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August 27, 2020

Mr. Todd Borci
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Mr. Kevin Brander P.E., Section Chief
Wastewater Management Section
MA 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 2020

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 2020.

Attachment 1 – Overview of MWRA Regional I/I Reduction Plan
Attachment 2 – MWRA Regional I/I Reduction Plan – FY20 Progress Update and Detailed Implementation Schedule for FY21 Activities
Attachment 3 – MWRA Actions Taken to Reduce I/I During FY20
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 – CY19 Community Wastewater Flow Data

Should you require additional information, please contact Carl H. Leone, Senior Program Manager, Community Support Program at carl.leone@mwra.com.

Sincerely,

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

cc: David Butler, MassDEP, NERO
Betsy Reilley, Director, MWRA, Environmental Quality
Wendy Leo, Senior Program Manager, MWRA, Environmental Quality
Carl H. Leone, Senior Program Manager, MWRA, Community Support Program

ATTACHMENT 1
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY20
Reporting Period – July 2019 Through June 2020

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 FY20
Reporting Period – July 2019 Through June 2020

MWRA REGIONAL I/I REDUCTION PLAN - FY20 PROGRESS UPDATE AND DETAILED IMPLEMENTATION SCHEDULE FOR FY21 ACTIVITIES

This document provides a progress update for FY20 accomplishments and a description of the activities to be accomplished during FY21 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 FY20, 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 FY20 are detailed in Attachment 3. Additional information on MWRA's FY20 maintenance activities is provided under separate submittal - NPDES Part I.18.g Annual Maintenance Status Sheets.

During FY21, 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 complete as noted below.

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.

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 FY20, 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 FY21.

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 FY21, 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 FY21, 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 FY20, 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 FY21.

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 FY2019, $441 million in grants and interest-free loans has been distributed to 43 member sewer communities to fund 605 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 FY20, MWRA continued to estimate community infiltration and inflow rates on a bimonthly basis. Community wastewater flow data for CY19 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. $12.9 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 $8.8 million for meter equipment asset protection is programmed in the CIP after FY28.

During FY21, unless the metering system is down during equipment replacement, MWRA will continue to estimate community infiltration and inflow rates on a bimonthly basis 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 including a complete review of metering equipment and software technologies, review of MWRA's community metering methodologies, and subsequent design and construction of upgrades. A total of $21.7 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 FY20, 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 FY21.

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 EOEA 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 FY20, 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 FY21.

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 once their grant/loan funds are all distributed. As of FY20, MWRA's commitment to fund local sewer rehabilitation projects under the I/I Local Financial Assistance Program totals $760.75 million.

During FY20, 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 $40.4 million was distributed during FY20. Since program inception in May 1993, $441 million has been distributed to fund 605 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 FY21, 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 FY20, 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 FY21, 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 FY20, 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 CY19 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.**

- **July 2019, 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.**

- **February 2020, Local Water System Assistance Program funding (interest-free 10-year loans) update e-mails were distributed to each member community and information on MWRA's Lead Service Line Replacement Loan Program was included.**

- **March 18, 2020, 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 18, 2020, 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 2020, annual community I/I questionnaires were distributed to member sewer communities to acquire information on FY19 local I/I reduction programs for development of MWRA's Annual I/I Reduction Report (see Attachment 5).**

During FY21, 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 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 FY21, 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 complete as noted below.

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.

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 FY20, 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 FY20, 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 FY20
Reporting Period – July 2019 Through June 2020

MWRA ACTIONS TAKEN TO REDUCE I/I DURING FY20

The MWRA Field Operations Department's Technical Inspection program staff have internally inspected approximately 26 miles of Authority-owned interceptors, internally inspected 41 inverted siphon barrels with sonar inspection equipment, and physically inspected 554 sewer manholes and other structures (diversion chambers, siphon headhouses, tide gates, etc.) during FY20. 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 problems.

During FY20, MWRA's maintenance work included hydraulic/mechanical cleaning of 28 miles of Authority-owned sewers, cleaning of 68 siphon barrels, and replacement of 48 manhole frames and covers. In addition, 105 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 FY20, 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 FY21 CIP at a cost of over $132 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 is 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 Section 4, 5, 6 and 186 on the North Metropolitan Sewer in Winthrop and just upstream of the Deer Island Treatment Plant will include rehabilitation of about 5,300 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 and 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 and the construction/construction services phases are ongoing. The overall design, construction and construction services cost estimate of $7.5 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 is 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. The design phase is scheduled for FY26 with a design/construction budget of $36 million.

- Interceptor Renewal/Asset Protection Project #5: Rehabilitation design and construction of portions of Sections 607, 609, and 610 in Milton with design 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 with 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 Melrose and Malden with design scheduled to begin in FY21 with a design/construction budget of $11.3 million.

ATTACHMENT 4
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY20
Reporting Period: July 2019 Through June 2020

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 FY20, $441 million has been distributed to fund 605 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.

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 I/I LOCAL FINANCIAL ASSISTANCE PROGRAM
FUNDING SUMMARY AS OF JULY 2020

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	$1,742,450	46%	$2,076,050
Bedford	$5,654,600	$2,439,658	43%	$3,214,942
Belmont	$8,255,100	$4,287,100	52%	$3,968,000
Boston	$218,001,200	$97,064,876	45%	$120,936,324
Braintree	$14,419,000	$9,928,840	69%	$4,490,160
Brookline	$21,355,200	$10,666,200	50%	$10,689,000
Burlington	$8,432,800	$6,212,800	74%	$2,220,000
Cambridge	$39,250,100	$28,830,100	73%	$10,420,000
Canton	$6,635,900	$2,675,900	40%	$3,960,000
Chelsea	$11,760,100	$8,500,100	72%	$3,260,000
Dedham	$9,220,000	$6,900,000	75%	$2,320,000
Everett	$13,381,500	$6,650,500	50%	$6,731,000
Framingham	$20,375,000	$13,671,000	67%	$6,704,000
Hingham	$2,802,500	$2,412,500	86%	$390,000
Holbrook	$2,779,600	$896,562	32%	$1,883,038
Lexington	$12,125,300	$10,565,300	87%	$1,560,000
Malden	$20,683,900	$5,641,900	27%	$15,042,000
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	$6,714,500	74%	$2,300,000
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	$30,357,400	87%	$4,580,000
Norwood	$11,589,400	$6,879,400	59%	$4,710,000
Quincy	$32,780,000	$25,082,239	77%	$7,697,761
Randolph	$10,070,800	$4,971,058	49%	$5,099,742
Reading	$7,749,100	$5,669,100	73%	$2,080,000
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	$6,427,900	81%	$1,475,000
Wakefield	$9,806,900	$7,246,900	74%	$2,560,000
Walpole	$6,110,000	$4,490,000	73%	$1,620,000
Waltham	$22,282,400	$15,226,900	68%	$7,055,500
Watertown	$10,155,800	$6,285,800	62%	$3,870,000
Wellesley	$9,249,700	$3,582,504	39%	$5,667,196
Westwood	$4,302,300	$2,091,300	49%	$2,211,000
Weymouth	$19,100,900	$10,425,900	55%	$8,675,000
Wilmington	$4,232,000	$2,462,000	58%	$1,770,000
Winchester	$6,793,000	$5,053,000	74%	$1,740,000
Winthrop	$5,553,400	$4,561,150	82%	$992,250
Woburn	$16,665,500	$14,675,500	88%	$1,990,000
Totals	$760,750,000	$441,041,137	58%	$319,708,863

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
Total		$110,495,923		$100,404,112		$106,712,390		$123,428,711	$441,041,137

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.

PROJECT PHASE	COMPLETE PROJECTS ($ millions)	ONGOING PROJECTS ($ millions)	TOTAL ($ millions)
Planning/Study:	$ 45.7	$ 8.2	$ 53.9 (12%)
Design:	14.8	3.3	18.1 (4%)
Construction:	248.4	98.6	347.0 (79%)
Eng. Services During Const.:	17.5	4.5	22.0 (5%)
TOTAL	$ 326.4 (74%)	$ 114.6 (26%)	$ 441.0 (100%)

Program Results

The I/I Local Financial Assistance Program began in May 1993. Through FY20, a total of 605 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 FY20) for planning/inspection include the following:

- 2,255 miles of sewer TV inspected
- 1,531 miles of sewer flow isolated
- 1,338 miles of sewer smoke tested
- 63,401 sewer manholes inspected
- 78,232 buildings inspected

Results for all projects (FY93 through FY20) targeting infiltration reduction include the following:

- 75 miles sewer replaced
- 264 miles sewer CIPP lined
- 185 miles sewer tested/chemically sealed
- 2,907 sewer spot repairs
- 17,395 service connection repairs
- 4.8 miles underdrains sealed

Results for all projects (FY93 through FY20) targeting inflow reduction include the following:

- 1,064 catch basins disconnected
- 44 miles of new or replaced storm drains
- 21,243 manholes rehabilitated/sealed
- 3,558 manhole covers replaced or inflow seals installed
- 551 sump pumps redirected
- 5,425 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 in a Sanitary Sewer

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.

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

Inflow into a Manhole

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

Regional Wastewater Flow Trends

Wastewater Flow Graph 1 (page 7) provides long-term regional flow data for the Deer Island Treatment Plant collection system and annual rainfall. The long-term average daily flow for the total system is about 353 mgd (last 31 years from 1989-2019) 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 315 mgd, a reduction of 76 mgd or 19% 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 significant rainfall exceeds the 1,270 mgd plant capacity, more than 3.5 times the average flow. 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 (2015-2019), MWRA's average daily flow of 315 mgd has been about 11% below the long-term average of 353 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 98 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:

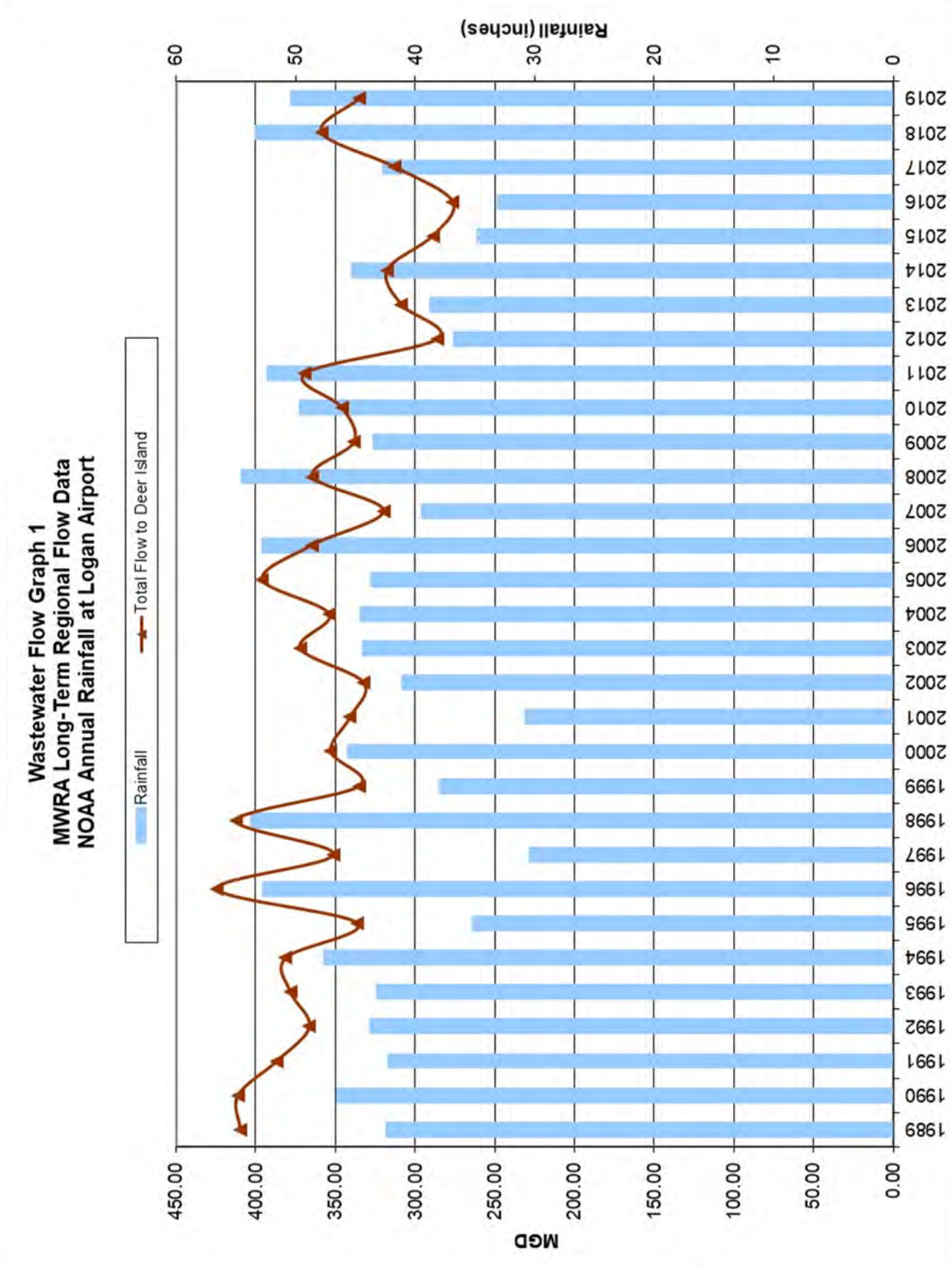
- MWRA's financial assistance for local I/I reduction and sewer rehabilitation projects provide gradual improvements to the regional collection system reducing I/I and stormwater. However, each year the regional collection system gets older and continues to deteriorate, which increases I/I.

- 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
Rainfall
Total Flow to Deer Island
MGD
Rainfall (inches)
450.00
400.00
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
60
50
40
30
20
10
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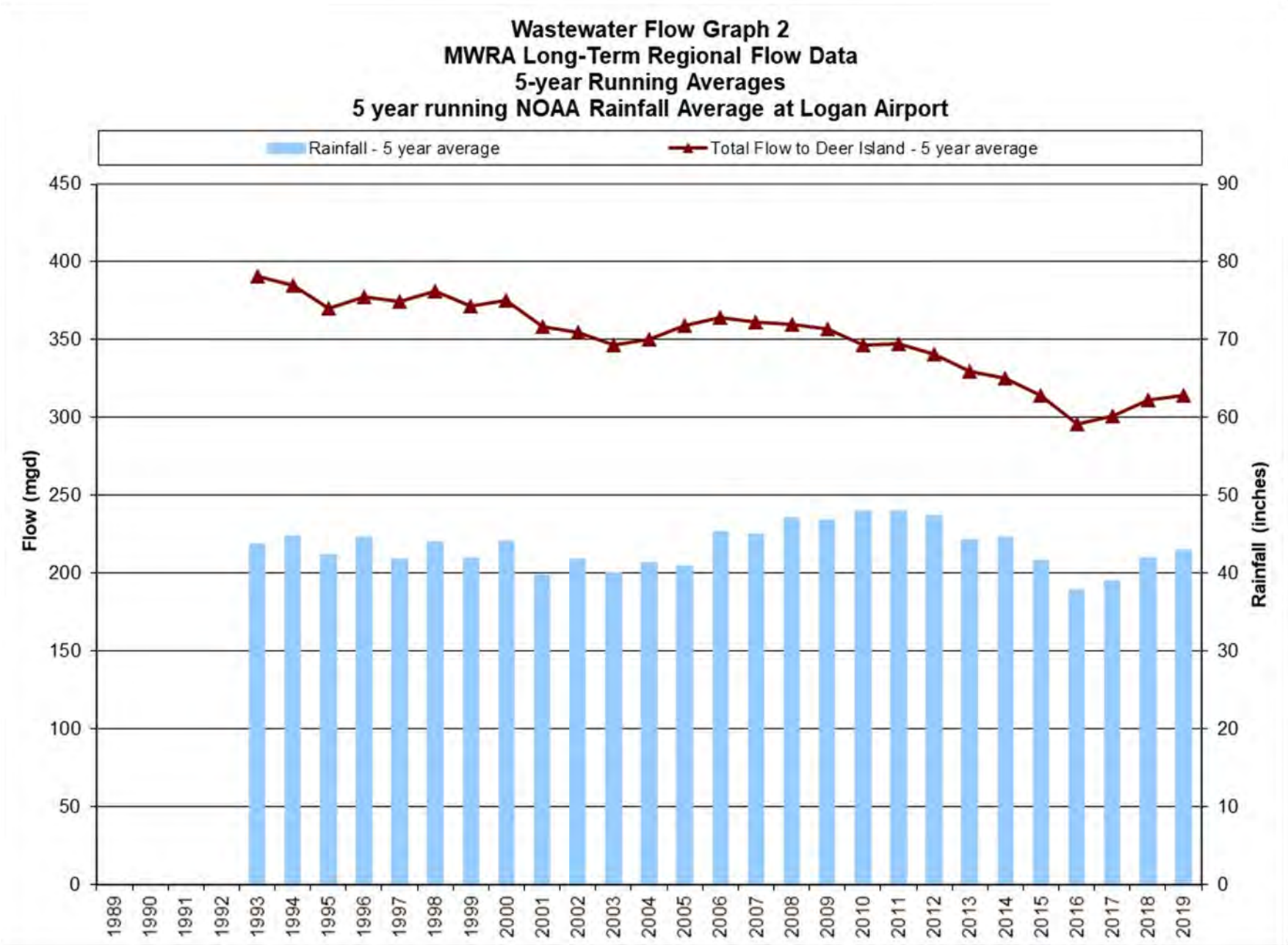
Wastewater Flow Graph 2
MWRA Long-Term Regional Flow Data
5-year Running Averages
5 year running NOAA Rainfall Average at Logan Airport
Rainfall - 5 year average
Total Flow to Deer Island - 5 year average
Flow (mgd)
Rainfall (inches)
450
400
350
300
250
200
150
100
50
0
90
80
70
60
50
40
30
20
10
0
1989
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2017
2018
2019

Community Projects Funded During FY20

During FY20, MWRA distributed a total of $40.4 million in grants and loans to member communities to help fund 29 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 FY20:

- First Quarter FY20 - August 2019 Funding Cycle with $14,287,100 distributed to eight communities: Belmont, Boston, Framingham, Hingham, Milton, Newton, Weymouth, and Winchester;

- Second Quarter FY20 - November 2019 Funding Cycle with $10,990,840 distributed to ten communities: Braintree, Dedham, Lexington, Melrose, Needham, Stoughton, Walpole, Watertown, Wilmington, and Woburn;

- Third Quarter FY20 - February 2020 Funding Cycle with $9,635,048 distributed to eight communities: Arlington, Braintree, Chelsea, Quincy, Randolph, Wakefield, Walpole, and Winthrop; and,

- Fourth Quarter FY20 - May 2020 Funding Cycle with $5,454,250 distributed to three communities: Brookline, Framingham, and Winthrop.

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM FUNDING SUMMARY

August 2019 Funding Cycle

Community	Funding Allocation
Belmont	$1,295,000
Boston	$2,952,100
Framingham	$2,050,000
Hingham	$390,000
Milton	$1,150,000
Newton	$4,580,000
Weymouth	$1,000,000
Winchester	$870,000
TOTAL	$14,287,100

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

TOWN OF BELMONT, MASSACHUSETTS
TOWN-WIDE MAINLINE SEWER REHABILITATION PROJECT
MWRA PROJECT NO. WRA-P11-04-3-1116

SCOPE OF SERVICES

The purpose of this project is to reduce I/I through rehabilitating sewer pipes in specific community sewer areas. Over the past 10 years, the Town has conducted cleaning and CCTV inspections within the sewer system through several investigation projects with the majority of the projects through their annual Pavement Management Program (PMP). The Town has inspected approximately 95,000 LF of sewer throughout the Town that have not been fully rehabilitated (i.e. replaced, lined or tested and sealed). Many of these segments have had structural repairs completed by excavation methods that were required to be repaired prior to roadway reconstruction as part of their PMP. The pipes were ranked using a 1-5 rating system with 1 in excellent condition to 5 being severely deteriorated. Utilizing the Town's 2007 Comprehensive Flow Monitoring Program Infiltration/Inflow Report, 9 of the 20 sewer tributary areas were at or above 4000 GPD/IDM. These infiltrating priority areas will be targeted for the scope of the Mainline Sewer Lining Project.

Approximately 28,000 LF of sewer has been inspected in the top nine areas that rated a 3, 4 or 5. Other areas of known infiltration or identified defective pipe will be incorporated as the scope is developed during design. Several packages of Additive Alternate Work will be incorporated to maximize the use of MWRA I/I financial assistance funds.

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 April 17, 2019.

Total project cost is estimated at $530,000. Eligible MWRA I/I Local Financial Assistance funding is $447,000.

PROJECT SCHEDULE

Item	Start Date	Completion Date
Design	August 2019	November 2019
Construction	November 2019	October 2020

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
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TOWN OF BELMONT, MASSACHUSETTS
TOWN-WIDE SUMP PUMP DISCONNECT/RELOCATION PROJECT /
MANHOLE INSERT FLOW METER PILOT STUDY (SUBAREA E)
MWRA PROJECT NO. WRA-P11-04-3-1124

SCOPE OF SERVICES

The purpose of these projects is to reduce I/I through relocating sump pumps and rehabilitating sewer pipes in specific community sewer areas.

The first project to be implemented under this funding is a Sump Pump Disconnect and Relocation Project. This project includes the relocation of approximately 118 sump pumps. These sump pumps are directly connected to the sewer and are targeted for relocation to storm drains.

The second project includes a pilot study to determine the effectiveness of the inflow removed. Subarea E has been targeted as the highest ranked inflow area according to the 2007 Comprehensive Flow Monitoring Program I/I Report and will be the area used to insert flow meters for the study.

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 July 12, 2019.

Total project cost is estimated at $848,000. Eligible MWRA I/I Local Financial Assistance funding is $848,000.

PROJECT SCHEDULE

Item	Start Date	Completion Date
Study	September 2019	June 2020
Design (Sump Pump Relocation)	September 2019	August 2020
Construction	September 2020	December 2021

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM
ATTACHMENT A
MWRA PROJECT NO. WRA-P11-05-3-1121

BWSC WATER, SEWERAGE AND DRAINAGE WORKS IMPROVEMENTS
EAST BOSTON SEWER SEPARATION - PHASE II
BWSC CONTRACT NO. 17-309-005

SCOPE OF SERVICES

This project will separate sewer flows within East Boston. The project work area includes the following streets: Bennington Street / Decatur Street / Jeffries Street / Liverpool Street / London Street / Lubec Street / Meridian Street / Princeton Street / Saratoga Street / Summer Street / Webster Street. The separation of sewers and drains will result in a decrease of combined sewer overflows that currently discharge to the Mystic and Chelsea Rivers (BOS 012 / 13). Separation of this area was not included in the MWRA's CSO Plan.

Work to be performed under this project includes, but is not necessarily limited to, contracted installation of approximately 1370 linear feet (LF) of 10 to 24-inch sewer pipe; structurally lining 4205 LF of 10-inch to 24-inch x 27-inch sewer pipe; installation of 27 manholes and four (4) catch basins; disconnecting 73 downspouts; rehabilitating 15 sewer manholes; performing one (1) excavated point repair; cleaning and TV inspecting 4205 LF of sewer pipe; and the performance of all other work pursuant to the terms and conditions detailed within the plans and specifications of BWSC Contract No. 17-309-005 [Water, Sewerage and Drainage Works Improvements in East Boston (East Boston Sewer Separation - Phase II)] and the approved MWRA Phase 11 I/I Local Financial Assistance Project Application received May 31, 2019.

The area being separated by this project is approximately 6 acres. 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 $4,974,150. Eligible MWRA I/I Local Financial Assistance is $2,952,100 (Separation Construction = $2,952,100).

PROJECT SCHEDULE

Item	Start Date	Completion Date
Construction	June 2019	August 2020

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
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CITY OF FRAMINGHAM, MASSACHUSETTS
WORCESTER ROAD WASTEWATER INFRASTRUCTURE IMPROVEMENTS
(PHASE I: EASTBOUND) - CONSTRUCTION (CONTRACT PW-402)
(PHASE II: WESTBOUND) - DESIGN
(PHASE III: NORTH-SOUTH SEWER CONNECTOR) - DESIGN
MWRA PROJECT NO. WRA-P11-14-3-1113

SCOPE OF SERVICES

Worcester Road (Eastbound) Wastewater Improvements (Phase I) – Construction: The proposed project includes contracted wastewater infrastructure replacement along Worcester Road in the City of Framingham. Phase I work is located along the eastbound side of Worcester Road (Concord Street to Natick Town Line) and includes residential work along Pierce Street and Dinsmore Avenue. Eligible work to be performed under this project includes, but is not necessarily limited to: 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; cleaning and TV inspection of 5820 LF of storm drain; and the performance of all other work pursuant to the terms and conditions detailed within the plans and specifications of Framingham Contract No. PW-402 (Worcester Road Water and Sewer Improvements - Phase I Eastbound) and the approved MWRA Phase 11 I/I Local Financial Assistance Project Application received March 26, 2019.

Project construction cost is estimated at $5,225,000. Eligible MWRA I/I Local Financial Assistance is $1,480,000 (Construction: $1,158,000 / Construction Administration & Resident Inspection: $322,000. [Additional project funding ($1,271,090) was provided under MWRA Project No. WRA-P11-14-3-1112].

Worcester Road (Westbound) Wastewater Improvements (Phase II) - Design: 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. Eligible MWRA I/I Local Financial Assistance is $90,000.

Worcester Road (North-South Sewer Connector) Improvements (Phase III) - Design: 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. Eligible MWRA I/I Local Financial Assistance is $480,000.

Total project cost (Phase I Construction / Phase II Design / Phase III Design) is estimated at $8,537,270. Eligible MWRA I/I Local Financial Assistance is $2,050,000 (MWRA I/I Program Phase 10 Funding Limit). As a result of the above Phase I construction work, an estimated 0.10 mgd of peak infiltration will be removed from the collection system upon contract completion.

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

CITY OF FRAMINGHAM, MASSACHUSETTS
WORCESTER ROAD WASTEWATER INFRASTRUCTURE IMPROVEMENTS
(PHASE I: EASTBOUND) - CONSTRUCTION (CONTRACT PW-402)
(PHASE II: WESTBOUND) - DESIGN
(PHASE III: NORTH-SOUTH SEWER CONNECTOR) - DESIGN
MWRA PROJECT NO. WRA-P11-14-3-1113

PROJECT SCHEDULE

Item	Start Date	Completion Date
Worcester Road (Eastbound) Wastewater Improvements (Phase I) - Construction:		
Construction	June 2019	December 2020
Worcester Road (Westbound) Wastewater Improvements (Phase II) - Design:		
Design	June 2019	December 2019
Worcester Road (North-South Sewer Connector) Improvements (Phase III) - Design:		
Design	June 2020	December 2020

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

TOWN OF HINGHAM, MASSACHUSETTS
CONTRACT FY17-S2: I/I INVESTIGATION & REHABILITATION PROGRAM
YEAR 3 ANNUAL SEWER PROGRAM - INFILTRATION AND INFLOW SERVICES
MWRA PROJECT NO. WRA-P11-15-3-1127

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 work area includes Hingham Sewer Subareas 1 through 8. Project work will include, but not be limited to, the following:

ON-CALL WASTEWATER SERVICES CONTRACT FY17-S2 (WORK ORDER 1.1) -
YEAR 3 ANNUAL SEWER PROGRAM: Contract 1 - Sewer cleaning and inspection including television inspection of approximately 40,000 LF of sewers. (Estimated Cost = $98,110)

YEAR 3 ANNUAL SEWER PROGRAM - INFILTRATION AND INFLOW SERVICES: Review television inspection videos of as many as 40,000 LF of sewer; topside manhole inspections of as many as 275 sanitary sewer manholes; perform a GIS mapping update; populate database with inspection information; submit a detailed letter report that describes the areas in which work was performed, summarize the work completed to date and include 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. (Estimated Cost = $87,000)

ON-CALL WASTEWATER SERVICES CONTRACT FY17-S2 (WORK ORDER 2.1) -
YEAR 2 ANNUAL SEWER PROGRAM CONSTRUCTION: Contract 2 - 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. (Estimated Cost = $204,890)

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 August 9, 2019 and the Agreements For Engineering Services By And Between The Town of Hingham, MA And Weston & Sampson Engineers. Peak I/I reduction is estimated to be 0.03 mgd. Total project cost is estimated at $390,000. Eligible MWRA I/I Local Financial Assistance is $390,000 (Phase 12 Funding Allocation Limit).

