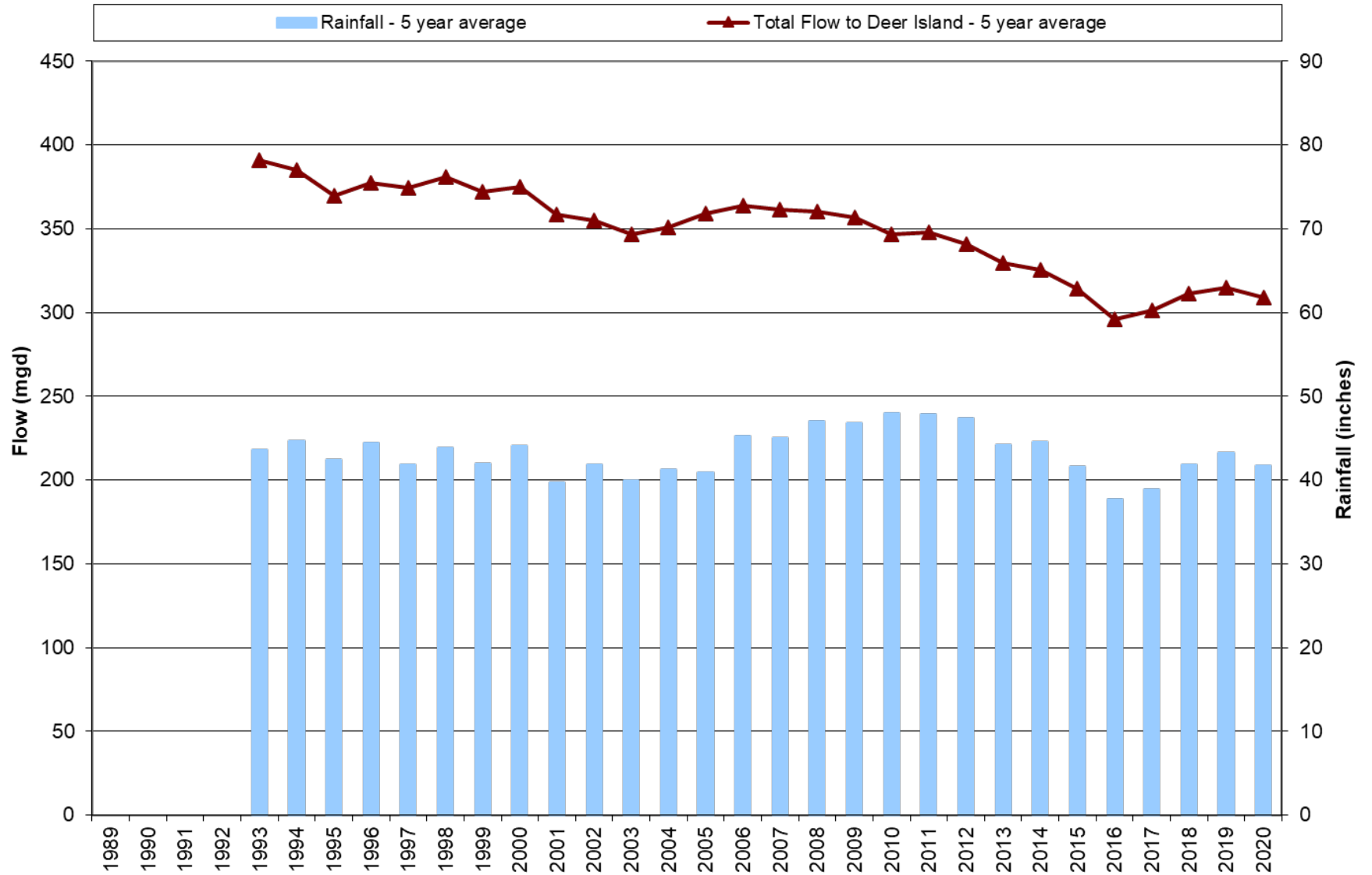
Regional wastewater flow trends are influenced by many factors, including:

- 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,
- In the MWRA service area over the last 20 years, the decline in per capita indoor water use could account for about 20 mgd in wastewater flow reduction after the increase in wastewater flow from increased sewered 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 FY21

During FY21, MWRA distributed a total of \$37.4 million in grants and loans to member communities to help fund 24 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 FY21:

- First Quarter FY21 - August 2020 Funding Cycle with \$6,087,196 distributed to five communities: Chelsea, Milton, Wakefield, Wellesley, and Winchester (see Section Pages 4-10 to 4-20);
- Second Quarter FY21 - November 2020 Funding Cycle with \$9,789,250 distributed to six communities: Belmont, Burlington, Newton, Quincy, Stoughton, and Weymouth; (see Section Pages 4-21 to 4-28);
- Third Quarter FY21 - February 2021 Funding Cycle with \$9,642,573 distributed to nine communities: Ashland, Braintree, Canton, Dedham, Everett, Reading, Stoughton, Waltham, and Winthrop (see Section Pages 4-29 to 4-43); and,
- Fourth Quarter FY21 - May 2021 Funding Cycle with \$11,878,316 distributed to four communities: Boston, Malden, Quincy, and Watertown (see Section Pages 4-44 to 4-49).

MWRA I/I Local Financial Assistance Program Funding Summary

August 2020 Funding Cycle

<u>Community</u>	<u>Funding Allocation</u>
Chelsea	\$ 1,630,000
Milton	\$ 1,150,000
Wakefield	\$ 1,280,000
Wellesley	\$ 1,157,196
Winchester	\$ 870,000
	<hr/>
Total	\$ 6,087,196

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

**CITY OF CHELSEA
BEACHAM STREET AND WILLIAMS STREET UTILITY IMPROVEMENTS PROJECT
MWRA PROJECT NO. WRA-P11-11-3-1153**

SCOPE OF SERVICES

The project includes utility and roadway improvements on Beacham Street and Williams Street from the Chelsea/Everett City Limit to Spruce Street. Utility improvements include construction of new drain to separate the combined sewer/drain system in Williams Street, replacement of under undersized drain in Beacham Street, and rehabilitation of existing sewer throughout the project area, among other scopes. Eligible I/I Project work will include, but not be limited to, the following:

1. Install CIPP in 850 LF of sewer services;
2. Install CIPP in 290 LF of 8-inch sewer main;
3. Install CIPP in 1,202 LF of 10-inch sewer main;
4. Install CIPP in 565 LF of 12-inch sewer main;
5. Reinstate 18 sewer service connections;
6. Cut 7 protruding service connections;
7. Perform 7 point repairs on sewer;
8. Perform 3,217 LF of heavy cleaning on 6-, 8-, 10-, and 12-inch sewers;
9. Install 50 LF of 8-, 10-, or 12-inch PVC sewer;
10. Install two 8-inch caps;
11. Install one 4-foot diameter precast concrete Sewer Manhole;
12. Perform 85 VF of cementitious lining in manholes;
13. Furnish and install 14 Sewer Manhole frame and covers;
14. Install 630 LF of 12-inch HDPE drain;
15. Install 505 LF of 15-inch HDPE drain;
16. Install 462 LF of 18-inch HDPE drain;
17. Install 16 LF of 24-inch HDPE drain;
18. Install 13 four-foot diameter precast concrete Drain Manholes;
19. Install 8 precast concrete catch basins;
20. Install 6 gutter inlets, frame, and grate; and
21. Install 6 sump manholes with frame and cover.

Work will also include dewatering, handling of existing flows, temporary paving, rodent control, mobilization, and traffic management. Estimated annual I/I removal after the completion of this rehabilitation project is approximately 0.03 mgd.

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 Weston & Sampson Engineers, Inc. and the approved MWRA I/I Local Financial Assistance Project Application received July 14, 2020. Eligible MWRA I/I Local Financial Assistance is \$1,630,000 (Phase 12 Distribution).

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

**CITY OF CHELSEA
BEACHAM STREET AND WILLIAMS STREET UTILITY IMPROVEMENTS PROJECT
MWRA PROJECT NO. WRA-P11-11-3-1153**

PROJECT SCHEDULE

<u>Description of Work</u>	<u>Start Date</u>	<u>Completion Date</u>
Bid & Award	August 2020	November 2020
Construction	December 2020	September 2022
Retesting & Warranty Inspection		March 2023

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11

**ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

TOWN OF MILTON, MASSACHUSETTS

**CIP PROJECT 1 INFILTRATION REHABILITATION - DESIGN / CONSTRUCTION
(MILTON CONTRACT NO. S20-1)**

CIP PROJECT 2 I/I INVESTIGATION AND REPORTING - STUDY

MWRA PROJECT NO. WRA-P11-21-3-1154

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. The project area includes Milton Subareas DI-02 / G-05A / G-05B / G-05C / G-08A / G-11C. Project work will include, but not be limited to, the following:

1. **CIP Project 1 Infiltration Rehabilitation Design:** Design cost-effective and value-effective sewer rehabilitations in Subareas DI-02 / G-05A / G-05B / G-05C; prepare construction rehabilitation drawings and specifications for public bidding; and prepare a final cost estimate for the designed rehabilitations. (Eligible Design Services Cost = \$75,000)

2. **CIP Project 1 Infiltration Rehabilitation Construction (Milton Contract No. S20-1):** Construction of cost-effective and value-effective sewer rehabilitations in Subareas DI-02 / G-05A / G-05B / G-05C and the performance of construction public bid/award/resident project representative services. Sewer rehabilitation work (Base Bid + Alternate Bid No. 1) includes approximately: 12,520 LF of cleaning and television 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. (Eligible Construction Cost = \$799,926 / Eligible Construction Services Cost = \$79,316)

3. **CIP Project 2 I/I Investigation and Reporting:** Clean, TV inspect, videotape and record 48,500 LF of sewer; conduct flow isolation on 43,000 LF of sewer; and perform topside manhole inspections of 300 sewer manholes in Subareas G-08A / G-11C. (Eligible Investigation Services Cost = \$195,758)

The above work will be performed pursuant to the terms and conditions detailed within the January 17, 2020 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 13, 2020. Total project cost is estimated at \$1,177,320 (Design = \$75,000 / Construction = \$799,926 / Construction Services = \$106,636 / Investigation Services = \$195,758). Eligible MWRA I/I Local Financial Assistance is \$1,150,000 (Phase 12 Allocation Limit). As a result of the above work, an estimated 0.06 mgd of peak I/I 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

**CIP PROJECT 1 INFILTRATION REHABILITATION - DESIGN / CONSTRUCTION
(MILTON CONTRACT NO. S20-1)**

CIP PROJECT 2 I/I INVESTIGATION AND REPORTING - STUDY

MWRA PROJECT NO. WRA-P11-21-3-1154

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
<u>CIP Project 1 Infiltration Rehabilitation</u>		
Design	February 2020	March 2020
Design Review	April 2020	May 2020
Advertise	May 2020	May 2020
Bid Opening	June 2020	June 2020
Contract Award	July 2020	July 2020
Rehabilitation Construction	August 2020	December 2020
Warranty Retesting	May 2021	June 2021
 <u>CIP Project 1 I/I Investigation and Reporting</u>		
Investigation	March 2020	July 2020
Data Review/Report Preparation	August 2020	December 2020

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

**TOWN OF WAKEFIELD
SEWER SYSTEM INFILTRATION REHABILITATION
YEAR 4 DESIGN & CONSTRUCTION**

MWRA PROJECT NO. WRA-P11-33-3-1150

SCOPE OF SERVICES

The purpose of this project is to rehabilitate community sewer basins that contribute excessive I/I to the sanitary sewer system. Project work will include, but not be limited to, the following:

1. Design of sewer rehabilitations for project construction work;
2. Perform 2,250 LF of cleaning and inspection of sewers;
3. Perform 11,000 LF of cleaning, inspection, testing and sealing of sewers;
4. Perform testing of 3,725 joints;
5. Perform sealing of 1,863 joints;
6. Perform 600 VF of cementitious lining in manholes;
7. Perform exterior grouting and interior patching to 12 manholes;
8. Replace 6 manhole frame and covers;
9. Install CIP short liners in 89 LF of sewer main;
10. Install CIPP in 9,500 LF of sewer main;
11. Grout 112 reinstated service connections;
12. Cut 36 intruding service connections;
13. Television inspect and test 36 service connections; and
14. Grout 36 service connections after television inspection and testing.

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 Wakefield and Weston & Sampson Engineers, Inc. and the approved MWRA I/I Local Financial Assistance Project Application received June 15, 2020. Total project cost is estimated at \$1,280,000 (Design/Construction Services = \$258,000) (Construction = \$1,022,000). Eligible MWRA I/I Local Financial Assistance is \$1,280,000 (Phase 12 Distribution). The estimate of annual I/I removal after the completion of this rehabilitation project is approximately 0.05 MGD.

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

**TOWN OF WAKEFIELD
SEWER SYSTEM INFILTRATION REHABILITATION
YEAR 4 DESIGN & CONSTRUCTION**

MWRA PROJECT NO. WRA-P11-33-3-1150

PROJECT SCHEDULE

<u>General Description of Work Performed</u>	<u>Start Date</u>	<u>Completion Date</u>
Design		July 2020
Bid Opening / Contract Award	August 2020	September 2020
Rehabilitation Construction	November 2020	March 2021
Retesting & Warranty Inspection	March 2022	April 2022

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

TOWN OF WELLESLEY, MASSACHUSETTS

**SEWER SYSTEM INSPECTION AND REHABILITATION
(CONTRACT NO. 16C-460-1564)**

CLIFF ROAD SEWER MAIN LINING

**WASTEWATER FLOW MONITORING WITH I/I ANALYSIS
AND SEWER SYSTEM EVALUATION SURVEY (SSES)**

MWRA PROJECT NO. WRA-P11-37-3-1152

SCOPE OF SERVICES

Sewer System Inspection and Rehabilitation (Contract No. 16C-460-1564): Project rehabilitation 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; sealing 400 vertical feet of manholes and performing 3750 LF of smoke testing. Total eligible project cost = \$744,414. An estimated 0.03 mgd of peak infiltration was removed from the community collection system.

