

August 27, 2004

Ms. Linda Murphy
Director, Office of Ecosystem Protection
U.S. Environmental Protection Agency New England
P.O. Box 8127
Boston, MA 02114

Mr. Glenn Haas
Director
Division of Watershed Management
Department of Environmental Protection
One Winter Street
Boston, MA 02108

RE: Massachusetts Water Resources Authority NPDES Permit Number MA0103284

Dear Ms. Murphy and Mr. Haas:

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 2004.

Attachment 1 – Overview of MWRA Regional I/I Reduction Plan

Attachment 2 – MWRA Regional I/I Reduction Plan - FY04 Progress Update and Detailed Implementation Schedule for FY05 Activities

Attachment 3 – MWRA Actions Taken to Reduce I/I During FY04

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 – CY03 Community Wastewater Flow Data

Should you require additional information, please contact Carl H. Leone, Senior Program Manager, Community Support Program at (617) 788-4356.

Sincerely,

Michael J. Hornbrook
Chief Operating Officer

cc: Eric Hall, US EPA
DEP-Regulatory Branch, Boston
DEP – NERO, Boston
Madelyn Morris, DEP, NERO
Richard Chretien, DEP, NERO
Grace Bigornia-Vitale, MWRA, NPDES Coordinator
Carl H. Leone, MWRA, Community Support Program

ATTACHMENT 1
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY04
Reporting Period – July 2003 Through June 2004

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 DEP as required under MWRA's NPDES Permit. The plan was submitted to EPA and DEP in June 2001 and DEP 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 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, DEP, 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 DEP, 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, 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.
3. 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.
4. 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.
5. 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.

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ATTACHMENT 2
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY04
Reporting Period – July 2003 Through June 2004

**MWRA REGIONAL I/I REDUCTION PLAN -
FY04 PROGRESS UPDATE AND DETAILED
IMPLEMENTATION SCHEDULE FOR FY05 ACTIVITIES**

This document provides a progress update for FY04 accomplishments and a description of the activities to be accomplished during FY05 for each of the I/I reduction strategies proposed in the MWRA Regional I/I Reduction Plan. The update appears in bold type directly below each I/I reduction strategy. This document can be cross-referenced to the graphic implementation schedule attached to the MWRA Regional I/I Reduction Plan. 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 three 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.

During FY04, MWRA properly operated and maintained the MWRA-owned interceptor system. Annual performance targets and ongoing accomplishments are tracked as part of the Authority's electronic MAXIMO maintenance database and are reported monthly to MWRA senior management. Specific activities undertaken by MWRA for FY04 are detailed in Attachment 3. Additional information on MWRA's FY04 maintenance activities is provided under separate submittal - NPDES Part I.18.g Annual Maintenance Status Sheets.

During FY05, MWRA will continue to properly operate and maintain the MWRA-owned interceptor system including review of operational targets for the specific activities noted in Strategies A, B, and C, above.

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)

During spring 2001 MWRA provided DEP 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 DEP. A follow-up letter dated June 20, 2001 requested DEP identify the format for finalizing the SSO reporting/record keeping electronic database.

During FY04, DEP (in conjunction with staff in the Massachusetts Information Technology Division), developed a new format SSO electronic database package. This project is part of statewide efforts to upgrade computerized resources and electronic access. The new system was rolled-out at part of the April 8, 2004 DEP/MWRA joint workshop. Implementation of DEP's new SSO electronic database system is expected to continue in FY05.

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)

During FY04, MWRA continued its project to inspect all inverted siphons using the sonar camera. Follow-up siphon cleaning and reinspection is expected to minimize

potential SSOs upstream of siphons and reduce the risk of hydraulic limitations and/or blockage from debris buildup in siphon barrels. This project will continue in FY05.

During FY04, MWRA began discussions with the Town of Braintree regarding the Town's possible plan to redirect some local flow currently tributary to MWRA's Pearl Street siphon. There is a potential to reconfigure the local system to discharge pumped flow downstream of the siphon. This location has had previous SSOs in extreme rainfall events. These discussions will continue in FY05.

During FY04, MWRA performed a major upgrade to its electronic sewer database and GIS mapping system. All MWRA manholes and structures have now been GPS located and more accurate mapping information exists. During FY05, MWRA will be coordinating with local communities to more accurately map connection points of local sewers to the MWRA interceptor system and will complete upgrades to the electronic sewer database and GIS mapping system.