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

TOWN OF HINGHAM, MASSACHUSETTS
CONTRACT FY17-S2: I/I INVESTIGATION & REHABILITATION PROGRAM
YEAR 3 ANNUAL SEWER PROGRAM - INFILTRATION AND INFLOW SERVICES
MWRA PROJECT NO. WRA-P11-15-3-1127

PROJECT SCHEDULE

Item	Start Date	Completion Date
Year 3 Annual Sewer Program		
Manhole Inspections	Spring 2019	Spring 2019
TV Inspections (On-Call Services Contract 1)	Spring 2019	Spring 2019
TV Inspections Review	Summer 2019	Fall 2019
Engineering Review / Reporting / Updating Database	Fall 2019	Winter 2020
On-Call Wastewater Services		
Year 2 Annual Sewer Program Construction	Fall 2019	Winter 2020
Year 2 Annual Sewer Program Construction Retest	Spring 2020	Spring 2020

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

TOWN OF MILTON, MASSACHUSETTS
YEAR 14 INFILTRATION REHABILITATION - DESIGN / CONSTRUCTION
(MILTON CONTRACT NO. S19-1)

CIP PROGRAM 1 I/I INVESTIGATION AND REPORTING - STUDY
MWRA PROJECT NO. WRA-P11-21-3-1123

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-04 / G-06 / G-07 / G-11B / G-11E / PS-02 / PS-03 / S-17A / S-18. Project work will include, but not be limited to, the following:

1. **Year 14 Infiltration Rehabilitation Design:** Design cost-effective and value-effective sewer rehabilitations in Subareas G-04 / G-06 / G-07 / G-11B / G-11E / PS-02 / PS-03 / S-17A / S-18; 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. **Year 14 Infiltration Rehabilitation Construction (Milton Contract No. S19-1):** Construction of cost-effective and value-effective sewer rehabilitations in Subareas G-04 / G-06 / G-07 / G-11B / G-11E / PS-02 / PS-03 / S-17A / S-18 and the performance of construction public bid/award/resident project representative services. Sewer rehabilitation work (Base Bid + Alternate Bid No. 1) includes approximately: 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. (Eligible Construction Cost = $848,000 / Eligible Construction Services Cost = $100,000)

3. **CIP Program 1 I/I Investigation and Reporting:** Clean, TV inspect, videotape and record 51,400 LF of sewer; conduct flow isolation on 50,100 LF of sewer; and perform topside manhole inspections of 300 sewer manholes in Subareas DI-02 / G-05A / G-05B / G-05C. (Eligible Investigation Services Cost = $127,000)

The above work will be performed pursuant to the terms and conditions detailed within the March 12, 2019 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 10, 2019. Total project cost is estimated at $1,409,172 (Design = $75,000 / Construction = $1,031,514 / Construction Services = $100,000 / Investigation Services = $202,658). Eligible MWRA I/I Local Financial Assistance is $1,150,000 (Phase 11 Allocation Limit). As a result of the above work, an estimated 0.08 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
YEAR 14 INFILTRATION REHABILITATION - DESIGN / CONSTRUCTION
(MILTON CONTRACT NO. S19-1)

CIP PROGRAM 1 I/I INVESTIGATION AND REPORTING - STUDY
MWRA PROJECT NO. WRA-P11-21-3-1123

PROJECT SCHEDULE

Item	Start Date	Completion Date
Year 14 Infiltration Rehabilitation		
Design	February 2019	March 2019
Design Review	April 2019	May 2019
Advertise	May 2019	May 2019
Bid Opening	June 2019	June 2019
Contract Award	July 2019	July 2019
Rehabilitation Construction	August 2019	October 2019
Warranty Retesting	April 2020	May 2020
CIP Program 1 I/I Investigation and Reporting		
Investigation	March 2019	July 2019
Data Review/Report Preparation	August 2019	December 2019

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

CITY OF NEWTON, MASSACHUSETTS
CIP PROJECT 7 & 8 SEWER REHABILITATIONS: DESIGN & CONSTRUCTION
MWRA PROJECT NO. WRA-P11-24-3-1126

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 design of CIP Project 8 and construction of CIP Projects 7 & 8.

The project area for CIP Project 7 includes Newton Subareas A006 / B034 / B035 / B036 / B037 / B038 / B039 / B040 / B073 / B075 / B076 / B077. Project work will include, but not be limited to, the following:

1. Root treatment of 13,150 LF of 6 to 32 x 22-inch diameter sewer main;
2. Install CIPP liners in 25,000 LF of 6 to 32 x 22-inch diameter sewer main;
3. Install structural CIPP liners in 11,175 LF of 6 to 12-inch diameter sewer main;
4. Install shorts liners in 185 LF of 8 to 20-inch diameter sewer main;
5. Install structural short liner in six (6) LF of 12-inch diameter sewer main;
6. Test and grout 45 service connections;
7. Install five (5) lateral liners;
8. Cut 17 protruding service connections;
9. Root treatment of nine (9) sewer manholes; and
10. Line 138 sewer manholes (includes invert sealing, exterior grouting and interior sealing).

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 work.

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 July 22, 2019. Total project cost is estimated at $9,053,641 (Construction = $7,353,641 / Construction Services = $1,400,000). Eligible MWRA I/I Local Financial Assistance is $4,580,000 (Phase 12 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.

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

CITY OF NEWTON, MASSACHUSETTS
CIP PROJECT 7 & 8 SEWER REHABILITATIONS: DESIGN & CONSTRUCTION
MWRA PROJECT NO. WRA-P11-24-3-1126

PROJECT SCHEDULE

Item	Start Date	Completion Date
Design:		
CIP Project 8 Design	September 2019	August 2020
CIP Project 8 Bid/Award	August 2020	September 2020
Construction:		
CIP Project 7 Construction	October 2019	September 2020
CIP Project 7 Warranty Retesting	April 2021	September 2021
CIP Project 8 Construction	October 2020	September 2021
CIP Project 8 Warranty Retesting	April 2022	September 2022

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

TOWN OF WEYMOUTH, MASSACHUSETTS
2019 SEWER SYSTEM I/I REHABILITATION: DESIGN / CONSTRUCTION
MWRA PROJECT NO. WRA-P11-39-3-1125

SCOPE OF SERVICES

The purpose of this project is to rehabilitate community sewer subareas (Subarea C-10) that contribute excessive I/I.

Rehabilitation work will include, but not be limited to, the following: 25,650 LF of cleaning and TV inspection; 23,000 LF of cleaning, inspecting, testing and sealing of sewer joints; chemical root treatment of 4250 LF of sewer main and eight (8) sewer manholes; topside inspection of 55 sewer manholes; installing 8500 LF of CIP pipe; installing short liners at 50 locations and structural short liners at four (4) locations; installing lateral liners at one (1) location; performing open cut point repairs at four (4) locations; testing and grouting 55 service connections; CIP lining of six (6) laterals; installing one (1) new sewer manhole; cementitious lining of 84 sewer manholes; furnishing and installing 15 manhole inflow dishes; and replacing six (6) manhole frames and convers.

Total rehabilitation project cost is estimated at $1,000,000. Eligible MWRA I/I Local Financial Assistance is $1,000,000 (Design & Construction Services: $190,000 / Rehabilitation Construction = $810,000). 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 July 17, 2019), the Contract Between The Town of Weymouth And Weston & Sampson Engineers, Inc. (dated May 17, 2019) and the Town of Weymouth Sewer System I/I Rehabilitation Contract Documents. As a result of the above work, an estimated 0.15 mgd of peak I/I will be removed from the collection system upon contract completion.

PROJECT SCHEDULE

Item	Start Date	Completion Date
Design	August 2019	September 2019
Bid & Award	October 2019	October 2019
Construction w/Warranty Retesting	November 2019	February 2020

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
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TOWN OF WINCHESTER, MASSACHUSETTS
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

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. The recommended sewer rehabilitations will be performed in the West Side and Leslie Road/Lawson Road Areas.

The recommended sewer rehabilitations will include but is not limited to: cleaning & TV inspection of 5 to 16-inch diameter sewers; root treatment of 6 to 12-inch diameter sewers and manholes; clean, inspect, testing & sealing of 6 to 12-inch diameter sewers; installation of short liners and structural short liners in 6 to 12-inch diameter sewers; installation of cured-in-place pipe liners and cured-in-place structural pipe liners in 6 to 12-inch diameter sewers; installation of lateral liners; testing & grouting of sewer services; cutting of protruding service connections; open cut repair of sewers; replacing the service connection wyes; cementitious lining of manholes; replacement of manhole frames & covers; building manhole benches & inverts; repairing manhole benches & inverts; sealing a combined manhole (MH No. SB-493); furnishing & installing manhole inflow dishes; installing bolted & gasketed manhole frames & covers; and all other related tasks and appurtenances including permanent and temporary pavement, police details and mobilization.

The intent of this project is to prioritize the sewer rehabilitations to take full advantage of the available construction estimated cost of $795,000. Therefore, the actual quantity and type of individual sewer rehabilitation items will not be known until completion of the project design and cost estimate which is expected in March 2020.

PROJECT SCHEDULE

Item	Start Date	Completion Date
Design	September 2019	March 2020
Construction	April 2020	December 2020

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM FUNDING SUMMARY

November 2019 Funding Cycle

Community	Funding Allocation
Braintree	$689,840
Dedham	$1,160,000
Lexington	$1,560,000
Melrose	$1,500,000
Needham	$800,000
Stoughton	$1,175,000
Walpole	$638,000
Watertown	$1,050,000
Wilmington	$428,000
Woburn	$1,990,000
TOTAL	$10,990,840

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

TOWN OF BRAINTREE, MASSACHUSETTS
I/I INVESTIGATION AND REHABILITATION PROGRAM - YEAR 7
2020 ANNUAL WASTEWATER FLOW MONITORING
MWRA PROJECT NO. WRA-P11-06-3-1129

SCOPE OF SERVICES

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

Year 7 I/I Investigation - Study / Design / Bid & Award (Est. Cost = $ 50,068)

Flow isolate as much as 46,400 LF of sewer in Braintree Sewer Subareas C3 / L6 / L7 / T1 to quantify infiltration amounts within manhole-to-manhole segments of sewer. Clean, TV inspect, videotape and record as much as 55,500 LF of sewer in Braintree Sewer Subareas C3 / L6 / L7 / T1. The TV inspection will be performed to locate problem areas and I/I sources within manhole-to-manhole segments of sewer. Conduct a topside physical survey of as many as 290 sewer manholes in Braintree Sewer Subareas C3 / L6 / L7 / T1 to identify defects and I/I sources. A written log will be furnished for each manhole inspected; and 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. Project work will be performed pursuant to the terms and conditions detailed within the 2019 Agreement For Engineering Services (Task Order No. 1) By And Between The Town of Braintree, MA And Weston & Sampson Engineers, Inc. This investigative work was also partially funded under MWRA Project No. WRA-P9-06-3-981 ($210,000).

Year 7 I/I Rehabilitation - Construction / Construction Services (Est. Cost = $ 459,772)

Construction of cost-effective and value-effective sewer rehabilitations in Subareas C3 / L6 / L7 / T1 / HC1 / HC2 / HC3 and the performance of construction public bid/award/resident project representative services. Sewer rehabilitation work (Base Bid + Alternate Bid Nos. 1 & 2) includes approximately: 21,400 LF of cleaning and television inspection; testing 4550 sewer joints and sealing 2275 sewer joints; installing 10,115 LF of CIP pipe; installing 162 LF of CIP short liners; grouting 195 reinstated service connections; installing ten (10) CIP lateral liners; cutting eight (8) protruding service connections; testing and grouting 38 service connections; and rehabilitating eight (8) sewer manholes (Eligible Construction Cost = $409,272 / Eligible Construction Services Cost = $50,500). This rehabilitation work was also partially funded under MWRA Project No. WRA-P9-06-3-981 ($550,000).

I/I INVESTIGATION AND REHABILITATION PROGRAM - YEAR 7
2020 ANNUAL WASTEWATER FLOW MONITORING
MWRA PROJECT NO. WRA-P11-06-3-1129

SCOPE OF SERVICES (continued)

2020 Annual Wastewater Flow Monitoring - Study (Est. Cost = $ 180,000)

Flow Monitoring: Calibrate and maintain as many as 10 continuous wastewater flow meters throughout the Town. The meters will record flows for a period of one year (120 meter-months). Meters will be installed in manholes containing measurable flow. This task includes as many as ten (10) relocations of meters, which can occur at any point throughout the contract. *Rainfall Monitoring:* Collect rainfall data throughout the course of the monitoring period for purposes of evaluating wastewater flow monitoring data and calculating peak inflow rates. Rainfall data will be collected from three (3) rainfall gauges currently owned by the Town. *Groundwater Monitoring:* Monitor groundwater levels at the USGS ground gauge site located in Duxbury, MA. As this groundwater gauge is located outside the project area, it only serves to indicate the general groundwater trends of the region, not the immediate study area. Weekly groundwater readings will be noted during the monitoring period. *Data Retrieval, Analysis and Reporting:* Monitor flow information on a monthly basis through the metering contractor's internet website. Data in electronic format shall be provided to the Town upon request. On an annual basis, the Town's consultant will estimate inflow and infiltration rates per area metered based on the flow metering information and rainfall data. The Town's consultant will prepare a letter report summarizing the flow monitoring results. The letter report will identify areas that appear to contribute excessive inflow and infiltration based on the data and will provide estimates of peak inflow and infiltration. The data obtained through this flow metering effort may be used to: (1) assess pre- and post-construction wastewater flows; (2) identify potential future metering sites; and (3) reassess the Town's July 2011 Annual I/I Removal Program. Project work will be performed pursuant to the terms and conditions detailed within the 2019 Agreement For Engineering Services (Task Order No. 4) By And Between The Town of Braintree, MA And Weston & Sampson Engineers, Inc.

Total project cost is estimated at $689,840. Eligible MWRA I/I Local Financial Assistance is $689,840. 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 16, 2019) 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 0.40 mgd of peak I/I will be removed from the collection system.

PROJECT SCHEDULE

Item	Start Date	Completion Date
Year 7 I/I Investigation / Rehabilitation:		
I/I Investigation and Reporting	March 2018	January 2019
Design	February 2019	July 2019
Bid and Award	August 2019	October 2019
Construction	November 2019	March 2020
Warranty Retesting	March 2021	May 2021
2020 Annual Wastewater Flow Monitoring:		
Flow Monitoring	January 2020	December 2020
Summary Report	January 2021	June 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-P11-12-3-1130

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:

Sewer rehabilitation work includes the installation of approximately 12,064 linear feet (LF) of cured-in-place (CIP) pipe; installation of 43 LF of short liners; lining 327 vertical feet of sewer manholes; CIP lining of 63 service connections; and installing ten (10) manhole benches and inverts (Estimated Rehabilitation Construction Cost = $1,004,560).

Additional work includes conducting a topside physical survey in as many as 660 sewer manholes and television inspection in as many as 130,000 LF of sewer main within Dedham Sewer Subareas DD / JJ / LL / MM and RR. (Estimated Manhole Survey Cost = $55,440 / Estimated Television Inspection Cost = $100,000).

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 October 18, 2019 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 11 Funding Allocation Limit). As a result of the above work, an estimated 0.18 mgd of peak infiltration will be removed from the collection system upon contract completion.

PROJECT SCHEDULE

Item	Start Date	Completion Date
Rehabilitation Construction	January 2020	December 2020
Warranty Retesting	March 2021	June 2021
TV / Manhole Inspection	March 2020	June 2020

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

TOWN OF LEXINGTON, MASSACHUSETTS
PHASE 7 SEWER SYSTEM IMPROVEMENTS - CONSTRUCTION
MWRA PROJECT NO. WRA-P11-17-3-1132

SCOPE OF SERVICES

The purpose of this project is to rehabilitate community sewer basins that contribute excessive I/I to the sanitary sewer system. The project area is primary located within Lexington Sewer Basins 1 / 6 / 7 / 8, with a few locations in Sewer Basins 2 / 12 / 13 / 14. Project work will include, but not be limited to, the following:

1. Perform three (3) open cut point repairs;
2. Excavate and dispose of 20 CY of rock;
3. Perform 28,586 LF of cleaning and inspection of sewers;
4. Perform 17,109 LF of cleaning, inspection, testing and sealing of sewers;
5. Perform testing of 2095 joints;
6. Perform sealing of 1048 joints;
7. Perform 1239 VF of cementitious lining in manholes;
8. Perform various rehabilitations to 55 manholes as specified in base bid;
9. Install 12 VF of internal drop connections in sewer manholes;
10. Install CIP short liners in 187 LF of sewer main;
11. Install structural CIP short liners in 46 LF of sewer main;
12. Grout (9) reinstated services;
13. Install CIPP in 12,555 LF of sewer main;
14. Grout 185 reinstated service connections;
15. Test and grout 65 service connections;
16. Cut six (6) intruding service connections;
17. Clean, inspect, and install 10 CIP lateral liners (up to 5 feet); and
18. Install CIP lateral liners in 100 LF of sewer main.

The above wok will be performed pursuant to the terms and conditions detailed within the Agreement For Engineering Services By and Between the Town of Lexington and Weston & Sampson Engineers, Inc. and the approved MWRA I/I Local Financial Assistance Project Application received October 17, 2019. Total project cost is estimated at $1,890,000 (Construction = $ 1,890,000). Eligible MWRA I/I Local Financial Assistance is $1,560,000 (Phase 12 Distribution). As a result of the above work, an estimated 0.16 mgd of peak infiltration will be removed from the collection system.

PROJECT SCHEDULE

Item	Start Date	Completion Date
Bid Opening / Contract Award	December 2019	December 2019
Rehabilitation Construction	January 2020	May 2020
Retesting & Warranty Inspection	March 2021	May 2021

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

CITY OF MELROSE, MASSACHUSETTS
PHASE 2 SEWER REHABILITATION PROJECT - DESIGN / CONSTRUCTION
PHASE 3 SEWER SYSTEM EVALUATION SURVEY - STUDY
MWRA PROJECT NO. WRA-P11-20-3-1137

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 the following:

Phase 2 Design and Construction: Work to be performed under this project includes: preparation of design plans and specifications, and publically bidding and constructing a CIPP liner project for the sewer rehabilitation of issues and I/I identified during the Phase 2 SSES Study. 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 October 23, 2019. (Estimated Design Cost = $45,400) / (Estimated Construction Cost = $908,300) / (Construction Services Cost = $25,800).

Phase 3 Sewer System Evaluation Survey: Project work will be conducted in Subareas 2/2A, 5/5A, 9, 20B (tributary to Subarea 19) and 22. This work includes, but will not be limited to the following: CCTV inspections, flow isolation, and smoke testing of approximately 76,000 LF of sewer mains and inspection of approximately 500 manholes. A written log will be furnished for each manhole inspected. Preparing 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 & Analysis Cost = $375,500).

Also included within this funding is a City Force Account charge ($65,000) associated with a Project Engineer and Deputy City Engineer within the City Engineering Division to oversee all phases of these projects. Police Details costs ($80,000) are also included within this funding.

Total cost for the above projects is estimated at $1,500,000. Eligible MWRA I/I Local Financial Assistance is $1,500,000 (Phase 11 & 12 funding).

PROJECT SCHEDULE

Item	Start Date	Completion Date
Phase 2 - Design	November 2019	December 2019
Phase 2 - Project Bid & Award	January 2020	February 2020
Phase 2 - Rehabilitation Construction	February 2020	December 2020
Phase 2 - Re-Test Warranty Inspection	September 2021	October 2021
Phase 3 - SSES Study	March 2020	November 2020

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

TOWN OF NEEDHAM, MASSACHUSETTS
I/I REMOVAL 2019 - CONSTRUCTION
(NEEDHAM CONTRACT NO. 20DPW022C)
MWRA PROJECT NO. WRA-P11-23-3-1128

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:

Construction of cost-effective and value-effective sewer rehabilitations in Needham Sewer Subareas 2-5 / 11-17 / 19-1 / 20-33 and the performance of construction public bid/award/resident project representative services. Sewer rehabilitation work (Base Bid + Alternate Bid No. 1) includes approximately: 26,200 LF of cleaning and television inspection of sewer main (pre- & post rehabilitation); chemical root treatment of 3150 LF of sewer main; chemical root treat of three (3) sewer services and two (2) sewer manholes; installing 10,000 LF of CIP pipe; sealing (grouting) 250 wyes; rehabilitating 270 VF of sewer manholes; and performing 101 sewer point liner repairs.

Total project cost is estimated at $1,534,623. Eligible MWRA I/I Local Financial Assistance is $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 7, 2019) and the Agreements For Engineering Services By And Between The Town of Needham, MA And BETA Group, Inc. As a result of the above work, an estimated 0.47 mgd of peak infiltration will be removed from the collection system.

PROJECT SCHEDULE

Item	Start Date	Completion Date
Rehabilitation Construction	October 2019	July 2021
Warranty Retesting	March 2022	June 2022

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

TOWN OF STOUGHTON, MASSACHUSETTS
YEARS 6 / 7 I/I REHABILITATION: CONSTRUCTION

ON-CALL SEWER CONTRACT DOCUMENT DEVELOPMENT AND BID & AWARD SERVICES

YEAR 8 SPRING 2020 I/I INVESTIGATION AND REPORTING
MWRA PROJECT NO. WRA-P11-32-3-1138

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:

Years 6 / 7 I/I Rehabilitation Construction: Construction of cost-effective / value-effective sewer rehabilitations and the performance of construction resident project representative services. Sewer rehabilitation work includes approximately: cleaning, inspecting, testing and sealing 8000 LF of sewer; testing & grouting 20 taps at connection to the main line; installing 14,000 LF of structural CIP pipe; installing 55 LF of structural short liners; performing open cut repairs at three (3) locations; rehabilitating 42 sewer manholes; installing 22 sewer manhole inflow dishes; replacing six (6) sewer manhole frames & covers; and resetting ten (10) sewer manhole framed & covers. (Estimated Construction Cost = $850,000 / Estimated Construction Services Cost = $150,000).

On-Call Sewer Contract Document Development and Bid & Award Services: Contracted design, bid & award services for contract documents associated with on-call sewer services. (Estimated Services Cost = $25,000).

Year 8 Spring 2020 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 feet of the 100-Year Flood Plan 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 = $150,000).

The above work will be performed pursuant to the terms and conditions detailed within Task Order No. FY20 #2 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 November 6, 2019. Total project cost is estimated at $1,175,000. Eligible MWRA I/I Local Financial Assistance is $1,175,000. As a result of the above work, an estimated 0.09 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 STOUGHTON, MASSACHUSETTS
YEARS 6 / 7 I/I REHABILITATION: CONSTRUCTION
ON-CALL SEWER CONTRACT DOCUMENT DEVELOPMENT AND BID & AWARD SERVICES
YEAR 8 SPRING 2020 I/I INVESTIGATION AND REPORTING
MWRA PROJECT NO. WRA-P11-32-3-1138

PROJECT SCHEDULE

Item	Start Date	Completion Date
Years 6 / 7 I/I Rehabilitation Construction		
Design / Design Review	November 2019	February 2020
Advertise	February 2020	February 2020
Bid Opening	March 2020	March 2020
Rehabilitation Construction	May 2020	October 2020
Warranty Retesting	April 2021	May 2021
On-Call Sewer Contract Document Development and Bid & Award Services		
Design / Design Review	November 2019	February 2020
Advertise	February 2020	February 2020
Bid Opening	March 2020	March 2020
Rehabilitation Construction	May 2020	October 2020
Warranty Retesting	April 2021	May 2021
Year 8 Spring 2020 I/I Investigation and Reporting		
Manhole Inspection	March 2020	May 2020
TV Inspection	March 2020	May 2020
TV Inspection Review	June 2020	August 2020
Data Review / Letter Report	September 2020	November 2020

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

TOWN OF WALPOLE, MASSACHUSETTS
2020 SEWER SYSTEM REHABILITATION - DESIGN / CONSTRUCTION
I/I REMOVAL PROGRAM (ROUND 2, YEAR 5) - INVESTIGATION
MWRA PROJECT NO. WRA-P11-34-3-1135

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:

2020 Sewer System Rehabilitation - Design/Construction/Construction Services

Rehabilitation work (in Walpole Sewer Subareas 1 / 2 / 4 / 6 / 7 / 13 / 14 / 16 / 17) will include, but not be limited to, the following: clean & TV inspect 34,708 LF of 8 to 36-inch sewer main; perform 175 topside sewer manhole inspections; test 6144 sewer joints; seal 3287 sewer joints; cementitious line 635 VF of sewer manholes; rehabilitate 19 sewer manholes; furnish & install 20 sewer manhole frames & covers; install 7500 LF of CIPP within 8 to 15-inch sewer main; grout 135 reinstated sewer laterals; grout 58 sewer laterals; install two (2) CIP lateral liners; install 96 LF of CIP short liners; and perform two (2) open cut point repairs. Estimated project cost = $1,348,887 (Design & Const. Services: $215,000 / Construction: $1,133,887). Eligible project cost = $530,600 (Design & Construction Services: $215,000 / Construction: $315,600). (Additional Construction funding provided through MWRA Project No. WRA-P11-34-3-1146)

I/I Removal Program (Round 2, Year 5) - Investigation

Investigation work will include 50,000 LF of flow isolation, 50,000 LF of TV inspection and topside physical survey of 300 sewer manholes within Stoughton Sewer Subarea 5. Work also includes the preparation of 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. (Eligible Investigation Services Cost: $207,400).

Total project cost is estimated at $1,556,287. Eligible MWRA I/I Local Financial Assistance is $738,000. As a result of the above work, an estimated 0.07 mgd of peak infiltration will be removed from the collection system.

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

TOWN OF WALPOLE, MASSACHUSETTS
2020 SEWER SYSTEM REHABILITATION - DESIGN / CONSTRUCTION
I/I REMOVAL PROGRAM (ROUND 2, YEAR 5) - INVESTIGATION
MWRA PROJECT NO. WRA-P11-34-3-1135

PROJECT SCHEDULE

Item	Start Date	Completion Date
2020 Sewer System Rehabilitation - Design/Construction/Construction Services:		
Design	January 2020	May 2020
Construction	July 2020	December 2020
Warranty Retesting	March 2021	May 2021
I/I Removal Program (Round 2, Year 5) - Investigation:		
Manhole Inspection	March 2020	May 2020
TV Inspection	March 2020	May 2020
TV Inspection Review	June 2020	August 2020
Data Review / Letter Report	September 2020	November 2020

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
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TOWN OF WATERTOWN, MASSACHUSETTS
CIP PROJECT 1 - PHASE II SEWER REHABILITATION CONSTRUCTION
MWRA PROJECT NO. WRA-P11-36-3-1133

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 I construction is currently underway and is being funded by MWRA Project No. WRA P11-36-3-1109.

This project is part of the town's sanitary sewer capital improvement plan. The construction project will be the second phase of rehabilitations identified from the CIP Project 1 investigations. The project will include rehabilitations in Sewer Subareas 1, 2, 6, 7, 9, 14, 16 and 18. 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. A final opinion of probable construction cost will be estimated. Phase II Construction will begin Spring 2020 upon the completion of Phase I construction.

The total project cost is estimated at $1,200,000. Eligible MWRA I/I Local Financial Assistance is $1,050,000 (MWRA Phase 10 Allocation Total) (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 October 18, 2019) and the Agreement For Engineering Services By and Between the Town of Watertown, MA and Weston & Sampson Engineers. I/I reduction totals will be estimated upon prioritization of the project area.

PROJECT SCHEDULE

Item	Start Date	Completion Date
Design	December 2019	February 2020
Construction	March 2020	April 2021

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
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FINANCIAL ASSISTANCE AGREEMENT

TOWN OF WILMINGTON, MASSACHUSETTS
ADDITIONAL CONSTRUCTION OF SEWER AND
MANHOLE REHABILITATON (SUBAREAS 5 /8)
MWRA PROJECT NO. WRA-P11-40-3-1136

SCOPE OF SERVICES

The purpose of this project is to reduce I/I through rehabilitating manholes and sewer mains in specific community sewer areas. This project funding will be combined with previous MWRA project funding of $428,000 (WRA-P11-40-3-1118) from June 2019 to perform construction rehabilitations within Wilmington's Sewer Meter Subareas 5 / 8. The work is based primarily on findings from the 2017-2018 Town-Wide Infiltration/Inflow Analysis (construction project). This project is part of a multi-phased sewer rehabilitation project for the Town and will include, but not be limited to, the following:

Installing 9800 LF of trenchless rehabilitation CIPPL and associated work; performing five (5) cured-in-place spot repairs (CIPSR); testing and sealing 95 services; installing five (5) lateral connection liners (LCL); rehabilitating 40 manholes, including cementitious or epoxy lining, grout injection, chimney seals, and repairs/replacement of frames and covers. The construction work 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 October 21, 2019.

Total project cost is estimated at $1,006,000. Eligible MWRA I/I Local Financial Assistance is $428,000 (MWRA Phase 10 allocation). Estimated I/I removal will be determined upon contract completion.

PROJECT SCHEDULE

Item	Start Date	Completion Date
Design	June 2019	October 2019
Project Bid & Award	November 2019	December 2019
Rehabilitation Construction	March 2020	September 2020
Re-Test Warranty Inspection	September 2021	October 2021

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
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CITY OF WOBURN, MASSACHUSETTS

CIP PROJECTS 1 / 2 / 5: STUDY
CIP SMOKE TESTING - PROJECT 2: STUDY
CIP PROJECT 4: DESIGN / CONSTRUCTION

MWRA PROJECT NO. WRA-P11-43-3-1134

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 City is requesting money for design, planning, and construction projects. A summary of the projects is included below. These projects are part of the community's East Woburn Sewer Capital Improvement (CIP) Plan.

CIP Project 1 Post Construction Flow Evaluation and CIP Project 2 Post Construction Flow Evaluation will evaluate pre-rehabilitation and post-rehabilitation flow isolation values to estimate peak infiltration removed through rehabilitations.

CIP Project 5 Inspection and Assessment will identify and quantify sources of infiltration and inflow. This work will include, but not be limited to: field investigations, manhole inspections, flow isolation and television inspection, project mapping, data analysis, preliminary design, cost effective analyses, and summary reporting.

CIP Smoke Testing - Project 2 will identify and quantify sources of inflow. This work will include, but not be limited to: field investigations, smoke testing, dyed-water testing, and dyed-water flooding, project mapping, data analysis, preliminary design, cost effective analyses, and summary reporting.

CIP Project 4 will include design and rehabilitation construction. Construction plans and specifications (to remove excessive I/I) will be developed and submitted, followed by rehabilitation construction. Construction will include 'Trenchless' and 'Excavate and Replace' rehabilitations to eliminate infiltration and inflow from the sanitary sewer system.

The overall total project cost is estimated at $1,990,000. Eligible MWRA I/I Local Financial Assistance is $1,990,000 (MWRA Phase 12 Allocation Total) (Planning = $730,250; Design $109,200; Construction = $1,150,550).

Project work will be performed pursuant to the terms and conditions detailed within the approved MWRA I/I Local Financial Assistance Project Application (received October 18, 2019) and the Agreement For Engineering Services By and Between the City of Woburn, MA and Weston & Sampson Engineers, Inc. Estimated I/I quantities to be reduced will be calculated following completion of the design.

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
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CITY OF WOBURN, MASSACHUSETTS

CIP PROJECTS 1 / 2 / 5: STUDY
CIP SMOKE TESTING - PROJECT 2: STUDY
CIP PROJECT 4: DESIGN / CONSTRUCTION

MWRA PROJECT NO. WRA-P11-43-3-1134

PROJECT SCHEDULE

Item	Start Date	Completion Date
Planning:		
CIP Project 1 Post Const. Flow Evaluation	December 2019	April 2020
CIP Project 2 Post Const. Flow Evaluation	December 2019	April 2020
CIP Project 5 Inspection and Assessment	February 2020	December 2020
CIP Smoke Testing - Project 2	July 2020	December 2020
Design:		
CIP Project 4 Design	December 2019	May 2020
CIP Project 4 Bid and Award	June 2020	July 2020
Construction:		
CIP Project 4 Rehab Construction	July 2020	January 2021
CIP Project 4 Re-Test Warranty Inspection	October 2021	November 2021

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM FUNDING SUMMARY

February 2020 Funding Cycle

Community	Funding Allocation
Arlington	$800,000
Braintree	$880,000
Chelsea	$2,949,000
Quincy	$1,780,200
Randolph	$1,076,258
Wakefield	$753,590
Walpole	$810,000
Winthrop	$586,000
TOTAL	$9,635,048

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
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TOWN OF ARLINGTON, MASSACHUSETTS

TASK 1 - PHASE #12 DESIGN, BID, & AWARD
TASK 2 - PHASE #12 REHABILITATION CONSTRUCTION & CONSTRUCTION SERVICES
TASK 3 - PHASE #10 POST-CONSTRUCTION FLOW EVALUATION

MWRA PROJECT NO. WRA-P11-01-3-1143

SCOPE OF SERVICES

The Town of Arlington requests funding for the following projects which are part of the Town's Sewer System Investigation and Planning Program, which is designed to reduce Inflow and Infiltration. Each phase of the Program includes the most cost-effective repairs remaining within the Town. The work included in the Phase #12 Design and Rehabilitation Construction Projects (Task 1 & 2) will be located in various portions of Investigation Area #1 through Area #11. Locus maps will be produced at the completion of the Phase #12 Design.