Cliff Road Sewer Main Lining: Project rehabilitation work consisted of CCTV inspection, installation of CIPP lining within approximately 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 approximately 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. Total eligible project cost = \$173,050. An estimated 0.01 mgd of peak infiltration was removed from the community collection system.

Wastewater Flow Metering with I/I Analysis Report and Sewer System Evaluation Survey: Professional services related to conducting wastewater flow metering, preparing an I/I Analysis Report and conducting a Sewer System Evaluation Survey (SSES). The *Report for the I/I Analysis and Flow Metering Program* provides an overview of the results for the 2018 Flow Metering Program including recommendations for the next phase of investigations. Flow monitoring, groundwater monitoring and rainfall monitoring were conducted from April 11 - June 20, 2018. An estimation of the Town's I/I quantity was determined by analyzing the data collected during the flow metering program. As a follow-up to the I/I Analysis, the Town is now conducting a SSES. The purpose of this study is to identify areas of I/I throughout Wellesley's sanitary sewer system. Total eligible study cost = \$239,732.

The above work was performed pursuant to the terms and conditions detailed within the approved MWRA I/I Local Financial Assistance Project Application received June 29, 2020. Combined cost for the above projects totals \$1,204,456. Eligible MWRA I/I Local Financial Assistance is \$1,157,196. An estimated 0.04 mgd of peak infiltration was removed from the community collection system.

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

TOWN OF WELLESLEY, MASSACHUSETTS

**SEWER SYSTEM INSPECTION AND REHABILITATION
(CONTRACT NO. 16C-460-1564)**

CLIFF ROAD SEWER MAIN LINING

**WASTEWATER FLOW MONITORING WITH I/I ANALYSIS
AND SEWER SYSTEM EVALUATION SURVEY (SSES)**

MWRA PROJECT NO. WRA-P11-37-3-1152

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
<u>Sewer System Inspection and Rehabilitation</u> (Contract No. 16C-460-1564)		
Sewer Inspection/Rehabilitation	July 2018	July 2019
<u>Cliff Road Sewer Main Lining</u>	April 2018	April 2018
<u>Wastewater Flow Monitoring with I/I Analysis and SSES</u>	February 2018	April 2019

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

**TOWN OF WINCHESTER
CONSTRUCTION OF RECOMMENDED SEWER REHABILITATIONS PER
PHASE II SANITARY SEWER EVALUATION SURVEY REPORT OF 2016 (PART B)**

MWRA PROJECT NO. WRA-P11-41-3-1151

SCOPE OF SERVICES

This project consists of the construction and engineering services provided during construction of the sewer rehabilitations as recommended by the “Phase II Sanitary Sewer Evaluation Survey Report” of June 2016. Construction will be determined after bids are received for this project (Summer 2020). The Phase II Sewer Rehabilitation will be separated into Base Bid, Alternate No. 1, Alternate No. 2, and Alternate No. 3. The work is generally located in the SB sewer subarea in the vicinity of Cambridge Street, High Street, Church Street, and Wildwood Street. The recommended sewer rehabilitations will include but not be limited to the following summary of work included in each bid:

Base Bid: Open cut repair of 28 LF of sewer; replacement of two (2) sewer service wyes; Chemical root treatment of 4,988 LF of sewer and seven (7) manholes; cleaning and inspection, testing and sealing of 839 LF of sewer; installation of 83 LF of cured-in-place short liners; installation of 12,223 LF of cured-in-place pipe and reinstatement and grouting of 144 services; installation of six (6) lateral liners; cutting four (4) protruding service connections; inspection and testing and sealing of six (6) service connections; cleaning and television inspection of 1,966 LF of sewer; cementitious lining of 733 VF of manholes; installation of five (5) manhole frame and covers; building of nine (9) manhole benches and inverts; sealing of one (1) drain invert in shared manhole; grouting and patching of 20 manholes; installation of one (1) inflow dish; and other related work.

Alternate Bid No. 1: Chemical root treatment of 1,349 LF of sewer and one (1) manhole; installation of 4,019 LF of cured-in-place pipe and reinstatement and grouting of 53 services; installation of two (2) lateral liners; cementitious lining of 162 VF of manholes; installation of one (1) manhole frame and cover; building of one (1) manhole bench and invert; and other related work.

Alternate Bid No. 2: Chemical root treatment of 1,461 LF of sewer; installation of 1,461 LF of cured-in-place pipe and reinstatement and grouting of 18 services; installation of three (3) lateral liners; cementitious lining of 52 VF of manholes; and other related work.

Alternate Bid No. 3: Open cut repair of 10 LF of sewer; replacement of one (1) sewer service wye; Chemical root treatment of 2,927 LF of sewer and three (3) manholes; cleaning and inspection, testing and sealing of 3,064 LF of sewer; installation of 42 LF of cured-in-place short liners; installation of 4,712 LF of cured-in-place pipe and reinstatement and grouting of 76 services; inspection and testing and sealing of 11 service connections; cementitious lining of 217 VF of manholes; building of four (4) manhole benches and inverts; grouting and patching of two (2) manholes; installation of two (2) inflow dishes; and other related work.

The construction will include the performance of all other work pursuant to the terms and conditions detailed within the project’s plans and specifications and the MWRA I/I Local Financial Assistance Project Application received July 1, 2019. Total project cost is estimated at \$1,750,000. Eligible MWRA I/I Local Financial Assistance is \$870,000 (MWRA Phase 12 allocation). Estimated annual I/I removal upon contract completion is 0.064 mgd.

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

**TOWN OF WINCHESTER
CONSTRUCTION OF RECOMMENDED SEWER REHABILITATIONS PER
PHASE II SANITARY SEWER EVALUATION SURVEY REPORT OF 2016 (PART B)**

MWRA PROJECT NO. WRA-P11-41-3-1151

PROJECT SCHEDULE

<u>Description of Work</u>	<u>Start Date</u>	<u>Completion Date</u>
Design	September 2019	July 2020
Construction/Construction Services	September 2020	September 2021

MWRA I/I Local Financial Assistance Program Funding Summary

November 2020 Funding Cycle

<u>Community</u>	<u>Funding Allocation</u>
Belmont	\$ 848,000
Burlington	\$ 1,110,000
Newton	\$ 4,580,000
Quincy	\$ 1,155,000
Stoughton	\$ 296,250
Weymouth	\$ 1,800,000
Total	\$ 9,789,250

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

**TOWN OF BELMONT
TOWN-WIDE MAINLINE SEWER REHABILITATION PROJECT**

MWRA PROJECT NO. WRA-P11-04-3-1160

SCOPE OF SERVICES

The purpose of this project is to reduce I/I through rehabilitating sewer pipes in specific community sewer areas. This additional project funding is going to further fund the Mainline Lining Project, which started with Phase 8 and 9 funding in 2019.

Additional mainline CIPP lining will be added to the Project from the Towns backlog of mainline sewers requiring CIPP lining that were previously inspected. The Town has inspected approximately 95,000 linear feet of sewer throughout the Town that have not been fully rehabilitated (i.e. replaced, lined or tested and sealed). Of the 95,000 LF inspected approximately 18,000 LF will be included in this Contract for CIPP lining. There will be service replacements and point repairs needed within this Contract prior to CIPP Lining. Some of the segments have had structural repairs completed by excavation methods that were required to be repaired prior to roadway reconstruction as part of the Town's Pavement Management Program.

The construction will include the performance of all other work pursuant to the terms and conditions detailed within the project's plans and specifications and the MWRA Phase 11 I/I Local Financial Assistance Project Application received November 4, 2020.

This additional project cost is estimated at \$848,000. Eligible MWRA I/I Local Financial Assistance funding is \$848,000 (MWRA Phase 10 funding).

PROJECT SCHEDULE

<u>General Description of Work</u>	<u>Start Date</u>	<u>Completion Date</u>
Investigations (Study)	September 2019	June 2020
Design	September 2019	December 2020
Construction	January 2020	July 2022

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

**TOWN OF BURLINGTON
PHASE 10 AND 11 SEWER SYSTEM REHABILITATIONS: DESIGN/CONSTRUCTION
CIP PROJECT 11 SSES – STUDY**

MWRA PROJECT NO. WRA-P11-08-3-1156

SCOPE OF SERVICES

The purpose of these projects is to reduce I/I through rehabilitating manholes and sewer pipes in specific community sewer areas. The projects are part of the Town’s Sewer Capital Improvement Program (CIP). These projects are part of a multi-phased sewer rehabilitation project for the Town and will include a study (investigation), design, construction, and construction services.

The CIP Project 11 SSES Study will include but not be limited to, the following: field investigations, flow isolation and television inspection, as well as project mapping, data analysis, preliminary design, cost effective analysis, and reporting, in order to identify and quantify sources of infiltration and inflow.

The CIP Phase 10 and 11 Rehabilitations will include design and construction of trenchless technology to eliminate infiltration and inflow from the sanitary sewer system.

The construction phase will include the performance of all other work pursuant to the terms and conditions detailed within the project’s plans and specifications and the MWRA Phase 11 I/I Local Financial Assistance Project Application received October 1, 2020.

Total project cost is estimated at \$1,110,000. Eligible MWRA I/I Local Financial Assistance is \$1,110,000 (Phase 12 allocation limit). Estimated I/I removal will be determined upon contract completion.

PROJECT SCHEDULE

<u>Description of Task</u>	<u>Start Date</u>	<u>Completion Date</u>
Phase 11 SSES Study	February 2021	November 2021
CIP Project 10 & 11 Design, Bid & Award	November 2021	April 2022
CIP Project 10 & 11 Construction of Rehabilitations	May 2022	November 2022
CIP Project 10 & 11 Re-Test & Warranty Inspection	April 2023	April 2023

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

**CITY OF NEWTON
CIP PROJECT 8 SEWER REHABILITATION CONSTRUCTION**

MWRA PROJECT NO. WRA-P11-24-3-1158

SCOPE OF SERVICES

The purpose of this project is to rehabilitate community subareas that contribute excessive I/I, eliminate sanitary sewer contamination to the underdrain system and repair underdrain access points that are contributing infiltration to the sanitary sewer system. The city is requesting money for the construction of CIP Project 8. CIP Project 8 is part of the City of Newton's 11 Year Sewer Capital Improvement (CIP) Plan.

The project area for CIP Project 8 includes Newton Subareas A004 / A005 / A007 / A008 / A009 / A09A. Project work will be determined with the completion of the design.

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 Newton and Weston & Sampson Engineers, Inc. and the approved MWRA Phase 11 I/I Local Financial Assistance Project Application received May 1, 2020. Total project cost is estimated at \$8,753,641 (Construction = \$7,353,641 / Construction Services = \$1,400,000). Eligible MWRA I/I Local Financial Assistance is \$4,580,000 (Phase 13 Allocation Limit). As a result of the above work, an estimated 0.75 mgd of peak I/I (from CIP Project 8) will be removed from the collection system.

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Design		
CIP Project 8 Design	April 2020	April 2021
CIP Project 8 Bid/Award	May 2021	June 2021
Construction		
CIP Project 8 Construction	June 2021	April 2022
CIP Project 8 Warranty Retesting	May 2022	October 2022

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

**CITY OF QUINCY, MASSACHUSETTS
FY21 / FY22 I/I REHABILITATION: DESIGN & BIDDING SERVICES
MWRA PROJECT NO. WRA-P11-26-2-1159**

SCOPE OF SERVICES

Project Type: The proposed project work will focus on design and bidding services to rehabilitate sewer mains and manholes within the City previously identified as in disrepair and critical for public health and safety, the environment and/or system operation. Project work will support I/I rehabilitation construction in FY21 and FY22.

Project Objective: The goal of the proposed work is to rehabilitate aging sewer mains and manholes within the City in order to reduce the I/I that contributes to a significant amount of the City’s sewer flow. In early 2020, the City began investigations for the 2020 SSES (investigation was funded under MWRA Project No. WRA-P11-26-3-1140). This investigation and subsequent analysis, along with a revisit of earlier SSES recommendations, have resulted in a comprehensive evaluation of identified collection system issues. The rehabilitation recommendations identified in the 2020 SSES will be the focus of this project.

The scope of work for this project will have two main components: (1) Design and Bidding Phase Services for FY21 sewer main and manhole rehabilitation evaluated to be the highest priority improvements due to issues that include known I/I contributions or suspected water quality impacts. Project work includes performing 4385 LF of open-cut repair within 8 to 12-inch sewer main and CIPP lining of 19,320 LF of 8 to 24-inch x 36-inch sewer main (Design Phase Services Cost = \$570,000 / Bidding Phase Services Cost = \$15,000); and (2) Design Phase Services for FY22 sewer main and manhole rehabilitation evaluated to be the highest priority improvements due to issues that include known I/I contributions or suspected water quality impacts. Project work includes performing 3275 LF of open-cut repair within 8 to 12-inch sewer main and CIPP lining of 22,640 LF of 8 to 24-inch sewer main (Design Phase Services Cost = \$570,000).

The above work will be performed pursuant to the terms and conditions detailed within the Agreement For Engineering Services Agreement By and Between the City of Quincy and Woodard & Curran, Inc. and the approved MWRA Phase 11 I/I Local Financial Assistance Project Application received October 16, 2020. Total project cost is estimated at \$1,155,000 (Design Phase Services Cost = \$1,140,000 / Bidding Phase Services Cost = \$15,000). Eligible MWRA I/I Local Financial Assistance is \$1,155,000.