During FY04, MWRA completed a major upgrade to its hydraulic model that consisted of converting from SWMM 4.3 to InfoWorks CS in order to take advantage of the hydraulic modeling capabilities available in newer software packages. The new model includes all manholes and pipe segments in the MWRA system. The new model was calibrated using data from MWRA's wastewater flow metering system and is integrated with the upgrades to the electronic sewer database and GIS mapping system. This work was performed under MWRA's Wastewater Hydraulic Optimization project.

During FY05, MWRA will utilize the updated electronic sewer database, GIS mapping system, and hydraulic modeling to review existing MWRA SSO sites in MWRA's south collection system including the SSO sites listed in MWRA's Collection System Operation and Maintenance Manual. This work will be coordinated with ongoing relief sewer projects on the Braintree/Weymouth Interceptor and Upper Neponset Valley Sewer that are being implemented to reduce SSOs in those areas.

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)

During FY04, most MWRA efforts under this strategy were be on hold awaiting DEP's implementation of the SSO electronic database (see Strategy A). As an interim measure, MWRA completed the data entry into a spreadsheet format of historic SSO data received from DEP for 1996 through 2001.

During FY05, MWRA will begin coordination with communities to review the compiled historic data and identify planned and/or ongoing local projects that may reduce the risk of SSOs.

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)

During FY04, no progress was made on this strategy pending the completion of the upgrade of MWRA's electronic sewer database, GIS mapping system, and hydraulic model (see Strategy B).

During FY05, MWRA will review existing SSO sites in MWRA's south collection system. The specific SSO sites will include those listed in the MWRA's Collection System Operation and Maintenance Manual.

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)

During FY04, MWRA continued ongoing planning/design/construction on a variety of relief sewer and sewer rehabilitation projects that will reduce existing SSOs. Progress on these projects is detailed in Attachment 3.

In conjunction with the implementation of Strategy D, above, MWRA will begin evaluating the existing SSO sites in MWRA's south collection system during FY05. Specific SSO sites will include those listed in the MWRA's Collection System Operation and Maintenance Manual. Hydraulic analyses performed for each existing capital project will be used in the summary report on the potential to eliminate each overflow. Work on this Strategy will likely begin in FY06 after Strategy D work is performed in FY05.

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)

During FY04, MWRA continued progress on the Wastewater Hydraulic Optimization Study including the major upgrade to its hydraulic model that consisted of converting from SWMM 4.3 to InfoWorks CS in order to take advantage of the hydraulic modeling capabilities available in newer software packages (see Strategy B). This work included workshops with MWRA staff and review of meter data from extreme rainfall events to help calibrate the new model. Much of this work was performed in coordination with ongoing MWRA CSO program efforts.

In conjunction with the implementation of Strategy D, MWRA will begin evaluating the existing SSO sites in MWRA's south collection system during FY05. Specific SSO sites will include those listed in the MWRA's Collection System Operation and Maintenance Manual. Work on this Strategy will likely begin in FY06 (combined with work on Strategy E) after Strategy D work is performed in FY05.

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 under this strategy is intended to follow-up on discussions with local plumbing inspectors who attend the annual DEP/MWRA joint workshops. During FY04, plumbing inspectors from several communities have become directly involved with local private inflow source removal programs funded by MWRA.

During FY05, MWRA will send an informational letter to all service area community plumbing inspectors and Health Departments (Boards of Health). The timing of distribution of the letter will be coordinated with DEP expanded rollout of the electronic SSO reporting form that was initially discussed at the April 2004 DEP/MWRA workshop.

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).

During FY04, MWRA continued to estimate community infiltration and inflow rates on a bimonthly basis. Community wastewater flow data for CY03 is included as Attachment 6. These flow data tables were distributed to all MWRA member sewer communities on July 7, 2004. Community wastewater flow rate basis data is distributed to member communities throughout the year on a bimonthly basis.

Beginning in the fall 03, MWRA began implementation of its \$5 million Wastewater Metering Replacement project. Under this project, wastewater metering system hardware and software is being replaced with a more modern system that includes the use of cellular communication for data transmittal. MWRA's wastewater metering system was taken out of service in March 2004 and will remain out of service through the first half of FY05. During this period, no MWRA wastewater flow data or I/I estimates will be available. When the new system becomes operative, MWRA will again 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 DEP as part of the annual summary report on actions taken to reduce I/I (submitted annually by September 1 per the 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)

As outlined above, during FY04, MWRA began the Wastewater Meter Replacement project. Construction of this project will run through FY05. No action under this Strategy will commence during FY04/FY05. This Strategy will be initiated in FY06, following completion of the Wastewater Meter Replacement project.

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)

During FY04, no specific actions were required under this Strategy. All member sewer communities are actively participating in MWRA's 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 utilize standards established in DEP's January 1993 I/I Guidelines.