Task 1 - Phase #12 Design, Bid, & Award:
The goal of the Phase #12 Design, Bid & Award project is to design the removal of cost-effective sources of I/I and produce contract documents suitable for public bidding in the investigation areas named above.

Task 2 - Phase #12 Rehabilitation Construction & Construction Services:
The goal of the Phase #12 Construction project is to rehabilitate and repair sewer infrastructure and remove sources of I/I identified during previous Sewer System Investigation Projects and included in the Phase #12 Design, Bid & Award project, within the investigation areas stated above.

Task 3 - Phase #10 Post Construction Flow Evaluation:
The Phase #10 Post-Construction Flow Evaluation will compare pre and post-rehabilitation ground water levels and flow isolation data to estimate the quantity of peak infiltration removed from the sewer system form the Phase #10 Construction project. A Draft and Final Report will be prepared evaluating the pre- and post-construction flows.

The above work will be performed pursuant to the terms and conditions detailed within the Agreement For Engineering Services By and Between the Town of Arlington and Weston & Sampson Engineers, Inc. and the approved MWRA I/I Local Financial Assistance Project Application received January 15, 2020. Total project cost is estimated at $885,000. Eligible MWRA I/I Local Financial Assistance is $800,000 (Phase 11 funds). (Eligible Phase #12 Design, Bid, & Award Cost = $85,000; Eligible Phase #12 Construction & Construction Services Cost = $700,000; Eligible Phase #10 Post Construction Flow Evaluation Cost = $15,000). Estimated I/I removal will be determined upon contract completion.

PROJECT SCHEDULE

Item	Start Date	Completion Date
Phase #12 Design, Bid & Award	January 2020	May 2020
Phase #12 Construction w/Warranty Retesting	July 2020	May 2021
Phase #10 Post Construction Flow Evaluation	May 2020	August 2020

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
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TOWN OF BRAINTREE, MASSACHUSETTS

I/I INVESTIGATION AND REHABILITATION PROGRAM - YEAR 9
MWRA PROJECT NO. WRA-P11-06-3-1142

SCOPE OF SERVICES

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

Year 9 I/I Investigation - Study (Est. Cost = $ 193,750)

Flow isolate as much as 42,500 LF of sewer in Braintree Sewer Subareas A1 / B1 / G1 / KG1 / N1 / R1 to quantify infiltration amounts within manhole-to-manhole segments of sewer. Clean, TV inspect, videotape and record as much as 46,900 LF of sewer in Braintree Sewer Subareas A1 / B1 / G1 / KG1 / N1 / R1. The TV inspection will be performed to locate problem areas and I/I sources within manhole-to-manhole segments of sewer. Conduct a topside physical survey of as many as 275 sewer manholes in Braintree Sewer Subareas A1 / B1 / G1 / KG1 / N1 / R1 to identify defects and I/I sources. A written log will be furnished for each manhole inspected; and 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. Project work will be performed pursuant to the terms and conditions detailed within the 2020 Agreement For Engineering Services (Task Order No. 5) By And Between The Town of Braintree, MA And Weston & Sampson Engineers, Inc.

Year 9 I/I Rehabilitation - Design/Construction/Construction Services (Est. Cost = $ 686,250)

Design and Construction of cost-effective and value-effective sewer rehabilitations in Subareas A1 / B1 / G1 / KG1 / N1 / R1 and the performance of construction public bid/award/resident project representative services. (Eligible Design Cost = $68,000 / Eligible Construction Cost = $508,250 / Eligible Construction Services Cost = $110,000).

Total project cost is estimated at $880,000. Eligible MWRA I/I Local Financial Assistance is $880,000. 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 January 13, 2020) 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 0.40 mgd of peak I/I will be removed from the collection system upon contract completion.

PROJECT SCHEDULE

Item	Start Date	Completion Date
I/I Investigation and Reporting	March 2020	January 2021
Design	February 2021	May 2021
Bid and Award	June 2021	June 2021
Construction/Retesting	July 2021	May 2022

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
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CITY OF CHELSEA, MASSACHUSETTS
BROADWAY & CARY AVENUE UTILITY IMPROVEMENTS PROJECT
MWRA PROJECT NO. WRA-P11-11-3-1141

SCOPE OF SERVICES

This sewer project is part of a construction project that involves the reconstruction/replacement of the water, sewer and storm drain infrastructure on Broadway between City Hall Mall and the City Limit at Revere, and the construction of drain and sewer improvements on Cary Avenue between Crescent Avenue and Broadway.

Eligible I/I Project work will include, but not be limited to: installation of approximately 4300 LF of 12-inch, 15-inch, and 18-inch PVC sewer with building connections and manholes; 350 LF of 12-inch and 36-inch RCP drain; and 1500 LF of 8-inch perforated underdrain along with catch basins, clean outs, and manholes. The project will remove approximately 4900 LF of aged VC combined sewer.

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 January 7, 2020. The total sewer portion of the project cost is estimated at $2,949,000 (Construction = $ 2,949,000). Eligible MWRA I/I Local Financial Assistance is $2,949,000 (Phase 10 & 11 Distribution). The inflow removal from this project will be applied in the future when all phases of the sewer system separation are complete. Infiltration removal estimates have not yet been completed.

PROJECT SCHEDULE

Item	Start Date	Completion Date
Design		February 2020
Bid & Award	March 2020	April 2020
Construction	July 2020	October 2021
Warranty Re-Test	August 2022	September 2022

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
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CITY OF QUINCY, MASSACHUSETTS
CITY-WIDE I/I IDENTIFICATION (SSES) & REHABILITATION CONSTRUCTION
MWRA PROJECT NO. WRA-P11-26-3-1140

SCOPE OF SERVICES

Project Type: Proposed project work is a combination of planning and construction. The planning portion will consist of a new Sanitary Sewer Evaluation Survey (SSES) as well as an addendum for two previously completed SSESs to provide supplementary information. The construction portion will rehabilitate sewer mains/manholes previously identified as in disrepair.

Project Objective: This project will rehabilitate damaged/aging sewer main and reduce I/I. This project will also help the City to effectively identify additional sources of I/I and damaged sewer main and prioritize needed repairs so that future public funds are applied to the most critical areas to provide a high return on investment. Over the years, investigation efforts have identified areas with I/I sources estimated to be more than one-half of the City's sewer flow.

In 2009, the City updated their focused plan to address the areas with the highest I/I, develop a schedule for rehabilitation of leaking sewer main and structures possibly impacting surface water quality, and systematically remove I/I from the system. Initial efforts focused on coastal areas due to the large quantities of I/I from tidal influence. The City conducted SSESs in 2011 and 2018 to refine and pinpoint areas within the collection system that are contributing to extraneous flows and provide recommendations for rehabilitation measures.

Based on the results of the previous SSESs, other investigations, and feedback from City staff and the public, the City has performed sewer projects to remedy I/I and water quality issues during each construction season between 2009 and 2019. This project will complete additional rehabilitation work and increase the amount of the City that has been analyzed in via an SSES. The project's scope of work will have two main components: (1) Rehabilitation Construction of sewer main/manholes with I/I contributions or suspected water quality impacts; and (2) SSES work consisting of field investigations, analysis of available data and documentation/reporting of findings.

Phase 1 Rehabilitation Construction: The proposed rehabilitation sites were selected for design/ construction due to the high priority given to them through prior SSES evaluation. These pipes have high I/I and significant structural damage. Rehabilitation design for these pipes is complete. Project work will be performed on Belmont Avenue, Island Avenue and within the Elmwood Park area and include open cut replacement of 1741 LF of 8 and 10-inch diameter sewer main. For improved bidding conditions, as well as reduced public disturbance, project construction will be included in an open cut bid package previously funded under MWRA Project No. WRA-P9-26-3-992. Peak I/I reduction from this work is estimated at 0.03 mgd.

Phase 2 Sanitary Sewer Evaluation Survey: SSES work will help to identify and quantify collection system I/I as well as prioritize projects to reduce I/I and water quality impacts in the future. As part of this work, two prior SSES documents, the 2018 Wollaston Beach SSES and the 2018 SSES, will be revisited and augmented with additional analysis consistent with required EPA guidelines as summarized in the draft EPA Consent Decree. The 2020 SSES field work will include: (1) Smoke Testing 220,704 LF of sewer main; (2) Flow Isolating 180,704 LF of sewer main; (3) Inspection of 1233 sewer manholes; (4) CCTV inspection of 137,558 LF sewer main; and (5) Sewer flow monitoring utilizing 12 flow meters and 175 groundwater level piezometers.

CITY OF QUINCY, MASSACHUSETTS
CITY-WIDE I/I IDENTIFICATION (SSES) & REHABILITATION CONSTRUCTION
MWRA PROJECT NO. WRA-P11-26-3-1140

SCOPE OF SERVICES continued

The 2020 SSES will evaluate approximately 20% of the City's 209 miles of sewer main and 8800 sewer manholes. The investigation locations will be selected based on several guidelines including, but not limited to, areas where high I/I is suspected, where multiple benefits can be achieved (i.e. flow monitoring locations where I/I can be evaluated that benefits future model calibration and informs bypass pumping requirements in future construction), and where other planned utility work within the City will be located so as not to miss windows of opportunity for rehabilitation.

Phase 3 Project Management: Work in this Phase includes project management, team communications, public outreach for SSES field investigations and strategic planning for future improvements.

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 January 10, 2020.

Total project cost is estimated at $2,830,200 (Rehabilitation Construction = $1,030,000 / SSES = $1,689,400 / Project Management = $ 110,800). Eligible MWRA I/I Local Financial Assistance is $1,780,200.

As a result of the above rehabilitation construction work, an estimated 0.03 mgd of peak I/I will be removed from the collection system upon contract completion.

PROJECT SCHEDULE

Item	Start Date	Completion Date
Rehabilitation Construction	November 2019	December 2020
Sanitary Sewer Evaluation Survey	December 2019	September 2020
Project Management	November 2019	December 2020

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
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TOWN OF RANDOLPH, MASSACHUSETTS
I/I REHABILITATION - DESIGN / CONSTRUCTION
MWRA PROJECT NO. WRA-P11-27-3-1139

SCOPE OF SERVICES

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

1. **I/I Rehabilitation Design:** The Town of Randolph conducted a flow monitoring program on its entire wastewater collection system in Spring 2017. The data from that program was used to develop an Infiltration and Inflow Analysis that included information on sub-areas experiencing high infiltration and inflow. The report also included recommendations for future I/I mitigation in those sub-areas. This proposed project is based on those recommendations. Rehabilitation design work will provide cost-effective and value-effective sewer rehabilitations; preparation of construction drawings and specifications for rehabilitation design public bidding; and preparation of a final cost estimate for the designed rehabilitations. (Estimated Design Cost = $99,500).

2. **I/I Rehabilitation Construction:** Construction of cost-effective and value-effective sewer rehabilitations and the performance of construction services (public bid and award) / resident inspection. Construction will include CCTV inspection of 52,000 LF of sewer main; rehabilitation of 45 sewer manholes; CIP lining of 5200 LF of sewer main; installing five (5) CIP short liners; grouting ten (10) service connections; removing & replacing sewer main at eight (8) locations; testing & sealing 1500 LF of sewer main; and performing chemical root treatment within 1500 LF of sewer main. Construction will also include the lining of the Marindale Road Street Pump Station wet well. (Estimated Construction Cost = $843,600 / Estimated Construction Services and Resident Inspection Cost = $102,000 / Police Details = $31,158).

The above work will be performed pursuant to the terms and conditions detailed within the Agreement For Professional Services By and Between the Town of Randolph and BETA Group, Inc. and the approved MWRA Phase 11 I/I Local Financial Assistance Project Application received January 3, 2020.

Total project cost is estimated at $1,076,258. Eligible MWRA I/I Local Financial Assistance is $1,076,258 (Phase 9 Distribution). 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.

PROJECT SCHEDULE

Item	Start Date	Completion Date
Design	January 2020	April 2020
Construction	May 2020	October 2020

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
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TOWN OF WAKEFIELD, MASSACHUSETTS
SEWER SYSTEM INFILTRATION REHABILITATION (YEAR 3) –
DESIGN & CONSTRUCTION
MWRA PROJECT NO. WRA-P11-33-3-1131

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 9766 LF of cleaning and inspection of sewers;
3. Perform 3646 LF of cleaning and inspection of brick interceptor;
4. Perform 1660 LF of cleaning, inspection, testing and sealing of sewers;
5. Perform testing of 287 joints;
6. Perform sealing of 144 joints;
7. Perform 650 VF of cementitious lining in manholes;
8. Perform various rehabilitations to 37 manholes as specified in base bid;
9. Install CIP short liners in 6 LF of sewer main;
10. Install structural CIP short liners in 4 LF of sewer main;
11. Install CIPP liners in 4343 LF of sewer main;
12. Install structural CIPP liners in 966 LF of sewer main;
13. Grout 137 reinstated service connections;
14. Cut three (3) intruding service connections; and
15. Television inspect, test, and grout (12) service connections.

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., the approved MWRA I/I Local Financial Assistance Project Application received October 16, 2019 (updated project scope letter received on January 14, 2020). Total project cost is estimated at $905,000 (Design/Construction Services = $205,000) / (Construction = $ 700,000). Eligible MWRA I/I Local Financial Assistance is $753,590 (Phase 11 Distribution). An estimate of I/I removal from this rehabilitation project has yet to be determined.

PROJECT SCHEDULE

Item	Start Date	Completion Date
Design		January 2020
Bid Opening / Contract Award	February 2020	March 2020
Rehabilitation Construction	March 2020	June 2020
Retesting & Warranty Inspection	March 2021	April 2021

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
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TOWN OF WALPOLE, MASSACHUSETTS
2020 SEWER SYSTEM REHABILITATION - CONSTRUCTION
MWRA PROJECT NO. WRA-P11-34-3-1146

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:

2020 Sewer System Rehabilitation - Construction

Rehabilitation work (in Walpole Sewer Subareas 1 / 2 / 4 / 6 / 7 / 13 / 14 / 16 / 17) will include, but not be limited to, the following: clean & TV inspect 34,708 LF of 8 to 36-inch sewer main; perform 175 topside sewer manhole inspections; test 6144 sewer joints; seal 3287 sewer joints; cementitious line 635 VF of sewer manholes; rehabilitate 19 sewer manholes; furnish & install 20 sewer manhole frames & covers; install 7500 LF of CIPP within 8 to 15-inch sewer main; grout 135 reinstated sewer laterals; grout 58 sewer laterals; install two (2) CIP lateral liners; install 96 LF of CIP short liners; and perform two (2) open cut point repairs.

Total construction cost is estimated at $1,133,887. Eligible MWRA I/I Local Financial Assistance is $810,000 (MWRA Phase 11 Allocation Limit = $810,000) (Additional Construction funding provided through MWRA Project No. WRA-P11-34-3-1135). As a result of the above work, an estimated 0.07 mgd of peak infiltration will be removed from the collection system upon contract completion.

PROJECT SCHEDULE

Item	Start Date	Completion Date
Construction	May 2020	December 2020
Warranty Retesting	March 2021	May 2021

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
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TOWN OF WINTHROP, MASSACHUSETTS

CENTER BUSINESS DISTRICT INFRASTRUCTURE IMPROVEMENTS
MWRA PROJECT NO. WRA-P11-42-3-1144

SCOPE OF SERVICES

This sewer project is part of a larger infrastructure and streetscape improvements project that involves the reconstruction/replacement of water, sewer and storm drain infrastructure in the Centre Business District of Winthrop.

Eligible I/I Project work will include, but not be limited to: construction of sewer main replacement on Pauline Street, Walden Street, Somerset Avenue, Cottage Park Road, Bartlett Road, Adams Street and Williams Street. Service laterals will be replaced from the sewer main to the property line to maximize reduction of I/I contribution. Approximately 4450 LF of 8 through 15-inch sewers will be constructed.

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 January 16, 2020. The total sewer portion of the project cost is estimated at $586,000 (Construction = $ 586,000). Eligible MWRA I/I Local Financial Assistance is $586,000 (Phase 10 & 11 Distribution). At the completion of this project, it is estimated that an annual average I/I of 0.105 mgd will be reduced from the collection system.

PROJECT SCHEDULE

Item	Start Date	Completion Date
Design	Complete	Complete
Bid & Award	Complete	Complete
Construction	April 2020	November 2021
Warranty Re-Test		May 2022

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM FUNDING SUMMARY

May 2020 Funding Cycle

Community	Funding Allocation
Brookline	$3,000,000
Framingham	$1,546,000
Winthrop	$908,250
TOTAL	$5,454,250

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
ATTACHMENT A
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TOWN OF BROOKLINE, MASSACHUSETTS
DESIGN & CONSTRUCTION OF RECOMMENDED SEWER REHABILITATIONS
IN SEWER SUBAREAS NI-4 / NI-5 / NI-7 / NI-8 / NI-9
MWRA PROJECT NO. WRA-P11-07-3-1147

SCOPE OF SERVICES

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

The investigation work includes but is not limited to the following: review of closed-circuit television (CCTV) inspection for all sewer mains in Sewer Subarea NI-8; field inspections of all sewer manholes within this subarea; review of smoke testing results and completing field investigations to address 12 catch basins connected to existing sewers within Sewer Subareas NI-4 / 5 / 7 / 8 / 9; and completing smoke testing within Sewer Subareas NI-1 / 2 / 3 / 6 /12 / DI-10 / X-14. The investigation portion of the project is being paid for by Town funds. The MWRA grant/loan will fund the design and construction phases. The design component of the project involves the preparation of biddable construction documents based on the investigation work completed. Separate construction contracts will be administered for the CIPP lining of sewers in NI-8, sewer manhole rehabilitation in NI-8, dig and replace point repair contract of sewers needing replacement in NI-8, and a separation contract to remove existing catch basins in Sewer Subareas NI-4 / 5 / 7 / 8 / 9. The construction component of the project involves the construction of measures outlined in the biddable construction documents and construction administration. The construction of the recommended sewer rehabilitations will include, but is not limited to: approximately 34,125 LF of cured-in-place (CIPP) lining of sanitary sewers and rehabilitation of approximately 210 manholes.

The above work will be performed pursuant to the terms and conditions detailed within the Agreement For Engineering Services By and Between the Town of Brookline and BETA Group, Inc. and the approved MWRA I/I Local Financial Assistance Project Application received April 16, 2020. The total project cost is estimated at $3,089,549. Eligible MWRA I/I Local Financial Assistance is $3,000,000 (Design = $270,450 / Construction = $2,729,550). As a result of the above work, an estimated 0.10 mgd of annual I/I will be removed from the collection system upon contract completion.

PROJECT SCHEDULE

Item	Start Date	Completion Date
I/I Investigations	April 2020	September 2020
Rehabilitation Design	June 2020	August 2020
Rehabilitation Construction	August 2020	March 2021

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
ATTACHMENT A-1
FINANCIAL ASSISTANCE AGREEMENT

CITY OF FRAMINGHAM, MASSACHUSETTS
UNION AVENUE & PEARL STREET SEWER SYSTEM REHABILITATION (PW 407)
MWRA PROJECT NO. WRA-P11-14-3-1148

SCOPE OF SERVICES

The Union Avenue & Pearl Street Sewer System Rehabilitation eligible project work includes, but is not necessarily limited to, the following:

· Replacement of approximately 650 linear feet of 8-inch sewer main;
· Replacement of approximately 250 linear feet of 10-inch sewer main;
· Installation of approximately 575 linear feet of 10-inch cured-in-place sewer main liner;
· Installation of approximately 575 linear feet of 12-inch cured-in-place sewer main liner;
· Replacement of approximately 800 linear feet of sewer service laterals; and
· Replacement of approximately 11 sewer manholes.

The proposed project is located within the Union Avenue area of Framingham, MA. The limits of the project area are Union Avenue between Proctor Street and Beech Street and Pearl Street between Lincoln Street and Franklin Street.

Eligible MWRA I/I Local Financial Assistance is $796,000 (Rehabilitation Construction: $662,000 / Construction Administration & Resident Inspection: $134,000). As a result of the above rehabilitation work, an estimated 0.14 mgd of peak infiltration will be removed from the collection system upon contract completion.

PROJECT SCHEDULE

Item	Start Date	Completion Date
Construction	June 2019	December 2020

MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM - PHASE 11
ATTACHMENT A-2
FINANCIAL ASSISTANCE AGREEMENT

CITY OF FRAMINGHAM, MASSACHUSETTS
SEWER SYSTEM EVALUATION SURVEY - PHASE 6
MWRA PROJECT NO. WRA-P11-14-3-1149

SCOPE OF SERVICES

The Sewer System Evaluation Survey - Phase 6 project work includes the following: (1) Dyed Water Testing of suspect inflow sources in as many as one hundred and fifteen (115) suspected private inflow sources that were identified during the SSES Phases 1 through 5 projects (including floor drains, roof leaders, yard drains, window drains, and driveway drains) in order to confirm or deny their connection to the sanitary sewer. Submit memorandum summarizing the results of the dyed water testing; (2) Private Source Inflow Removal Program Development: Perform building inspections in as many as thirty-eight (38) properties that were identified to have a sump pump connected to the sanitary sewer during the SSES Phases 1 through 5 projects in order to confirm or deny their connection to the sanitary sewer, and collect information for removal; Prepare a memorandum summarizing the results of the building inspections; Prepare an Invitation for Bid (IFB) document to secure contractor to perform sump pump separation work. A portion of the funding may be used towards sump pump separation; and (3) Infiltration/Inflow (I/I) Analyses (Flow Monitoring) Phase 6 Area including: Installing fifteen (15) flow metering devices, six (6) groundwater gauges, and one (1) rainfall gauge for a twelve week monitoring period. Perform an analysis of the meter data to estimate flow and I/I quantities. Prepare draft letter summarizing proposed scope of work and estimated costs for future SSES programs that includes potential investigation from past SSES studies. Additional future tasks to be performed as part of SSES Phase 6, Part 2 depend on the results of the above flow metering work and future decisions by the City and may include the following: Topside manhole inspections of as many as 945 manholes; Television inspection on as many as 173,500 LF of sanitary sewer segments ranging in size between 8 and 24-inches; Groundwater monitoring at as many as nine (9) locations; Cost-Effectiveness Analysis; A detailed letter report that will describe the area in which work was performed, summarize the work completed to date and include recommendations; a cost-effectiveness analysis and prioritization analysis for rehabilitation of those pipeline and manhole defects and sources of infiltration and inflow that have been identified during this investigation.

Total project cost is estimated at $750,000. Eligible MWRA I/I Local Financial Assistance is $750,000 (SSES Phase 6, Part 1: $369,000 / SSES Phase 6, Part 2: $381,000). As a result of the above Phase 6 rehabilitation work, an estimated 0.10 mgd of peak infiltration will be removed from the collection system upon contract completion.

PROJECT SCHEDULE

Item	Start Date	Completion Date
SSES Phase 6 - Part 1	September 2019	December 2020
SSES Phase 6 - Part 2	March 2021	June 2021
Design	July 2021	December 2021
Construction	March 2022	December 2022

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

TOWN OF WINTHROP, MASSACHUSETTS

PHASE 2 SSES /
PALMYRA STREET AND CRESCENT STREET SEWER IMPROVEMENTS
MWRA PROJECT NO. WRA-P11-42-3-1145

SCOPE OF SERVICES

The following two sewer projects to be funded through the MWRA I/I Local Financial Assistance Program are part of the Town's I/I reduction program.: **Phase 2 Sewer System Evaluation Survey (SSES)** and the **Palmyra Street and Crescent Street Sewer Improvements Project**. The projects are necessary to reduce I/I in the sewer system. The Phase 2 SSES project will identify locations where I/I is prevalent and make recommendations to cost-effectively remove these sources. The Palmyra Street and Crescent Street Sewer Improvements Project will repair sewer mains containing holes, cracks, voids and other deficiencies contributing I/I to the system and make necessary improvements to eliminate sanitary sewer overflows and the frequency required to clean and maintain these sewer mains.

The **Phase 2 Sewer System Evaluation Survey (SSES)**, is the next phase in the Town's I/I identification program. This work was recommended in the Town's Infiltration/Inflow Analysis report dated October 2019. Project work will include, but not be limited to the following: flow isolation, manhole inspections, CCTV inspections and smoke testing. The Phase 2 SSES work will identify sources of I/I in Subareas 2 / 2B / 3A / 3B / 4 / 5 / 9 / 9A. Data collected during the project will be reviewed and analyzed to determine where I/I can be cost effectively removed. The resulting deliverable will be a report that summarizes locations of defects causing I/I and recommendations to rehabilitate the affected sewers using trenchless technologies and conventional excavation.

The **Palmyra Street and Crescent Street Sewer Improvements Project** includes design and construction of sewer main replacement on Palmyra Street, Wheelock Street, Pauline Street and Crescent Street. The work will include, but not be limited to replacing approximately 1350 LF of 8-inch through 12-inch vitrified clay (VC) sewer mains with new 8-inch through 12-inch polyvinyl chloride (PVC) sewer mains. Service laterals will be replaced from the sewer main to the property line to maximize reduction of I/I contribution. An estimated nine manholes and ten frames & covers will also be replaced.

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 January 16, 2020. The total sewer portion of the project cost is estimated at $908,250 (Study = $298,500 / Design = $74,500 / Construction = $535,250). Eligible MWRA I/I Local Financial Assistance is $908,250 (Phase 11 & 12 Distribution). At the completion of this project, it is estimated that an annual average infiltration/inflow of 0.05 mgd will be removed from the collection system.

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

TOWN OF WINTHROP, MASSACHUSETTS

PHASE 2 SSES /
PALMYRA STREET AND CRESCENT STREET SEWER IMPROVEMENTS
MWRA PROJECT NO. WRA-P11-42-3-1145

PROJECT SCHEDULE

Item	Start Date	Completion Date
Phase 2 SSES:		
Flow Isolation, MH Inspections, CCTV, Smoke testing	March 2020	August 2020
SSES Report		December 2020
Palmyra Street and Crescent Street Sewer Improvements:		
Design		March 2020
Bid & Award	June 2020	July 2020
Construction	August 2020	November 2020
Final Paving		May 2021

ATTACHMENT 5
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY20
Reporting Period: July 2019 Through June 2020

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 FY20, MWRA has distributed $441 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 FY20. Community information is summarized below:

1. ARLINGTON: North System

Background Information:
- Miles of Sewer: 106
- Sewered Population: 45,474
- Three Year (CY17 - CY19) Annual Average I/I: 2.55 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 Arlington DPW is continuing its water meter replacement program. At the time of a water meter replacement, a building inspection is performed by the Town employee while they are still in the home. As of July 10, 2020, 7688 building inspections have been completed. The building inspections are ongoing and anticipated to be completed Town-wide by December 2020.

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 were opened on July 23, 2020. The project is expected to be substantially complete by November 2020 with warranty inspections completed by November 2021.

Reporting Period Activity: The warranty inspection for the Phase #10 Sanitary Sewer Rehabilitations - Bid No. 18-42 was completed in May 2020. The Phase #10 Post Construction Flow Evaluation Report was completed in July 2020.

The Phase #11 Sanitary Sewer Rehabilitations - Bid No. 19-23 was substantially complete in December 2019. The following work was completed: root treatment of 1808 LF of sewer; installed 7252 LF of cured-in-place pipe (CIPP) lining; grouted 156 service connections in cured-in-place pipe; installed 49 LF of gravity sewer; replaced one (1) sewer service connection; cut seven (7) protruding service connections; cementitious lining of 92 VF of manholes; grouted and patched four (4) manholes; installed two (2) manhole inflow dishes; built two (2) manhole benches and inverts; raised two (2) manhole frames and covers to grade; replaced one (1) frame and cover; 609 LF cleaning, inspection, testing, and sealing of mainline joints; enclosed seven (7) storm drains in shared manholes; tested and grouted nine (9) service connections; and installed nine (9) LF of cured-in-place short liners. Warranty inspections were completed in May 2020.

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: 13,549
- Three Year (CY17 - CY19) Annual Average I/I: 0.53 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

Private Source Inflow Removal Program: Sump pump/roof leader investigations (via DPW personnel) by sub-basin during CY19/20:

Sub-Basin 1:	172 inspections	Sub-Basin 2:	175 inspections
Sub-Basin 3:	54 inspections	Sub-Basin 4:	197 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. The majority of the 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: 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 95% complete. Smoke & Dye Testing work is scheduled to be 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 seven (8) 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 $2,076,050 remaining in funding assistance.

3. BEDFORD: North System

Background Information:
- Miles of Sewer: 78
- Sewered Population: 13,321
- Three Year (CY17 - CY19) Annual Average I/I: 1.30 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)

Private Source Inflow Removal Program: The recent water meter replacement program gained access to 4163 properties. During the meter change out, the contractor also inspected the sites for the presence of sump pumps. 1305 sump pumps were noted, of which 58 were discharging to a sewer connection and 52 were indeterminate as to the discharge point. Bedford's next step is to develop a plan to eliminate these connections from the sewer system, starting with the noted Town facilities. The Town will consider how much, if any, financial assistance it will provide to property owners for the work.

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

Reporting Period Activity: The Phase #5 Sanitary Sewer Rehabilitation Project was substantially complete in Summer 2019 and was successfully retested in Spring 2020. Line segments and manholes contained an estimated 117,504 gpd of infiltration (58,752 gpd removable).

The Old Billerica and Meadowbrook Sewer Pumping Stations were replaced in Summer/Fall 2019. Work included replacing or sealing pumping station wetwells to remove infiltration.