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
FY21 I/I Rehabilitation:		
Design	November 2020	March 2021
Bidding	March 2021	May 2021
FY22 I/I Rehabilitation:		
Design	February 2021	December 2021

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

**TOWN OF STOUGHTON, MASSACHUSETTS
YEARS 6 / 7 INFILTRATION REHABILITATIONS CONSTRUCTION:
CHANGE ORDER NO. 1
MWRA PROJECT NO. WRA-P11-32-3-1155**

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. The project area includes Stoughton Subareas 1, 2, 8, 11 and 14. Project work will include, but not be limited to, the following:

**TOWN-WIDE SEWER INVESTIGATION & REHABILITATION -
YEARS 6 / 7 INFILTRATION CONSTRUCTION (CHANGE ORDER NO. 1):**

Construction of cost-effective/value-effective sewer rehabilitations for the Years 6 / 7 Infiltration Construction project including pipeline, manhole and service connection rehabilitations. Project work includes replacement of approximately 300 LF of 21-inch reinforced concrete sewer pipe, three (3) sewer manholes and one (1) sewer lateral, along with related construction activities. (Estimated Additional Year 8 I/I Rehabilitation Cost = \$30,500 / Estimated Lateral Replacement @ No. 947 Central Street Cost = \$11,500 / Estimated Shirley Road Sewer Replacement Cost = \$209,250).

**TOWN-WIDE SEWER INVESTIGATION & REHABILITATION -
YEARS 6 / 7 INFILTRATION CONSTRUCTION SERVICES (AMMENDMENT NO. 1):**

Project work includes design/construction services to oversee the construction of the additional sewer rehabilitations for the Years 6 / 7 Infiltration Construction. (Estimated Design/Construction Services Cost = \$45,000).

The above work will be performed pursuant to the terms and conditions detailed within Task Order No. FY20 #5 under the August 24, 2019 General Engineering Services Agreement By and Between the Town of Stoughton and Weston & Sampson Engineers, Inc. and the approved MWRA Phase 11 I/I Local Financial Assistance Project Application received September 23, 2020. Total project cost is estimated at \$296,250. Eligible MWRA I/I Local Financial Assistance is \$296,250. As a result of the above work, an estimated 0.04 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>
Design / Design Review	August 2020	September 2020
Rehabilitation Construction	December 2020	February 2021
Warranty Retesting	April 2021	May 2021

**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-P11-39-3-1157**

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 10: (Estimated Cost = \$233,500)

1. Flow isolate as much as 49,140 LF of sewer in Subarea C-14 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 53,170 LF of sewer in Subarea C-14. 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 2021 when groundwater levels are typically at their highest.
3. Conduct topside physical survey of as many as 265 sewer manholes in Subarea C-14 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.

2020/21 (Year 8) Sewer System Infiltration Rehabilitation: (Estimated Cost = \$1,566,500)

Project rehabilitation work will include, but not be limited to, the following: Clean/inspect/test and seal 14,761 LF of sewer; perform 2907 LF of heavy cleaning; perform open cut sewer main repairs at 16 locations; perform 315 LF of root treatment in sewer mains and 18 manholes; install short liners at 22 locations; install 11,842 LF of CIP pipe; rehabilitate 124 sewer manholes; grout 38 service connections; clean & inspect 27 service connections; install 31 lateral liners; install 5 manhole inflow dishes; TV inspect 1202 LF of sewer; and inspect 17 sewer manholes. Project work will be performed in Subareas D-2 and D-3. (Construction Cost = \$1,411,500 / Construction Services Cost = \$155,000).

Total project cost is estimated at \$1,800,000. Eligible MWRA I/I Local Financial Assistance is \$1,800,000. Project work will be performed pursuant to the terms and conditions detailed within the approved MWRA Phase 11 I/I Local Financial Assistance Project Application (received October 15, 2020) and the Agreements For Engineering Services By And Between The Town of Weymouth, MA And Weston & Sampson Engineers, Inc. As a result of the above work, an estimated 0.26 mgd of peak I/I will be removed from the collection system upon contract completion.

**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-P11-39-3-1157**

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Town-Wide Sewer System Investigation Program - Year 10:		
Flow Isolation	March 2021	May 2021
TV Inspection	March 2021	May 2021
Manhole Inspection	March 2021	May 2021
Data Review / Letter Report	June 2021	November 2021
2020/21 (Year 8) Sewer System Infiltration Rehabilitation:		
Bid and Award	December 2020	December 2020
Construction	January 2021	May 2021
Warranty Retesting	September 2021	November 2021

MWRA I/I Local Financial Assistance Program Funding Summary

February 2021 Funding Cycle

Community	Funding Allocation
Ashland	\$ 277,610
Braintree	\$ 102,903
Canton	\$ 272,600
Dedham	\$ 1,160,000
Everett	\$ 2,410,800
Reading	\$ 1,040,000
Stoughton	\$ 118,750
Waltham	\$ 3,987,660
Winthrop	\$ 272,250
Total	\$ 9,642,573

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

**TOWN OF ASHLAND, MASSACHUSETTS
I/I IDENTIFICATION & REHABILITATION IN ASHLAND SUB-BASINS 1 / 2 / 3 / 4
MWRA PROJECT NO. WRA-P11-02-3-1168**

SCOPE OF SERVICES

The purpose of this project is to identify, quantify and rehabilitate community sub-basins that contribute excessive I/I, evaluate rehabilitation options and rehabilitate the sewer system. Ashland has conducted I/I investigations in a majority of its sanitary sewer system since 1987. The proposed work will identify I/I sources through smoke testing in the sub-basins previously identified as having elevated levels of inflow. The smoke testing work will be conducted in sections of all four of Ashland's Sub-basins: 1-1 / 1-3 / 1-4 / 1-5 / 2-3 / 3-2 / 4-1 / 4-2 / 4-5. All four sub-basins have received I/I analysis and SSES work twice since 1987, with removal of the all cost-effective I/I sources. There has been clear water flow quantified in previous studies and further investigated over the last four years. The investigation portion of this project consists of conducting smoke testing, dye testing and sewer service CCTV inspections to identify removable I/I sources. This project also includes removal of I/I sources previous identified, including service lateral and sewer manhole repairs. Project work will include, but not be limited to, the following:

1. Smoke and Dye Testing: Smoke Testing will be performed on 196,419 LF of sewer main. Work under this task will include analysis of the smoke testing results and selection of dye testing locations for Summer 2021 project work, in an effort to identify extraneous flows that are entering the Ashland sewer system. The dye testing results will be reviewed and recommendations prepared in the final reporting.
2. Sewer Service CCTV Inspection: This work will utilize a remote controlled close circuit television to inspect 62 service laterals to identify if the clear water flow identified during previous investigations is groundwater related. The recordings will be reviewed and recommendations for repairs and I/I quantified.
3. Sewer Service Repairs: Work consists of excavating and repairing seven (7) service laterals that were previously identified as having groundwater intrusion.
4. Brick Manhole Riser Repair: Work consists of repairing four (4) brick risers to eliminate surface water from entering sewer manholes identified during previous investigations.
5. Brick Manhole Riser Repair and Frame and Cover Replacement: Work consists of replacing ten (10) damaged frame and covers and repairing brick risers to eliminate surface water from entering sewer manholes identified during previous investigations.

The above work will be performed pursuant to the terms and conditions detailed within the approved MWRA Phase 11 I/I Local Financial Assistance Project Application (received January 19, 2021) and the Engineering Services Contracts By And Between The Town of Ashland, MA and Haley & Ward, Inc.

Total project cost is estimated at \$303,610. Eligible MWRA I/I Local Financial Assistance is \$277,610 (Program Phase 9 / 10 Funding Allocation). As a result of the above work, an estimated 0.13 mgd of peak I/I will be removed from the collection system upon contract completion.

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

**TOWN OF ASHLAND, MASSACHUSETTS
I/I IDENTIFICATION & REHABILITATION IN ASHLAND SUB-BASINS 1 / 2 / 3 / 4
MWRA PROJECT NO. WRA-P11-02-3-1168**

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Sewer CCTV Inspections	March 2021	May 2021
Smoke Testing	June 2021	July 2021
Sewer Service CCTV Inspections	September 2021	November 2021
Summary Report	November 2021	January 2022
I/I Rehabilitation	September 2021	June 2022

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

**TOWN OF BRAINTREE, MASSACHUSETTS
MAIN INTERCEPTOR INVESTIGATION /
YEAR 8 I/I REHABILITATION (CHANGE ORDER NO. 1)**

MWRA PROJECT NO. WRA-P11-06-3-1165

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:

Main Interceptor Investigation - Study (Task Order No. 6 Est. Cost = \$ 72,903)

The Main Interceptor Investigation includes CCTV inspection of as much as 7370 LF of sewer main between the Adams Street Siphon and Quincy Avenue. A hydraulic capacity analysis to evaluate the theoretical design capacity of the project area sewer mains will also be performed. In addition, an overflow location feasibility study will be undertaken to evaluate the conditions under which the permitted overflow located at 44 Allen Street is activated. This information will be used to determine the feasibility of relocating the permitted overflow location at 44 Allen Street.

Year 8 I/I Rehabilitation (Change Order No. 1) - Construction (Est. Cost = \$ 30,000)

Contract No. S20-1 Change Order No. 1 work includes CIPP lining a 15-inch VC pipeline (approximately 133 LF) on Hancock Street between Frederick Road and Myrtle Avenue.

Total project cost is estimated at \$102,903. Eligible MWRA I/I Local Financial Assistance is \$102,903. Project work will be performed pursuant to the terms and conditions detailed within the approved MWRA Phase 11 I/I Local Financial Assistance Project Application (received January 14, 2021) and the Agreements 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 0.02 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>
Main Interceptor Investigation:		
Investigation and Reporting	February 2021	June 2021
Year 8 I/I Rehabilitation (Change Order No. 1):		
Construction	March 2021	May 2021

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11

**ATTACHMENT A
FINANCIAL ASSISTANCE AGREEMENT**

**TOWN OF CANTON, MASSACHUSETTS
INFILTRATION AND INFLOW STUDY**

MWRA PROJECT NO. WRA-P11-10-1-1163

SCOPE OF SERVICES

The purpose of this project is to identify and quantify community sub-basins that contribute excessive I/I and evaluate sewer system rehabilitation options. Project work will include professional services to plan and execute an I/I Study in accordance with the MassDEP I/I Analysis and SSES Guidelines (dated May 2017).

Task 1. Design Flow Metering (I/I) Program: This task will include design and development of a work plan that outlines the I/I metering program to collect wastewater flow, rainfall and groundwater data. A GIS geodatabase of the I/I study's sewer data layers will be created. A preliminary map book of the proposed field instrument installation locations will also be provided. (Task 1 Cost = \$20,030)

Task 2. Flow Metering and Field Investigations: Task 2 will implement the field investigation work plan developed under Task 1. The Town's engineering consultant shall retain and oversee a field services specialty subcontractor to 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 shall consist of up to 28 temporary flow meters and up to four (4) rain gauges. A field investigation data summary will be provided by the subcontractor. (Task 2 Cost = \$173,500)

Task 3. Data Analysis: This task will involve 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. Additional work includes determining inflow for one and five-year frequency storms; determining the rainfall/inflow relationship; and assessing the sanitary sewer overflow risk based on a five year, 24-hour event. (Task 3 Cost = \$36,600)

Task 4. I/I Analysis Report and Recommendations: Task 4 will develop a report and recommendations from the results of the overall I/I study. The I/I Analysis Report will include recommendations for further field investigations to isolate and identify specific I/I sources. The I/I study results will be incorporated into the Sewer Risk Analysis and Inspection Program to further prioritize the inspection recommendations from the 2020 Sewer AMP. (Task 4. Cost = \$42,470)

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 October 30, 2020) and the approved MWRA I/I Local Financial Assistance Project Application (received November 23, 2020).

Total project cost is estimated at \$272,600. Eligible MWRA I/I Local Financial Assistance is \$272,600.

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

**TOWN OF CANTON, MASSACHUSETTS
INFILTRATION AND INFLOW STUDY**

MWRA PROJECT NO. WRA-P11-10-1-1163

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Design Flow Metering Program	January 2021	February 2021
Flow Metering	March 2021	May 2021
Data Analysis	May 2021	July 2021
I/I Report / Recommendations	August 2021	December 2021

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

**TOWN OF DEDHAM, MASSACHUSETTS
I/I IDENTIFICATION & REHABILITATION**

MWRA PROJECT NO. WRA-P11-12-3-1166

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:

CCTV inspection in as many as 55,000 LF of sewer main; chemical root treatment in as many as 30,000 LF of sewer main; installation of approximately 4700 linear feet (LF) of cured-in-place (CIP) pipe; installation of twelve (12) LF of CIP short liners; cementitious lining 280 vertical feet of sewer manholes; grouting and patching 34 sewer manholes; performing twelve (12) open cut point repairs; and CIP lining of fifteen (15) service connections. (Estimated Rehabilitation Construction Cost = \$1,106,300).

Additional work includes conducting a topside physical survey in as many as 600 sewer manholes within Dedham Sewer Subareas BB / GG / UU / XX and YY. (Estimated Manhole Survey Cost = \$53,700).

The above work will be performed pursuant to the terms and conditions detailed within the approved MWRA Phase 11 I/I Local Financial Assistance Project Application received January 15, 2021 and the Agreement For Professional Services By And Between The Town of Dedham, MA And Weston & Sampson Engineers, Inc.

Total project cost is estimated at \$1,160,000. Eligible MWRA I/I Local Financial Assistance is \$1,160,000 (Phase 12 Funding Allocation Limit). As a result of the above work, an estimated 0.11 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>
Rehabilitation Construction	March 2021	December 2021
Warranty Retesting	March 2022	June 2022
TV / Manhole Inspection	March 2021	June 2021

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

**CITY OF EVERETT
VILLAGE I/I REHABILITATION PROJECT**

MWRA PROJECT NO. WRA-P11-13-3-1162

SCOPE OF SERVICES

The purpose of this project is to construct I/I rehabilitation in the Village and Main Street areas of the City of Everett, in order to reduce sources of inflow and infiltration and sewer repair defects. The construction rehabilitation is based on a current engineering design prepared by BETA Group.

The design is based on a report prepared by BETA titled 2018 Sewer I/I Investigation Subareas EV-4C, EV-5C, EV-CH2, & Others TV Inspection Report (December 2018).