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

During FY04, no additional actions under this strategy were performed pending the completion of MWRA's major upgrade to its electronic sewer database and GIS mapping system. All MWRA manholes and structures have now been GPS located and more accurate mapping information exists. During FY05, MWRA will be coordination with local communities to more accurately map connection points of local sewers to the MWRA interceptor system and will complete upgrades to the electronic sewer database and GIS mapping system. MWRA will continue work on this strategy via coordination with community staff on review of the mapping information. Technical assistance to communities within the Boston Harbor Basin (Neponset and Weymouth/Weir River Watersheds) and Ipswich Basin (Ipswich River Watershed) will be prioritized.

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)

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 the program through 2013. During FY04, MWRA continue to provide grants and loans to member sewer communities to fund local I/I reduction and sewer system rehabilitation projects. A total of \$8.4 million was distributed during FY04. Since inception of the program in May 1993, over \$100 million has been distributed to fund local projects. A detailed status update on MWRA’s I/I Local Financial Assistance Program is included as Attachment 4.

During FY05, MWRA will continue to distribute funds and assist communities in the management of projects under the I/I Local Financial Assistance Program.

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)

During FY04, MWRA continued to provide emergency assistance to member communities, as requested. These efforts included internal TV inspection of 4 miles of local sewers.

During FY05, 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)

In July 2003, MWRA distributed technical information to wastewater system operators, including:

- 1. MWRA Regional Infiltration/Inflow Reduction Plan, September 2002.**
- 2. Generic Standards for Design and Construction of Building Sewers. These standards for service connections were adapted from the Town of Stoughton Standards as enacted by the Town in March 2003.**
- 3. AMSA Wet Weather Survey Final Report, dated May 2003.**
- 4. Two versions of the Water Environment Federation (WEF) publication “Fat Free Sewers” and information for purchase.**

During FY05, MWRA will continue to coordinate with EPA and MADEP to identify information on I/I and SSO issues to be distributed within the region.

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)

During FY04, MWRA continued to summarize previous information/technology distributions regarding I/I reduction and SSOs.

During FY05, MWRA will provide EPA and MADEP a draft copy of the information summary so that the agencies can provide input prior to distribution to regional stakeholders.

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)

In April 2003, the third joint DEP/MWRA workshop – “Operation, Maintenance and Rehabilitation” was held.

During FY04, MWRA will continue to work cooperatively with DEP on this strategy. A fourth joint workshop will be discussed for spring 2005.

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)

During FY04, MWRA continued compiling available materials. MWRA distributed the Fat-Free Sewers brochure to wastewater system operators in July 2003.

During FY05, MWRA will continue work on this strategy. In conjunction with the summary of previous information/technology distributions (see Strategy B), MWRA will provide EPA and MADEP a draft copy of the information summary so the agencies can provide input prior to distribution to regional stakeholders.

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)

During FY04, no specific actions were required under this Strategy. Communities actively involved with private inflow removal programs have generally been developing

public education information related to their specific project and/or utilizing information already available via local engineering consultants.

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)

During FY04, MWRA revised and upgraded its web site www.mwra.com. Communities can obtain a great deal of information from the MWRA web site and links to other organizations are provided. In February 2004, informational letters were sent to all member communities providing an update on MWRA community support programs and reference to MWRA web site information.

During FY05, MWRA will continue work on this strategy.

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)

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 issues. It is not likely that I/I and SSO issues will fit into the context of this program. No action under this Strategy is anticipated for FY05.

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)

During FY04, no assistance from MWRA was requested by MADEP.

During FY05, any action under this strategy will be initiated jointly with MADEP.

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)

During FY04, no assistance from MWRA was requested under this Strategy. MWRA maintains copies of sewer system informational videos developed by the Town of Weymouth for use on its local cable station. These videotapes can be provided to other communities as an example.

During FY05, MWRA will respond to community requests.

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.

MWRA provide 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 will continue to maintain a supply of I/I Task Force Reports and will provide 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.

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)

During FY03, all member communities were requested to provide a copy of their existing local Sewer Use Regulations to MWRA. In July 2003, all member communities were provided a copy of a generic standard for design and construction of building sewers. Some communities requested electronic copies of the standard and expressed interest in incorporating the standard into their existing local regulations.

During FY04, MWRA began review of the local Sewer Use Regulations and began development of a table format for comparison of the local regulations. Based on the

outcome of the review, a format for developing recommendations for improvements will be determined. This work will continue in FY05. The outcome of this strategy is dependent on potential future issuance of EPA’s SSO Rules, including the CMOM Regulations, which would impact the recommendations for local sewer use regulations.

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.