In early 2020, two multi-residential developments (100 Plank Street and 200 Albion Road) were charged local I/I fees based on the number of bedrooms to be constructed ($10/gal/day). These funds were collected at issuance of the building permits, but no buildings have been constructed to date.

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 (CY17 - CY19) Annual Average I/I: 1.74 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report: Preliminary Design Report - Investigations of Sewers to Identify I/I Report (January 2013)

Private Source Inflow Removal Program: Building inspections were completed for 83 homes to confirm sump pump connections. Of the houses inspected, 28 were determined to be connected to the sewer system. A sump pump removal and relocation project will be undertaken Spring 2021.

I/I Rehabilitation Projects in Design or Construction: The Town submitted two funding applications for MWRA I/I Local Financial Assistance in the August 2019 covering the following projects:
- Mainline CIPP Lining Project: Work includes 10,000 LF of sewer mainline lining;
- Manhole Cover Insert Inflow Study: Work will evaluate the effectiveness of inflow removal with manhole cover inserts with potential implementation Town-Wide.
- Private Sector Inflow Removal - Sump Pump Disconnection & Relocations: Work includes removal of up to 90 sump pumps connected to the sewer system.

The Mainline CIPP Lining Project has evolved into a comprehensive lining contract with mainline and lateral lining. Approximately 50 sewer laterals and 3500 LF of mainline sewer laterals will be lined. Additionally work includes service replacements and point repairs required ahead of the mainline CIPP lining. Project work is scheduled in begin August 2020 with substantial completion by December 2020.

The Manhole Cover Insert Inflow Study is ongoing. Several storm events were recorded this Spring prior to installation of the inserts. A couple of events have been successfully recorded after the inserts were installed with some difficulty getting recordable data after the inserts were installed. The data is being analyzed and a summary report will follow in the coming month.

The Private Sector Inflow Removal Project will include 30 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 mainlines will be lined in addition to multiple service replacements and point repairs.

Reporting Period Activity: The Town has inspected approximately 16,000 LF of sewer main and storm drain associated with the 2020 Pavement Management Program (PMP). Point repairs, service replacements and full-length replacements will be conducted on structural defects within the PMP limits in Spring/Summer 2020, Additional future trenchless repairs will be conducted to complete the recommended repairs.

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 $8,255,100 allotted through the Program's Phases 1 - 13, the community will have $3,968,000 remaining in funding assistance.

5. BOSTON: North and South Systems

Background Information:

- Miles of Sewer: 858
- Sewered Population: 683,724
- Three Year (CY17 - CY19) Annual Average I/I: 35.95 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: 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 10,500 dye water tests. Approximately 25,291 downspouts have been disconnected. During CY05 - CY20, 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-three (83) projects have received funding through the MWRA I/I Local Financial Assistance Program. During FY07 - FY20, BWSC completed the following MWRA-financed rehabilitation projects: 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: Upper Roxbury Area Sewer Separation Phase 2 (MWRA Project No. WRA-P9-05-3-969), East Boston Sewer Separation Phase I (MWRA Project No. WRA-P9-05-3-988) and East Boston Sewer Separation Phase II (MWRA Project No. WRA-P11-05-3-1121).

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-three (83) 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 $120,936,324 remaining in funding assistance.

6. BRAINTREE: South System

Background Information:

- Miles of Sewer: 140
- Sewered Population: 37,045
- Three Year (CY17 - CY19) Annual Average I/I: 4.42 mgd
- MassDEP Administrative Actions since 2010: None

Latest I/I or SSES Report: 2017 Annual Wastewater Flow Monitoring (April 2018)
Annual Town-Wide Sewer Program - Year 6 Investigation (January 2018)
Annual Town-Wide Sewer Program - Year 7 Investigation (January 2019)
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 (Ongoing)
Annual Town-Wide Sewer Program - Year 9 Investigation (Ongoing)

Private Source Inflow Removal Program: The Town has performed multiple building inspections over the past year. One private inflow source was removed from the sewer system and redirected.

Sump pump removal program is ongoing. Ten (10) private source sump pump removal contracts have redirected 296 sump pumps to date. 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 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 is substantially complete. Year 8 rehabilitation construction to be bid Fall 2020. (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 ongoing. The Year 7 project will remove 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 now substantially complete. Warranty Inspection work to be completed Summer 2020. 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: 2020 Annual Wastewater Flow Monitoring began January 2020 and will be complete December 2020 (MWRA Project No. WRA-P11-06-3-1129). 2019 Annual Wastewater Flow Monitoring began January 2019 and was complete December 2019. Summary Report to be complete Fall 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 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 fifteen (15) 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 $4,490,160 remaining in funding assistance.

7. BROOKLINE: North and South Systems

Background Information:

- Miles of Sewer: 111
- Sewered Population: 58,565
- Three Year (CY17 - CY19) Annual Average I/I: 4.45 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 Ave/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: Green Mountain Pipeline Services is the Town's contractor for Contract PW/18-22 Sewer System Rehabilitation. Contract work included installing 39,197 LF (7.4 miles) of 8 through 24-inch CIPP in the Town's sanitary sewer system. The contract is 95% complete, with expected completion in the next couple months. The Covid-19 Pandemic has delayed the installation of the final few CIPP liners to complete the project. Prior to CIPP, many of the sanitary sewers had extremely high infiltration (near Sargent Pond, NI-5 Basin) as witnessed on pre-lining CCTV.

National Water Main Cleaning Company is the Town's contractor for Contract PW/19-10 Epoxy Lining of Sewer Manholes. Contract work included installing 2574 VF of epoxy liner in 260 sewer manholes. The contractor also replaced 26 defective sewer manholes frames and covers. Extremely heavy infiltration was observed in a few of the sewer manholes connected to the 20-inch sewer around Sargent Pond. This contract is 95% complete.

In October 2019, the Town executed Contract PW/19-9 Sanitary Sewer Improvements with Aqua Line Utility Inc. This contract involved the replacement of 375 LF of collapsed sanitary 8-inch sewer pipe and six (6) sanitary sewer spot repairs. This contract is complete except for final restoration.

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, 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 (CY17 - CY19) Annual Average I/I: 1.76 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)

Private Source Inflow Removal Program: Performed 14 house-to-house inspections over the last year. The Town is attempting to inspect 37 Amnesty List properties to identify improper connections to the sanitary sewer system. Inspections are currently on hold due to the Covid-19 Pandemic. The Town's sewer connection fund balance (5 for 1 sewer connection fee), excluding encumbrances, is $1,416,816.

I/I Rehabilitation Projects in Design or Construction: Weston & Sampson completed Project 9 SSES Fall 2019 and identified 41,513 gpd of cost effective, value effective, and non-excessive recommended removable peak infiltration. Project 8 and 9 Rehabilitations are scheduled to start Summer 2020.

In June 2019, funds were distributed for the design and construction of sanitary sewer rehabilitations in the Project 8 and 9 Areas and a SSES in the Project 9 and 10 Areas. These projects are a component of the Town's Capital Improvement Program and part of a multi-phased sewer rehabilitation program. (MWRA Project No. WRA-P11-08-3-1119).

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 thirteen (13) 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 $2,220,000 remaining in funding assistance.

9. CAMBRIDGE: North System

Background Information:

- Miles of Sewer: 148
- Sewered Population: 107,278
- Three Year (CY17 - CY19) Annual Average I/I: 7.11 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)

Private Source Inflow Removal Program: The City removed the illicit connection at 57 Magazine Street in the Cambridgeport catchment area (referenced below) in August 2019. 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. The City also conducted house-to-house inspections and IDDE investigations in the Sparks Street and Matignon Road drainage areas over the past year. 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 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 will be redirected by Fall 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 are currently in progress for developments at: Cambridge Crossing (North Point Development), 203 Concord Turnpike, 50 Cambridge Park Drive, 55 Wheeler Street, 325 Main Street, 135 Broadway, Cambridgeside Mall Redevelopment, Volpe Center Redevelopment, 325 Binney Street, 87/101 Cambridge Park Drive and 101 Smith Place.

I/I Rehabilitation Projects in Design or Construction:

- Talbot Street Storm Drain and Outfall: completed June 2020
- Willard Street Sewer Separation and Re-establishment of the Stormwater Outfall: work at 90% design
- Binney Street Sewer Separation (Contract 9a&b by Divco): completed March 2020
- Monsignor O'Brien (MOB) Phase 1 Sewer Separation: estimated completion Fall 2021
- Monsignor O'Brien (MOB) Phase 2a (Lechmere Canal Outfall): estimated completion August 2020
- Parking Lot 6 (PL6) Stormwater Storage Tank Installation: estimated completion December 2020
- Cottage/Lopez Drainage Improvements Sewer Separation: subsurface construction is substantially complete
- Cambridge Crossing received an MWRA permit for a direct connection to the Cambridge Branch Sewer at Medford Street in Somerville. A total of 1200 LF of force main and 800 LF of gravity sewer has been installed.
- Cambridge Crossing Sewer Separation (Gore Street by Divco): estimated completion 2020
- Cambridge Crossing (Morgan Street) Pump Station: completed July 2020
- Inman Square Sewer Separation: under design, estimated completion Fall 2020
- Upper Hampshire Street Catchment IDDE and Sewer Separation: estimated completion Spring 2021
- River Street Reconstruction: work at 25% design, estimated construction completion 2023
- Port Phase II Infrastructure Improvements; under design, estimated construction completion 2024
- Broadway Drain Line Extension/Enlargement (Main Street I/I project for Boston Properties): estimated completion 2021
- Land Boulevard Sewer Separation (Cambridgeside): estimated completion 2022
- North Mass Ave Residential Side Street Infiltration Program: ongoing by various developers
    - 193 Concord Turnpike: completed March 2020
    - 50 Cambridge Park Drive: under construction, estimated completion August 2020
    - 55 Wheeler Street: in design, estimated completion estimated 2021

Reporting Period Activity: In 2020, the City performed CCTV inspections on approximately 152,800 LF of sewer main and drain pipe. In addition, the City lined 12,035 LF of sewer main and drain pipe. Also, the City's Remedial Repair Contractor made various repairs to the City's sewer and drain system at 204 locations. Theses 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). Estimated project completion is 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 Morgan Park Sanitary Sewer Tank (currently under design).

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 (CY17 - CY19) Annual Average I/I: 1.77 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)

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: 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. The Town replaced 250 LF of broken 8-inch VC sewer main on Washington Street (at Walnut Street). The Town also conducted a 12-week flow metering program within Subsystems 7/9/12/14/16/18/19/24 to identify areas with extraneous flows.

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 $6,635,900 allotted through the Program's Phases 1 - 13, the community has $3,960,000 remaining in funding assistance.

11. CHELSEA: North System

Background Information:
- Miles of Sewer: 41
- Sewered Population: 40,227
- Three Year (CY17 - CY19) Annual Average I/I: 2.69 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., rain garden at Mace Housing Complex).

I/I Rehabilitation Projects in Design or Construction: Final design of utility and road improvements for Beacham Street was completed in 2020. This project includes comprehensive sewer and drain reconstruction, including sewer separation. Construction is anticipated to cover the 2020-2021 period.

Final design of utility and road improvements for Upper Broadway was completed in 2020. This project includes comprehensive sewer and drain reconstruction, including sewer separation. Construction is anticipated to cover the 2020-2021 period.

Construction of the Essex Street & Highland Street Utility Improvements is ongoing and expected to be complete 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 February 2020, funds ($2,949,000) were distributed for the following project: Broadway & Cary Avenue Utility Improvements Project. (MWRA Project No. WRA-P11-11-3-1141). Details of this project are included in Attachment 4.

In July 2020, the City requested funds to support the proposed Beacham Street Roadway and Utility Improvement Project.

Reporting Period Activity: See above project list.

MWRA I/I Local Financial Assistance Program: The community has financed thirteen (14) 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 $3,260,000 remaining in funding assistance.

12. DEDHAM: South System

Background Information:

- Miles of Sewer: 95
- Sewered Population: 24,502
- Three Year (CY17 - CY19) Annual Average I/I: 2.21 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)

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 CY15-20.

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 2019 Sewer Rehabilitation On-Call Services Project (MWRA Project No. WRA-P11-12-3-1130), completed the installation of 9400 LF of CIPP lining, 10 LF of short liners, 53 full wrap lateral liners and 250 VF of manhole exterior grouting and interior cementitious lining. The project was estimated to have removed approximately 225,000 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 660 sewer manholes. The Town plans to utilize this data, along with previous year's backlog work, to perform CY20/21 rehabilitation on the most cost-effective sewer lines/manholes utilizing an on-call rehabilitation contract.

Reporting Period Activity: 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 seventeen (17) 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 $2,320,000 remaining in funding assistance.

13. EVERETT: North System

Background Information:

- Miles of Sewer: 57
- Sewered Population: 44,749
- Three Year (CY17 - CY19) Annual Average I/I: 2.86 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 is designed and scheduled to be disconnected in 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 in Summer 2020.

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 was completed with construction underway in Summer 2020. 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 underway in Summer 2020. An estimated 710,000 gpd of peak inflow is anticipated to be removed when 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.

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 to be used to fund future I/I removal projects.

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 $13,381,500 allotted through the Program's Phases 1 - 13, the community has $6,731,000 remaining in funding assistance.

14. FRAMINGHAM: South System

Background Information:

- Miles of Sewer: 275
- Sewered Population: 69,216
- Three Year (CY17 - CY19) Annual Average I/I: 2.51 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 three 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 will be 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. As noted, the City has an ongoing phased pipeline and manhole rehabilitation design and construction program addressing high priority defects identified in previous SSES investigations. Phase 1 is complete and Phase 2 is ongoing. Review of the Phase 3 Sewer Defects Repairs appropriation has been deferred to September 2020 by the City Council due to the COVID-19 pandemic.

The Phase 6 SSES (MWRA Project No. WRA-P11-14-1-1149) was initiated in July 2019. 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. The data are being compiled and reviewed. The City has prepared draft bid documents for the removal of 10 sump pumps.

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 ongoing. Project work includes: 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 are 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 ongoing. Project work includes 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 includes residential work along Pierce Street and Dinsmore Avenue. Project work includes: 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 1070 LF of 6 to 12-inch sewer main replacements at five locations. City Operations staff / on-call service providers installed 1905 LF of CIPP and rehabilitated 45 sewer manholes. Within Marble Street, 463 LF of sewer main was replaced and 168 LF of sewer main was CIP lined.

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 (CY17 - CY19) Annual Average I/I: 0.95 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 are ongoing. 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 ongoing. (MWRA Project No. WRA-P11-15-3-1127).

Contract 3 (December 2016 Bid Contract - 2019 Contract Extension) Open Cut Repairs: Performed open cut sewer repairs within Talbot Road, Planters Field Lane and Whiton Avenue. Project work was completed in December 2019.

FY17 I/I Investigation & Rehabilitation Program: Sewer cleaning and inspection including TV inspection of approximately 41,400 LF of sewers. Review TV inspection videos of approximately 35,000 LF of sewer main. Conduct topside physical survey of 240 sewer manholes. Trenchless sewer repairs including 2971 LF of sewer testing and sealing; 1786 LF of structural CIP pipe; short liners at five (5) locations; CIP lateral liners at five (5) locations; ten (10) manhole rehabilitations; and furnish/install 19 manhole inflow dishes. Sewer dig repairs including five (5) open cut point repairs. Thaxter Street & Lincoln Street manhole frame and cover

replacement. Broad Cove Force Main (Lincoln Street) Spot Repair. Project work was completed Summer 2019. (MWRA Project No. WRA-P9-15-3-994).

Reporting Period Activity: A 6 to 1 [at $2.67/gallon] fee for new system flow has been implemented. The generated funds are earmarked for I/I identification and repair. In October 2019, wet well structure, wet well piping and pump repairs at the Mill Street Pump Station were performed. In December 2019, an emergency dig repair for a collapsed sewer main in the Blackberry Lane Easement was performed. Twelve (12) LF of VC sewer was replaced with PVC sewer main. In January 2020, emergency repairs at the Walton Cove Pump Station were undertaken. Also, thirteen (13) 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 (CY17 - CY19) Annual Average I/I: 0.43 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 (CY17 - CY19) Annual Average I/I: 3.13 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 7: Sewer Basins 8 & 12 (July 2017)
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)

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 Phase 6 Sewer System Improvements construction started in February 2019 and was substantially complete in October 2019. This project's goal was to remove I/I primarily in Sewer Basins 02 and 12. Retest work was completed in Spring 2020. The final project pay estimate is being processed.

The Phase 7 Sewer System Improvements construction started in June 2020 and is scheduled to be substantially complete in the Fall 2020. This project's goal is to remove I/I primarily in Sewer Basins 01 and 08.

Town-Wide Flow Metering was performed from mid-March through the beginning of June 2019. There were 19 meters in total used to cover the 14 sewer basins (along with three rain gauges and four groundwater gauges). The metering data was used to quantify I/I in the sewer system. Based on the report findings, approximately 4 MGD of infiltration and 7 MGD of peak design storm inflow were identified in the sewer system. This will be used to prioritize the Annual I/I Program moving forward.

The Sewer System Evaluation Survey for Sewer Basin 10 (Phase 10) was completed in January 2020. The project identified approximately 85,000 gpd of cost-effective removable peak I/I in the 85,000 LF of sewer main surveyed.

In November 2019, funds ($1,560,000) were distributed for the following construction project: Phase 7 Sewer System Improvements (MWRA Project No. WRA-P11-17-3-1132). Details of this project are included in Attachment 4.

Reporting Period Activity: New modifications and extensions to the sewer system include: Hobbs Brook Subdivision: 8 homes; 81 Pleasant Street: septic abandonment/new sewer installation; 178 Concord Avenue: septic abandonment/new sewer installation; Cedar Street Subdivision (Winding Road/Penny Lane): 9 homes; Liberty Ridge Subdivision (Jefferson Drive): 14 homes completed and on sewer; and 75 Hayden Avenue: new sewer connection.

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 (CY17 - CY19) Annual Average I/I: 4.09 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 December 2018, $1,048,000 in MWRA grant/loan funds were distributed for a Flow Monitoring and SSES Project - Design and Construction (MWRA Project No. WRA-P9-18-3-996).

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 $20,683,900 allotted through the Program's Phases 1 - 13, the community has $15,042,000 remaining in funding assistance.

19. MEDFORD: North System

Background Information:
- Miles of Sewer: 113
- Sewered Population: 57,757
- Three Year (CY17 - CY19) Annual Average I/I: 3.63 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)

Private Source Inflow Removal Program: As part of the ongoing SSES studies (and as recently requested by the MassDEP), the development of a Private Inflow Source Removal Plan is underway.

I/I Rehabilitation Projects in Design or Construction: 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. Night flow isolation work has been completed and smoke testing scheduled to begin August 2020.

Mini-System P sewer rehabilitation work is ongoing.

Reporting Period Activity: Sewer Rehabilitation work in Mini-System F took place in June 2019 and included the lining of Manholes F-022 to F-033 (Locust Street.). Mini-system F development still under construction.

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 (CY17 - CY19) Annual Average I/I: 2.72 mgd
- MassDEP Administrative Actions: None

Latest I/I or SSES Report:

City-Wide I/I Flow Metering (December 2016)
Sewer System Investigation and Evaluation (Spring 2017)
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)

Private Source Inflow Removal Program: Smoke testing was performed in the next four (4) subareas where investigations were done as part of the 2019 Phase 2 SSES. Potential private inflow sources were discovered. These will be investigated in the near future.

I/I Rehabilitation Projects in Design or Construction: In Spring 2016, sewer flow metering was performed City-Wide, with 29 meters operating for 10 weeks. Groundwater and rainfall monitoring were also performed during this period. The flow metering report was completed in December 2016. The data summarized in this report were used to select the top five subareas for follow-up SSES work, which was performed in 2017. Work performed since the last annual report in July 2019 has included the following:

- Inland Waters is performing 2020 SSES work in the third phase subareas identified during the Spring 2016 flow monitoring as contributing the highest I/I to the system. CCTV and manhole inspections in these eight (8) subareas are now complete; flow isolation work is nearing completion. Smoke testing will be performed in Fall 2020.
- Completed the design of the 2020 Sewer Rehabilitation Project (CIPP lining). The project includes approximately 7000 LF of root treatment and the installation of approximately 25,000 LF of CIPP liners as identified during the 2019 Phase 2 SSES. The project will be bid for construction during Summer 2020.

Reporting Period Activity: In June 2016, the Board of Aldermen voted in favor of an ordinance to increase the City's infiltration and inflow mitigation fee from $2.14 per gallon per day (gpd) to $6.89/gpd. This revised cost reflects the actual cost of the Subarea 21 and 22 project per gpd of I/I removal, accounting for design, construction, and construction administration costs. The cost was confirmed to still be accurate following the 2017 and 2018 sewer investigation and lining projects. This fee is now being routinely charged to all projects for which a Title 5 flow increase is apparent from the building permit application. In 2017, the City instituted a process with the Inspectional Services Department to ensure that I/I fee reviews are occurring for all applicable projects. During FY20, the City collected $45,095 in I/I mitigation fees through this mechanism, which is kept in a dedicated fund and is only used for work related to I/I reduction.

The sewer enterprise fund fully covered the costs of sewer system operations, maintenance, debt service and other expenses. The City maintains reserves equal to at least 10 % of the operating budget.

In December 2019, funds were distributed for the following projects: Design and Construction for Phase 2 Sewer Rehabilitation and Phase 3 Sewer System Evaluation Survey (MWRA Project No. WRA-P11-20-3-1137). Details for these project are included in Attachment 4.

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 (CY17 - CY19) Annual Average I/I: 2.15 mgd
- MassDEP Administrative Actions since 2010: None

Latest I/I or SSES Report: I/I Town-Wide Sewer Evaluation – Year 10 (February 2015)
I/I Town-Wide Sewer Evaluation – Year 11 (February 2016)
I/I Town-Wide Sewer Evaluation – Year 12 (January 2017)
I/I Town-Wide Sewer Evaluation – Year 13 (December 2017)
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 (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.

I/I Rehabilitation Projects in Design or Construction: The CIP Project 1 Sewer Rehabilitations has been bid and construction is set to begin Summer 2020 (Milton Contract No. S20-1 / MWRA Project No. WRA-P11-21-3-1153). Work will be performed in Subareas G-04 / G-06 / G-07 / G-11B / G-11E / PS-02 / PS-03 / S-17A / S-18 and includes 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 will remove 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] has reached substantial completion. Warranty retesting work is scheduled for 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.

Year 13 Sewer System Infiltration Rehabilitation [MWRA Project No. WRA-P9-21-3-987 / Milton Contract S18-1] was bid in June 2018 with construction beginning in August 2018. Work was performed in Subareas DI-02 / G-03A / G-03C / G-08D / G-09 / G-10A / G-10B / G-11D / S-01 / S-01A / S-07B / S-07D / S-08 and included approximately: 15,300 LF of cleaning and television inspection; 9725 LF of testing and sealing of joints; installing 8600 LF of CIP pipe; installing 209 LF of CIP short liners; performing three open cut point repairs; cutting three protruding service connections; testing and grouting 161 service connections; rehabilitating 34 manholes; topside inspection of 43 sewer manholes; and performing 20,425 LF of post-construction flow isolation. Year 13 Sewer System Infiltration Rehabilitation has reached substantial completion with Warranty Retesting completed Summer 2019.

Year 12 Sewer System Infiltration Rehabilitation [MWRA Project No. WRA-P9-21-3-972 / Milton Contract S17-1] was bid June 2017. Construction began in August 2017. Work was performed in Subareas G-02A / G-03B / G-03D / G-09 / G-10A / G-16 / G-17 / G-19 / G-20 / S-01 / S-01A and included approximately 4370 LF of cleaning and TV inspection; 17,000 LF of testing and sealing of joints; performing 1075 LF of chemical root treatment; installing 5080 LF of CIP pipe; installing 230 LF of CIP short liners; cutting one protruding service connection; testing and grouting 110 service connections; rehabilitating 71 manholes; installing 12 manhole inflow dishes; replacing 4 manhole frames and covers; TV inspection of

4270 LF of sewer and topside inspection of 30 sewer manholes; and performing 22,000 LF of post-construction flow isolation. Year 12 Sewer System Infiltration Rehabilitation has reached substantial completion with Warranty Retesting completed Spring 2019. The Year 12 project is estimated to have removed 56,376 gpd of infiltration from the Town's sewer system.

Reporting Period Activity: CIP Project 2 Investigation was completed Spring 2020. Data review and reporting is ongoing. (MWRA Project No. WRA-P11-21-3-1153). 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.

Year 14 I/I Rehabilitation Investigation (MWRA Project No. WRA-P9-21-3-987) was completed Spring 2018 (Subareas G-04 / G-06 / G-07 / G-11B / G-11E / PS-02 / PS-03 / S-17A / S-18). Work included cleaning, TV inspection, videotaping and recording 47,600 LF of sewer; conducting flow isolation on 45,500 LF of sewer; and performing topside manhole inspections of 270 sewer manholes. Summary Report completed November 2018. Approximately 146,592 gpd of peak infiltration was observed during television inspections and 10,368 gpd of peak infiltration was identified during manhole inspections.

Approximately 2860 LF of 8-inch PVC sewers were added to Milton's sewer system within Woodlot Drive and Marine Road. These two neighborhoods include 30 connections for new single-family homes. In addition, there were 14 connections made in existing sewers for new properties at various locations.

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 $9,014,500 allotted through the Program's Phases 1 - 13, the community has $2,300,000 remaining in funding assistance.

22. NATICK: South System

Background Information:

- Miles of Sewer: 145
- Sewered Population: 32,281
- Three Year (CY17 - CY19) Annual Average I/I: 1.17 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 SSES (MWRA Project No. WRA-P5-22-1-523) included a house-to-house inspection component. Home inspections are also conducted in conjunction with a 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.

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. To date, 145,000 LF of CCTV inspection has been completed and 766 sewer manhole inspections have been performed in Sewer Basins 6 / 11/ 14 / 16. Recommended findings from this inspection work have been incorporated into a Sewer Rehabilitation Project (Natick Contract No. S-162 / MWRA Project No. WRA-P9-22-3-990). 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. The project covers a three year period. 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: 22 Strathmore: 68,000 SF of biotech incubator with capacity for up to 40 laboratories. Based upon flows from similar facilities, this site will yield approximately 2560 GPD. Building is on-line. No additional sewer main installed with one service from the sewer main to the new building. 72-76 South Avenue: Three vacant buildings were torn down and a sixteen bedroom condominium was developed. This will yield approximately 1760 GPD of flow (based upon Title V). No additional sewer main installed with one service from the sewer main to the new building. Windy Lo Subdivision: This sixteen unit subdivision includes 64 bedrooms which would yield 7040 GPD (based upon Title V). Approximately 1225 LF of 8-inch PVC gravity sewer, 10 manholes and 16 services will be installed. 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 was installed as part of this project. Stacy Street: a six unit development with each unit having three bedrooms. Development is fully occupied. This yields an increase in flow of 1980 gpd (based upon Title V). No additional sewer main installed with only services from the sewer main to the new buildings. 1225 Worcester Street (Old Sams Club site): Tear down of Old Sams Club building complete. A development of an Over 62 Community and Hotel has been built and both buildings are on-line. The increased sewer flow is 33,574 gpd (based upon Title V).

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 (CY17 - CY19) Annual Average I/I: 2.06 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 was substantially complete in March 2020 with a few minor repairs and high groundwater post-rehabilitation TV inspection to confirm infiltration removal remaining (Needham Contract No. 20DPW022C / MWRA Project No. WRA-P11-23-3-1128). 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 (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: The Town is currently performing an evaluation of the I-95 interceptor to assess influent flows and the condition of the interceptor.

Sealing laterals was performed at seven locations (7200 gpd of infiltration removed); Four sewer manholes were replaced (12,600 gpd of infiltration removed); CIPP lining occurred at four locations (21,150 gpd of infiltration removed); CIPP point repair occurred at ten locations (13,140 gpd of infiltration removed); CIPP lateral lining undertaken at five locations (10,800 gpd of infiltration removed); Service wye replacement was performed at fifteen locations (26,240 gpd of infiltration removed).

Twelve meters (ten permanent and two portable area velocity flow module) have been installed for continued I/I monitoring. Town-Wide CCTV inspection of 178,000 LF of sewer main was completed as part of the Phase II I/I Investigation Report (over 680,000 gpd of peak infiltration observed). Winding River Road Zone 2 sewer extension and pump station work completed Fall 2019. Six homes were connected to the sanitary system as part of this project.

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

24. NEWTON: North and South Systems

Background Information:

- Miles of Sewer: 271
- Sewered Population: 88,718
- Three Year (CY17 - CY19) Annual Average I/I: 7.48 mgd
- MassDEP Administrative Actions since 2010: None

Latest I/I or SSES Reports:

CIP - Project 3 Inspection & Assessment Report (January 2015)
CIP - Project 4 Inspection & Assessment Report (February 2015)
CIP - Project 5 Inspection and Assessment Report (November 2015)
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)

Private Source Inflow Removal Program: Private Inflow Source Removal for FY 2020 consisted of one sump pump removal. The City revised its ordinance on infiltration and inflow mitigation for developers on November 4, 2019.

I/I Rehabilitation Projects in Design or Construction:

CIP Project 5 Rehabilitations (Invitation for Bid #18-05) is complete. CIP Project 5 Post Construction Flow Evaluation is complete and identified an estimated 194,996 gpd of peak infiltration removed.

CIP Project 6 Rehabilitations is complete. Warranty repairs and project closeout documents are anticipated to be completed Summer 2020. 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 is ongoing and is scheduled to be completed by July 1, 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 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 132,489 LF of sewer and 854 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 121,166 LF of sewer and 714 manholes.

In August 2019, funds were distributed for the following project: Design & Construction of CIP Project 7 & 8 Sewer Rehabilitations (WRA-P11-24-3-1126). Details for this project are included in Attachment 4.

MWRA I/I Local Financial Assistance Program: The community has financed twenty-nine (29) 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 $4,580,000 remaining in funding assistance.

25. NORWOOD: South System

Background Information:
- Miles of Sewer: 83
- Sewered Population: 29,032
- Three Year (CY17 - CY19) Annual Average I/I: 3.92 mgd
- MassDEP Administrative Actions since 2010: None

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

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

I/I Rehabilitation Projects in Design or Construction: Meadowbrook Priority Area 5 Rehabilitation 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 CIPP lining of 7515 LF of sewer main, installation of 600 LF of 8-inch PVC sewer main, lining 38 sewer manholes and lining 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 (CY17 - CY19) Annual Average I/I: 5.73 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 (Ongoing)

Private Source Inflow Removal Program: The City has partnered with the Plumbing Inspector on its FOG Program. As part of this program, the 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 and outlines penalties for illegal connections/discharges to the sanitary sewer system (http://www.quincyma.gov/government/pwd/watersewerfees.cfm). The fee structure remains in effect and has resulted in improvements to the system.