Construction rehabilitation Work for this project will include but not be limited to the following: CIPP, lateral grouting, dig and replace, manhole rehabilitation, and point repairs. Approximately 0.14 MGD of peak infiltration and 0.11 MGD of peak inflow is anticipated to be removed.

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 Phase 11 I/I Local Financial Assistance Project Application received October 22, 2020. Total project cost is estimated at \$2,410,800 (Construction = \$2,293,200; Construction Services = \$69,600; Police Detail = \$48,000). Eligible MWRA I/I Local Financial Assistance is \$2,410,800 (Phase 10 and 11).

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Design	May 2020	December 2020
Bid/Award	January 2021	February 2021
Construction	March 2021	November 2021
Warranty/Retesting	March 2022	April 2022

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

**TOWN OF READING
TOWN-WIDE SEWER SYSTEM REHABILITATION: STUDY / DESIGN / CONSTRUCTION**

MWRA PROJECT NO. WRA-P11-28-3-1164

SCOPE OF SERVICES

The purpose of this project is to reduce I/I through rehabilitating manholes and sewer pipes throughout the Town of Reading. The project is part of an ongoing I/I program. The Town has made significant progress in I/I identification and CIPPL projects in the past with most of the work based primarily on the recommendations of the August 2010 and November 2012 CDM Smith reports titled “Infiltration and Inflow Investigations” (the 2010 and 2012 Reports).

The Work includes a multi-phased sewer rehabilitation project with the following tasks:

1. Flow monitoring program with a report/memo.
2. An update to the existing and calibrated collection system hydraulic model.
3. Approximately six (6) model scenario runs.
4. Design of CIPPL.
5. Construction of CIPPL.

The CIPPL work will complement the already extensive I/I work completed to date as part of Reading’s ongoing I/I program. Tasks 1-3 as described above are intended to be an update to the 2010 and 2012 reports which are now ten years old. The model update will allow the Town to take a fresh look at the current state of the sewer system and target areas that will maximize reduction in infiltration and inflow.

The bid package and construction project will primarily focus on CIPPL work that is to be identified during Tasks 1 through 3 as described above.

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 Reading and CDM Smith and the MWRA I/I Local Financial Assistance Project Application received January 14, 2021. Total project cost is estimated at \$1,240,000. Eligible MWRA I/I Local Financial Assistance is \$1,040,000 (MWRA Phase 12 Total Funding Allocation). The expected I/I removal for this project will be determined after the model runs are complete.

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

**TOWN OF READING
TOWN-WIDE SEWER SYSTEM REHABILITATION: STUDY / DESIGN / CONSTRUCTION**

MWRA PROJECT NO. WRA-P11-28-3-1164

PROJECT SCHEDULE

<u>Description of Work</u>	<u>Start Date</u>	<u>Completion Date</u>
Planning (Flow Monitoring)	Spring 2021	Summer 2021
Design	Summer 2021	September 2021
Project Bid & Award	September 2021	October 2021
Construction	Winter 2021	Fall 2022

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

**TOWN OF STOUGHTON, MASSACHUSETTS
YEAR 9 I/I INVESTIGATION AND REPORTING**

MWRA PROJECT NO. WRA-P11-32-1-1170

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. The project area includes Stoughton Subareas 1 - 15. Project work will include, but not be limited to, the following:

Year 9 I/I Investigation and Reporting: TV inspect 50,000 LF of sewer and review TV inspection videotapes of 50,000 LF of sewer within 800 to 1000 feet of the 100-Year Flood Plan and on streets scheduled to be paved that have not been inspected or rehabilitated in the last five years. 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 Investigation Services Cost = \$160,000).

The above work will be performed pursuant to the terms and conditions detailed within the General Engineering Services Agreement By and Between the Town of Stoughton and Weston & Sampson Engineers, Inc. and the approved MWRA Phase 11 I/I Local Financial Assistance Project Application received January 28, 2021. Total project cost is estimated at \$160,000. Eligible MWRA I/I Local Financial Assistance is \$118,750 (MWRA I/I Financial Assistance Phase 12 Allocation Limit).

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
<u>Year 9 I/I Investigation and Reporting</u>		
CCTV Inspection	March 2021	May 2021
CCTV Inspection Review	June 2021	August 2021
Data Review / Letter Report	September 2021	November 2021

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

**CITY OF WALTHAM
BEAR HILL VALLEY SEWER REHABILITATION - AREA 13 / 14B (PHASE 2)**

MWRA PROJECT NO. WRA-P11-35-3-1167

SCOPE OF SERVICES

The purpose of this project is to reduce I/I through rehabilitating manholes and sewer pipes in specific community sewer areas. This is the third phase of a multi-phased sewer rehabilitation project for the City's Sewer Area 13 / 14B. Project work will include, but not be limited to, the following:

Installing and/or performing 2,200 LF of 6-inch PVC sanitary sewer pipe; 650 LF of 8-inch PVC sanitary sewer pipe; 360 LF of 10-inch PVC sanitary sewer pipe; 450 LF of 21-inch PVC sanitary sewer pipe; 1,450 LF of sanitary sewer service connections (all diameters); 340 VF of 4-foot diameter manhole for sewer or drain; 100 VF sewer or drain structure rebuild or remodel; (10) catch basins – frame and grate replacement; (5) catch basins – curb inlet, frame and grate replacement; 50 LF of 12-inch RCP pipe for drainage; (1) temporary sewer bypass pump; (4) manhole frame sealing; (25) manholes – point repair of chimney; (5) manholes – point repair of wall; (2) manholes – point repair of bench; (6) manholes – frame and cover replacement; (6) manholes - cross bore removal; (2) manholes – cleaning; 100 VF of manhole lining; 80 VF of manhole grouting; (2) root removals from manholes; (30) sanitary sewer pipe – root removals (per joint); (7) sanitary sewer pipe – point repair replace 5' to 10'; (3) sanitary sewer pipe – point repair replace 11' to 25'; (2) sanitary sewer pipe – cut intruding laterals; 2,200 LF of lining sanitary sewer pipe (less than 18" diameter); 1,020 LF lining of sanitary sewer pipe (18" diameter and greater); (55) reinstatements of sewer services after lining; (24) inspections of manholes; 1,200 LF CCTV inspection of sanitary sewer pipes (all diameters); 800 LF of heavy cleaning of pipe; and the performance of all other work pursuant to the terms and conditions detailed within the plans and specifications for the City of Waltham Bear Hill Valley Area 13 / 14B-2 Sewer and Manhole Rehabilitation and the approved MWRA I/I Local Financial Assistance Project Application received January 15, 2021.

The project work area includes: Bear Hill Road, Bedford Street, Charles Street Avenue, Curtis Street, Dartmouth Street, Eddy Street, Edge Hill Road, Everett Street, Highland Street, Hope Avenue, Lunda Street, Main Street, Nathan Road, Overland Road, Prospect Hill Avenue, Prospect Street, Prospect Street Avenue, Russell Street, Shakespeare Road, Sharon Street, South Street, Tower Road/Interstate 95/Route 128, Wheelock Road, and various City easements.

Overall project cost is estimated at \$5,000,000. Eligible MWRA I/I Local Financial Assistance is \$3,987,660 (Construction=\$3,820,630; Construction Services=\$167,030). As a result of the above sanitary system rehabilitation work, an estimated 0.42 MGD of peak I/I will 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 WALTHAM
BEAR HILL VALLEY SEWER REHABILITATION - AREA 13 / 14B (PHASE 2)**

MWRA PROJECT NO. WRA-P11-35-3-1167

PROJECT SCHEDULE

<u>Description of Work</u>	<u>Start Date</u>	<u>Completion Date</u>
Project Bid & Award	October 2020	December 2020
Rehabilitation Construction	April 2021	Fall 2022

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

**TOWN OF WINTHROP
EMERGENCY SEWER REPAIR - REVERE STREET**

MWRA PROJECT NO. WRA-P11-42-3-1169

SCOPE OF SERVICES

This sewer project is an emergency repair to a sewer collapse in a section of sewer main on Revere Street. This section of sewer main was identified during I/I investigations completed by Woodard & Curran and recommended for replacement. The Town was working to design improvements to replace this section of main due to the number of structural issues uncovered during the I/I investigation work when the main failure occurred.

The failed gravity sewer was approximately 18-20 feet below grade. An existing force main was found directly above the gravity sewer being repaired. The force main had to be removed and replaced in order to make the necessary repairs. Work was also hindered by the presence of a 10-inch steel/cast iron gas main that had to be supported with steel beams.

The failure was discovered on December 24, 2020 and required immediate bypass pumping to prevent a back-up in sewer service connections. The Town contacted a subcontractor (Rapid Flow) to set up an emergency bypass system to bypass sewer flows around the collapsed section. The bypass required closure of one lane on Revere Street from approximately the intersection of Upland Road to the intersection with Crest Ave. Detours were set up and 24-hour police details were on site to assist with traffic control. The Town also contacted contractors to assist in making the necessary repairs. DeFelice Corp. mobilized to the site and began excavation on December 26, 2020.

Eligible I/I Project work will include, but not be limited to, the following: Emergency repair of a collapsed section of 8-inch VC gravity sewer; re-instating a sewer service with a chimney at the point of collapse; bypass pumping of gravity sewer flows; removing, bypassing and replacing a section of 10-inch force main; septage hauling during removal and replacement of the force main; CIPP lining of 8-inch VC pipe; traffic management (including 24-hour police details) and traffic controls.

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 on December 31, 2020. The total sewer portion of the project cost is estimated at \$375,000. Eligible MWRA I/I Local Financial Assistance is \$272,250 (Phase 12 Distribution).

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

**TOWN OF WINTHROP
EMERGENCY SEWER REPAIR - REVERE STREET**

MWRA PROJECT NO. WRA-P11-42-3-1169

PROJECT SCHEDULE

<u>Description of Work</u>	<u>Start Date</u>	<u>Completion Date</u>
Construction (Emergency Repair)	December 2020	Spring 2021

MWRA I/I Local Financial Assistance Program Funding Summary

May 2021 Funding Cycle

Community	Funding Allocation
Boston	\$ 7,531,555
Malden	\$ 1,084,000
Quincy	\$ 2,212,761
Watertown	\$ 1,050,000
Total	\$11,878,316

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM
ATTACHMENT A**

**BWSC DRAINAGE, SEWERAGE AND WATER WORKS IMPROVEMENTS
SOUTH BOSTON SEWER SEPARATION - PHASE I
BWSC CONTRACT NO. 20-309-012**

MWRA PROJECT NO. WRA-P11-05-3-1171

SCOPE OF SERVICES

The South Boston Sewer Separation Project encompasses 403 acres, generally bounded by Andrew Square, Dorchester Avenue, West Broadway and Telegraph Hill. 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 and parking areas will also be performed. The separation of sewers and drains will result in a decrease of combined sewer overflows that currently discharge to the Fort Point Channel. Phase I is the first of five separation contracts for the area. Separation of this area was not included in the MWRA’s CSO Plan.

Work to be performed under this Phase I project includes, but is not necessarily limited to: contracted replacement of 8600 linear feet (LF) of combined sewers via installation of 5600 LF of 10 to 48-inch storm drain; structurally lining 1570 LF of 12-inch x 15-inch to 24-inch x 27-inch sewer pipe; installation of 93 manholes and nine (9) catch basins; disconnecting 14 downspouts; rehabilitating three (3) sewer manholes; conversion of 2910 LF of existing combined sewer to storm drain; cleaning and TV inspecting 2495 LF of existing combined sewer overflow conduits; and the performance of all other work pursuant to the terms and conditions detailed within the plans and specifications of BWSC Contract No. 20-309-012 [Drainage, Sewerage and Water Works Improvements in South Boston (South Boston Sewer Separation - Phase I)] and the approved MWRA Phase 11 I/I Local Financial Assistance Project Application received October 23, 2020.

The design storm peak hour inflow rate reduction is 3.0 MGD, design storm inflow volume reduction is 0.25 MG and the average annual inflow reduction is 0.02 MGD. Total project cost is estimated at \$16,868,088. Eligible MWRA I/I Local Financial Assistance is \$7,531,555 (Separation Construction = \$7,531,555).

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Contract Bid / Award	March 2021	March 2021
Construction	Summer 2021	Summer 2023

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

**CITY OF MALDEN, MASSACHUSETTS
SSES & SEWER IMPROVEMENTS - DESIGN/CONSTRUCTION**

MWRA PROJECT NO. WRA-P11-18-3-1174

SCOPE OF SERVICES

The scope of work for this project includes but will not be limited to: Sewer System Evaluation Study (SSES); and design/rehabilitation construction of sewer main/manholes with known I/I contributions or suspected water quality impacts.

Sanitary Sewer Evaluation Survey (SSES): The study will focus on the City of Malden Sewershed 3B. This area is the low elevation area of the city. The intention is that the recommendations of this SSES will lead to a City of Malden Sewer Rehabilitation Contract. The study will employ flow meters, TV inspections, smoke testing, and other means typical of a SSES.

An SSES Report will summarize details in which the above work was performed, and include recommendations, a cost-effectiveness analysis and prioritization analysis for rehabilitation of sewer main/manhole defects and I/I sources identified during the investigation. Estimated rehabilitation construction costs will also be provided. (Estimated SSES Cost = \$300,000).

Sewer Improvements – Design & Construction: Sewer Improvements includes: Developing construction plans and specifications (to remove excessive I/I identified during the above SSES, followed by CIPP rehabilitation construction (within approximately 20,000 LF of sewer main). [Estimated Design = \$84,000 / Construction = \$600,000 / Construction Services = \$100,000].

Overall project cost is estimated at \$1,084,000. Eligible MWRA I/I Local Financial Assistance (Phase 7) is \$1,084,000. An estimated peak I/I removal total will be established upon SSES completion.