A Member Community Collection System Operation and Maintenance Manual Guidance Document and Overflow Response Plan was developed and submitted to EPA and MADEP for review in June 2001. This guidance document has been made available to member communities. During FY04, MADEP 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 members 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. No additional work on this strategy is planned in FY05. Future work under this strategy is dependent on potential future issuance of EPA’s SSO Rules, including the CMOM Regulations, which may provide a basis for additional MWRA guidance to member communities.

[Go to Attachment 3](#)

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ATTACHMENT 3
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY04
Reporting Period – July 2003 Through June 2004

MWRA ACTIONS TAKEN TO REDUCE I/I DURING FY04

The MWRA Field Operations Department's Technical Inspection program staff have internally inspected approximately 29 miles of Authority-owned interceptors and approximately 4 miles of community-owned sewers, internally sonar inspected 54 inverted siphon barrels (33 total siphons), and physically inspected about 820 sewer manholes and other structures (diversion chambers, siphon headhouses, etc.) during FY04. During the internal inspection process, problems such as physical defects, infiltration, 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 FY04, maintenance work included the cleaning of 33 siphon barrels, rehabilitation of 24 sewer manholes, and replacement of 46 manhole frames and covers. 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. Also during FY04, 2400 manholes were located using MWRA's global positioning system (GPS) equipment. MWRA's entire collection system has now been GPS surveyed and the information has been added to the collection system electronic GIS database.

During FY04, MWRA staff completed the first phase of the Interceptor Renewal Program. The purpose of the program is to develop an ongoing framework for identifying and prioritizing projects to rehabilitate the Authority-owned interceptors, and then facilitate implementation of those projects. For a ten-year planning period (2006 through 2015), MWRA has completed the framework for identifying and prioritizing projects and developed a \$102 million planning level cost estimate for repairing the interceptors that pose the greatest risk and consequence of failure. The Interceptor Renewal Program will continue the interceptor rehabilitation work currently being performed under MWRA's Interceptor Asset Protection Program. During FY04, construction was completed on the \$1.3 million rehabilitation of 4000 feet of the Mill Brook Valley Relief Sewer (Section 93A). During FY05, rehabilitation of an associated portion of sewer force main is scheduled. The evaluation/design portion of the \$2 million rehabilitation of Section 80/83 has been substantially completed during FY04 and construction is scheduled for FY06/07. The \$4 million Mystic Valley Sewer (Section 160) evaluation/rehabilitation project is scheduled for FY06/08. Each of these projects will reduce I/I entering the MWRA interceptor system.

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

1. The initial portion of the West Roxbury Tunnel rehabilitation project included the sliplining of approximately 1000 feet of 84-inch pipe (Sewer Section 138) and rebuilding of the west portal chamber (beginning of Sewer Section 137). Construction of this \$10 million project has been completed. The second phase of this project is design and construction to

rehabilitate approximately 12,000 linear feet of the 84-inch West Roxbury Tunnel (Sewer Section 137). Design and construction of this \$75 million project is scheduled for FY05 through FY12.

2. MWRA's \$228 million Braintree/Weymouth Relief Facilities Project includes rehabilitation of approximately 2000 feet of 60 x 57-inch interceptor within Section 124 in Weymouth. This portion of sewer is severely deteriorated and contributes significant infiltration. Design of this \$11 million rehabilitation project was completed in FY04 and construction is scheduled for FY05/06.
3. MWRA's \$28 million Upper Neponset Valley Sewer Project is intended to provide hydraulic relief to about four miles of Sewer Sections 526, 527, 528, 529, and 530 located in Newton and West Roxbury. These sewers, constructed in 1896 to 1902, receive flow from West Roxbury, Newton, Brookline and Dedham. As an outcome of this project, I/I and periodic sewer system overflows will be reduced. This project is in the design stage.
4. MWRA's \$7 million Cummingsville Replacement Sewer Project is intended to provide hydraulic relief through replacement of about one mile of Sewer Section 47 (constructed in the 1890's) and rehabilitation of about one mile of Sewer Section 86 (constructed in 1952) in Winchester. As an outcome of this project, I/I and periodic sewer system overflows will be reduced. Design and permitting continued during FY04 and the project is scheduled for completion during FY05 through FY08.
5. MWRA's \$60 million East Boston Branch Sewer Relief Project will replace or rehabilitate approximately 25,000 feet of existing sewer in East Boston to provide hydraulic relief and reduce CSO discharges. Design of the project is ongoing and construction is scheduled for FY05/08.
6. MWRA's Combine Sewer Overflows (CSO) Program includes a number of projects that will provide for the separation of sanitary sewer and stormwater flows. These projects will reduce stormwater inflow to the collection system. Details of MWRA's CSO Control Plan are reported under the requirements of NPDES Permit – Part I, Item 19. Long-term CSO Control Plan.