Developers contribute one percent of the total project value to the City of Quincy Sewer and Drain Rehabilitation Fund (QSDRF). Additionally, the City has begun to implement 310 CMR 12.04 and require those new connections, whose flow exceeds 15,000 GPD, to continue to the 4:1 removal required under the regulations. This regulation is enforced during the site plan review process. Through July 1, 2020, the QSDRF had a balance of $3,954,687.

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 FY19 CIPP Sewer Improvements - Contract 1 (MWRA Project No. WRA-P9-26-3-992) work 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.

The FY19 Sewer Open Cut Improvements Project (MWRA Project Nos. WRA-P9-26-3-992/1140) work began March 2020. Project work includes: installing 3560 LF of new 8 to 18-inch gravity sewer main and rehabilitating 22 sewer manholes on Island Avenue, Peterson Road, Belmont Street, Amsterdam Avenue, Sherman Street and Elmwood Park. Project scheduled to be substantially complete Fall 2020.

Wollaston Beach Area SSES Rehabilitation Phase II Project (MWRA Project No. WRA-P9-26-3-971): Project bid in June 2018. Sewer rehabilitation work included approximately: 2670 LF of cleaning, inspection, testing and sealing of joints; heavy cleaning and inspecting 514 LF of sewer; exterior sealing and cementitious lining of 1526 VF of sewer manholes; chemical root treatment of 9411 LF of sewer; installing 16 LF of short liner; installing CIP pipe from manhole-to-manhole in 21,129 LF of sewer; television inspecting, testing and sealing 57 service connections and cutting three (3) protruding service connections. Construction substantially complete in April 2019. Warranty retest inspection work completed Fall 2019.

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 includes 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 includes 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 to be performed June 2020 to December 2020.

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 includes: 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 (5) 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 price was $1,028,966. Project scheduled to be substantially complete November 2020 (except for final paving and 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 includes: 17,975 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 includes rehabilitating 47 sewer manholes. The awarded price was $1,283,592. Project scheduled to be substantially complete October 2020 (except for final paving and 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 600 LF of 6-inch wastewater force main. The awarded price was $2,373,500. Project scheduled to be substantially complete Spring 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.

Sanitary Sewer Evaluation Survey (SSES) Phase III Project (MWRA Project No. WRA-P9-26-13-944) work included: (1) Smoke Testing 48,000 LF of sewer to identify segments of pipe with direct/indirect inflow sources; (2) Flow isolating 68,500 LF of sewer to quantify infiltration amounts within manhole-to-manhole segments of sewer; (3) Cleaning, CCTV inspecting, videotaping and recording 76,000 LF of sewer. The TV inspection was performed to locate problem areas and I/I sources within manhole-to-manhole segments of sewer; (4) Conducting topside physical survey of 576 sewer manholes for defects and I/I sources. A written log was furnished for each manhole inspected; and (5) Preparing a SSES Summary Report that details areas in which the above work was performed, summarizing work completed to date and including recommendations, a cost-effectiveness analysis and prioritization analysis for rehabilitation of pipeline/manhole defects and I/I sources identified during this investigation. Estimated rehabilitation costs were also provided. Also, a City-Wide sewer system hydraulic model for critical lateral and interceptor sewers was developed. Of the 68,500 LF of sewer pipe flow isolated, approximately 6300 LF had infiltration rates higher than 4000 gpd/idm. Of the 76,600 LF of sewer pipe CCTV inspected, approximately 48,900 LF was recommended to be structurally lined and approximately 8300 LF was recommended to be replaced by open cut excavation.

Emergency Sewer Repairs included: (1) Squantum Street (850 LF of 10-inch sewer and 18 LF of 6-inch lateral); and (2) Repairs to The Strand forcemain.

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 $32,780,000 allotted through the Program's Phases 1 - 13, the community has $7,697,761 remaining in funding assistance.

27. RANDOLPH: South System

Background Information:

- Miles of Sewer: 101
- Sewered Population: 34,203
- Three Year (CY17 - CY19) Annual Average I/I: 2.07 mgd
- MassDEP Administrative Actions since 2010: None

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

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

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

Reporting Period Activity: The Town will be conducting TV inspection of approximately 50,000 LF of sewer mains in Fall 2020. This is part of a larger I/I Design / Rehabilitation Project (MWRA Project No. WRA-P11-27-3-1139). A Town-Wide wastewater flow metering program was performed during Spring 2017. Data review/report preparation completed Summer 2018. The Town is finalizing a SSES based on the Spring 2017 wastewater flow metering.

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 (CY17 - CY19) Annual Average I/I: 1.87 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: Phase 3 Collection System Improvements (MWRA Project No. WRA-P11-28-3-1114) work includes installation of approximately 20,000 LF of CIPP lining. Date of completion is anticipated to be September 30, 2020.

Reporting Period Activity: Installed/replaced approximately 1650 LF of service laterals to 46 residences. In addition, the Town received $55,059 in sewer I/I connection fees from various developments in FY20.

In June 2019, $1,040,000 in MWRA grant/loan funds were distributed for the design and construction of the Sewer and Manhole Rehabilitation - Phase C Project (MWRA Project No. WRA-P11-28-3-1114).

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 $7,749,100 allotted through the Program's Phases 1 - 13, the community has $2,080,000 remaining in funding assistance.

29. REVERE: North System

Background Information:
- Miles of Sewer: 98
- Sewered Population: 53,766
- Three Year (CY17 - CY19) Annual Average I/I: 3.15 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 (Ph 5) (CWSRF 4386) (April 30, 2020)

Private Source Inflow Removal Program: Revere performed the following work under Contract 6A (CWSRF-4439, WW-001) July 2019 through June 2020 by PG Construction, Inc.

- Redirection of 46 sump pumps
- Redirection of 18 roof leaders
- 1,360 l.f. 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 33,500 lf of 8" sewer
- Cured-in-place lining of 680 lf of 10" sewer
- Cured-in-place lining of 1,685 lf of 12" sewer
- Cured-in-place lining of 1,575 lf of 15" sewer
- Cured-in-place lining of 235 lf of 16" sewer
- Cured in place lining of 220 lf 18" sewer
- Cured in place lining of 1,530 lf 24" sewer
- Installed service lateral connection liners at 475 locations
- Installed full length service lateral connection liners at 164 locations
- Installed 1,770 vf cement/epoxy manhole lining
- Sealed 1,854 manhole corbels
- 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 (CY17 - CY19) Annual Average I/I: 4.96 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 City is enforcing City Ordinance Chapter 11 (Public Works), Article VII (Sewers), Section 11-165 (roof water, surface water and other drainage). This ordinance gives the City authority to disconnect and prevent roof, surface and other water from entering the collection system in various sections of the City.

I/I Rehabilitation Projects in Design or Construction:

CIP Project 1 Sewer Manhole Rehabilitation: The rehabilitations were designed as part of the CIP Project 1 Manhole Inspection / Assessment and Design Project. A preliminary design of rehabilitations was completed during the reporting phase of the project and detailed within the report titled *CIP Project 1 Manhole Inspection and Assessment (March 2018).* Work under this project (MWRA Project No. WRA-P11-30-3-1111) includes chemical root treatment of 20 sewer manholes; cementitious lining of sewer manholes (4620 VF); building benches and inverts in 110 sewer manholes; replacing 147 sewer manhole frames and covers; raising and replacing five (5) sewer manhole frames and covers; furnishing and installing 58

sewer manhole inflow dishes; redirecting six (6) sewer manhole access ports; sealing five (5) sewer manhole access ports; sealing underdrain inverts in four (4) sewer manholes; and plugging two (2) underdrain pipe connections. Construction to begin Summer 2019. Warranty retest inspections scheduled for Spring 2020.

15 Year CIP: The field work associated with the CIP Project 1 Manhole Inspection / Assessment and Design Project began in February 2017 and was completed in June 2017. Work included inspecting 4478 manholes and identified 255,024 gpd of infiltration. Manhole rehabilitation design is complete.

The field work associated with the CIP Project 2 Pipeline Inspection & Assessment Project (in the areas of Teele Square, Davis Square and Tufts University) began in April 2018 and is ongoing.

Somerville Avenue Infrastructure and Streetscape Improvement Project: Construction of the three-year project began in May 2018. To date, work has consisted of utility relocations in advance of the installation of the large stormwater box culvert and cleaning of existing sewers in advance of lining.

Bike Path Sewer / Drain Repair:

The rehabilitation of a 24-inch cross-country combined sewer pipe has been put on hold due to the private property impacts and restoration costs. The Engineering Department is currently evaluating options to reroute the line to within City rights-of-way.

Cedar Street Sewer Separation Project: The Cedar Street Sewer Separation Project began in June 2016. Construction is ongoing. The contractor completed the subsurface component of the project in May 2018 including localized sewer separation from Elm Street to Highland Avenue by replacing existing brick combined sewer with 48-inch RCP drain and 12-inch PVC sewer. The contractor is currently completing the surface restoration component of the project. The system currently re-combines in Elm Street. Therefore there is no inflow reduction until future separation work is completed. CCTV inspection to quantify infiltration reduction was not performed; however, given the age of the system, a benefit can be assumed.

Reporting Period Activity: In May 2018, the City formally adopted an Inflow/Infiltration ordinance requiring 4:1 offset of any new or increased flows to the system. The ordinance is more stringent than state guidance and requires the mitigation for any and all increases, although an administrative de minimus exemption is available to internal remodel projects that result in increases less than 330 gpd. To facilitate the program, developers may pay a fee that is deposited to a dedicated I/I reduction account created under the Sewer Enterprise Fund.

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 (CY17 - CY19) Annual Average I/I: 1.88 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: Under its NPDES Phase 2 Stormwater permit requirements (MS4), the Town is continuing to investigate and eliminate illicit cross-connections between the sanitary sewer and storm water systems as part of the Illicit Discharge Detection and Elimination Program (IDDE).

I/I Rehabilitation Projects in Design or Construction:

- Phase 6 / Boston Regional Medical Center (BRMC) Sewer Rehabilitation: Project substantially complete. Warranty re-inspection work scheduled for Summer/Fall 2020.
- Fallon Road / Park Street System Rehabilitation (Phase 1) substantially complete. Completion expected Fall 2020.

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.

Additional Developments for FY20 include the following:

Whipple Avenue - 2; Spring 2020
Main Street - 471 (10 residential units, 2 commercial units); Summer 2020
Birch Street - 7; Summer 2020
Gracewood Road - 5; Spring 2020
Elm Street - 135; Spring 2020
Flint Avenue - 16; Summer 2020

In March 2019, $970,000 in MWRA grant/loan funds were distributed for the Planning, Design & Construction of Phase 7 Sewer System I/I Rehabilitation in Study Area 4 (MWRA Project No. WRA-P11-31-3-1107).

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 (CY17 - CY19) Annual Average I/I: 1.86 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) Evaluation (September 2019)
Year 8 (Round 2) 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 is ongoing.

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 No. WRA-P11-32-3-1138). Project work to be complete December 2020. Warranty retesting work scheduled for Spring 2021. Project to remove 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: Reprioritized Year 8 Spring 2020 I/I Investigation (MWRA Project No. WRA-P11-32-3-1138) completed Spring 2020. Data review/report preparation ongoing. Estimated completion date November 2020.

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

Sewer extension of approximately 9000 LF off Daly Drive by private developer is ongoing. Sewer extension of approximately 3000 LF at Forest Green by private developer is ongoing.

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 $7,902,900 allotted through the Program's Phases 1 - 13, the community has $1,475,000 remaining in funding assistance.

33. WAKEFIELD: North System

Background Information:
- Miles of Sewer: 93
- Sewered Population: 27,067
- Three Year (CY17 - CY19) Annual Average I/I: 3.03 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 in March 2020. 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 the Winter 2020/2021.

Construction of recommended repairs identified in the Sewer System Evaluation Survey - Year Three will began in July 2020. This project is estimated to have removed approximately 55,000 gpd of peak infiltration while repairing approximately 8000 LF of sewer main.

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 February 2020, funds were distributed for the following projects: Year 3 - Sewer System Infiltration Rehabilitation (Design & Construction) and Year 4 - Study (MWRA Project No. WRA-P11-33-3-1131). Details of this project are included in Attachment 4.

MWRA I/I Local Financial Assistance Program: The community has financed twenty-seven (27) 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 $2,560,000 remaining in funding assistance.

34. WALPOLE: South System

Background Information:
- Miles of Sewer: 59
- Sewered Population: 18,303
- Three Year (CY17 - CY19) Annual Average I/I: 1.05 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 (Ongoing)

Private Source Inflow Removal Program: The Town includes house-to-house private inflow inspection program as part of its water meter replacement 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). 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.

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 is ongoing. 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 Year 5 I/I Investigation (Round 2) work was completed Spring 2020. Data review and reporting is ongoing (MWRA Project No. WRA-P11-34-3-1135).

The Year 4 I/I Investigation (Round 2) 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 400 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 (CY17 - CY19) Annual Average I/I: 3.80 mgd
- MassDEP Administrative Actions since 2010: ACOP-NE-10-1N001 (February 2010)

Latest I/I or SSES Report:

Inflow & Infiltration Improvements Section 5C (Lexington St - Trapelo Rd to Town Line) (March 2014)
Inflow & Infiltration Analysis Sewer System Section 12A-2 Lakeview Area (July 2014)
Inflow & Infiltration Improvements Phase 5.1, Section 6B6 - Pond End Lane Area (August 2014)
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)

Private Source Inflow Removal Program: Two sump pumps were removed from the City sewer system at 598 Lexington Street during FY20. The private inflow removed was 2 @ 1,200 GPD per sump pump = 2400 GPD.

I/I Rehabilitation Projects in Design or Construction:

- CMOM Plan: Draft Report due 7/31/20; Final Report expected September 30, 2020
- Area 13/14B - Bear Hill Valley Sewer Rehabilitation Project bid on July 7th, 2020; Fall 2020 Construction start anticipated

Reporting Period Activity: Hobbs Brook Management installed a new sewer pumping station at 404 Wyman Street and lined over 1250 LF of City sewer main on Wyman Street. This enabled the defective sewer pipe under Rt. 128 / I -95 to be abandoned.

Lexington & School Street - Sewer & Water Improvements: 396 LF of 10-inch sewer cleaned & lined, 1198 LF of 8-inch sewer cleaned & lined; 40 sewer services reinstated; nine (9) sewer manhole inverts rebuilt and cement lined (epoxy lining currently taking place); 252 LF of 8-inch sewer main replaced; 543 LF of sewer services were replaced; four (4) manhole frames & covers replaced and 1325 LF of heavy cleaning of the sewer mains was accomplished.

July 2019 to December 2019: 22 sewer laterals were repaired / replaced mainline to property line by City forces. The City conservatively estimated that the relaying the old sewer laterals has removed 111 GPD of I/I, based upon the length of the sewer laterals. A total of 582.5 LF of pipe was replaced.

January 2020 - June 2020: 21 sewer laterals were repaired / replaced, main line to property line by City forces. The City conservatively estimated that the relaying the old sewer laterals has removed 80 GPD of I/I, based upon the length of sewer laterals. A total of 204 LF of pipe was replaced.

Bentley University 4 to 1 I&I Mitigation Project: Bentley University hired CDMSmith to design & oversee the I/I Mitigation project; CDMSmith was assigned by the City Engineer to remove 38,656 gpd. The removal gallons total was calculated for the construction of a new multi-sport arena located at 400 Beaver Street. Bentley hired Green Mountain Pipeline services to rehabilitate a leaking section of City sewer main that passes through a wetland area located off Waverly Oaks Road in the vicinity of the Beaver Street intersection. The work consisted of cleaning and installing 450 LF of a cast in place pipe, CIIP lining, installing five (5) watertight manhole covers and sealing four (4) sewer manholes.

In June 2019, $3,849,500 in MWRA grant/loan funds was distributed for the Sewer Area 13 / 14B Sewer and Manhole Rehabilitation Project. The estimated I/I removal from this project is 0.03 mgd annually (MWRA Project No. WRA-P11-35-3-1106).

MWRA I/I Local Financial Assistance Program: The community has financed nine (9) 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 $7,055,500 remaining in funding assistance.

36. WATERTOWN: North System

Background Information:

- Miles of Sewer: 75
- Sewered Population: 34,612
- Three Year (CY17 - CY19) Annual Average I/I: 1.45 mgd
- MassDEP Administrative Actions since 2010: None

Latest I/I or SSES Report: TV Inspection Subsystem 7 and Sewer Rehabilitation (2016)
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)

Private Source Inflow Removal Program: As part of the Town's IDDE program, a common manhole for a building service was identified allowing sewage and drainage to comingle. The manhole was retrofitted to separate the sewer.

I/I Rehabilitation Projects in Design or Construction: The Sanitary Sewer Rehabilitations (Contract 18-01S) is complete. Based on the 2017 Sewer Rehabilitations Report (December 2017), an estimated 8568 gpd of infiltration was removed from the sanitary sewer collection system.

CIP Project 1 Rehabilitations (Contract 19-01S) is currently under construction. The project includes rehabilitations identified during CIP Project 1 Inspection and Assessment projects and 12,302 LF of sewer and drain inspected as part of Contract 18-01S. The project includes removal of an estimated 16,128 gpd of infiltration and 38,468 gpd of inflow.

CIP Project 1A Rehabilitations (Contract 20-01S) is scheduled for public bidding in August 2020. The project includes rehabilitations identified during CIP Project 1 Inspection and Assessment projects. The project includes removal of an estimated 13,392 gpd of infiltration and 38,468 gpd of inflow.

CIP Project 1B Rehabilitations is currently being designed and is scheduled to be bid upon completion of CIP Project 1A Rehabilitations. The project includes rehabilitations identified during CIP Project 1 Inspection and Assessment projects. The project includes removal of an estimated 13,392 gpd of infiltration and 38,468 gpd of inflow.

Reporting Period Activity: 320 LF of sanitary sewer and ten (10) sewer services were replaced on Avon Road. Boylston Properties provided a $286,102 contribution to fund sewer investigations and rehabilitation work as part of its Phase I and IA work at Arsenal Yards.

In December 2019, funds were distributed for additional funding of Project #1109 - CIP Project 1: I/I Investigation & Rehabilitation Program (MWRA Project No. WRA-P11-36-3-1133). Details of this project are included in Attachment 4.

MWRA I/I Local Financial Assistance Program: The community has financed ten (10) 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 $3,870,000 remaining in funding assistance.

37. WELLESLEY: South System

Background Information:
- Miles of Sewer: 134
- Sewered Population: 28,801
- Three Year (CY17 - CY19) Annual Average I/I: 1.83 mgd
- MassDEP Administrative Actions since 2010: None

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

Private Source Inflow Removal Program: Based upon previous private source inflow studies, DPW is contacting the owners of identified illegal sump pumps. To date, 18 sump pumps have been removed from the sanitary system. Also, the Town continues to pursue illegal sump pump connections identified through the water meter ERT Battery Change-out Transaction Program.

I/I Rehabilitation Projects in Design or Construction: 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 FY20, Sewer System Inspection and Rehabilitation work consisted of 16,337 LF of sewer main cleaning and CCTV inspection, 3482 joints tested, 404 joints sealed with grout and 769 VF of brick manholes sealed. The Town also flushed 158,144 LF of sewer main and rodded 3620 LF of sewer main and 329 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 a 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 thirteen (13) 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 $5,667,196 remaining in funding assistance.

38. WESTWOOD: South System

Background Information:
- Miles of Sewer: 77
- Sewered Population: 14,450
- Three Year (CY17 - CY19) Annual Average I/I: 0.97 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)

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: FY20 Sewer System Rehabilitation Program removed an estimated 70,000 gpd of infiltration from the sewer system based upon estimated infiltration flows through visual observations of CCTV work during the FY19 Sewer Investigations.

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 (CY17 - CY19) Annual Average I/I: 5.47 mgd
- MassDEP Administrative Actions since 2010: None

Latest I/I or SSES Report: Town-Wide Sewer Investigation - Year 6 (January 2016)
Town-Wide Sewer Investigation - Year 7 (October 2018)
Town-Wide Sewer Investigation - Year 8 (October 2019)
Town-Wide Sewer Investigation - Year 9 (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). Six (6) sump pumps were redirected during FY13-20.

I/I Rehabilitation Projects in Design or 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 is scheduled to be completed in August 2020 (MWRA Project No. WRA-P11-39-3-1125). Approximately 0.136 mgd of infiltration and 0.017 mgd of peak design storm inflow will be removed through construction.

Year 6 I/I Rehabilitation Design was completed in August 2018 (MWRA Project No. WRA-P9-39-3-978). Year 6 Rehabilitation Construction completed in March 2019 (MWRA Project No. WRA-P9-39-3-989). Rehabilitation construction resulted in the removal of approximately 0.045 mgd of infiltration and 0.039 mgd of peak design storm inflow.

Reporting Period Activity: The Year 9 I/I Investigation is currently ongoing. Field investigations have been completed and the summary report is being drafted. 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 on the

Year 8 report recommendations) is scheduled to begin Fall 2020. Approximately 0.257 mgd of infiltration and 0.0057 mgd of peak design storm inflow will be removed through construction.

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 $19,100,900 allotted through the Program's Phases 1 - 13, the community has $8,675,000 remaining in funding assistance.

40. WILMINGTON: North System

Background Information:
- Miles of Sewer: 29
- Sewered Population: 4,880
- Three Year (CY17 - CY19) Annual Average I/I: 0.73 mgd
- MassDEP Administrative Actions: None

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

Private Source Inflow Removal Program: Town continuing inspections on an as-needed basis.

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

Reporting Period Activity: Arcadis has completed the design of the Sewer System Rehabilitation for I/I Subareas 5 and 8 (MWRA Project No. WRA-P11-40-3-1118). The project was bid and the Town is preparing to award the contract to the low bidder: Insituform Technologies, LLC.

In December 2019, additional funds were distributed to support MWRA Project No. WRA-P11-40-3-1118: Construction of Sewer and Manhole Rehabilitation (Subareas 5 and 8). Details of this project are included in Attachment 4 (MWRA Project No. WRA-P11-40-3-1136).

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.

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 (CY17 - CY19) Annual Average I/I: 1.40 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. No additional sump pumps were removed from the sewer system during this period.

I/I Rehabilitation Projects in Design or Construction: Warranty retesting work for the Phase II Sanitary Sewer Rehabilitations (Part A) was completed in Spring 2020.

The Phase II Sanitary Sewer Rehabilitations (Part B) project will begin in September 2020. 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 2019, funds ($870,000) were distributed for 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 project are included in Attachment 4.

In August 2020, additional funds ($870,000) will be distributed to assist with MWRA Project No. WRA-P11-41-3-1122: Construction of Recommended Sewer Rehabilitations per Phase II Sanitary Sewer Evaluation Survey Report of 2016 (Part B).
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 $6,793,000 allotted through the Program's Phases 1 - 13, the community has $1,740,000 remaining in funding assistance.

42. WINTHROP: North System

Background Information:
- Miles of Sewer: 36
- Sewered Population: 18,625
- Three Year (CY17 - CY19) Annual Average I/I: 1.21 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: Sewer System I/I Assessment (April 2014)
Flow Monitoring Program (March-May 2019)
I/I Analysis Report (October 2019)

Private Source Inflow Removal Program: As part of the 2020 SSES program, smoke testing is anticipated to start at the end of July or the beginning of August 2020. Inspection data will then be reviewed and recommendations to remove I/I will be summarized in a report to be submitted in September 2020. 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: Bids were received in June 2020 for the replacement of 1180 LF of gravity sewer on Palmyra Street and Crescent Street. Anticipated start date for construction is August 2020.

The construction for the Centre Business District Infrastructure Improvements Project is ongoing. Project work includes the replacement of water, sewer and drain in the center of Town.

Reporting Period Activity: As part of the 2020 SSES program, Woodard & Curran completed flow isolation of approximately 26,900 LF of sanitary sewer, cleaning and CCTV inspection of approximately 25,300 LF of sanitary sewer and inspections for approximately 240 sewer manholes. Inspection data is currently being reviewed and recommendations to remove I/I will be summarized in a report to be submitted in September 2020.

In March 2020, MWRA funds were distributed for the Centre Business District Improvements Project (MWRA Project No. WRA-P11-42-3-1144). Details of this project are included in Attachment 4.

In April 2020, MWRA funds were distributed for the following projects: Phase 2 SSES and Palmyra Street & Crescent Street Sewer Improvements (MWRA Project No. WRA-P11-42-3-1145). Details of this project are included in Attachment 4.

In March 2019, MWRA funds were distributed for a Town-Wide Wastewater Flow Monitoring and I/I Analysis in compliance with 314 CMR 12.04(2) (MWRA Project No. WRA-P11-42-1-1110).

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 $5,553,400 allotted through the Program's Phases 1 - 13, the community has $992,250 remaining in funding assistance.

43. WOBURN: North System

Background Information:
- Miles of Sewer: 141
- Sewered Population: 38,867
- Three Year (CY17 - CY19) Annual Average I/I: 2.93 mgd
- MassDEP Administrative Actions since 2010: None

Latest I/I or SSES Report:

CIP Smoke Testing - Project 1 Final Report (February 2014)
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 (Ongoing)

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

I/I Rehabilitation Projects in Design or Construction: CIP Project 3 Rehabilitations are scheduled to start Summer 2020. The project is estimated to remove 56,981 gpd of peak infiltration and 9602 gpd of peak inflow. CIP Project 4 is under design.

Reporting Period Activity: In March 2019, $1,990,000 in MWRA funds were distributed for Construction of Recommended Sewer Rehabilitations in CIP Project Area 3 (MWRA Project No. WRA-P11-43-3-1108).

In December 2019, funds were distributed for the following projects: CIP Project 1/2/5 Study, CIP Smoke Testing - Project 2 and CIP Project 4 Design/Construction (MWRA Project No. WRA-P11-43-3-1134). Details of these projects 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 $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 FY20
Reporting Period – July 2019 Through June 2020

CY19 COMMUNITY WASTEWATER FLOW DATA

This attachment contains calendar year 2019 wastewater flow data for the 43 MWRA member sewer communities. There are four separate data tables as detailed below.

TABLE 1 (one page - page number 2) presents the CY19 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 (one page - page number 3) presents the CY19 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 (one page - page 4) presents the CY19 Community Wastewater Flow Component Estimates with additional information based on estimated community inch-diameter-miles of sewer.

TABLE 4 (13 pages - page numbers 5 through 17) presents the Estimated Community Wastewater Flow Components for CY19. 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.