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
Sanitary Sewer Evaluation Survey	Fall 2021	Spring 2022
Rehabilitation Design	Summer 2022	Summer 2022
Rehabilitation Construction	Fall 2022	Fall / Winter 2022
Warranty Retesting	Summer 2023	Summer 2023

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

**CITY OF QUINCY, MASSACHUSETTS
FY21 I/I REHABILITATION: CONSTRUCTION
MWRA PROJECT NO. WRA-P11-26-3-1172**

SCOPE OF SERVICES

Project Type: The proposed project work will focus on construction to rehabilitate sewer mains and manholes within the City previously identified as in disrepair and critical for public health and safety, the environment and/or system operation. Project work will support I/I rehabilitation construction in FY21.

Project Objective: The goal of the proposed work is to rehabilitate aging sewer mains and manholes within the City in order to reduce the I/I that contributes to a significant amount of the City's sewer flow. In early 2020, the City began investigations for the 2020 SSES (investigation was funded under MWRA Project No. WRA-P11-26-3-1140). This investigation and subsequent analysis, along with a revisit of earlier SSES recommendations, have resulted in a comprehensive evaluation of identified collection system issues. The rehabilitation recommendations identified in the 2020 SSES will be the focus of this project. FY21 Design and Bidding Phase Services for this rehabilitation work was funded under MWRA Project No. WRA-P11-26-2-1159.

For improved bidding conditions and overall construction administration efficiency, the rehabilitation construction work will be divided into two contracts: FY21 CIPP Sewer Improvements and FY21 Open Cut Sewer Repairs.

FY21 CIPP Sewer Improvements work includes performing 37,323 LF of CIPP lining within 8 to 20-inch sewer main. Project work will be undertaken on Airport Road and Easement / Albion Road / Ames Street / Ardell Street / Babcock Street / Baxter Avenue / Copley Street / Cove Way Easement / Darrow Street / Dimmock Street / Doane Street / East Squantum Street / Elm Street and Easement / Harriet Avenue / Huckins Street / Malvern Street / Manet Avenue and Easement / Mears Avenue / Morgan Road / Ocean Street / Parke Avenue / Pope Street / Quincy Shore Drive and Easement / Rhoda Street / Ridgeway Street / Shea Street / Shed Street / Small Street / Stoughton Street / Sturtevant Road / Thurston Avenue / TRYA Marina Easement / Waterson Avenue / Wesson Avenue / Willard Street / Williams Street and Winthrop Street.

FY21 Open Cut Sewer Repair work includes performing 3375 LF of open-cut repair within 8 to 10-inch sewer main. Project work will be undertaken on Airport Road and Easement / Baxter Avenue / Elmwood Park and Quincy Shore Drive and Easement.

The above work will be performed pursuant to the terms and conditions detailed within the Agreement For Engineering Services Agreement By and Between the City of Quincy and Woodard & Curran, Inc. and the approved MWRA Phase 11 I/I Local Financial Assistance Project Application received March 18, 2021.

Total project cost is estimated at \$6,462,500 (Construction Cost = \$5,800,000 / Construction Services Cost = \$662,500). Eligible MWRA I/I Local Financial Assistance is \$2,212,761 (Construction Cost = \$2,212,761). As a result of the above work, an estimated 0.12 mgd of peak I/I will 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 QUINCY, MASSACHUSETTS
FY21 I/I REHABILITATION: CONSTRUCTION
MWRA PROJECT NO. WRA-P11-26-3-1172**

PROJECT SCHEDULE

<u>Item</u>	<u>Start Date</u>	<u>Completion Date</u>
FY21 I/I Rehabilitation: Construction		
CIPP Sewer Improvements	May 2021	March 2022
Open Cut Sewer Repairs	June 2021	March 2022

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

**TOWN OF WATERTOWN
CIP PROJECT 1B - SEWER REHABILITATION CONSTRUCTION**

MWRA PROJECT NO. WRA-P11-36-3-1173

SCOPE OF SERVICES

The purpose of this project is to construct rehabilitations identified during sanitary sewer evaluation surveys completed in CIP Project 1 areas. CIP Project 1 includes three sanitary sewer evaluation surveys (SSES). Phase 1A construction is currently funded by MWRA Project No. WRA P11-36-3-1133.

This project is part of the town's sanitary sewer capital improvement plan. The construction project will be the third phase of rehabilitations identified from the CIP Project 1 investigations. Using the information collected in the CIP Project 1 investigations, cost-effective rehabilitation design will be performed. In addition, specifications and plans (to remove excessive I/I identified during CIP Project 1 investigations) will be prepared for public bidding. CIP Project 1B rehabilitations is scheduled to be bid over the summer of 2021.

The total project cost is estimated at \$2,400,000. Eligible MWRA I/I Local Financial Assistance is \$1,050,000 (MWRA Phase 11 funding) (Construction = \$1,050,000).

Project work will be performed pursuant to the terms and conditions detailed within the approved MWRA I/I Local Financial Assistance Project Application (received April 15, 2021) and the Agreement For Engineering Services By and Between the Town of Watertown, MA and Weston & Sampson Engineers, Inc. At the completion of this sewer rehabilitation project an estimated 0.05 MGD of peak infiltration and inflow will be removed from the sewer collection system.

PROJECT SCHEDULE

<u>Description of Work</u>	<u>Start Date</u>	<u>Completion Date</u>
Bid Award	June 2021	July 2021
Rehabilitation Construction	July 2021	September 2022

ATTACHMENT 5
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY21
Reporting Period: July 2020 Through June 2021

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 FY21, MWRA has distributed \$478 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 FY21. Community information is summarized below:

1. ARLINGTON: North System

Background Information:

- Miles of Sewer: 106
- Sewered Population: 45,474
- 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)

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 is developing a Private Inflow Removal Program with anticipated finalization by April 2022.

I/I Rehabilitation Projects in Design or Construction: In March 2020, funds were distributed for the Phase 12 Sewer System Rehabilitation Construction Project and Phase 10 Post Construction Flow Evaluation (MWRA Project No. WRA-P11-01-3-1143). Details of this project are included in Attachment 4. The Phase #12 Sanitary Sewer Rehabilitations Bid No. 20-32 was opened on July 23, 2020. The project was substantially complete in November 2020 with warranty inspections to be completed by November 2021.

Reporting Period Activity: The warranty inspection for the Phase #11 Sanitary Sewer Rehabilitations - Bid No. 19-23 was completed in May 2020. The Phase #11 Post Construction Flow Evaluation Report will be completed in July 2021. The Phase #12 Sanitary Sewer Rehabilitations - Bid No. 20-32 was substantially complete in April 2021. The following excavation work was completed to separate the sewer and drain systems in five (5) shared manhole areas: installed 48 LF of gravity sewer; installed 426 LF of gravity drain; abandoned 139 LF of gravity drain; replaced three (3) sewer service connections; installed two (2) precast sewer manholes; installed two (2) precast drain manholes; installed 13 precast separation manholes; and removed and disposed of three (3) shared manholes. The following trenchless work was completed: root treatment of 531 LF of sewer; installed 1798 LF of cured-in-place pipe (CIPP) lining; grouted 33 service connections in cured-in-place pipe; cut one (1) protruding service connection; and enclosed four (4) storm drains in shared manholes. The warranty inspections will be completed in Fall 2021 or Spring 2022, pending groundwater conditions. The Phase #13 Sanitary Sewer Rehabilitations Bid No. 21-34 was opened on July 21, 2021. The project is expected to be substantially complete by November 2021 with warranty inspections completed by November 2022.

MWRA I/I Local Financial Assistance Program: The community has financed twenty-five (25) 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 \$3,680,000 remaining in funding assistance.

2. ASHLAND: South System

Background Information:

- Miles of Sewer: 66
- Sewered Population: 13,952
- 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 CY20/21 (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 has contracted Truax Corp. to perform internal TV inspection of 199,500 LF of sewer main in Ashland Sewer System Sub-Basins 1 / 2. Sewer main investigation work has been completed. An Investigations Summary Report is currently being prepared. The report will address sewer main rehabilitation options.

Reporting Period Activity: 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 by National Water Main and Cleaning Company in Summer 2019. Thirteen (13) short liner spot repairs were installed within Town sewer mains. Town forces continue to jet problematic and high grease areas.

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: 13,745
- 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: Sump pump connections in nine (9) apartment buildings were disconnected from the Town's sewer and rerouted to overland flow.

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

Reporting Period Activity: The Phase #6 Sewer System Evaluation and Survey is ongoing. Cleaning and inspections were completed in Summer 2021. An estimate I/I quantity removed will be identified upon investigation review. The Evaluation and Report will be completed by Fall 2021. The Phase #6 Design Project is expected to be performed during Fall 2021/Winter 2022. The Phase #6 Construction Project is expected to begin in Spring 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 \$5,654,600 allotted through the Program's Phases 1 - 13, the community has \$3,214,942 remaining in funding assistance.

4. BELMONT: North System

Background Information:

- Miles of Sewer: 78
- Sewered Population: 26,061
- 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: Building inspections/sewer dyed-water testing were completed for 24 houses to identify illicit connections to the storm drain. Sump pump connections/discharge location were also inspected. Of the 24 houses inspected, one (1) sump pump was determined to be connected to the sewer system. This may be added to the upcoming sump pump removal and relocation project starting up August 2021 upon further evaluation.

I/I Rehabilitation Projects in Design or Construction: The Mainline CIPP Lining Project has been completed. Approximately 63 sewer laterals were lined including 1635 LF of mainline sewer lateral. A total of 3359 LF of mainline sewers were lined, one (1) sewer service was replaced, four (4) total point repairs and one (1) drain manhole was rehabilitated. An estimated 30,200 GPD of infiltration was removed. The Manhole Cover Insert Inflow Study has been completed and was submitted to the MWRA in March 2020. The Private Sector Inflow Removal Project has been awarded and construction will begin in August 2021. The project will include 28 confirmed sewer sump pumps to be disconnected from the sewer system and relocated to the storm drain system or the ground surface. Additionally, 16,500 LF of sewer main will be lined. Several service replacements and point repairs will be undertaken as part of this project.

Reporting Period Activity: The Town has inspected approximately 10,000 LF of sewer and storm drain associated with the Town's 2021 Pavement Management Program (PMP). Point repairs, service replacements and new manholes will be performed within the PMP limits in Summer 2021. Additional future trenchless repairs will be conducted to complete the recommended repairs.

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: 683,724
- 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 25,296 downspouts have been disconnected. During CY05 - CY21, 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-four (84) projects have received funding through the MWRA I/I Local Financial Assistance Program. During FY07 - FY21, BWSC completed the following MWRA-financed rehabilitation projects: 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 include: 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 I (MWRA Project No. WRA-P9-05-3-988).

BWSC entered into an I/I reduction agreement with the Massachusetts DEP 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-four (84) 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 \$113,404,769 remaining in funding assistance.

6. BRAINTREE: South System

Background Information:

- Miles of Sewer: 140
- Sewered Population: 37,045
- Three Year (CY18 - CY20) Annual Average I/I: 4.38 mgd
- MassDEP Administrative Actions since 2010: None

Latest I/I or SSES Report: Howard Street Pump Station Area Investigation (April 2019)
2018 Annual Wastewater Flow Monitoring (July 2019)
Annual Town-Wide Sewer Program - Year 8 Investigation (January 2020)
2019 Annual Wastewater Flow Monitoring (September 2020)
Main Interceptor Investigation (June 2021)
Annual Town-Wide Sewer Program - Year 9 Investigation (Ongoing)
2020 Annual Wastewater Flow Monitoring (Ongoing)

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

Sump pump removal program is ongoing. Ten (10) private source sump pump removal contracts have redirected 296 sump pumps to date. Developer Flow Reduction Program is now 6 to 1 per DEP 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 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 No. WRA-P11-06-3-1142). Year 9 I/I Investigation (Study) work began February 2021 and was completed in June 2021. Summary Report to be complete January 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 ongoing. The Year 8 project will remove an estimated 0.05 mgd of peak infiltration from the Town's sewer system (MWRA Project No. WRA-P11-06-3-1104).

Year 7 I/I Investigation (Study) work in Subareas C3 / L6 / L7 / T1 began March 2018 and was completed in July 2018. Summary Report was completed January 2019. Year 7 rehabilitation design complete July 2019. Year 7 rehabilitation construction was bid August 2019. Rehabilitation construction is complete. The Year 7 project removed an estimated 0.10 mgd of peak infiltration from the Town's sewer system. (MWRA Project Nos. WRA-P9-06-3-981 / 1129).

Year 6 I/I Investigation (Study) work in Subareas A2 / L3 / L5 began March 2017 and was completed in July 2017. Summary Report completed January 2018. Year 6 rehabilitation design completed August 2018. Year 6 Rehabilitation Construction began October 2018 and is complete. The Year 6 project removed an estimated 0.30 mgd of peak infiltration from the Town's sewer system. (MWRA Project No. WRA-P9-06-3-961).

Reporting Period Activity: Main Interceptor Investigation completed June 2021 (MWRA Project No. WRA-P11-06-3-1165). 2020 Annual Wastewater Flow Monitoring began January 2020 and was completed December 2020 (MWRA Project No. WRA-P11-06-3-1129). Summary Report to be complete Fall 2021. 2019 Annual Wastewater Flow Monitoring began January 2019 and was complete December 2019. Summary Report completed September 2020. 2018 Annual Wastewater Flow Monitoring began January 2018 and was complete December 2018 (MWRA Project No. WRA-P9-06-1-975). Approximately 22% of the Town's sewer system was directly monitored for this analysis. Summary Report complete July 2019. Howard Street Pump Station Tributary Area TV Inspection work in Subareas HC1 / HC2 / HC3 began January 2019 and was complete March 2019. Summary Report completed April 2019 (MWRA Project No. WRA-P9-06-3-961). Recommended rehabilitations for this area were incorporated into the above Year 7 rehabilitation construction project. One development with eight (8) single-family homes has been connected to Braintree's sewer system over the past year.

MWRA I/I Local Financial Assistance Program: The community has financed sixteen (16) 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 \$4,387,257 remaining in funding assistance.