TABLE 1 - CY19 MWRA WASTEWATER METERING SYSTEM COMMUNITY FLOW ESTIMATES

2/7/2020

Community	Total Population	Sewered Population	CY19 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	5.51	5.87	6.24	6.60	5.70	4.12	3.71	3.38	3.36	4.09	4.81	7.18	5.04	1.6%	7.18	1.7%
Ashland	17,706	13,781	1.48	1.44	1.45	1.61	1.46	1.17	1.08	1.03	1.01	1.04	1.12	1.42	1.28	0.4%	1.61	0.4%
Bedford	14,197	13,700	2.97	3.02	3.04	3.28	2.97	2.48	2.33	1.97	1.79	1.87	2.08	2.79	2.55	0.8%	3.28	0.8%
Belmont	26,458	26,061	3.53	3.74	3.85	4.28	3.54	2.67	2.54	2.27	2.10	2.39	2.73	4.40	3.17	1.0%	4.40	1.0%
BWSC	685,094	683,724	105.59	97.33	101.48	119.76	102.31	91.26	100.34	81.79	74.94	86.10	84.94	110.94	96.43	29.8%	119.76	28.0%
Braintree	37,156	37,052	10.61	9.57	10.31	10.80	9.01	6.92	6.40	5.00	4.46	4.74	6.75	11.28	7.98	2.5%	11.28	2.6%
Brookline	59,157	58,565	10.71	10.45	11.04	12.59	9.36	7.12	7.16	6.54	5.33	6.11	6.63	11.09	8.67	2.7%	12.59	2.9%
Burlington	27,176	26,616	4.11	4.35	4.53	4.73	4.39	3.62	3.55	2.92	2.65	2.81	3.26	4.54	3.79	1.2%	4.73	1.1%
Cambridge	113,630	113,607	17.59	17.42	17.21	20.23	17.07	19.29	21.57	19.19	16.41	18.31	17.77	23.60	18.82	5.8%	23.60	5.5%
Canton	23,444	16,669	3.62	3.27	3.66	3.78	3.49	2.95	2.52	2.29	2.12	2.23	2.50	3.80	3.02	0.9%	3.80	0.9%
Chelsea	40,227	40,227	5.97	5.88	5.92	6.69	5.52	5.45	5.62	4.88	4.25	5.80	6.02	7.98	5.83	1.8%	7.98	1.9%
Dedham	25,364	24,557	5.00	4.58	4.74	5.22	4.49	3.35	3.04	2.82	2.30	2.42	2.96	5.24	3.84	1.2%	5.24	1.2%
Everett	46,324	46,324	7.13	7.35	6.81	6.94	6.58	5.59	6.29	6.17	5.43	5.56	4.73	6.80	6.28	1.9%	7.35	1.7%
Framingham	72,032	69,273	8.18	8.16	8.27	9.02	7.76	5.68	5.77	5.01	4.79	4.93	5.37	7.62	6.71	2.1%	9.02	2.1%
Hingham	8,175	7,748	1.91	1.78	1.97	2.16	1.67	1.23	1.26	0.91	0.76	0.84	1.17	2.13	1.48	0.5%	2.16	0.5%
Holbrook	11,026	9,925	1.12	1.00	1.08	1.15	1.02	0.81	0.71	0.65	0.65	0.67	0.79	1.17	0.90	0.3%	1.17	0.3%
Lexington	33,727	33,154	5.57	6.59	6.94	7.55	6.61	4.44	3.91	3.46	3.36	3.56	4.33	6.09	5.19	1.6%	7.55	1.8%
Malden	61,246	60,970	9.43	10.12	10.12	10.18	8.90	7.74	7.58	7.08	6.88	6.97	8.03	11.56	8.71	2.7%	11.56	2.7%
Medford	57,797	57,757	7.57	7.68	8.06	8.73	7.64	6.03	6.69	6.71	5.85	6.42	7.24	10.96	7.47	2.3%	10.96	2.6%
Melrose	28,367	28,333	4.91	5.39	5.29	5.46	4.90	3.62	3.43	2.97	2.60	3.05	3.94	7.23	4.40	1.4%	7.23	1.7%
Milton	27,575	26,941	4.50	4.25	4.66	5.10	4.27	2.71	2.58	2.02	1.68	1.92	2.58	5.03	3.44	1.1%	5.10	1.2%
Natick	36,246	32,324	3.54	3.54	3.56	4.02	3.53	2.66	2.73	2.47	2.18	2.19	2.43	3.65	3.04	0.9%	4.02	0.9%
Needham	30,999	29,492	4.83	4.44	4.66	5.05	4.53	3.33	3.34	3.05	2.60	2.92	3.30	4.89	3.91	1.2%	5.05	1.2%
Newton	88,994	88,104	18.08	18.06	18.55	21.15	18.52	12.80	11.82	11.41	9.75	10.49	11.89	18.65	15.09	4.7%	21.15	4.9%
Norwood	29,195	29,026	7.99	6.88	7.30	7.60	6.74	5.65	4.94	4.02	3.74	4.10	4.82	7.87	5.97	1.8%	7.99	1.9%
Quincy	94,166	94,166	15.65	15.00	16.01	17.33	15.64	12.77	13.23	11.13	9.61	10.51	11.75	16.63	13.77	4.3%	17.33	4.1%
Randolph	34,272	34,210	4.72	4.25	4.63	4.72	4.33	3.36	2.81	2.40	2.28	2.50	3.02	5.09	3.67	1.1%	5.09	1.2%
Reading	26,106	25,850	3.77	3.96	4.30	4.32	3.91	2.90	1.90	1.72	1.57	1.75	2.13	3.34	2.96	0.9%	4.32	1.0%
Revere	53,993	53,761	7.26	7.63	7.58	7.94	7.06	6.17	6.49	5.27	4.79	6.17	6.67	9.08	6.84	2.1%	9.08	2.1%
Somerville	81,360	81,360	10.02	9.93	9.10	11.29	8.46	7.43	9.69	8.85	7.29	10.07	8.95	13.00	9.51	2.9%	13.00	3.0%
Stoneham	22,036	21,816	3.69	3.61	4.00	4.17	3.22	2.61	3.12	2.72	2.43	2.70	3.35	5.55	3.43	1.1%	5.55	1.3%
Stoughton	28,528	20,472	4.31	3.72	3.82	4.14	3.73	2.72	2.24	1.77	1.72	1.90	2.43	4.13	3.05	0.9%	4.31	1.0%
Wakefield	27,157	27,067	5.22	5.57	5.86	5.98	5.47	4.02	3.68	3.21	2.73	3.01	3.88	5.77	4.53	1.4%	5.98	1.4%
Walpole	25,073	18,554	2.82	2.57	2.62	2.78	2.76	2.07	1.83	2.29	1.54	1.66	2.00	2.40	2.28	0.7%	2.82	0.7%
Waltham	62,442	61,599	10.49	10.71	10.91	12.27	10.56	8.57	7.93	7.57	7.42	7.55	8.10	10.88	9.41	2.9%	12.27	2.9%
Watertown	35,756	35,756	4.07	4.09	4.20	4.50	3.97	3.03	2.88	2.95	2.63	2.80	3.03	4.52	3.55	1.1%	4.52	1.1%
Wellesley	29,479	28,801	4.16	4.11	4.22	4.92	4.12	2.90	2.82	2.80	2.41	2.67	2.98	4.81	3.58	1.1%	4.92	1.2%
Westwood	16,056	15,056	2.14	2.14	2.21	2.44	2.06	1.65	1.42	1.40	1.22	1.28	1.47	2.19	1.80	0.6%	2.44	0.6%
Weymouth	56,664	55,202	11.94	10.52	11.16	11.39	10.02	7.75	7.32	5.89	5.15	5.98	7.92	12.50	8.96	2.8%	12.50	2.9%
Wilmington	23,803	4,889	1.49	1.56	1.58	1.70	1.73	1.63	1.49	1.47	1.50	1.48	1.53	1.68	1.57	0.5%	1.73	0.4%
Winchester	22,838	22,790	2.91	3.10	3.30	3.46	2.98	2.16	1.96	1.62	1.51	1.58	1.89	2.97	2.45	0.8%	3.46	0.8%
Winthrop	18,625	18,625	2.39	2.30	2.34	2.45	2.53	2.26	2.51	2.24	1.95	2.22	2.47	2.71	2.37	0.7%	2.71	0.6%
Woburn	39,701	38,867	6.51	6.80	6.91	8.03	9.71	7.79	7.53	6.14	5.32	5.48	5.06	7.30	6.89	2.1%	9.71	2.3%
Total/Average	2,344,877	2,278,245	365.01	353.73	365.49	407.51	354.24	294.48	301.76	261.45	234.06	262.84	280.82	402.46	323.62	100%	427.50	100%
Logan Airport Monthly Rainfall (in)			3.62	3.45	2.95	6.52	3.35	5.15	5.81	3.48	2.16	4.45	3.37	6.07				

TABLE 2 - 2019 MWRA COMMUNITY WASTEWATER FLOW COMPONENT ESTIMATES (CY19-12 MONTHS)

2/7/2020

						2019 Averages (1)			Components of Average Daily Flow (Estimated) (2)							
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
COMMUNITY	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	5.04	1.56%	4.66	2.16	42.9%	2.50	49.6%	0.38	7.5%	7.18	1.68%
Ashland	17,706	13,781	2	66	2	1.28	0.40%	1.21	0.41	32.0%	0.80	62.5%	0.07	5.5%	1.61	0.38%
Bedford	14,197	13,700	1	78	4	2.55	0.79%	2.40	1.10	43.1%	1.30	51.0%	0.14	5.5%	3.28	0.77%
Belmont	26,458	26,061	2	78	2	3.17	0.98%	2.80	1.40	44.2%	1.40	44.2%	0.36	11.4%	4.40	1.03%
BWSC (5)	685,094	683,724	255	858	33	96.43	29.80%	82.08	23.58	24.5%	58.50	60.7%	14.36	14.9%	119.76	28.01%
Braintree	37,156	37,052	21	140	8	7.98	2.47%	7.11	3.91	49.0%	3.20	40.1%	0.88	11.0%	11.28	2.64%
Brookline (5)	59,157	58,565	10	111	14	8.67	2.68%	7.62	3.42	39.4%	4.20	48.4%	1.05	12.1%	12.59	2.95%
Burlington	27,176	26,616	1	115	1	3.79	1.17%	3.60	1.60	42.2%	2.00	52.8%	0.18	4.7%	4.73	1.11%
Cambridge (5)	113,630	113,607	127	148	9	18.82	5.82%	16.13	4.63	24.6%	11.50	61.1%	2.69	14.3%	23.60	5.52%
Canton	23,444	16,669	65	62	6	3.02	0.93%	2.79	1.39	46.0%	1.40	46.4%	0.23	7.6%	3.80	0.89%
Chelsea (5)	40,227	40,227	47	41	8	5.83	1.80%	4.56	1.56	26.8%	3.00	51.5%	1.27	21.8%	7.98	1.87%
Dedham	25,364	24,557	30	95	8	3.84	1.19%	3.57	1.77	46.1%	1.80	46.9%	0.28	7.3%	5.24	1.23%
Everett	46,324	46,324	21	57	6	6.28	1.94%	5.77	2.57	40.9%	3.20	51.0%	0.51	8.1%	7.35	1.72%
Framingham	72,032	69,273	2	275	4	6.71	2.07%	6.33	1.54	23.0%	4.79	71.4%	0.38	5.7%	9.02	2.11%
Hingham	8,175	7,748	1	39	1	1.48	0.46%	1.35	0.85	57.4%	0.50	33.8%	0.13	8.8%	2.16	0.51%
Holbrook	11,026	9,925	2	31	2	0.90	0.28%	0.84	0.34	37.8%	0.50	55.6%	0.06	6.7%	1.17	0.27%
Lexington	33,727	33,154	17	170	6	5.19	1.60%	4.89	2.69	51.8%	2.20	42.4%	0.30	5.8%	7.55	1.77%
Malden	61,246	60,970	242	100	6	8.71	2.69%	8.07	3.17	36.4%	4.90	56.3%	0.64	7.3%	11.56	2.70%
Medford	57,797	57,757	74	113	6	7.47	2.31%	6.57	2.37	31.7%	4.20	56.2%	0.90	12.0%	10.96	2.56%
Melrose	28,367	28,333	188	74	5	4.40	1.36%	3.84	2.04	46.4%	1.80	40.9%	0.55	12.5%	7.23	1.69%
Milton	27,575	26,941	56	83	13	3.44	1.06%	3.03	1.63	47.4%	1.40	40.7%	0.41	11.9%	5.10	1.19%
Natick	36,246	32,324	30	135	4	3.04	0.94%	2.87	1.07	35.2%	1.80	59.2%	0.17	5.6%	4.02	0.94%
Needham	30,999	29,492	21	132	2	3.91	1.21%	3.64	1.74	44.5%	1.90	48.6%	0.27	6.9%	5.05	1.18%
Newton	88,994	88,104	52	271	7	15.09	4.66%	13.85	6.05	40.1%	7.80	51.7%	1.23	8.2%	21.15	4.95%
Norwood	29,195	29,026	31	108	6	5.97	1.84%	5.46	3.06	51.3%	2.40	40.2%	0.50	8.4%	7.99	1.87%
Quincy	94,166	94,166	56	202	6	13.77	4.25%	12.75	4.55	33.0%	8.20	59.5%	1.03	7.5%	17.33	4.05%
Randolph	34,272	34,210	2	101	2	3.67	1.13%	3.45	1.55	42.2%	1.90	51.8%	0.22	6.0%	5.09	1.19%
Reading	26,106	25,850	2	96	2	2.96	0.91%	2.79	1.49	50.3%	1.30	43.9%	0.16	5.4%	4.32	1.01%
Revere	53,993	53,761	3	98	2	6.84	2.11%	6.09	2.59	37.9%	3.50	51.2%	0.75	11.0%	9.08	2.12%
Somerville (5)	81,360	81,360	43	128	8	9.51	2.94%	6.93	1.43	15.0%	5.50	57.8%	2.58	27.1%	13.00	3.04%
Stoneham	22,036	21,816	27	63	7	3.43	1.06%	3.11	1.71	49.9%	1.40	40.8%	0.32	9.3%	5.55	1.30%
Stoughton	28,528	20,472	1	88	2	3.05	0.94%	2.85	1.45	47.5%	1.40	45.9%	0.20	6.6%	4.31	1.01%
Wakefield	27,157	27,067	11	93	2	4.53	1.40%	4.23	2.73	60.3%	1.50	33.1%	0.29	6.4%	5.98	1.40%
Walpole	25,073	18,554	1	59	2	2.28	0.70%	2.19	0.99	43.4%	1.20	52.6%	0.08	3.5%	2.82	0.66%
Waltham	62,442	61,599	5	138	4	9.41	2.91%	8.80	3.20	34.0%	5.60	59.5%	0.61	6.5%	12.27	2.87%
Watertown	35,756	35,756	14	75	3	3.55	1.10%	3.26	1.06	29.9%	2.20	62.0%	0.30	8.5%	4.52	1.06%
Wellesley	29,479	28,801	2	134	3	3.58	1.11%	3.29	1.59	44.4%	1.70	47.5%	0.28	7.8%	4.92	1.15%
Westwood	16,056	15,056	3	77	3	1.80	0.56%	1.69	0.79	43.9%	0.90	50.0%	0.11	6.1%	2.44	0.57%
Weymouth	56,664	55,202	19	238	4	8.96	2.77%	8.23	4.53	50.6%	3.70	41.3%	0.73	8.1%	12.50	2.92%
Wilmington	23,803	4,889	2	29	1	1.57	0.49%	1.53	0.73	46.5%	0.80	51.0%	0.04	2.5%	1.73	0.40%
Winchester	22,838	22,790	102	83	7	2.45	0.76%	2.30	1.20	49.0%	1.10	44.9%	0.16	6.5%	3.46	0.81%
Winthrop	18,625	18,625	22	36	4	2.37	0.73%	2.08	0.98	41.4%	1.10	46.4%	0.29	12.2%	2.71	0.63%
Woburn	39,701	38,867	18	141	13	6.89	2.13%	6.41	2.71	39.3%	3.70	53.7%	0.48	7.0%	9.71	2.27%
Totals/Averages	2,344,877	2,278,245	1,958	5,365		323.62	100.00%	287.02	111.33	34.4%	175.69	54.3%	36.57	11.3%	427.50	100.00%

FOOTNOTES:

(1) Figures tabulated using data from the MWRA Wastewater Metering System for Calendar Year 2019.

(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 December 2019 divided by 365 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 - 2019 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	5.04	2.16	0.38	2.50	5,283	2,662	2,264	398	3,585	55
Ashland	13,781	66	594	1.28	0.41	0.07	0.80	2,155	808	690	118	1,061	58
Bedford	13,700	78	738	2.55	1.10	0.14	1.30	3,455	1,680	1,491	190	1,795	95
Belmont	26,061	78	708	3.17	1.40	0.36	1.40	4,477	2,486	1,977	508	4,615	54
BWSC	683,724	858	14,024	96.43	23.58	14.36	58.50	6,876	2,705	1,681	1,024	16,737	86
Braintree	37,052	140	1,300	7.98	3.91	0.88	3.20	6,138	3,685	3,008	677	6,286	86
Brookline	58,565	111	1,332	8.67	3.42	1.05	4.20	6,509	3,356	2,568	788	9,459	72
Burlington	26,616	115	1,150	3.79	1.60	0.18	2.00	3,296	1,548	1,391	157	1,565	75
Cambridge	113,607	148	2,368	18.82	4.63	2.69	11.50	7,948	3,091	1,955	1,136	18,176	101
Canton	16,669	62	567	3.02	1.39	0.23	1.40	5,326	2,857	2,451	406	3,710	84
Chelsea	40,227	41	618	5.83	1.56	1.27	3.00	9,434	4,579	2,524	2,055	30,976	75
Dedham	24,557	95	832	3.84	1.77	0.28	1.80	4,615	2,464	2,127	337	2,947	73
Everett	46,324	57	686	6.28	2.57	0.51	3.20	9,155	4,490	3,746	743	8,947	69
Framingham	69,273	275	2,750	6.71	1.54	0.38	4.79	2,440	698	560	138	1,382	69
Hingham	7,748	39	297	1.48	0.85	0.13	0.50	4,983	3,300	2,862	438	3,333	65
Holbrook	9,925	31	312	0.90	0.34	0.06	0.50	2,885	1,282	1,090	192	1,935	50
Lexington	33,154	170	1,763	5.19	2.69	0.30	2.20	2,944	1,696	1,526	170	1,765	66
Malden	60,970	100	1,000	8.71	3.17	0.64	4.90	8,710	3,810	3,170	640	6,400	80
Medford	57,757	113	1,130	7.47	2.37	0.90	4.20	6,611	2,894	2,097	796	7,965	73
Melrose	28,333	74	641	4.40	2.04	0.55	1.80	6,864	4,041	3,183	858	7,478	64
Milton	26,941	83	747	3.44	1.63	0.41	1.40	4,605	2,731	2,182	549	4,940	52
Natick	32,324	135	1,180	3.04	1.07	0.17	1.80	2,576	1,051	907	144	1,259	56
Needham	29,492	132	1,232	3.91	1.74	0.27	1.90	3,174	1,631	1,412	219	2,045	64
Newton	88,104	271	2,710	15.09	6.05	1.23	7.80	5,568	2,686	2,232	454	4,539	89
Norwood	29,026	108	1,091	5.97	3.06	0.50	2.40	5,472	3,263	2,805	458	4,630	83
Quincy	94,166	202	2,020	13.77	4.55	1.03	8.20	6,817	2,762	2,252	510	5,099	87
Randolph	34,210	101	1,138	3.67	1.55	0.22	1.90	3,225	1,555	1,362	193	2,178	56
Reading	25,850	96	864	2.96	1.49	0.16	1.30	3,426	1,910	1,725	185	1,667	50
Revere	53,761	98	1,434	6.84	2.59	0.75	3.50	4,770	2,329	1,806	523	7,653	65
Somerville	81,360	128	1,920	9.51	1.43	2.58	5.50	4,953	2,089	745	1,344	20,156	68
Stoneham	21,816	63	567	3.43	1.71	0.32	1.40	6,049	3,580	3,016	564	5,079	64
Stoughton	20,472	88	888	3.05	1.45	0.20	1.40	3,435	1,858	1,633	225	2,273	68
Wakefield	27,067	93	888	4.53	2.73	0.29	1.50	5,101	3,401	3,074	327	3,118	55
Walpole	18,554	59	577	2.28	0.99	0.08	1.20	3,951	1,854	1,716	139	1,356	65
Waltham	61,599	138	1,380	9.41	3.20	0.61	5.60	6,819	2,761	2,319	442	4,420	91
Watertown	35,756	75	675	3.55	1.06	0.30	2.20	5,259	2,015	1,570	444	4,000	62
Wellesley	28,801	134	1,340	3.58	1.59	0.28	1.70	2,672	1,396	1,187	209	2,090	59
Westwood	15,056	77	693	1.80	0.79	0.11	0.90	2,597	1,299	1,140	159	1,429	60
Weymouth	55,202	238	2,380	8.96	4.53	0.73	3.70	3,765	2,210	1,903	307	3,067	67
Wilmington	4,889	29	280	1.57	0.73	0.04	0.80	5,607	2,750	2,607	143	1,379	164
Winchester	22,790	83	747	2.45	1.20	0.16	1.10	3,280	1,821	1,606	214	1,928	48
Winthrop	18,625	36	324	2.37	0.98	0.29	1.10	7,315	3,920	3,025	895	8,056	59
Woburn	38,867	141	1,410	6.89	2.71	0.48	3.70	4,887	2,262	1,922	340	3,404	95
Total	2,278,245	5,365	60,249	323.6	111.3	36.6	175.7						
Average	52,982	125	1,401	7.5	2.6	0.9	4.1	5,010	2,495	2,012	483	5,486	72

Table 4 - Estimated Community Wastewater Flow Components for 2019 — 2/7/2020 —

Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average (MGD)
Ashland	Average Daily Flow	1.48	1.44	1.45	1.61	1.46	1.17	1.08	1.03	1.01	1.04	1.12	1.42	1.28
	Dry Day Average Daily Flow	1.30	1.40	1.40	1.50	1.37	1.15	1.05	1.00	1.00	1.02	1.08	1.23	1.21
	Estimated Infiltration	0.50	0.60	0.60	0.70	0.57	0.35	0.25	0.20	0.20	0.22	0.28	0.43	0.41
	Estimated Sanitary Flow	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
	Estimated Inflow	0.18	0.04	0.05	0.11	0.09	0.02	0.03	0.03	0.01	0.02	0.04	0.19	0.07
Boston (South Only)	Raw Average Daily Flow	29.88	28.47	30.37	34.62	30.63	18.61	22.58	18.13	12.76	15.63	17.59	32.52	24.32
	Raw Dry Day Average Daily Flow	24.18	26.54	27.88	31.92	26.22	17.92	20.00	15.36	11.57	13.30	14.12	26.73	21.30
	Raw Estimated Infiltration	15.88	18.24	19.58	23.62	17.92	9.62	11.70	7.06	3.27	5.00	5.82	18.43	13.00
	MWRA Estimated Infiltration	6.18	7.10	7.62	9.19	6.97	3.74	4.55	2.75	1.27	1.95	2.27	7.17	5.06
	Final Average Daily Flow	23.70	21.37	22.75	25.43	23.66	14.87	18.03	15.38	11.49	13.68	15.32	25.35	19.26
	Final Dry Day Average Daily Flow	18.00	19.44	20.26	22.73	19.25	14.18	15.45	12.61	10.30	11.35	11.85	19.56	16.24
	Final Estimated Infiltration	9.70	11.14	11.96	14.43	10.95	5.88	7.15	4.31	2.00	3.05	3.55	11.26	7.94
	Estimated Sanitary Flow	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30
	Estimated Inflow	5.70	1.93	2.49	2.70	4.41	0.69	2.58	2.77	1.19	2.33	3.47	5.79	3.02
Braintree	Raw Average Daily Flow	11.40	10.57	11.34	11.91	9.91	7.46	6.91	5.28	4.64	4.97	7.23	12.37	8.66
	Raw Dry Day Average Daily Flow	8.57	9.95	10.17	10.73	9.30	6.85	6.68	5.07	4.39	4.77	6.43	10.62	7.78
	Raw Estimated Infiltration	5.37	6.75	6.97	7.53	6.10	3.65	3.48	1.87	1.19	1.57	3.23	7.42	4.58
	MWRA Estimated Infiltration	0.79	1.00	1.03	1.11	0.90	0.54	0.51	0.28	0.18	0.23	0.48	1.09	0.68
	Final Average Daily Flow	10.61	9.57	10.31	10.80	9.01	6.92	6.40	5.00	4.46	4.74	6.75	11.28	7.98
	Final Dry Day Average Daily Flow	7.78	8.95	9.14	9.62	8.40	6.31	6.17	4.79	4.21	4.54	5.95	9.53	7.11
	Final Estimated Infiltration	4.58	5.75	5.94	6.42	5.20	3.11	2.97	1.59	1.01	1.34	2.75	6.33	3.91
	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	3.20
	Estimated Inflow	2.83	0.62	1.17	1.18	0.61	0.61	0.23	0.21	0.25	0.20	0.80	1.75	0.88
Brookline (South Only)	Raw Average Daily Flow	7.09	6.90	7.48	8.78	6.02	4.15	4.25	3.82	2.85	3.72	4.48	8.22	5.64
	Raw Dry Day Average Daily Flow	5.32	6.39	6.57	7.36	5.43	3.85	3.88	3.05	2.69	3.36	3.66	6.05	4.79
	Raw Estimated Infiltration	3.22	4.29	4.47	5.26	3.33	1.75	1.78	0.95	0.59	1.26	1.56	3.95	2.69
	MWRA Estimated Infiltration	0.02	0.03	0.03	0.04	0.02	0.01	0.01	0.01	0.00	0.01	0.01	0.03	0.02
	Final Average Daily Flow	7.07	6.87	7.45	8.74	6.00	4.14	4.24	3.81	2.85	3.71	4.47	8.19	5.62
	Final Dry Day Average Daily Flow	5.30	6.36	6.54	7.32	5.41	3.84	3.87	3.04	2.69	3.35	3.65	6.02	4.77
	Final Estimated Infiltration	3.20	4.26	4.44	5.22	3.31	1.74	1.77	0.94	0.59	1.25	1.55	3.92	2.67
	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	2.10	2.10
	Estimated Inflow	1.77	0.51	0.91	1.42	0.59	0.30	0.37	0.77	0.16	0.36	0.82	2.17	0.85
Canton	Raw Average Daily Flow	3.86	3.54	3.96	4.11	3.77	3.17	2.69	2.42	2.22	2.35	2.64	4.07	3.23
	Raw Dry Day Average Daily Flow	3.17	3.42	3.69	3.89	3.50	3.06	2.65	2.35	2.17	2.27	2.45	3.46	3.00
	Raw Estimated Infiltration	1.77	2.02	2.29	2.49	2.10	1.66	1.25	0.95	0.77	0.87	1.05	2.06	1.60
	MWRA Estimated Infiltration	0.24	0.27	0.30	0.33	0.28	0.22	0.17	0.13	0.10	0.12	0.14	0.27	0.21
	Final Average Daily Flow	3.62	3.27	3.66	3.78	3.49	2.95	2.52	2.29	2.12	2.23	2.50	3.80	3.02
	Final Dry Day Average Daily Flow	2.93	3.15	3.39	3.56	3.22	2.84	2.48	2.22	2.07	2.15	2.31	3.19	2.79
	Final Estimated Infiltration	1.53	1.75	1.99	2.16	1.82	1.44	1.08	0.82	0.67	0.75	0.91	1.79	1.39
	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	1.40	1.40
	Estimated Inflow	0.69	0.12	0.27	0.22	0.27	0.11	0.04	0.07	0.05	0.08	0.19	0.61	0.23
Dedham	Average Daily Flow	5.00	4.58	4.74	5.22	4.49	3.35	3.04	2.82	2.30	2.42	2.96	5.24	3.84
	Dry Day Average Daily Flow	4.17	4.36	4.37	4.90	4.27	3.26	3.02	2.61	2.22	2.36	2.72	4.61	3.57
	Estimated Infiltration	2.37	2.56	2.57	3.10	2.47	1.46	1.22	0.81	0.42	0.56	0.92	2.81	1.77
	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	1.80	1.80
	Estimated Inflow	0.83	0.22	0.37	0.32	0.22	0.09	0.02	0.21	0.08	0.06	0.24	0.63	0.28

Table 4 - Estimated Community Wastewater Flow Components for 2019											2/7/2020		PAGE 2	Annual Average
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	(MGD)
Framingham	Average Daily Flow	8.18	8.16	8.27	9.02	7.76	5.68	5.77	5.01	4.79	4.93	5.37	7.62	6.71
	Dry Day Average Daily Flow	7.08	7.78	7.86	8.54	7.34	5.55	5.61	4.82	4.74	4.80	5.32	6.61	6.33
	Estimated Infiltration	2.28	2.98	3.06	3.74	2.54	0.75	0.81	0.02	0.04	0.00	0.52	1.81	1.54
	Estimated Sanitary Flow	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.70	4.80	4.80	4.80	4.79
	Estimated Inflow	1.10	0.38	0.41	0.48	0.42	0.13	0.16	0.19	0.05	0.13	0.05	1.01	0.38
Hingham	Average Daily Flow	1.91	1.78	1.97	2.16	1.67	1.23	1.26	0.91	0.76	0.84	1.17	2.13	1.48
	Dry Day Average Daily Flow	1.51	1.68	1.76	1.92	1.61	1.21	1.25	0.88	0.74	0.82	0.96	1.86	1.35
	Estimated Infiltration	1.01	1.18	1.26	1.42	1.11	0.71	0.75	0.38	0.24	0.32	0.46	1.36	0.85
	Estimated Sanitary Flow	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
	Estimated Inflow	0.40	0.10	0.21	0.24	0.06	0.02	0.01	0.03	0.02	0.02	0.21	0.27	0.13
Holbrook	Average Daily Flow	1.12	1.00	1.08	1.15	1.02	0.81	0.71	0.65	0.65	0.67	0.79	1.17	0.90
	Dry Day Average Daily Flow	0.97	0.96	1.01	1.07	0.95	0.81	0.70	0.64	0.64	0.66	0.71	0.99	0.84
	Estimated Infiltration	0.47	0.46	0.51	0.57	0.45	0.31	0.20	0.14	0.14	0.16	0.21	0.49	0.34
	Estimated Sanitary Flow	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
	Estimated Inflow	0.15	0.04	0.07	0.08	0.07	0.00	0.01	0.01	0.01	0.01	0.08	0.18	0.06
Milton (South Only)	Average Daily Flow	4.12	3.84	4.26	4.71	3.90	2.46	2.38	1.84	1.52	1.76	2.40	4.72	3.16
	Dry Day Average Daily Flow	3.19	3.58	3.79	4.23	3.47	2.38	1.91	1.71	1.48	1.64	1.98	3.94	2.77
	Estimated Infiltration	1.94	2.33	2.54	2.98	2.22	1.13	0.66	0.46	0.23	0.39	0.73	2.69	1.52
	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	1.25	1.25
	Estimated Inflow	0.93	0.26	0.47	0.48	0.43	0.08	0.47	0.13	0.04	0.12	0.42	0.78	0.39
Natick	Average Daily Flow	3.54	3.54	3.56	4.02	3.53	2.66	2.73	2.47	2.18	2.19	2.43	3.65	3.04
	Dry Day Average Daily Flow	3.30	3.44	3.34	3.85	3.46	2.58	2.59	2.32	2.13	2.16	2.25	3.04	2.87
	Estimated Infiltration	1.50	1.64	1.54	2.05	1.66	0.78	0.79	0.52	0.33	0.36	0.45	1.24	1.07
	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	1.80	1.80
	Estimated Inflow	0.24	0.10	0.22	0.17	0.07	0.08	0.14	0.15	0.05	0.03	0.18	0.61	0.17
Needham	Average Daily Flow	4.83	4.44	4.66	5.05	4.53	3.33	3.34	3.05	2.60	2.92	3.30	4.89	3.91
	Dry Day Average Daily Flow	4.06	4.23	4.35	4.76	4.39	3.25	3.21	2.77	2.53	2.76	3.27	4.16	3.64
	Estimated Infiltration	2.16	2.33	2.45	2.86	2.49	1.35	1.31	0.87	0.63	0.86	1.37	2.26	1.74
	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	1.90	1.90
	Estimated Inflow	0.77	0.21	0.31	0.29	0.14	0.08	0.13	0.28	0.07	0.16	0.03	0.73	0.27
Newton (South Only)	Raw Average Daily Flow	11.43	11.41	11.82	13.57	11.60	7.77	7.19	6.91	5.58	6.39	7.44	12.03	9.42
	Raw Dry Day Average Daily Flow	9.13	10.62	10.80	12.31	11.02	7.52	6.95	6.25	5.28	6.13	6.70	9.86	8.54
	Raw Estimated Infiltration	5.03	6.52	6.70	8.21	6.92	3.42	2.85	2.15	1.18	2.03	2.60	5.76	4.44
	MWRA Estimated Infiltration	0.01	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.00	0.01	0.01	0.02	0.01
	Final Average Daily Flow	11.42	11.39	11.80	13.55	11.58	7.76	7.18	6.90	5.58	6.38	7.43	12.01	9.41
	Final Dry Day Average Daily Flow	9.12	10.60	10.78	12.29	11.00	7.51	6.94	6.24	5.28	6.12	6.69	9.84	8.52
	Final Estimated Infiltration	5.02	6.50	6.68	8.19	6.90	3.41	2.84	2.14	1.18	2.02	2.59	5.74	4.42
	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	4.10	4.10
	Estimated Inflow	2.30	0.79	1.02	1.26	0.58	0.25	0.24	0.66	0.30	0.26	0.74	2.17	0.88

Table 4 - Estimated Community Wastewater Flow Components for 2019											2/7/2020		PAGE 3	Annual Average
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	(MGD)
Norwood	Raw Average Daily Flow	8.40	7.37	7.80	8.14	7.19	6.00	5.22	4.18	3.88	4.29	5.04	8.39	6.32
	Raw Dry Day Average Daily Flow	6.37	7.10	7.23	7.61	6.79	5.80	5.11	3.93	3.79	4.19	4.56	7.41	5.82
	Raw Estimated Infiltration	3.97	4.70	4.83	5.21	4.39	3.40	2.71	1.53	1.39	1.79	2.16	5.01	3.42
	MWRA Estimated Infiltration	0.41	0.49	0.50	0.54	0.45	0.35	0.28	0.16	0.14	0.19	0.22	0.52	0.35
	Final Average Daily Flow	7.99	6.88	7.30	7.60	6.74	5.65	4.94	4.02	3.74	4.10	4.82	7.87	5.97
	Final Dry Day Average Daily Flow	5.96	6.61	6.73	7.07	6.34	5.45	4.83	3.77	3.65	4.00	4.34	6.89	5.46
	Final Estimated Infiltration	3.56	4.21	4.33	4.67	3.94	3.05	2.43	1.37	1.25	1.60	1.94	4.49	3.06
	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	2.40
	Estimated Inflow	2.03	0.27	0.57	0.53	0.40	0.20	0.11	0.25	0.09	0.10	0.48	0.98	0.50
Quincy	Average Daily Flow	15.65	15.00	16.01	17.33	15.64	12.77	13.23	11.13	9.61	10.51	11.75	16.63	13.77
	Dry Day Average Daily Flow	12.97	14.32	14.74	15.68	14.86	12.34	12.66	10.62	9.34	10.07	10.47	14.93	12.75
	Estimated Infiltration	4.77	6.12	6.54	7.48	6.66	4.14	4.46	2.42	1.14	1.87	2.27	6.73	4.55
	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	8.20	8.20
	Estimated Inflow	2.68	0.68	1.27	1.65	0.78	0.43	0.57	0.51	0.27	0.44	1.28	1.70	1.03
Randolph	Average Daily Flow	4.72	4.25	4.63	4.72	4.33	3.36	2.81	2.40	2.28	2.50	3.02	5.09	3.67
	Dry Day Average Daily Flow	4.03	4.10	4.34	4.54	4.10	3.26	2.80	2.36	2.21	2.47	2.73	4.51	3.45
	Estimated Infiltration	2.13	2.20	2.44	2.64	2.20	1.36	0.90	0.46	0.31	0.57	0.83	2.61	1.55
	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	1.90	1.90
	Estimated Inflow	0.69	0.15	0.29	0.18	0.23	0.10	0.01	0.04	0.07	0.03	0.29	0.58	0.22
Stoughton	Average Daily Flow	4.31	3.72	3.82	4.14	3.73	2.72	2.24	1.77	1.72	1.90	2.43	4.13	3.05
	Dry Day Average Daily Flow	3.69	3.60	3.59	3.83	3.56	2.64	2.20	1.73	1.69	1.84	2.20	3.65	2.85
	Estimated Infiltration	2.29	2.20	2.19	2.43	2.16	1.24	0.80	0.33	0.29	0.44	0.80	2.25	1.45
	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	1.40	1.40
	Estimated Inflow	0.62	0.12	0.23	0.31	0.17	0.08	0.04	0.04	0.03	0.06	0.23	0.48	0.20
Walpole	Average Daily Flow	2.82	2.57	2.62	2.78	2.76	2.07	1.83	2.29	1.54	1.66	2.00	2.40	2.28
	Dry Day Average Daily Flow	2.63	2.53	2.55	2.64	2.70	2.05	1.81	2.15	1.51	1.63	1.96	2.17	2.19
	Estimated Infiltration	1.43	1.33	1.35	1.44	1.50	0.85	0.61	0.95	0.31	0.43	0.76	0.97	0.99
	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	1.20	1.20
	Estimated Inflow	0.19	0.04	0.07	0.14	0.06	0.02	0.02	0.14	0.03	0.03	0.04	0.23	0.08
Wellesley	Average Daily Flow	4.16	4.11	4.22	4.92	4.12	2.90	2.82	2.80	2.41	2.67	2.98	4.81	3.58
	Dry Day Average Daily Flow	3.38	3.94	3.95	4.51	3.98	2.86	2.64	2.52	2.33	2.59	2.77	4.07	3.29
	Estimated Infiltration	1.68	2.24	2.25	2.81	2.28	1.16	0.94	0.82	0.63	0.89	1.07	2.37	1.59
	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	1.70	1.70
	Estimated Inflow	0.78	0.17	0.27	0.41	0.14	0.04	0.18	0.28	0.08	0.08	0.21	0.74	0.28
Westwood	Average Daily Flow	2.14	2.14	2.21	2.44	2.06	1.65	1.42	1.40	1.22	1.28	1.47	2.19	1.80
	Dry Day Average Daily Flow	1.86	2.08	2.11	2.24	1.95	1.60	1.40	1.33	1.19	1.27	1.40	1.92	1.69
	Estimated Infiltration	0.96	1.18	1.21	1.34	1.05	0.70	0.50	0.43	0.29	0.37	0.50	1.02	0.79
	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	0.90	0.90
	Estimated Inflow	0.28	0.06	0.10	0.20	0.11	0.05	0.02	0.07	0.03	0.01	0.07	0.27	0.11

Table 4 - Estimated Community Wastewater Flow Components for 2019										2/7/2020			PAGE 4	
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average (MGD)
Weymouth	Average Daily Flow	11.94	10.52	11.16	11.39	10.02	7.75	7.32	5.89	5.15	5.98	7.92	12.50	8.96
	Dry Day Average Daily Flow	9.50	10.05	10.18	10.55	9.61	7.54	7.25	5.77	4.99	5.44	6.90	11.04	8.23
	Estimated Infiltration	5.80	6.35	6.48	6.85	5.91	3.84	3.55	2.07	1.29	1.74	3.20	7.34	4.53
	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	3.70	3.70
	Estimated Inflow	2.44	0.47	0.98	0.84	0.41	0.21	0.07	0.12	0.16	0.54	1.02	1.46	0.73
Subtotal (Southern System)	Raw Average Daily Flow	147.98	139.35	147.43	161.79	140.14	101.07	100.82	86.20	71.67	80.62	95.53	156.19	119.03
	Raw Dry Day Average Daily Flow	120.38	132.07	135.68	148.58	129.88	97.48	95.37	79.24	68.63	75.55	84.64	132.86	108.26
	Raw Estimated Infiltration	66.53	78.22	81.83	94.73	76.03	43.63	41.52	25.39	14.88	21.70	30.79	79.01	54.42
	MWRA Estimated Infiltration	7.65	8.91	9.50	11.23	8.64	4.87	5.53	3.34	1.69	2.51	3.13	9.10	6.33
	Final Average Daily Flow	140.33	130.44	137.93	150.56	131.50	96.20	95.29	82.86	69.98	78.11	92.40	147.09	112.69
	Final Dry Day Average Daily Flow	112.73	123.16	126.18	137.35	121.24	92.61	89.84	75.90	66.94	73.04	81.51	123.76	101.93
	Final Estimated Infiltration	58.88	69.31	72.33	83.50	67.39	38.76	35.99	22.05	13.19	19.19	27.66	69.91	48.09
	Estimated Sanitary Flow	53.85	53.85	53.85	53.85	53.85	53.85	53.85	53.85	53.75	53.85	53.85	53.85	53.84
	Estimated Inflow	27.60	7.28	11.75	13.21	10.26	3.59	5.45	6.96	3.04	5.07	10.89	23.33	10.76
South System Pump Station as Reported by NPDES	Average Daily Flow	146.30	136.70	142.90	159.40	137.50	103.90	99.40	86.80	74.50	83.30	98.10	154.70	118.58

Table 4 - Estimated Community Wastewater Flow Components for 2019											2/7/2020		PAGE 5	Annual Average
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	(MGD)
Arlington	Raw Average Daily Flow	5.60	6.00	6.38	6.76	5.83	4.18	3.76	3.41	3.39	4.15	4.89	7.33	5.14
	Raw Dry Day Average Daily Flow	4.69	5.69	5.92	6.47	5.69	4.06	3.62	3.16	3.22	4.03	4.48	6.06	4.75
	Raw Estimated Infiltration	2.19	3.19	3.42	3.97	3.19	1.56	1.12	0.66	0.72	1.53	1.98	3.56	2.25
	MWRA Estimated Infiltration	0.09	0.13	0.14	0.16	0.13	0.06	0.05	0.03	0.03	0.06	0.08	0.15	0.09
	Final Average Daily Flow	5.51	5.87	6.24	6.60	5.70	4.12	3.71	3.38	3.36	4.09	4.81	7.18	5.04
	Final Dry Day Average Daily Flow	4.60	5.56	5.78	6.31	5.56	4.00	3.57	3.13	3.19	3.97	4.40	5.91	4.66
	Final Estimated Infiltration	2.10	3.06	3.28	3.81	3.06	1.50	1.07	0.63	0.69	1.47	1.90	3.41	2.16
	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	2.50	2.50
	Estimated Inflow	0.91	0.31	0.46	0.29	0.14	0.12	0.14	0.25	0.17	0.12	0.41	1.27	0.38
Bedford	Average Daily Flow	2.97	3.02	3.04	3.28	2.97	2.48	2.33	1.97	1.79	1.87	2.08	2.79	2.55
	Dry Day Average Daily Flow	2.67	2.90	2.89	3.08	2.86	2.38	2.23	1.92	1.78	1.81	2.00	2.35	2.40
	Estimated Infiltration	1.37	1.60	1.59	1.78	1.56	1.08	0.93	0.62	0.48	0.51	0.70	1.05	1.10
	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	1.30	1.30
	Estimated Inflow	0.30	0.12	0.15	0.20	0.11	0.10	0.10	0.05	0.01	0.06	0.08	0.44	0.14
Belmont	Average Daily Flow	3.53	3.74	3.85	4.28	3.54	2.67	2.54	2.27	2.10	2.39	2.73	4.40	3.17
	Dry Day Average Daily Flow	2.80	3.42	3.45	3.80	3.35	2.59	2.33	2.02	1.92	2.20	2.43	3.38	2.80
	Estimated Infiltration	1.40	2.02	2.05	2.40	1.95	1.19	0.93	0.62	0.52	0.80	1.03	1.98	1.40
	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	1.40	1.40
	Estimated Inflow	0.73	0.32	0.40	0.48	0.19	0.08	0.21	0.25	0.18	0.19	0.30	1.02	0.36
Boston (North Only)														
Boston Charlestown	Raw Average Daily Flow	3.73	3.54	3.37	4.10	3.56	3.70	4.41	3.81	3.80	4.19	3.79	5.04	3.92
	Raw Dry Day Average Daily Flow	2.91	2.79	2.77	3.12	2.89	2.88	2.98	3.13	3.32	3.35	2.87	4.42	3.12
	Raw Estimated Infiltration	1.21	1.09	1.07	1.42	1.19	1.18	1.28	1.43	1.62	1.65	1.17	2.72	1.42
	MWRA Estimated Infiltration	0.16	0.15	0.14	0.19	0.16	0.16	0.17	0.19	0.22	0.22	0.16	0.36	0.19
	Final Average Daily Flow	3.57	3.39	3.23	3.91	3.40	3.54	4.24	3.62	3.58	3.97	3.63	4.68	3.73
	Final Dry Day Average Daily Flow	2.75	2.64	2.63	2.93	2.73	2.72	2.81	2.94	3.10	3.13	2.71	4.06	2.93
	Final Estimated Infiltration	1.05	0.94	0.93	1.23	1.03	1.02	1.11	1.24	1.40	1.43	1.01	2.36	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	1.70	1.70
	Estimated Inflow	0.82	0.75	0.60	0.98	0.67	0.82	1.43	0.68	0.48	0.84	0.92	0.62	0.80
Boston Columbus Park	Raw Average Daily Flow	40.81	35.31	38.53	48.13	39.18	40.07	44.23	28.78	25.14	30.67	29.62	39.66	36.70
	Raw Dry Day Average Daily Flow	34.93	30.59	33.96	36.04	32.43	34.69	33.00	25.31	23.05	26.27	24.01	31.59	30.50
	Raw Estimated Infiltration	14.43	10.09	13.46	15.54	11.93	14.19	12.50	4.81	2.55	5.77	3.51	11.09	10.00
	MWRA Estimated Infiltration	0.40	0.28	0.38	0.43	0.33	0.40	0.35	0.13	0.07	0.16	0.10	0.31	0.28
	Final Average Daily Flow	40.41	35.03	38.15	47.70	38.85	39.67	43.88	28.65	25.07	30.51	29.52	39.35	36.42
	Final Dry Day Average Daily Flow	34.53	30.31	33.58	35.61	32.10	34.29	32.65	25.18	22.98	26.11	23.91	31.28	30.22
	Final Estimated Infiltration	14.03	9.81	13.08	15.11	11.60	13.79	12.15	4.68	2.48	5.61	3.41	10.78	9.72
	Estimated Sanitary Flow	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50
	Estimated Inflow	5.88	4.72	4.57	12.09	6.75	5.38	11.23	3.47	2.09	4.40	5.61	8.07	6.20
Boston East Boston	Raw Average Daily Flow	6.41	7.09	6.84	8.30	6.92	6.93	7.27	6.19	5.81	6.78	9.09	7.91	7.12
	Raw Dry Day Average Daily Flow	4.82	6.49	6.07	6.04	6.03	5.71	5.55	5.50	5.34	5.63	6.25	6.41	5.81
	Raw Estimated Infiltration	1.32	2.99	2.57	2.54	2.53	2.21	2.05	2.00	1.84	2.13	2.75	2.91	2.31
	MWRA Estimated Infiltration	0.20	0.45	0.39	0.38	0.38	0.33	0.31	0.30	0.28	0.32	0.42	0.44	0.35
	Final Average Daily Flow	6.21	6.64	6.45	7.92	6.54	6.60	6.96	5.89	5.53	6.46	8.67	7.47	6.78
	Final Dry Day Average Daily Flow	4.62	6.04	5.68	5.66	5.65	5.38	5.24	5.20	5.06	5.31	5.83	5.97	5.47
	Final Estimated Infiltration	1.12	2.54	2.18	2.16	2.15	1.88	1.74	1.70	1.56	1.81	2.33	2.47	1.97
	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	3.50	3.50
	Estimated Inflow	1.59	0.60	0.77	2.26	0.89	1.22	1.72	0.69	0.47	1.15	2.84	1.50	1.31

Table 4 - Estimated Community Wastewater Flow Components for 2019											2/7/2020			PAGE 6	Annual Average
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		(MGD)
Boston Ward Street	Raw Average Daily Flow	32.27	31.81	31.65	35.91	30.45	26.66	27.44	28.26	29.76	32.53	27.96	34.93		30.80
	Raw Dry Day Average Daily Flow	27.85	29.81	28.87	30.97	27.95	24.96	25.70	24.54	27.39	30.62	25.43	29.40		27.78
	Raw Estimated Infiltration	3.35	5.31	4.37	6.47	3.45	0.46	1.20	0.04	2.89	6.12	0.93	4.90		3.28
	MWRA Estimated Infiltration	0.57	0.91	0.75	1.11	0.59	0.08	0.21	0.01	0.49	1.05	0.16	0.84		0.56
	Final Average Daily Flow	31.70	30.90	30.90	34.80	29.86	26.58	27.23	28.25	29.27	31.48	27.80	34.09		30.24
	Final Dry Day Average Daily Flow	27.28	28.90	28.12	29.86	27.36	24.88	25.49	24.53	26.90	29.57	25.27	28.56		27.22
	Final Estimated Infiltration	2.78	4.40	3.62	5.36	2.86	0.38	0.99	0.03	2.40	5.07	0.77	4.06		2.72
	Estimated Sanitary Flow	24.50	24.50	24.50	24.50	24.50	24.50	24.50	24.50	24.50	24.50	24.50	24.50		24.50
	Estimated Inflow	4.42	2.00	2.78	4.94	2.50	1.70	1.74	3.72	2.37	1.91	2.53	5.53		3.02
Boston (North Total)	Raw Average Daily Flow	83.22	77.75	80.39	96.44	80.11	77.36	83.35	67.04	64.51	74.17	70.46	87.54		78.55
	Raw Dry Day Average Daily Flow	70.51	69.68	71.67	76.17	69.30	68.24	67.23	58.48	59.10	65.87	58.56	71.82		67.22
	Raw Estimated Infiltration	20.31	19.48	21.47	25.97	19.10	18.04	17.03	8.28	8.90	15.67	8.36	21.62		17.02
	MWRA Estimated Infiltration	1.33	1.79	1.66	2.11	1.46	0.97	1.04	0.63	1.06	1.75	0.84	1.95		1.38
	Final Average Daily Flow	81.89	75.96	78.73	94.33	78.65	76.39	82.31	66.41	63.45	72.42	69.62	85.59		77.17
	Final Dry Day Average Daily Flow	69.18	67.89	70.01	74.06	67.84	67.27	66.19	57.85	58.04	64.12	57.72	69.87		65.84
	Final Estimated Infiltration	18.98	17.69	19.81	23.86	17.64	17.07	15.99	7.65	7.84	13.92	7.52	19.67		15.64
	Estimated Sanitary Flow	50.20	50.20	50.20	50.20	50.20	50.20	50.20	50.20	50.20	50.20	50.20	50.20		50.20
	Estimated Inflow	12.71	8.07	8.72	20.27	10.81	9.12	16.12	8.56	5.41	8.30	11.90	15.72		11.33
Brookline (North Only)	Average Daily Flow	3.64	3.58	3.59	3.85	3.36	2.98	2.92	2.73	2.48	2.40	2.16	2.90		3.05
	Dry Day Average Daily Flow	3.26	3.42	3.51	3.58	3.22	2.85	2.67	2.48	2.36	2.28	2.13	2.41		2.84
	Estimated Infiltration	1.16	1.32	1.41	1.48	1.12	0.75	0.57	0.38	0.26	0.18	0.03	0.31		0.74
	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	2.10		2.10
	Estimated Inflow	0.38	0.16	0.08	0.27	0.14	0.13	0.25	0.25	0.12	0.12	0.03	0.49		0.20
Burlington	Average Daily Flow	4.11	4.35	4.53	4.73	4.39	3.62	3.55	2.92	2.65	2.81	3.26	4.54		3.79
	Dry Day Average Daily Flow	3.68	4.17	4.31	4.52	4.31	3.50	3.45	2.82	2.62	2.80	3.09	3.99		3.60
	Estimated Infiltration	1.68	2.17	2.31	2.52	2.31	1.50	1.45	0.82	0.62	0.80	1.09	1.99		1.60
	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	2.00		2.00
	Estimated Inflow	0.43	0.18	0.22	0.21	0.08	0.12	0.10	0.10	0.03	0.01	0.17	0.55		0.18
Cambridge	Raw Average Daily Flow	18.01	18.00	17.85	20.98	17.97	20.31	22.70	20.00	16.87	18.95	18.44	24.62		19.58
	Raw Dry Day Average Daily Flow	14.52	15.62	16.09	16.85	17.90	18.79	19.53	17.30	14.75	16.06	16.27	18.74		16.88
	Raw Estimated Infiltration	3.02	4.12	4.59	5.35	6.40	7.29	8.03	5.80	3.25	4.56	4.77	7.24		5.38
	MWRA Estimated Infiltration	0.42	0.58	0.64	0.75	0.90	1.02	1.13	0.81	0.46	0.64	0.67	1.02		0.76
	Final Average Daily Flow	17.59	17.42	17.21	20.23	17.07	19.29	21.57	19.19	16.41	18.31	17.77	23.60		18.82
	Final Dry Day Average Daily Flow	14.10	15.04	15.45	16.10	17.00	17.77	18.40	16.49	14.29	15.42	15.60	17.72		16.13
	Final Estimated Infiltration	2.60	3.54	3.95	4.60	5.50	6.27	6.90	4.99	2.79	3.92	4.10	6.22		4.63
	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	11.50		11.50
	Estimated Inflow	3.49	2.38	1.76	4.13	0.07	1.52	3.17	2.70	2.12	2.89	2.17	5.88		2.69
Chelsea	Raw Average Daily Flow	6.21	6.14	6.20	6.97	5.74	5.63	5.82	5.01	4.34	5.99	6.23	8.33		6.05
	Raw Dry Day Average Daily Flow	4.94	5.09	5.28	5.30	4.77	4.45	4.60	4.06	3.75	4.59	4.72	5.83		4.78
	Raw Estimated Infiltration	1.94	2.09	2.28	2.30	1.77	1.45	1.60	1.06	0.75	1.59	1.72	2.83		1.78
	MWRA Estimated Infiltration	0.24	0.26	0.28	0.28	0.22	0.18	0.20	0.13	0.09	0.19	0.21	0.35		0.22
	Final Average Daily Flow	5.97	5.88	5.92	6.69	5.52	5.45	5.62	4.88	4.25	5.80	6.02	7.98		5.83
	Final Dry Day Average Daily Flow	4.70	4.83	5.00	5.02	4.55	4.27	4.40	3.93	3.66	4.40	4.51	5.48		4.56
	Final Estimated Infiltration	1.70	1.83	2.00	2.02	1.55	1.27	1.40	0.93	0.66	1.40	1.51	2.48		1.56
	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	3.00		3.00
	Estimated Inflow	1.27	1.05	0.92	1.67	0.97	1.18	1.22	0.95	0.59	1.40	1.51	2.50		1.27

Table 4 - Estimated Community Wastewater Flow Components for 2019											2/7/2020		PAGE 7	
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average (MGD)
Everett	Raw Average Daily Flow	7.15	7.37	6.83	6.96	6.60	5.60	6.30	6.18	5.44	5.57	4.73	6.81	6.29
	Raw Dry Day Average Daily Flow	6.68	7.12	6.46	6.36	6.33	5.29	5.90	5.53	4.80	4.78	4.18	6.04	5.79
	Raw Estimated Infiltration	3.48	3.92	3.26	3.16	3.13	2.09	2.70	2.33	1.60	1.58	0.98	2.84	2.59
	MWRA Estimated Infiltration	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01
	Final Average Daily Flow	7.13	7.35	6.81	6.94	6.58	5.59	6.29	6.17	5.43	5.56	4.73	6.80	6.28
	Final Dry Day Average Daily Flow	6.66	7.10	6.44	6.34	6.31	5.28	5.89	5.52	4.79	4.77	4.18	6.03	5.77
	Final Estimated Infiltration	3.46	3.90	3.24	3.14	3.11	2.08	2.69	2.32	1.59	1.57	0.98	2.83	2.57
	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	3.20
	Estimated Inflow	0.47	0.25	0.37	0.60	0.27	0.31	0.40	0.65	0.64	0.79	0.55	0.77	0.51
Lexington	Raw Average Daily Flow	5.83	7.02	7.36	8.09	7.07	4.66	4.09	3.58	3.47	3.70	4.52	6.42	5.47
	Raw Dry Day Average Daily Flow	4.98	6.75	6.62	7.91	7.04	4.48	4.07	3.43	3.37	3.66	4.24	5.67	5.17
	Raw Estimated Infiltration	2.78	4.55	4.42	5.71	4.84	2.28	1.87	1.23	1.17	1.46	2.04	3.47	2.97
	MWRA Estimated Infiltration	0.26	0.43	0.42	0.54	0.46	0.22	0.18	0.12	0.11	0.14	0.19	0.33	0.28
	Final Average Daily Flow	5.57	6.59	6.94	7.55	6.61	4.44	3.91	3.46	3.36	3.56	4.33	6.09	5.19
	Final Dry Day Average Daily Flow	4.72	6.32	6.20	7.37	6.58	4.26	3.89	3.31	3.26	3.52	4.05	5.34	4.89
	Final Estimated Infiltration	2.52	4.12	4.00	5.17	4.38	2.06	1.69	1.11	1.06	1.32	1.85	3.14	2.69
	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	2.20	2.20
	Estimated Inflow	0.85	0.27	0.74	0.18	0.03	0.18	0.02	0.15	0.10	0.04	0.28	0.75	0.30
Malden	Raw Average Daily Flow	9.74	10.60	10.58	10.70	9.30	8.01	7.84	7.26	7.05	7.15	8.28	12.05	9.04
	Raw Dry Day Average Daily Flow	8.18	10.01	9.81	10.42	9.13	7.81	7.68	6.78	6.75	6.76	7.51	10.05	8.40
	Raw Estimated Infiltration	3.28	5.11	4.91	5.52	4.23	2.91	2.78	1.88	1.85	1.86	2.61	5.15	3.50
	MWRA Estimated Infiltration	0.31	0.48	0.46	0.52	0.40	0.27	0.26	0.18	0.17	0.18	0.25	0.49	0.33
	Final Average Daily Flow	9.43	10.12	10.12	10.18	8.90	7.74	7.58	7.08	6.88	6.97	8.03	11.56	8.71
	Final Dry Day Average Daily Flow	7.87	9.53	9.35	9.90	8.73	7.54	7.42	6.60	6.58	6.58	7.26	9.56	8.07
	Final Estimated Infiltration	2.97	4.63	4.45	5.00	3.83	2.64	2.52	1.70	1.68	1.68	2.36	4.66	3.17
	Estimated Sanitary Flow	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90
	Estimated Inflow	1.56	0.59	0.77	0.28	0.17	0.20	0.16	0.48	0.30	0.39	0.77	2.00	0.64
Medford	Raw Average Daily Flow	7.78	8.02	8.49	9.20	8.02	6.23	6.94	6.92	6.01	6.65	7.51	11.54	7.78
	Raw Dry Day Average Daily Flow	5.98	7.10	7.88	8.26	7.47	5.95	6.36	6.04	5.60	6.18	6.54	9.21	6.88
	Raw Estimated Infiltration	1.78	2.90	3.68	4.06	3.27	1.75	2.16	1.84	1.40	1.98	2.34	5.01	2.68
	MWRA Estimated Infiltration	0.21	0.34	0.43	0.47	0.38	0.20	0.25	0.21	0.16	0.23	0.27	0.58	0.31
	Final Average Daily Flow	7.57	7.68	8.06	8.73	7.64	6.03	6.69	6.71	5.85	6.42	7.24	10.96	7.47
	Final Dry Day Average Daily Flow	5.77	6.76	7.45	7.79	7.09	5.75	6.11	5.83	5.44	5.95	6.27	8.63	6.57
	Final Estimated Infiltration	1.57	2.56	3.25	3.59	2.89	1.55	1.91	1.63	1.24	1.75	2.07	4.43	2.37
	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	4.20	4.20
	Estimated Inflow	1.80	0.92	0.61	0.94	0.55	0.28	0.58	0.88	0.41	0.47	0.97	2.33	0.90
Melrose	Raw Average Daily Flow	5.41	5.89	6.00	6.28	5.63	4.04	3.80	3.20	2.74	3.30	4.34	8.06	4.89
	Raw Dry Day Average Daily Flow	4.39	4.38	5.46	6.02	5.55	3.97	3.73	2.97	2.52	3.09	3.86	6.07	4.34
	Raw Estimated Infiltration	2.59	2.58	3.66	4.22	3.75	2.17	1.93	1.17	0.72	1.29	2.06	4.27	2.54
	MWRA Estimated Infiltration	0.50	0.50	0.71	0.82	0.73	0.42	0.37	0.23	0.14	0.25	0.40	0.83	0.49
	Final Average Daily Flow	4.91	5.39	5.29	5.46	4.90	3.62	3.43	2.97	2.60	3.05	3.94	7.23	4.40
	Final Dry Day Average Daily Flow	3.89	3.88	4.75	5.20	4.82	3.55	3.36	2.74	2.38	2.84	3.46	5.24	3.84
	Final Estimated Infiltration	2.09	2.08	2.95	3.40	3.02	1.75	1.56	0.94	0.58	1.04	1.66	3.44	2.04
	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	1.80	1.80
	Estimated Inflow	1.02	1.51	0.54	0.26	0.08	0.07	0.07	0.23	0.22	0.21	0.48	1.99	0.55