7. BROOKLINE: North and South Systems

Background Information:

- Miles of Sewer: 111
- Sewered Population: 59,073
- 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, 8 & 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: 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 are on the lookout 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: The Town closed-out contract PW/18-22 Sewer System Rehabilitation, which included CIPP within approximately 7.4 miles (39,197 LF) of 8 to 24-inch sanitary sewer. The Town executed PW/21-04 Sewer System Rehabilitation which will rehabilitate approximately 30,000 LF of 8 to 24-inch sanitary sewer. This is currently under construction. Expected date of completion is October 2021. The Town executed PW/21-06 Epoxy Lining of SMHs. This contract will epoxy line 2100 LF of manholes. Construction is expected to start August 2021 with completion in December 2021. The Town executed PW/21-05 Sewer System Repairs. Contract work includes six (6) sewer spot repairs. Construction is expected to start August 2021 with completion in October 2021.

The Town is in the process of closing the following contracts: PW/19-10 Epoxy Lining of SMHs and PW/19-09 Sanitary Sewer Improvements. PW/19-10 work included installing 2574 VF of epoxy liner in 260 sewer manholes and replacing 26 defective sewer manholes frames and covers. PW/19-09 work involved the replacement of 375 LF of collapsed sanitary 8-inch sewer pipe and six (6) sanitary sewer spot repairs.

1080 Beacon Street, a large apartment complex that was under reconstruction with a roof area of 5300 SF, was found to have its two storm drains tied to the sanitary sewer. The owner redirected the two storm drains to the Town's storm drain that was installed as part of the Beacon Street separation project.

In January of 2020, the Town signed an agreement with BETA Group for I/I Investigation and Sewer Rehabilitation Design for NI-8 Basin and smoke testing for the Town's next phase of sewer rehabilitation.

In June 2020, MWRA I/I funds (\$3,000,000) were distributed for the Design & Construction of Recommended Sewer Rehabilitations in Sewer Subareas NI-4, NI-5, NI-7, NI-8 and NI-9 (MWRA Project No. WRA-P11-07-3-1147). Details of this project 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 nine (9) 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 \$10,689,000 remaining in funding assistance.

8. BURLINGTON: North System

Background Information:

- Miles of Sewer: 115
- Sewered Population: 26,605
- 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 (Fall 2020)
Project 11 SSES (Fall 2021)

Private Source Inflow Removal Program: Performed 14 house-to-house inspections last year. The Town is attempting to inspect 37 Amnesty List properties to identify improper connections to the sanitary sewer system. Inspections are on hold due to the COVID-19 Pandemic. The Town's sewer connection fund balance (5 for 1 sewer connection fee), excluding encumbrances, is \$1,639,893.

I/I Rehabilitation Projects in Design or Construction: Project 10 SSES was completed Winter 2021 and identified 16,818 gpd of cost effective, value effective, and non-excessive recommended removable peak infiltration. The Project 11 SSES is anticipated to be complete Fall 2021.

Project 8 and 9 Rehabilitations were substantially completed Fall 2020. Warranty re-test was completed Winter 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 SSES in the Project 11 Area. 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: 107,278
- 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 (In Progress)

Private Source Inflow Removal Program: The City removed the illicit connections at 9 Grey Gardens East and 2 Hemlock Street in the Sparks Street catchment area in Fall 2020. Illicit connections at 1640 Cambridge Street in the Dewolfe catchment area were removed in Spring 2021. Coordination to address an illicit connection identified at 255 Main Street in the Broad Canal catchment area is ongoing.

The City conducted house inspections and IDDE investigations in the Sparks Street, Matignon Road, Dewolfe, Broad Canal, Flag Street, and University Road drainage areas over the past year. 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 will conduct house-to-house inspections in the Port neighborhood over the coming year 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). One (1) additional illicit connection was identified on Norfolk Street which was redirected in Summer 2020.

The City completed (2018) an IDDE project in the Cambridgeport catchment area which included cleaning and inspection of the drainage system, building inspections, dye testing and sampling. This project was performed in advance of the construction of a new stormwater outfall at Talbot Street (completed June 2020). Three illicit connections were identified. Illicit connections were removed at 201 Vassar Street and 744 Massachusetts Avenue. An illicit connection at 57 Magazine Street was removed in August 2019. A round of dry weather sampling will be conducted to clear the remaining area downstream of the illicit connections and the overall catchment area.

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 (Mall Redevelopment, 60-110 First Street); Volpe Center Redevelopment (55 Broadway); 101 Smith Place; CHA Jackson Place, 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 on MOB: Sewer and drain separated with a temporary connection to a combined manhole (connection to be removed in Phase 2b); estimated completion Fall 2021
- 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
- Cottage/Lopez Drainage Improvements completed December 2020
- Talbot Street Storm Drain and Outfall completed June 2020
- Willard Street Sewer Separation and Re-establishment of the Stormwater Outfall: City is finishing the Willard Street design. The project to bid this Fall. Construction NTP expected by the end of the year. Construction duration is approximately 18 months.
- River Street Reconstruction: Work at 75% design; estimated construction completion 2024
- Port Phase II Infrastructure Improvements: Work under design; estimated construction completion 2024
- 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 in design; estimated completion Spring 2022

- CambridgeSide Redevelopment (600-110 First Street): Land Boulevard/First Street Sewer Separation in design. Estimated completion 2022
- Ongoing projects by various developers:
 - North Mass Ave Residential Side Street Infiltration Program is ongoing
 - 193 Concord Turnpike: Completed March 2020
 - 50 Cambridge Park Drive: Under construction; estimated completion Fall 2021
 - 55 Wheeler Street: In design; estimated completion 2022

Reporting Period Activity: In FY21, the City performed CCTV inspections on approximately 146,086 LF of sewer main and drain pipe. In addition, the City lined 10,081 LF of sewer main and drain pipe. Also, the City's FY21 Remedial Repair Contractor made various repairs to the City's sewer and drain system at 159 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 currently under design). The Tobin Montessori Vassal Lane Upper School Stormwater Storage Tank project consists of the construction of a stormwater storage tank (which started this year) with an estimated completion in 2023. 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.

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: 16,603
- 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 ongoing (WRA Project No. WRA-P11-10-1-1163). Work to date includes: (1) development of the flow metering program, including meter and gauge placement; (2) flow meters placement into the community system in March/April 2021 and data collection commencement; flow meters removal in early June 2021; (3) completed all sewer manhole inspections (summary report near completion); and (4) flow meter data analysis ongoing. I/I Report / Recommendations due December 2021.

Town performed CCTV inspection within 30,000 LF of sewer main as part of their I/I Management Plan. CCTV Inspection program is ongoing. CCTV inspection tapes are being reviewed with identified problem areas addressed.

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 \$6,635,900 allotted through the Program's Phases 1 - 13, the community has \$3,687,400 remaining in funding assistance.

11. CHELSEA: North System

Background Information:

- Miles of Sewer: 41
- Sewered Population: 40,227
- 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)

Private Source Inflow Removal Program: The City began collecting Sewer Bank fees for redevelopment projects in CY13. The City has also begun 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 estimated to begin in 2022-2023.

Final design of utility and road improvements for Central Avenue, Willow Street, & Watts Street is ongoing. This project includes sewer improvements to remove inflow and drain construction that will reduce localized flooding. Construction estimated to begin in 2021-2022.

Construction of utility improvements for Upper Broadway is ongoing. This project includes comprehensive sewer reconstruction for future sewer separation. Construction will be completed in Fall 2021. Future sewer separation work will occur with the construction of new drains during MassDOT-funded road reconstruction in 2024.

Construction of utility improvements for Beacham Street & 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 will be completed Fall 2021.

Construction of the Essex Street & Highland Street Utility Improvements was completed in 2020. This project includes comprehensive sewer reconstruction and sewer separation.

Design of the coastal barrier at Island End River began in 2020 and is ongoing. The design is likely to include tide gates and a pump station among other drainage improvements.

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). Details of this project are included in Attachment 4.

In February 2020, funds (\$2,949,000) were distributed for the Broadway & Cary Avenue Utility Improvements Project. (MWRA Project No. WRA-P11-11-3-1141). Details of this project are included in Attachment 4.

In August 2021, the City requested funds to support the proposed Central Avenue, Willow Street, & Watts Street Utility Improvement Project.

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. Of the \$11,760,100 allotted through the Program's Phases 1 - 13, the community has \$1,630,000 remaining in funding assistance.

12. DEDHAM: South System

Background Information:

- Miles of Sewer: 95
- Sewered Population: 24,502
- Three Year (CY18 - CY20) Annual Average I/I: 2.16 mgd
- MassDEP Administrative Actions since 2010: None

Latest I/I or SSES Report: Town-Wide Flow Monitoring (November 2016)
 Sewer System Hydraulic Flow Model Update (March 2017)
 2018 Sewer Manhole Investigation (October 2018)
 2019 Sewer Manhole Investigation (September 2019)
 2020 Sewer Manhole Investigations (August 2020)

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 CY15-21.

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 (4) 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 Rehabilitation On-Call Services Project (MWRA Project No. WRA-P11-12-3-1166), 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 gallons per day of infiltration.

The community also continued its annual sewer system inspection program. In March 2020, the Town began cleaning and CCTV inspecting 100,000 LF of sewer main and performing top-side inspection of approximately 600 sewer manholes. The Town plans to utilize this data, along with previous year's backlog work, to perform CY21 rehabilitation on the most cost-effective sewer lines/manholes utilizing an on-call rehabilitation contract.

Reporting Period Activity: In Summer/Fall 2020, 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 except any additional flow.

Approximately 480 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.

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: 44,749
- 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: Disconnection of roof drains and a sump pump from the building on Ashland Street has been designed. Disconnection is scheduled for Summer 2020. Several buildings in the Lower Broadway area were demolished with downspouts ultimately discharging to catch basins connected to the sewer. The catch basins are scheduled to be redirected to storm drains. A Sewer and Drain Ordinance was adopted in Fall 2018. The City has begun collecting fees. The City collected fees from developments totaling approximately \$1.65 million. Fees are used to fund future I/I removal projects.

I/I Rehabilitation Projects in Design or Construction: A tide gate was installed upstream of the stormwater outfall off of Robin Street resolving tidal inflow of an estimated 200,000 gpd.

Lower Broadway Sewer I/I Rehabilitation Project Design complete. Construction is ongoing. Building and site drainage was disconnected from the sewer system. An estimated 491,369 gpd of peak inflow and 69,700 gpd of peak infiltration are estimated to be removed.

Design for redirecting roof downspouts, a sump pump, and three (3) catch basins to the stormwater system at Ashland Street was completed with construction ongoing. An estimated 710,000 gpd of peak inflow is anticipated to be removed when work is complete.

Reporting Period Activity: Mitigation projects for the Encore Casino site include drainage improvements in the Lower Broadway neighborhood including Route 99 - Broadway, Dexter Street and Robin Street. Improvements include disconnections and installation of deep sump catch basins.

The Rivergreen Subdivision (permitted in the late 1990's) was recently built-out to support relocated commercial properties from the Lower Broadway neighborhood. Improvements include deep sump catch basins and stormwater detention ponds.

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 \$13,381,500 allotted through the Program's Phases 1 - 13, the community has \$4,320,200 remaining in funding assistance.

14. FRAMINGHAM: South System

Background Information:

- Miles of Sewer: 275
- Sewered Population: 69,216
- 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 (Ongoing)

Private Source Inflow Removal Program: The City's ten-year capital 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 in fifteen (15) subcatchments within the Phase 6 SSES area. Over the last year, the City has developed design contract documents for the Private Inflow Removal Pilot Project. 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. Bidding documents are being finalized. The second round of home inspections has been put on hold due to COVID-19 pandemic restrictions. Flow metering was performed in the Phase 6 area to determine infiltration rates. Approximately 20,000 LF of flow isolation and television inspection was performed in two meter areas identified with net peak infiltration above the MassDEP threshold. There were also 700 manhole inspections performed in nine (9) meter areas that were identified to be above the MassDEP threshold for infiltration and inflow.

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 is 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 TV 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 television 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 of the City. 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 1265 LF of sewer main replacements at five (5) locations. City Operations staff / on-call service providers installed 2975 LF of CIPP and rehabilitated 12 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: 7,363
- 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 CY17-20, 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; Reviewed television 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 (August 2019) 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 sources of infiltration and inflow that have been identified during the investigation. Project work is complete. (MWRA Project No. WRA-P11-15-3-1127).

Contract FY17-S2 - Year 2 Annual Sewer Construction Program: Television 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. Project work is complete. (MWRA Project No. WRA-P11-15-3-1127).

Reporting Period Activity: Emergency gravity main repair (40 LF) on Lincoln Street (Route 3A) was performed. Emergency force main repair (3 LF of 6-inch force main) on North Street was completed. Targeted manhole inspections within FOG locations were undertaken. Broad Cove Pump Station upgrades were performed and included a new grinder system, sluice gate, VFDs, pump motors and electrical components. Replaced one pump at the Greenbrook Pump Station. Aerators installed at Bradley Woods and Mill Street Pump Stations. Cementitious and epoxy lining of Sewer Manhole 268 in the Lewis Court Easement was performed. Miscellaneous lateral rehabilitations (grouting and lining) were completed. Also, eight (8) new connections were added to the municipal sewer system.

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: 9,923
- 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 the DPW and Town Plumbing Inspector. The State has approved the Town's Sewer Bank Policy.

I/I Rehabilitation Projects in Design or Construction: TV inspection was conducted on 10,500 LF of sewer in Sub-areas H(7) and H(8). Manholes inspections (300 total) were conducted primarily in Sub-areas A/F/G/H(8).

Reporting Period Activity: Approximately 800 LF of 8-inch sewer was added to the community system via a new subdivision (Ford Crossing). No homes active at this time. The Town has completed its yearly check of all cross-country sewer manholes. Plymouth Street System Extension has been completed. Abington Avenue sewer work has also been completed. Phase 3/4 properties associated with collection system expansion are now being connected at owner's request. Phase 5 System Extension (Spring Street Area) and Spring Street Pump Station work is complete.

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: 33,120
- 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 (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 that may be adopted by the Town. 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 09 (Phase 11) was completed in March 2021. The project identified approximately 35,000 gpd of cost-effective removable peak I/I within the 55,000 LF of sewer main. The Phase 7 Sewer System Improvements construction began June 2020 and is scheduled to be substantially complete Summer 2021. This project's goal is to remove I/I primarily in Sewer Basins 01 and 08.

Reporting Period Activity: Septic abandonment/new sewer install were completed at the following locations: 11 Norton Street, 22 Carriage Street, 17 Saddle Club Road, 1312 Mass Ave, 378 Woburn Street, 21 Hastings Street, 160 Marrett Road, 8 Hayes Avenue, 2 Hayes Avenue, 6 John Hosmer Street, 39 Turning Mill Street, 8 Eliot Road, and 44 Paul Revere Road. New homes / buildings were added at the following locations: 109 Reed Street (Kay Tiffany Way Subdivision 5 homes); 840 Emerson Gardens 21 units; and 400 Shire Way (large office building addition).

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: 60,940
- Three Year (CY18 - CY20) Annual Average I/I: 3.92 mgd
- MassDEP Administrative Actions since 2010: 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 (4) I/I Assessment Program (April 2020)

Private Source Inflow Removal Program: The City continues to monitor potential private inflow sources. The City's DPW Commission voted to approve a revised Water & Sewer Fee Schedule on October 9, 2018. This 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: No sewer rehabilitation projects or significant sewer maintenance activities were performed during this reporting period. The City's contract work with the engineering firm Nangle Consulting Associates continues. A comprehensive I/I and sewer flow analysis, including a flow metering program, and other means of identifying I/I in targeted portions of the City's sewer collection system is ongoing. The City is proposing 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 City wide SSES & Sewer Improvements - Design / Construction project (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: 57,757
- 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: Locations found during Phase 1 inspections on 8/20 & prior inspections – removal plan to be developed in FY22.

I/I Rehabilitation Projects in Design or Construction: Mini-P Sewer Rehabilitation contract awarded in June 2021 (construction work has yet to start). An I/I Metering Report was delivered to MassDEP in December 2019. Investigation work into highest I/I areas as defined in report is continuing.

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: 28,333
- 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, MH Inspection) (Spring 2019)
2020 Phase 3 SSES Project (CCTV, Flow Isolation Smoke Testing, MH Inspection) (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)

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. Additionally, the City, as part of its water main replacement projects, has begun performing basement inspections for illicit connections, when connecting homes to a temporary bypass system.

I/I Rehabilitation Projects in Design or Construction: The 2020 Sewer Rehabilitation Project (CIPP Lining) was bid in September 2020. Work began December 2020 and was completed (with the exception of post-construction flow isolation) in May 2021. 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. Post-construction flow isolation will be conducted Spring 2022. The approximate I/I removal quantity will be determined upon completion of the post-construction flow isolation.

Reporting Period Activity: The following private developments have either tied into or been approved to tie into the City's or MWRA's sewer system: Blueberry Hill Lane, formerly referred to as Indian Rock Road (located off Forest Street), is a development presently under construction with 19 townhouse units of residential housing. The sewer main has been installed and six (6) units have been granted occupancy. Patrick's Place, formerly referred to as Colucci Estates (located off Swains Pond Avenue), is a development presently under construction with nine (9) lot subdivision for residential housing. A portion of the sewer main has been installed, but no units have been completed yet for occupancy.

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: 26,941
- 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 (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 house 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 follows up as needed.

I/I Rehabilitation Projects in Design or Construction: CIP Modified Comprehensive Project 2 Design work is ongoing. Project bidding is scheduled for Summer 2021.

The CIP Project 1 Sewer Rehabilitations 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 television 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: CIP Project 3 Investigation was completed Spring 2021. Data review and reporting is ongoing.

CIP Project 2 Investigation was completed Spring 2020. Data review and reporting is ongoing. (MWRA Project No. WRA-P11-21-3-1154). Work includes 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.

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.

MWRA I/I Local Financial Assistance Program: The community has financed twenty-two (22) I/I reduction projects through the Authority's funding assistance program. Of the \$9,014,500 allotted through the Program's Phases 1 - 13, the community has \$1,150,000 remaining in funding assistance.

22. NATICK: South System

Background Information:

- Miles of Sewer: 146
- Sewered Population: 32,281
- 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 No. WRA-P9-22-3-990). 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 were nine connections to the main during the timeframe of July 1 2020 through June 30 2021. 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. No services have been installed to the main to date. 7 Hovey: Service connection for the Rivers Country Day School. A \$141,600 entrance fee was assessed.

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 \$9,332,600 allotted through the Program's Phases 1 - 13, the community has \$3,750,000 remaining in funding assistance.

23. NEEDHAM: South System

Background Information:

- Miles of Sewer: 132
- Sewered Population: 29,577
- 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)

Private Source Inflow Removal Program: A private source identification program, using Town-owned CCTV equipment, is ongoing. Town continues to enforce 4:1 I/I removal prior to issuing occupancy permits.

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. These areas are being evaluated and added to the rehabilitation work. A total of 464,880 gpd of peak infiltration is anticipated to be removed from the sanitary system upon contract completion.

Alden Road Pump Station Wet Well Replacement Project (MWRA Project No. WRA-P9-23-3-985): Design 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 Project has been completed. Estimated completion date of construction is early 2022. The 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 sewer extension.

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: 88,718
- 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 CIP Project 6 Post Construction Flow Evaluation is being drafted. 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 ongoing. Construction to be complete in September 2021. 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: Design & Construction of CIP Project 8 Sewer Rehabilitations (MWRA Project No. WRA-P11-24-3-1158). Details for this project are included in Attachment 4. In August 2019, MWRA funds were distributed for the Design & Construction of CIP Project 7 & 8 Sewer Rehabilitations (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. Of the \$34,937,400 allotted through the Program's Phases 1 - 13, the community has \$0 remaining in funding assistance.

25. NORWOOD: South System

Background Information:

- Miles of Sewer: 83
- Sewered Population: 29,032
- 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: Town is planning to initiate design of a manhole replacement project along the Airport Interceptor. Manholes in this area are deteriorated and have significant inflow.

Meadowbrook Priority Area 5 Rehabilitation Design (MWRA Project No. WRA-P9-25-3-964) completed Summer 2018. 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. Work included CIP lining of 7515 LF of sewer main, installation of 600 LF of 8-inch PVC sewer main, lining 38 sewer manholes and CIP 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.

Meadowbrook Area Sewer Rehabilitation Project is complete. Rehabilitation work included CIPP lining 8190 LF of sewer main, manhole rehabilitation and the CIPP lining of 299 service connections.

Hospital and Florence Avenue Areas Sewer Rehabilitation (SRF Project) is complete. Project work included CIPP lining 7500 LF of 6 to 12-inch sewer main, manhole rehabilitation and CIPP lining 100 house service connections.

Reporting Period Activity: I/I Assessment and GIS Tracking Program (MWRA Project No. WRA-P9-25-1-919) work is substantially 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: 94,166
- Three Year (CY18 - CY20) Annual Average I/I: 5.34 mgd
- MassDEP Administrative Actions since 2010: None

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's Storm Water Discharge Ordinance has been approved. The ordinance forbids non-sanitary connections. A new fee structure was made effective July 1, 2013. The Ordinance outlines penalties for illegal connections/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 City of 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 29, 2021, the QSDRF had a balance of \$2,886,305.

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. Project work includes: 38,000 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 includes rehabilitating 86 sewer manholes. Project work to be substantially complete December 2021 (except for warranty inspection).

City initiated the FY21 Sewer Open Cut Design Project (MWRA Project No. WRA-P11-26-3-1159) with an anticipated bid date in August 2021. I/I reduction work includes approximately 2800 LF of new 8 to 10-inch gravity sewer main on Quincy Shore Drive, Manet Avenue and Dahlgren Street.

The FY19 Sewer Open Cut Improvements Project (MWRA Project Nos. WRA-P9-26-3-992 / 1140) began March 2020. 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. Project work completed March 2021.

The FY19 CIPP Sewer Improvements - Contract 1 (MWRA Project No. WRA-P9-26-3-992) began April 2019 and was substantially complete September 2019. Warranty inspection completed in June 2020. Project work included: CIPP lining 9673 LF of 8 to 30 x 45-inch sewer pipe on Newcomb Street / Armory Street / Sharon Road / Colby Road / Faxon Road / Botolph Street / Watkins Street / Morse Street / Merrymount Parkway; testing & sealing 1100 pipe joints; grouting 150 service connections; and rehabilitating 36 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 is located on Assabet Road, Shennen Street, Highfield Road, Copley Street, Dickens Street, Saint Anns Road, Hunt Street, Lafayette Street and Trescott Street. The awarded contract price was \$1,028,966. Project substantially complete March 2021 (except for warranty inspection). 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. Final project cost was \$1,383,931. Project substantially complete June 2021 (except for warranty inspection). 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 includes construction of a new dual wastewater/stormwater pump station and installation of 600 LF of 6-inch wastewater force main. The awarded contract price was \$2,373,500. Project scheduled to be substantially complete September 2021. 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) Replaced 6 LF of 8-inch VCP with 8-inch PVC on Phipps Street; (2) Completed three spot repairs of 8-inch VCP (approximately 8 to 13 LF each) with 8-inch PVC on Adams Street; (3) CIPP lined 36 LF of a 6-inch VCP lateral on Huntley Road; and (4) Replaced 8 LF of 8-inch VCP within the easement between Adams Street and Reservoir Road.

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: 34,203
- 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: Replaced 300 LF of sewer main on Gloria Road. Replaced 900 LF of sewer main on Sherman Drive.

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 will be conducting CCTV inspection of approximately 50,000 LF of sewer mains in Fall 2021. This is part of a larger I/I Design / Rehabilitation Project (MWRA Project No. WRA-P11-27-3-1139). Martindale Pump Station wet well lining work to begin late 2021 (Randolph Contract 20-S1 / MWRA Project No. WRA-P11-27-3-1139).

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: 25,579
- 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: Town-wide flow monitoring was performed. CDM Smith is using the data to update the Town's model. The Town, using the new flow data, will continue the CIPP Lining Program this Summer/Fall.

Reporting Period Activity: Installed/replaced approximately 1860 LF of service laterals to 60 residences. In addition, the Town received \$213,552 in sewer I/I connection fees from various developments in FY21.

In March 2021, MWRA funds were distributed for Town-Wide Sewer System Rehabilitation: Study / Design / Construction (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: 53,766
- 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)

Private Source Inflow Removal Program: The City performed the following work under Contract 7A (CWSRF-6648, WW-002): Redirection of 25 sump pumps and installation of 600 LF of drain extension. The City continues to maintain a 10:1 I/I removal ratio for new commercial and multi-family construction.

I/I Rehabilitation Projects in Design or Construction: Work done during this time period includes:

- Cured-in-place lining of 375 LF of 6-inch sewer;
- Cured in place lining of 18,410 LF of 8-inch sewer;
- Cured-in-place lining of 2,080 LF of 10-inch sewer;
- Cured-in-place lining of 140 LF of 12-inch sewer;
- Installed service lateral connection liners at 524 locations;
- Installed full length service lateral connection liners at 32 locations;
- Installed 860 VF cement/epoxy manhole lining;
- Sealed 56 manhole corbels; and
- Performed 13 sewer spot repairs.

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

MWRA I/I Local Financial Assistance Program: The community has financed six (6) 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 \$11,438,000 remaining in funding assistance.

30. SOMERVILLE: North System

Background Information:

- Miles of Sewer: 128
- Sewered Population: 81,360
- Three Year (CY18 - CY20) Annual Average I/I: 4.29 mgd
- MassDEP Administrative Actions since 2010: 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 2018)
CIP Project 2 - Pipeline Inspection, Assessment, and Design (Ongoing)

Private Source Inflow Removal Program: The Engineering Division reviewed 63 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: Work continued on CIP Project 2, with approximately 5700 LF of mainline sewer pipe lined via CIPP. The project was substantially complete in late Spring 2021. The total infiltration removed through CIP Project 2 is estimated at 7200 gpd.

Poplar Street Pump Station: The Preliminary Design Report for the Poplar Street Pump Station was completed in the Summer 2021. The proposed pump station will have a 15 MGD pumping capacity with an outlet to the Millers River via the MBTA drainage system. The pump station provides a stormwater discharge for the sewer separation projects in Union Square, Spring Hill and adjacent areas. This allows these I/I contributions to be removed from MWRA's Cambridge Branch Combined Sewer. The Pump Station is expected to be operational in 2025.

Spring Hill Sewer Separation: The design of Phase I of the sewer separation of a portion of Spring Hill was completed, with construction planned to start in 2022. 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 due to the proposed Green Stormwater Infrastructure that will be realized once construction of this project is complete.

Somerville Avenue Infrastructure and Streetscape Improvement Project: To date, nearly all subsurface work (including the installation of a stormwater box culvert and sewer/water/drainage systems) has been completed except for the area in the vicinity of McGrath Highway. The project is currently progressing with streetscape improvements with anticipated partial substantial completion scheduled for October 2021. The remainder of work beyond October will involve the completion of box culvert installation and sewer relocation at the eastern limits of the project. Final completion for this outstanding work is currently scheduled for July 2022. An estimated inflow removal of 0.4 MGD will be realized once the Poplar Street Pump Station is completed.

Reporting Period Activity: The Marginal Interceptor Rehabilitation project design has been completed, with construction anticipated to start Fall 2021. There is no significant I/I reduction impact from this work. This work will consist of cementitious lining of approximately 1300 LF of 85-inch x 90-inch brick pipe.

The CCTV work currently ongoing will have follow-along rehabilitation projects, with the first such design project being performed beginning in August 2021, with an anticipated construction start of April 2022.