Table 4 - Estimated Community Wastewater Flow Components for 2019											2/7/2020			PAGE 8	Annual Average
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		(MGD)
Milton (North Only)	Average Daily Flow	0.38	0.41	0.40	0.39	0.37	0.25	0.20	0.18	0.16	0.16	0.18	0.31		0.28
	Dry Day Average Daily Flow	0.31	0.39	0.37	0.38	0.34	0.24	0.19	0.17	0.16	0.16	0.16	0.28		0.26
	Estimated Infiltration	0.16	0.24	0.22	0.23	0.19	0.09	0.04	0.02	0.01	0.01	0.01	0.13		0.11
	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	0.15		0.15
	Estimated Inflow	0.07	0.02	0.03	0.01	0.03	0.01	0.01	0.01	0.00	0.00	0.02	0.03		0.02
Newton (North Only)	Average Daily Flow	6.66	6.67	6.75	7.60	6.94	5.04	4.64	4.51	4.17	4.11	4.46	6.64		5.68
	Dry Day Average Daily Flow	5.76	6.46	6.46	7.31	6.78	4.96	4.48	4.11	3.83	3.95	4.24	5.69		5.33
	Estimated Infiltration	2.06	2.76	2.76	3.61	3.08	1.26	0.78	0.41	0.13	0.25	0.54	1.99		1.63
	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	3.70		3.70
	Estimated Inflow	0.90	0.21	0.29	0.29	0.16	0.08	0.16	0.40	0.34	0.16	0.22	0.95		0.35
Reading	Raw Average Daily Flow	3.79	3.98	4.33	4.34	3.93	2.91	1.91	1.72	1.57	1.75	2.14	3.36		2.97
	Raw Dry Day Average Daily Flow	3.37	3.81	4.12	3.89	3.91	2.87	1.91	1.67	1.54	1.70	2.05	2.92		2.81
	Raw Estimated Infiltration	2.07	2.51	2.82	2.59	2.61	1.57	0.61	0.37	0.24	0.40	0.75	1.62		1.51
	MWRA Estimated Infiltration	0.02	0.02	0.03	0.02	0.02	0.01	0.01	0.00	0.00	0.00	0.01	0.02		0.01
	Final Average Daily Flow	3.77	3.96	4.30	4.32	3.91	2.90	1.90	1.72	1.57	1.75	2.13	3.34		2.96
	Final Dry Day Average Daily Flow	3.35	3.79	4.09	3.87	3.89	2.86	1.90	1.67	1.54	1.70	2.04	2.90		2.79
	Final Estimated Infiltration	2.05	2.49	2.79	2.57	2.59	1.56	0.60	0.37	0.24	0.40	0.74	1.60		1.49
	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	1.30		1.30
	Estimated Inflow	0.42	0.17	0.21	0.45	0.02	0.04	0.00	0.05	0.03	0.05	0.09	0.44		0.16
Revere	Raw Average Daily Flow	7.28	7.66	7.61	7.97	7.08	6.19	6.51	5.28	4.80	6.19	6.69	9.11		6.86
	Raw Dry Day Average Daily Flow	6.01	6.90	6.89	6.96	6.70	5.86	6.08	4.83	4.31	5.63	5.63	7.52		6.11
	Raw Estimated Infiltration	2.51	3.40	3.39	3.46	3.20	2.36	2.58	1.33	0.81	2.13	2.13	4.02		2.61
	MWRA Estimated Infiltration	0.02	0.03	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.03		0.02
	Final Average Daily Flow	7.26	7.63	7.58	7.94	7.06	6.17	6.49	5.27	4.79	6.17	6.67	9.08		6.84
	Final Dry Day Average Daily Flow	5.99	6.87	6.86	6.93	6.68	5.84	6.06	4.82	4.30	5.61	5.61	7.49		6.09
	Final Estimated Infiltration	2.49	3.37	3.36	3.43	3.18	2.34	2.56	1.32	0.80	2.11	2.11	3.99		2.59
	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	3.50		3.50
	Estimated Inflow	1.27	0.76	0.72	1.01	0.38	0.33	0.43	0.45	0.49	0.56	1.06	1.59		0.75
Somerville	Raw Average Daily Flow	10.06	9.99	9.15	11.34	8.49	7.43	9.72	8.86	7.29	10.11	8.98	13.07		9.55
	Raw Dry Day Average Daily Flow	7.06	8.03	7.72	7.59	6.87	5.64	6.76	5.83	5.71	7.16	6.89	8.35		6.96
	Raw Estimated Infiltration	1.56	2.53	2.22	2.09	1.37	0.14	1.26	0.33	0.21	1.66	1.39	2.85		1.46
	MWRA Estimated Infiltration	0.04	0.06	0.05	0.05	0.03	0.00	0.03	0.01	0.00	0.04	0.03	0.07		0.03
	Final Average Daily Flow	10.02	9.93	9.10	11.29	8.46	7.43	9.69	8.85	7.29	10.07	8.95	13.00		9.51
	Final Dry Day Average Daily Flow	7.02	7.97	7.67	7.54	6.84	5.64	6.73	5.82	5.71	7.12	6.86	8.28		6.93
	Final Estimated Infiltration	1.52	2.47	2.17	2.04	1.34	0.14	1.23	0.32	0.21	1.62	1.36	2.78		1.43
	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	5.50		5.50
	Estimated Inflow	3.00	1.96	1.43	3.75	1.62	1.79	2.96	3.03	1.58	2.95	2.09	4.72		2.58
Stoneham	Raw Average Daily Flow	3.94	3.99	4.47	4.68	3.57	2.83	3.44	2.95	2.62	2.96	3.67	6.11		3.77
	Raw Dry Day Average Daily Flow	2.93	3.68	4.22	4.51	3.51	2.75	3.32	2.82	2.54	2.96	3.32	4.80		3.45
	Raw Estimated Infiltration	1.53	2.28	2.82	3.11	2.11	1.35	1.92	1.42	1.14	1.56	1.92	3.40		2.05
	MWRA Estimated Infiltration	0.25	0.38	0.47	0.51	0.35	0.22	0.32	0.23	0.19	0.26	0.32	0.56		0.34
	Final Average Daily Flow	3.69	3.61	4.00	4.17	3.22	2.61	3.12	2.72	2.43	2.70	3.35	5.55		3.43
	Final Dry Day Average Daily Flow	2.68	3.30	3.75	4.00	3.16	2.53	3.00	2.59	2.35	2.70	3.00	4.24		3.11
	Final Estimated Infiltration	1.28	1.90	2.35	2.60	1.76	1.13	1.60	1.19	0.95	1.30	1.60	2.84		1.71
	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	1.40		1.40
	Estimated Inflow	1.01	0.31	0.25	0.17	0.06	0.08	0.12	0.13	0.08	0.00	0.35	1.31		0.32

Table 4 - Estimated Community Wastewater Flow Components for 2019											2/7/2020		PAGE 9	Annual Average
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	(MGD)
Wakefield	Raw Average Daily Flow	5.23	5.59	5.88	6.00	5.49	4.03	3.69	3.22	2.73	3.02	3.89	5.78	4.54
	Raw Dry Day Average Daily Flow	4.39	5.26	5.49	5.81	5.38	3.91	3.61	2.91	2.60	2.95	3.52	5.20	4.25
	Raw Estimated Infiltration	2.89	3.76	3.99	4.31	3.88	2.41	2.11	1.41	1.10	1.45	2.02	3.70	2.75
	MWRA Estimated Infiltration	0.01	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01
	Final Average Daily Flow	5.22	5.57	5.86	5.98	5.47	4.02	3.68	3.21	2.73	3.01	3.88	5.77	4.53
	Final Dry Day Average Daily Flow	4.38	5.24	5.47	5.79	5.36	3.90	3.60	2.90	2.60	2.94	3.51	5.19	4.23
	Final Estimated Infiltration	2.88	3.74	3.97	4.29	3.86	2.40	2.10	1.40	1.10	1.44	2.01	3.69	2.73
	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	1.50
	Estimated Inflow	0.84	0.33	0.39	0.19	0.11	0.12	0.08	0.31	0.13	0.07	0.37	0.58	0.29
Waltham	Raw Average Daily Flow	10.65	10.94	11.13	12.54	10.78	8.70	8.02	7.64	7.48	7.63	8.20	11.05	9.56
	Raw Dry Day Average Daily Flow	9.20	10.63	10.56	11.64	10.55	8.48	7.68	7.25	7.03	7.35	7.82	9.31	8.95
	Raw Estimated Infiltration	3.60	5.03	4.96	6.04	4.95	2.88	2.08	1.65	1.43	1.75	2.22	3.71	3.35
	MWRA Estimated Infiltration	0.16	0.23	0.22	0.27	0.22	0.13	0.09	0.07	0.06	0.08	0.10	0.17	0.15
	Final Average Daily Flow	10.49	10.71	10.91	12.27	10.56	8.57	7.93	7.57	7.42	7.55	8.10	10.88	9.41
	Final Dry Day Average Daily Flow	9.04	10.40	10.34	11.37	10.33	8.35	7.59	7.18	6.97	7.27	7.72	9.14	8.80
	Final Estimated Infiltration	3.44	4.80	4.74	5.77	4.73	2.75	1.99	1.58	1.37	1.67	2.12	3.54	3.20
	Estimated Sanitary Flow	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60
	Estimated Inflow	1.45	0.31	0.57	0.90	0.23	0.22	0.34	0.39	0.45	0.28	0.38	1.74	0.61
Watertown	Average Daily Flow	4.07	4.09	4.20	4.50	3.97	3.03	2.88	2.95	2.63	2.80	3.03	4.52	3.55
	Dry Day Average Daily Flow	3.43	3.88	3.92	4.17	3.77	2.89	2.73	2.66	2.52	2.66	2.77	3.74	3.26
	Estimated Infiltration	1.23	1.68	1.72	1.97	1.57	0.69	0.53	0.46	0.32	0.46	0.57	1.54	1.06
	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	2.20	2.20
	Estimated Inflow	0.64	0.21	0.28	0.33	0.20	0.14	0.15	0.29	0.11	0.14	0.26	0.78	0.30
Wilmington	Raw Average Daily Flow	1.50	1.57	1.59	1.71	1.74	1.64	1.50	1.48	1.51	1.49	1.54	1.69	1.58
	Raw Dry Day Average Daily Flow	1.42	1.56	1.54	1.69	1.72	1.61	1.48	1.44	1.50	1.44	1.54	1.54	1.54
	Raw Estimated Infiltration	0.62	0.76	0.74	0.89	0.92	0.81	0.68	0.64	0.70	0.64	0.74	0.74	0.74
	MWRA Estimated Infiltration	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Final Average Daily Flow	1.49	1.56	1.58	1.70	1.73	1.63	1.49	1.47	1.50	1.48	1.53	1.68	1.57
	Final Dry Day Average Daily Flow	1.41	1.55	1.53	1.68	1.71	1.60	1.47	1.43	1.49	1.43	1.53	1.53	1.53
	Final Estimated Infiltration	0.61	0.75	0.73	0.88	0.91	0.80	0.67	0.63	0.69	0.63	0.73	0.73	0.73
	Estimated Sanitary Flow	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
	Estimated Inflow	0.08	0.01	0.05	0.02	0.02	0.03	0.02	0.04	0.01	0.05	0.00	0.15	0.04
Winchester	Average Daily Flow	2.91	3.10	3.30	3.46	2.98	2.16	1.96	1.62	1.51	1.58	1.89	2.97	2.45
	Dry Day Average Daily Flow	2.53	2.97	3.06	3.39	2.93	2.09	1.93	1.54	1.46	1.51	1.74	2.44	2.30
	Estimated Infiltration	1.43	1.87	1.96	2.29	1.83	0.99	0.83	0.44	0.36	0.41	0.64	1.34	1.20
	Estimated Sanitary Flow	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
	Estimated Inflow	0.38	0.13	0.24	0.07	0.05	0.07	0.03	0.08	0.05	0.07	0.15	0.53	0.16
Winthrop	Average Daily Flow	2.39	2.30	2.34	2.45	2.53	2.26	2.51	2.24	1.95	2.22	2.47	2.71	2.37
	Dry Day Average Daily Flow	1.94	2.10	2.06	2.17	2.23	1.97	2.18	2.02	1.84	1.95	2.13	2.34	2.08
	Estimated Infiltration	0.84	1.00	0.96	1.07	1.13	0.87	1.08	0.92	0.74	0.85	1.03	1.24	0.98
	Estimated Sanitary Flow	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
	Estimated Inflow	0.45	0.20	0.28	0.28	0.30	0.29	0.33	0.22	0.11	0.27	0.34	0.37	0.29

Table 4 - Estimated Community Wastewater Flow Components for 2019											2/7/2020		PAGE 10	Annual Average
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	(MGD)
Woburn	Raw Average Daily Flow	6.87	7.23	7.37	8.72	10.65	8.41	8.10	6.46	5.55	5.67	5.20	7.67	7.33
	Raw Dry Day Average Daily Flow	6.23	6.75	6.98	8.59	10.33	8.12	7.74	6.00	5.34	5.04	4.72	6.33	6.85
	Raw Estimated Infiltration	2.53	3.05	3.28	4.89	6.63	4.42	4.04	2.30	1.64	1.34	1.02	2.63	3.15
	MWRA Estimated Infiltration	0.36	0.43	0.46	0.69	0.94	0.62	0.57	0.32	0.23	0.19	0.14	0.37	0.44
	Final Average Daily Flow	6.51	6.80	6.91	8.03	9.71	7.79	7.53	6.14	5.32	5.48	5.06	7.30	6.89
	Final Dry Day Average Daily Flow	5.87	6.32	6.52	7.90	9.39	7.50	7.17	5.68	5.11	4.85	4.58	5.96	6.41
	Final Estimated Infiltration	2.17	2.62	2.82	4.20	5.69	3.80	3.47	1.98	1.41	1.15	0.88	2.26	2.71
	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	3.70	3.70
	Estimated Inflow	0.64	0.48	0.39	0.13	0.32	0.29	0.36	0.46	0.21	0.63	0.48	1.34	0.48
Subtotal (Northern System)	Raw Average Daily Flow	228.93	229.00	233.61	264.22	229.05	202.65	211.02	181.60	166.81	188.79	191.97	262.32	215.83
	Raw Dry Day Average Daily Flow	191.86	207.77	212.74	226.84	211.94	185.75	183.49	160.24	152.92	168.57	166.54	212.08	189.99
	Raw Estimated Infiltration	70.01	85.92	90.89	104.99	90.09	63.90	61.64	38.39	31.07	46.72	44.69	90.23	68.14
	MWRA Estimated Infiltration	4.25	5.71	6.05	7.27	6.31	4.37	4.55	3.01	2.73	4.06	3.55	6.95	4.90
	Final Average Daily Flow	224.68	223.29	227.56	256.95	222.74	198.28	206.47	178.59	164.08	184.73	188.42	255.37	210.93
	Final Dry Day Average Daily Flow	187.61	202.06	206.69	219.57	205.63	181.38	178.94	157.23	150.19	164.51	162.99	205.13	185.09
	Final Estimated Infiltration	65.76	80.21	84.84	97.72	83.78	59.53	57.09	35.38	28.34	42.66	41.14	83.28	63.24
	Estimated Sanitary Flow	121.85	121.85	121.85	121.85	121.85	121.85	121.85	121.85	121.85	121.85	121.85	121.85	121.85
	Estimated Inflow	37.07	21.23	20.87	37.38	17.11	16.90	27.53	21.36	13.89	20.22	25.43	50.24	25.83
Total (North and South)	Raw Average Daily Flow	376.91	368.35	381.04	426.01	369.19	303.72	311.84	267.80	238.48	269.41	287.50	418.51	334.85
	Raw Dry Day Average Daily Flow	312.24	339.84	348.42	375.42	341.82	283.23	278.86	239.48	221.55	244.12	251.18	344.94	298.26
	Raw Estimated Infiltration	136.54	164.14	172.72	199.72	166.12	107.53	103.16	63.78	45.95	68.42	75.48	169.24	122.56
	MWRA Estimated Infiltration	11.90	14.62	15.55	18.50	14.95	9.24	10.08	6.35	4.42	6.57	6.68	16.05	11.23
	Final Average Daily Flow	365.01	353.73	365.49	407.51	354.24	294.48	301.76	261.45	234.06	262.84	280.82	402.46	323.62
	Final Dry Day Average Daily Flow	300.34	325.22	332.87	356.92	326.87	273.99	268.78	233.13	217.13	237.55	244.50	328.89	287.02
	Final Estimated Infiltration	124.64	149.52	157.17	181.22	151.17	98.29	93.08	57.43	41.53	61.85	68.80	153.19	111.33
	Estimated Sanitary Flow	175.70	175.70	175.70	175.70	175.70	175.70	175.70	175.70	175.60	175.70	175.70	175.70	175.69
	Estimated Inflow	64.67	28.51	32.62	50.59	27.37	20.49	32.98	28.32	16.93	25.29	36.32	73.57	36.60
North System as Reported by NPDES	Average Daily Flow	237.30	236.80	242.40	274.20	234.50	215.10	217.00	186.70	172.90	196.90	196.80	270.80	223.44
Total System as Reported by NPDES	Average Daily Flow	383.60	373.50	385.30	433.60	372.00	319.00	316.40	273.50	247.40	280.20	294.90	425.50	342.02

Table 4 - Estimated Community Wastewater Flow Components for 2019											2/7/2020			PAGE 11	Annual Average
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		(MGD)
Chelsea Creek	Average Daily Flow	110.38	113.70	115.23	125.40	110.39	96.51	93.42	81.95	74.18	82.56	88.82	130.75		101.91
	Dry Day Average Daily Flow	92.03	103.64	107.14	111.29	103.57	87.78	83.01	72.02	68.10	74.54	77.54	102.40		90.19
	Estimated Infiltration	45.13	56.74	60.24	64.39	56.67	40.88	36.11	25.12	21.20	27.64	30.64	55.50		43.29
	Estimated Sanitary Flow	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90		46.90
	Estimated Inflow	18.35	10.06	8.09	14.11	6.82	8.73	10.41	9.93	6.08	8.02	11.28	28.35		11.72
Columbus Park	Average Daily Flow	41.84	36.23	39.41	49.37	40.05	40.80	45.16	29.60	25.49	31.40	30.24	40.57		37.54
	Dry Day Average Daily Flow	35.47	31.26	34.63	36.76	33.05	35.14	33.22	25.61	23.31	26.53	24.32	32.08		30.96
	Estimated Infiltration	14.82	10.61	13.98	16.11	12.40	14.49	12.57	4.96	2.66	5.88	3.67	11.43		10.31
	Estimated Sanitary Flow	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65		20.65
	Estimated Inflow	6.37	4.97	4.78	12.61	7.00	5.66	11.94	3.99	2.18	4.87	5.92	8.49		6.58
Ward Street	Average Daily Flow	67.55	66.98	67.58	76.69	65.80	58.92	59.45	57.77	57.12	61.94	58.17	74.77		64.39
	Dry Day Average Daily Flow	58.00	63.07	63.35	67.86	61.86	54.22	55.10	51.32	52.70	57.77	53.22	62.24		58.37
	Estimated Infiltration	13.50	18.57	18.85	23.36	17.36	9.72	10.60	6.82	8.20	13.27	8.72	17.74		13.87
	Estimated Sanitary Flow	44.50	44.50	44.50	44.50	44.50	44.50	44.50	44.50	44.50	44.50	44.50	44.50		44.50
	Estimated Inflow	9.55	3.91	4.23	8.83	3.94	4.70	4.35	6.45	4.42	4.17	4.95	12.53		6.02
Winthrop Terminal	Average Daily Flow	20.47	20.19	20.67	22.47	19.48	19.08	20.45	18.17	17.44	22.32	20.19	23.46		20.37
	Dry Day Average Daily Flow	15.89	18.08	18.01	18.63	17.19	18.17	17.78	17.68	16.35	18.84	16.77	20.59		17.83
	Estimated Infiltration	6.09	8.28	8.21	8.83	7.39	8.37	7.98	7.88	6.55	9.04	6.97	10.79		8.03
	Estimated Sanitary Flow	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80		9.80
	Estimated Inflow	4.58	2.11	2.66	3.84	2.29	0.91	2.67	0.49	1.09	3.48	3.42	2.87		2.54
Subtotal - Northern Headworks	Average Daily Flow	240.24	237.10	242.89	273.93	235.72	215.31	218.48	187.49	174.23	198.22	197.42	269.55		224.21
	Dry Day Average Daily Flow	201.39	216.05	223.13	234.54	215.67	195.31	189.11	166.63	160.46	177.68	171.85	217.31		197.35
	Estimated Infiltration	79.54	94.20	101.28	112.69	93.82	73.46	67.26	44.78	38.61	55.83	50.00	95.46		75.50
	Estimated Sanitary Flow	121.85	121.85	121.85	121.85	121.85	121.85	121.85	121.85	121.85	121.85	121.85	121.85		121.85
	Estimated Inflow	38.85	21.05	19.76	39.39	20.05	20.00	29.37	20.86	13.77	20.54	25.57	52.24		26.86
Headworks as Reported by NPDES	SUM of ADF's	237.30	236.80	242.40	274.20	234.50	215.10	217.00	186.70	172.90	196.90	196.80	270.80		223.44
Chelsea Creek	Average Daily Flow	109.30	113.60	115.00	125.60	109.80	96.50	92.40	81.60	74.00	82.90	88.50	131.40		101.68
Columbus Park	Average Daily Flow	41.20	36.30	39.50	49.50	40.00	41.00	45.20	29.50	25.40	30.90	30.30	41.10		37.51
Ward Street	Average Daily Flow	66.60	66.70	67.20	76.60	65.20	58.60	59.10	57.50	55.90	60.70	57.80	74.70		63.88
Winthrop Terminal	Average Daily Flow	20.20	20.20	20.70	22.50	19.50	19.00	20.30	18.10	17.60	22.40	20.20	23.60		20.37
Total System Flow (Southern Collection System Plus Northern Headworks)	Raw Average Daily Flow	388.22	376.45	390.32	435.72	375.86	316.38	319.30	273.69	245.90	278.84	292.95	425.74		343.23
	Raw Dry Day Average Daily Flow	321.77	348.12	358.81	383.12	345.55	292.79	284.48	245.87	229.09	253.23	256.49	350.17		305.61
	Raw Estimated Infiltration	146.07	172.42	183.11	207.42	169.85	117.09	108.78	70.17	53.49	77.53	80.79	174.47		129.92
	MWRA Estimated Infiltration	7.65	8.91	9.50	11.23	8.64	4.87	5.53	3.34	1.69	2.51	3.13	9.10		6.33
	Final Average Daily Flow	380.57	367.54	380.82	424.49	367.22	311.51	313.77	270.35	244.21	276.33	289.82	416.64		336.90
	Final Dry Day Average Daily Flow	314.12	339.21	349.31	371.89	336.91	287.92	278.95	242.53	227.40	250.72	253.36	341.07		299.28
	Final Estimated Infiltration	138.42	163.51	173.61	196.19	161.21	112.22	103.25	66.83	51.80	75.02	77.66	165.37		123.59
	Estimated Sanitary Flow	175.70	175.70	175.70	175.70	175.70	175.70	175.70	175.70	175.60	175.70	175.70	175.70		175.69
	Estimated Inflow	66.45	28.33	31.51	52.60	30.31	23.59	34.82	27.82	16.81	25.61	36.46	75.57		37.62

Table 4 - Estimated Community Wastewater Flow Components for 2019											2/7/2020		PAGE 12	Annual Average
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	(MGD)
Boston (Total)	Raw Average Daily Flow	113.10	106.22	110.76	131.06	110.74	95.97	105.93	85.17	77.27	89.80	88.05	120.06	102.87
	Raw Dry Day Average Daily Flow	94.69	96.22	99.55	108.09	95.52	86.16	87.23	73.84	70.67	79.17	72.68	98.55	88.51
	Raw Estimated Infiltration	36.19	37.72	41.05	49.59	37.02	27.66	28.73	15.34	12.17	20.67	14.18	40.05	30.01
	MWRA Estimated Infiltration	7.51	8.89	9.28	11.30	8.43	4.71	5.59	3.38	2.33	3.70	3.11	9.12	6.44
	Final Average Daily Flow	105.59	97.33	101.48	119.76	102.31	91.26	100.34	81.79	74.94	86.10	84.94	110.94	96.43
	Final Dry Day Average Daily Flow	87.18	87.33	90.27	96.79	87.09	81.45	81.64	70.46	68.34	75.47	69.57	89.43	82.08
	Final Estimated Infiltration	28.68	28.83	31.77	38.29	28.59	22.95	23.14	11.96	9.84	16.97	11.07	30.93	23.58
	Estimated Sanitary Flow	58.50	58.50	58.50	58.50	58.50	58.50	58.50	58.50	58.50	58.50	58.50	58.50	58.50
	Estimated Inflow	18.41	10.00	11.21	22.97	15.22	9.81	18.70	11.33	6.60	10.63	15.37	21.51	14.36
Brookline (Total)	Raw Average Daily Flow	10.73	10.48	11.07	12.63	9.38	7.13	7.17	6.55	5.33	6.12	6.64	11.12	8.69
	Raw Dry Day Average Daily Flow	8.58	9.81	10.08	10.94	8.65	6.70	6.55	5.53	5.05	5.64	5.79	8.46	7.64
	Raw Estimated Infiltration	4.38	5.61	5.88	6.74	4.45	2.50	2.35	1.33	0.85	1.44	1.59	4.26	3.44
	MWRA Estimated Infiltration	0.02	0.03	0.03	0.04	0.02	0.01	0.01	0.01	0.00	0.01	0.01	0.03	0.02
	Final Average Daily Flow	10.71	10.45	11.04	12.59	9.36	7.12	7.16	6.54	5.33	6.11	6.63	11.09	8.67
	Final Dry Day Average Daily Flow	8.56	9.78	10.05	10.90	8.63	6.69	6.54	5.52	5.05	5.63	5.78	8.43	7.62
	Final Estimated Infiltration	4.36	5.58	5.85	6.70	4.43	2.49	2.34	1.32	0.85	1.43	1.58	4.23	3.42
	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	4.20	4.20
	Estimated Inflow	2.15	0.67	0.99	1.69	0.73	0.43	0.62	1.02	0.28	0.48	0.85	2.66	1.05
Milton (Total)	Average Daily Flow	4.50	4.25	4.66	5.10	4.27	2.71	2.58	2.02	1.68	1.92	2.58	5.03	3.44
	Dry Day Average Daily Flow	3.50	3.97	4.16	4.61	3.81	2.62	2.10	1.88	1.64	1.80	2.14	4.22	3.03
	Estimated Infiltration	2.10	2.57	2.76	3.21	2.41	1.22	0.70	0.48	0.24	0.40	0.74	2.82	1.63
	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	1.40	1.40
	Estimated Inflow	1.00	0.28	0.50	0.49	0.46	0.09	0.48	0.14	0.04	0.12	0.44	0.81	0.41
Newton (Total)	Raw Average Daily Flow	18.09	18.08	18.57	21.17	18.54	12.81	11.83	11.42	9.75	10.50	11.90	18.67	15.10
	Raw Dry Day Average Daily Flow	14.89	17.08	17.26	19.62	17.80	12.48	11.43	10.36	9.11	10.08	10.94	15.55	13.87
	Raw Estimated Infiltration	7.09	9.28	9.46	11.82	10.00	4.68	3.63	2.56	1.31	2.28	3.14	7.75	6.07
	MWRA Estimated Infiltration	0.01	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.00	0.01	0.01	0.02	0.01
	Final Average Daily Flow	18.08	18.06	18.55	21.15	18.52	12.80	11.82	11.41	9.75	10.49	11.89	18.65	15.09
	Final Dry Day Average Daily Flow	14.88	17.06	17.24	19.60	17.78	12.47	11.42	10.35	9.11	10.07	10.93	15.53	13.85
	Final Estimated Infiltration	7.08	9.26	9.44	11.80	9.98	4.67	3.62	2.55	1.31	2.27	3.13	7.73	6.05
	Estimated Sanitary Flow	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80
	Estimated Inflow	3.20	1.00	1.31	1.55	0.74	0.33	0.40	1.06	0.64	0.42	0.96	3.12	1.23

Table 4 - Estimated Community Wastewater Flow Components for 2019										2/7/2020			PAGE 13	Annual Average
Community	Flow Characteristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	(MGD)
Subtotal	Raw Average Daily Flow	117.50	111.88	113.59	135.73	112.31	110.73	121.59	100.91	93.01	109.22	104.11	133.56	113.72
Northern System CSO	Raw Dry Day Average Daily Flow	97.03	98.42	100.76	105.91	98.84	97.12	98.12	85.67	83.31	93.68	86.44	104.74	95.84
Communities Only:	Raw Estimated Infiltration	26.83	28.22	30.56	35.71	28.64	26.92	27.92	15.47	13.11	23.48	16.24	34.54	25.64
[Sum of Boston (North),	MWRA Estimated Infiltration	2.03	2.69	2.63	3.19	2.61	2.17	2.40	1.58	1.61	2.62	1.75	3.39	2.39
Cambridge, Chelsea,	Final Average Daily Flow	115.47	109.19	110.96	132.54	109.70	108.56	119.19	99.33	91.40	106.60	102.36	130.17	111.33
and Somerville]	Final Dry Day Average Daily Flow	95.00	95.73	98.13	102.72	96.23	94.95	95.72	84.09	81.70	91.06	84.69	101.35	93.46
	Final Estimated Infiltration	24.80	25.53	27.93	32.52	26.03	24.75	25.52	13.89	11.50	20.86	14.49	31.15	23.26
	Estimated Sanitary Flow	70.20	70.20	70.20	70.20	70.20	70.20	70.20	70.20	70.20	70.20	70.20	70.20	70.20
	Estimated Inflow	20.47	13.46	12.83	29.82	13.47	13.61	23.47	15.24	9.70	15.54	17.67	28.82	17.88
Subtotal	Raw Average Daily Flow	111.43	117.12	120.02	128.49	116.74	91.92	89.43	80.69	73.80	79.57	87.86	128.76	102.10
Northern System Without	Raw Dry Day Average Daily Flow	94.83	109.35	111.98	120.93	113.10	88.63	85.37	74.57	69.61	74.89	80.10	107.34	94.15
North CSO Communities:	Raw Estimated Infiltration	43.18	57.70	60.33	69.28	61.45	36.98	33.72	22.92	17.96	23.24	28.45	55.69	42.50
	MWRA Estimated Infiltration	2.22	3.02	3.42	4.08	3.70	2.20	2.15	1.43	1.12	1.44	1.80	3.56	2.51
	Final Average Daily Flow	109.21	114.10	116.60	124.41	113.04	89.72	87.28	79.26	72.68	78.13	86.06	125.20	99.59
	Final Dry Day Average Daily Flow	92.61	106.33	108.56	116.85	109.40	86.43	83.22	73.14	68.49	73.45	78.30	103.78	91.64
	Final Estimated Infiltration	40.96	54.68	56.91	65.20	57.75	34.78	31.57	21.49	16.84	21.80	26.65	52.13	39.99
	Estimated Sanitary Flow	51.65	51.65	51.65	51.65	51.65	51.65	51.65	51.65	51.65	51.65	51.65	51.65	51.65
	Estimated Inflow	16.60	7.77	8.04	7.56	3.64	3.29	4.06	6.12	4.19	4.68	7.76	21.42	7.95
Subtotal	Raw Average Daily Flow	259.41	256.47	267.45	290.28	256.88	192.99	190.25	166.89	145.47	160.19	183.39	284.95	221.13
North/South Systems Without	Raw Dry Day Average Daily Flow	215.21	241.42	247.66	269.51	242.98	186.11	180.74	153.81	138.24	150.44	164.74	240.20	202.41
North CSO Communites:	Raw Estimated Infiltration	109.71	135.92	142.16	164.01	137.48	80.61	75.24	48.31	32.84	44.94	59.24	134.70	96.92
	MWRA Estimated Infiltration	9.87	11.93	12.92	15.31	12.34	7.07	7.68	4.77	2.81	3.95	4.93	12.66	8.84
	Final Average Daily Flow	249.54	244.54	254.53	274.97	244.54	185.92	182.57	162.12	142.66	156.24	178.46	272.29	212.29
	Final Dry Day Average Daily Flow	205.34	229.49	234.74	254.20	230.64	179.04	173.06	149.04	135.43	146.49	159.81	227.54	193.57
	Final Estimated Infiltration	99.84	123.99	129.24	148.70	125.14	73.54	67.56	43.54	30.03	40.99	54.31	122.04	88.08
	Estimated Sanitary Flow	105.50	105.50	105.50	105.50	105.50	105.50	105.50	105.50	105.40	105.50	105.50	105.50	105.49
	Estimated Inflow	44.20	15.05	19.79	20.77	13.90	6.88	9.51	13.08	7.23	9.75	18.65	44.75	18.72