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: 21,816
- 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: The Town is continuing to investigate and eliminate illicit cross-connections between the sanitary sewer and storm water systems as part of its NPDES Phase 2 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 Project No. WRA-P11-31-3-1107) Final Design and Bidding complete. Contract Awarded in June 2021. Construction commencement scheduled for August 2021.

Phase 6 / Boston Regional Medical Center (BRMC) Sewer Rehabilitation: Project work substantially complete.

Fallon Road / Park Street System Rehabilitation (Phase 1): Project work substantially complete.

Reporting Period Activity: The Town is continuing to evaluate options for establishing a 4:1 I/I removal program in accordance with MA DEP Regulations at 314 CMR 12.

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 \$7,829,900 allotted through the Program's Phases 1 - 13, the community has \$1,940,000 remaining in funding assistance.

32. STOUGHTON: South System

Background Information:

- Miles of Sewer: 89
- Sewered Population: 20,323
- 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 (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 throughout Stoughton. 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 completed Spring 2021. Project removed an estimated 0.085 mgd of peak infiltration and 0.008 mgd of peak inflow.

Years 3, 4 and 5 Construction Design (MWRA Project No. WRA-P9-32-3-982) complete March 2018. Construction began in August 2018 (Stoughton Contract 18-1 / MWRA Project Nos. WRA-P9-32-3-995/1120). Project work substantially complete February 2020. Warranty retesting work completed Spring 2020. Project removed an estimated 0.075 mgd of peak infiltration and 0.079 mgd of peak inflow. An additional 0.073 mgd of peak removable infiltration was removed as a part of Contract 18-1, Change Order No. 1.

Reporting Period Activity: Year 9 Spring 2021 I/I Investigation (MWRA Project No. WRA-P11-32-1-1170) ongoing. Data review/report preparation to be completed November 2021.

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 0.027 mgd of peak removable infiltration and 0.016 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 0.054 mgd of peak removable infiltration and 0.004 mgd of peak removable inflow.

The third phase of the privately funded Goddard Highlands Development is under construction. 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 \$7.5M 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 to begin Summer 2021.

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: 27,067
- 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)

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: CCTV / sewer manhole inspections for approximately 100,000 LF of sewer main for the Sewer System Evaluation Survey - Year Four was completed. Summary Report was provided to the Town. This project identified 112,000 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. Construction of these recommended repairs is scheduled for CY21.

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) (MWRA Project No. WRA-P11-33-3-1150). Details of this project are included in Attachment 4.

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: 18,303
- 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 1 (January 2017)
I/I Investigation Program (Round 2): Year 2 (January 2018)
I/I Investigation Program (Round 2): Year 3 (November 2018)
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)

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 Nos. 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 substantial complete in November 2020. Warranty retesting work scheduled for Fall 2021. This project incorporates four years of I/I investigation reports (Year 8; Round 2, Year 1; Round 2, Year 2; and Round 2, Year 3).

Reporting Period Activity: 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 1850 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: 61,580
- Three Year (CY18 - CY20) Annual Average I/I: 3.53 mgd
- MassDEP Administrative Actions since 2010: 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 (On-Going)

Private Source Inflow Removal Program: From July 2020 to December 2020, twenty-one (21) sewer laterals were repaired/replaced from the mainline to the property line by City crews. The Town estimated that the relaying the old sewer laterals removed 105 gpd of I/I based upon the length of the sewer laterals (a total of 435 LF of pipe was replaced).

From January 2021 to June 2021, thirty-five (35) sewer laterals were repaired/replaced from the mainline to the property line by City crews. The Town estimated that the relaying the old sewer laterals removed 176 gpd of I/I based upon the length of sewer laterals (a total of 777 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). Estimated completion Fall 2021. Project work includes:

- Replacing 1368 LF of existing sewer main of various diameters 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 7 existing manhole frames and covers;
- CIPP lining 2573 LF of existing sewer main of various diameters; and
- Heavy cleaning of 2978 LF of existing sewer main of various diameters.

Reporting Period Activity: School Street & Lexington Street Water & Sewer Improvements work complete. Rehabilitated ten (10) existing brick sewer manholes with two-stage cement/epoxy liner.

Kenmore Terrace Sewer Replacement work is complete. Replaced 144 LF of existing 8-inch sewer main with 8-inch SDR 35 PVC, replaced two (2) existing brick sewer manhole with precast concrete structures; and replaced one (1) existing sewer service with 4" SDR 35 PVC from the mainline to the property line.

Redesign of Wimbledon Circle Pump Station substantially complete. Project work to be bid Fall 2021.

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: 34,612
- 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: Repaired sanitary sewer lateral through storm drain at 48 Merrill Road. Repaired sanitary sewer lateral through storm drain at 55 Webster Street. Repaired sanitary sewer lateral through storm drain at 36 Hardy Avenue.

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

CIP Project 1A Rehabilitations (Contract 20-01S) is ongoing. Construction is scheduled to be completed Summer 2021. The project includes rehabilitations identified during CIP Project 1 Inspection and Assessment Project. The project includes removal of an estimated 13,392 gpd of infiltration and 38,468 gpd of inflow.

CIP Project 1B Rehabilitations are scheduled to be bid Summer 2021 (MWRA Project No. WRA-P11-36-3-1173). The project includes rehabilitations identified during CIP Project 1 Inspection and Assessment Project and various Illicit Discharge Detection and Elimination (IDDE) Investigation Projects. The project includes removal of an estimated 14,000 gpd of infiltration and 39,000 gpd of inflow.

Reporting Period Activity: Replaced 950 LF of 8-inch sewer as part of the Hosmer School project. Relocated 500 LF of sewer for new construction at 85 Walnut Street. Replaced 350 LF of 8-inch sewer and six (6) sewer service connections on York Avenue. Replaced 50 LF of 8-inch sewer on Harnden Avenue.

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: 28,801
- 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. Also, 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 2021, the Town performed a detailed inspection of 900 sewer manholes. A manhole rehabilitation contract was awarded in May 2021. If funding and time allows, the Town also has a plan to do smoke testing in this 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.

During FY21, Sewer System Inspection and Rehabilitation work consisted of 8200 LF of sewer main cleaning and CCTV inspection. The Town also flushed 73,640 LF of sewer main and rodded 292 sewer laterals.

Reporting Period Activity: 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: 14,450
- 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 video inspect sewer mains at various locations for evidence of inflow.

I/I Rehabilitation Projects in Design or Construction: FY21 Sewer System Rehabilitation Design work will be completed August 2021. A Sewer System Rehabilitation Construction Project is scheduled to follow the FY21 design work. Anticipated rehabilitation construction completion date is June 2022. The construction contract will remove an estimated 30,000 gpd of infiltration from the sewer system (based upon estimated infiltration quantities observed during the FY21 Sewer Investigations CCTV inspection work). The FY21 CCTV and manhole inspections are the third phase of I/I identification work throughout the Westwood sewer system. These investigations were conducted between April - May 2021 and included 5256 LF of CCTV inspections and 34 top-side manhole inspections.

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.

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.

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 seven (7) 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 \$2,211,000 remaining in funding assistance.

39. WEYMOUTH: South System

Background Information:

- Miles of Sewer: 238
- Sewered Population: 55,123
- 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 6 (January 2018)
Town-Wide Sewer Investigation - Year 7 (October 2018)
Town-Wide Sewer Investigation - Year 8 (October 2019)
Town-Wide Sewer Investigation - Year 9 (March 2021)
Town-Wide Sewer Investigation – Year 10 (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 8 I/I Investigation was completed in October 2019. The investigation identified approximately 0.514 mgd of infiltration and 0.057 mgd of peak design storm inflow. Rehabilitation design (based on the Year 8 report recommendations) completed February 2021. Year 8 Rehabilitation Construction scheduled to begin Summer 2021 (MWRA Project No. WRA-P11-39-3-1157). Approximately 0.257 mgd of infiltration and 0.006 mgd of peak design storm inflow will be removed through construction.

The Year 7 I/I Investigation was completed in October 2018. The investigation identified approximately 0.155 mgd of infiltration and 0.017 mgd of peak design storm inflow. Rehabilitation design (based on the Year 7 report recommendations) completed in January 2020. Year 7 Rehabilitation Construction was completed in July 2020 (MWRA Project No. WRA-P11-39-3-1125). Approximately 0.130 mgd of infiltration and 0.017 mgd of peak design storm inflow was removed through construction.

Reporting Period Activity: The Year 10 I/I Investigation (MWRA Project No WRA-P11-39-3-1157) is currently ongoing. Field investigations are substantially complete.

The Year 9 I/I Investigation was completed in March 2021. The investigation identified approximately 0.214 mgd of infiltration and 0.0004 mgd of peak design storm inflow. Rehabilitation design (based upon the Year 9 report recommendations) is ongoing. Approximately 0.107 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 0.514 mgd of infiltration and 0.0057 mgd of peak design storm inflow. Rehabilitation design (based upon the Year 8 report recommendations) completed February 2021. Approximately 0.257 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 (20) 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 \$6,875,000 remaining in funding assistance.

40. WILMINGTON: North System

Background Information:

- Miles of Sewer: 29
- Sewered Population: 4,880
- 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: Town 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 MA DEP Regulations at 314 CMR 12.

I/I Rehabilitation Projects in Design or Construction: The Sewer System Rehabilitation for I/I in Sub Areas 5 and 8 (MWRA Project No. WRA-P11-40-3-1118) was awarded in August 2020. Construction is ongoing and is expected to be completed in August 2021. 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: There is an ongoing development proposal for a new housing development at Jefferson Road, which includes a new wastewater pump station at No. 364 Middlesex Avenue and a gravity sewer extension and force main along Middlesex Avenue. A capacity assessment and peer review of the design plans and specifications for this project was recently completed.

There is an ongoing development proposal for repurposing of No. 201 Lowell Street (also known as the Textron Facility) for a new warehouse/distribution facility with office space and remodeling of one of the existing buildings. A capacity assessment and peer review for this project was recently completed. Manhole inspections and CCTV inspections of existing, private sewers has been completed; inspection data is being reviewed.

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: 22,824
- 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.

I/I Rehabilitation Projects in Design or Construction: The Phase II Rehabilitations (Part B) Project began in November 2020 and is expected to be completed in August 2021. Warranty Re-Test inspection will be performed Spring 2022. The Phase II Sanitary Sewer Rehabilitations (Part B) will remove an estimated 62,319 gpd of infiltration and 17,301 gpd of inflow.

Reporting Period Activity: In August 2020, MWRA funds (MWRA Project No. WRA-P11-41-3-1151) were distributed to assist with Construction of Recommended Sewer Rehabilitations Per Phase II Sanitary Sewer Evaluation Survey Report of 2016 (Part B) (MWRA Project No. WRA-P11-41-3-1122). Details of this rehabilitation project is included in Attachment 4.

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: 18,625
- Three Year (CY18 - CY20) Annual Average I/I: 1.14 mgd
- MassDEP Administrative Actions since 2010: 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: As part of the 2021 SSES program, smoke testing is anticipated to start in Fall 2021 (smoke testing scheduled for the late Summer 2020 was postponed due to COVID-19 restrictions). Inspection data will then be reviewed and recommendations to remove I/I will be summarized in a report to be submitted to be submitted in Fall 2022. 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 1180 LF of gravity sewer on Palmyra Street and Crescent Street was completed this year. As part of the Centre Business District Infrastructure Improvements Project, approximately 4300 LF of sewer was replaced on Pauline Street from Walden Street to Woodside Avenue, Woodside Avenue from Pauline Street to Pleasant Street, Somerset Avenue from Pleasant Street to Woodside Avenue, Cottage Park Road from Pleasant Street to Somerset Avenue, Bartlett Road from Woodside Avenue to Pleasant Street, Adams Street from Woodside Avenue to Williams Street, Williams Street from Adams Street to Pleasant Street, and Jefferson Street from Putnam Street to Fremont Street. Emergency sewer repairs were also completed on Johnson Avenue and Revere Street.

Reporting Period Activity: As part of the SSES program, approximately 65,000 LF of sewer flow isolation and approximately 315 manhole inspections was complete. Approximately 35,000 LF of sanitary sewer cleaning/CCTV inspection and 100,000 LF of sewer smoke testing is planned for Fall 2021. Once inspections are completed and reviewed, the amount of I/I entering the sewer system through identified defects will be quantified and the cost to rehabilitate those defects will be calculated and presented in a report to be submitted in Fall 2022.

In February 2021, MWRA funds were distributed for the Revere Street Emergency Sewer Repair (MWRA Project No. WRA-P11-42-3-1169). Details of this project are included in Attachment 4.

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 \$5,553,400 allotted through the Program's Phases 1 - 13, the community has \$720,000 remaining in funding assistance.

43. WOBURN: North System

Background Information:

- Miles of Sewer: 141
- Sewered Population: 38,867
- 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)

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 were completed Spring 2021. The project removed an estimated 56,981 gpd of peak infiltration and 9,602 gpd of peak inflow.

CIP Project 4 Rehabilitations as scheduled to begin Fall 2021. The project is estimated to remove 27,606 gpd of peak infiltration and 17,473 gpd of peak inflow.

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

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 FY21
Reporting Period – July 2020 Through June 2021

CY20 COMMUNITY WASTEWATER FLOW DATA

This attachment contains calendar year 2020 wastewater flow data for the 43 MWRA member sewer communities. There are four separate data tables as detailed below.

TABLE 1 (Section Page 6-2) 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 6-3) 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 6-4) presents the CY20 Community Wastewater Flow Component Estimates with additional information based on estimated community inch-diameter-miles of sewer.

TABLE 4 (Section Pages 6-5 through 6-17) 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 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
	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
	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
	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

1-Feb-21

PAGE 3

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

1-Feb-21

PAGE 5

Annual
Average
(MGD)

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

1-Feb-21

PAGE 6

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

1-Feb-21

PAGE 7

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

1-Feb-21

PAGE 8

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

1-Feb-21

PAGE 9

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

1-Feb-21

PAGE 10

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

1-Feb-21

PAGE 11

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

PAGE 13

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