ATTACHMENT 4
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY04
Reporting Period – July 2003 Through June 2004

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

Financial Assistance Update

All 43-member sewer communities are participating in MWRA's \$180.75 million Infiltration/Inflow (I/I) Local Financial Assistance (grant/loan) Program. The program began in May 1993 and, through FY04, over \$100 million has been distributed to fund local I/I reduction and sewer system rehabilitation projects. The program budget of \$180.75 million includes the addition of \$40 million in new phase 5 funds approved by the MWRA Board of Directors in June 2004. The table on page 2 provides a summary of funding allocations, distributions, and funds remaining for each member community. Distribution of the remaining \$80 million in funds has been approved through FY13.

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 Advisory Board, the Board of Directors approved a total program budget of \$180.75 million. The funds have been allocated among the 43 MWRA sewer communities based on respective shares of overall MWRA wholesale sewer charges. 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, 4, and 5 funds (total of \$117 million) to a 45 percent grant and a 55 percent interest-free loan. The loan portion is repaid to MWRA over a five-year period beginning one year after the date the funds are distributed.

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, staff perform site visits to document progress.

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. 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 repair/replacement of the collection system.

**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM
FUNDING SUMMARY AS OF JUNE 2004**

Community	Total Allocations (Phases 1/2/3/4/5)	Total Distributions (Phases 1/2/3/4/5)	Funds Remaining
Arlington	\$3,449,000	\$1,277,200	\$2,171,800
Ashland	\$734,500	\$550,500	\$184,000
Bedford	\$1,383,600	\$549,300	\$834,300
Belmont	\$2,108,100	\$1,167,400	\$940,700
Boston	\$51,618,200	\$23,931,726	\$27,686,474
Braintree	\$3,109,000	\$1,983,127	\$1,125,873
Brookline	\$5,112,200	\$3,980,200	\$1,132,000
Burlington	\$1,949,800	\$761,200	\$1,188,600
Cambridge	\$9,323,100	\$6,003,455	\$3,319,645
Canton	\$1,645,900	\$1,281,900	\$364,000
Chelsea	\$2,469,100	\$1,609,264	\$859,836
Dedham	\$2,381,000	\$1,833,000	\$548,000
Everett	\$3,141,500	\$2,425,500	\$716,000
Framingham	\$5,003,000	\$1,882,395	\$3,120,605
Hingham	\$589,500	\$445,500	\$144,000
Holbrook	\$640,600	\$496,600	\$144,000
Lexington	\$2,827,300	\$1,533,600	\$1,293,700
Malden	\$4,593,900	\$3,226,997	\$1,366,903
Medford	\$4,794,600	\$3,726,600	\$1,068,000
Melrose	\$2,301,300	\$579,800	\$1,721,500
Milton	\$2,279,500	\$1,779,500	\$500,000
Natick	\$2,270,600	\$1,157,000	\$1,113,600
Needham	\$2,630,600	\$1,478,300	\$1,152,300
Newton	\$8,265,400	\$4,545,700	\$3,719,700
Norwood	\$2,715,400	\$1,744,600	\$970,800
Quincy	\$7,665,000	\$5,985,000	\$1,680,000
Randolph	\$2,354,800	\$1,330,900	\$1,023,900
Reading	\$1,736,100	\$975,400	\$760,700
Revere	\$3,750,900	\$1,331,500	\$2,419,400
Somerville	\$6,155,800	\$889,700	\$5,266,100
Stoneham	\$2,043,900	\$1,635,900	\$408,000
Stoughton	\$1,852,900	\$1,436,900	\$416,000
Wakefield	\$2,356,900	\$1,531,600	\$825,300
Walpole	\$1,447,000	\$1,139,000	\$308,000
Waltham	\$5,392,400	\$4,212,400	\$1,180,000
Watertown	\$2,581,800	\$322,565	\$2,259,235
Wellesley	\$2,255,700	\$455,940	\$1,799,760
Westwood	\$973,300	\$733,300	\$240,000
Weymouth	\$4,529,900	\$3,206,941	\$1,322,959
Wilmington	\$968,000	\$740,000	\$228,000
Winchester	\$1,704,000	\$952,300	\$751,700
Winthrop	\$1,342,400	\$287,100	\$1,055,300
Woburn	\$4,302,500	\$3,322,500	\$980,000
Totals	\$180,750,000	\$100,439,310	\$80,310,690

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-one percent of funds distributed to date have financed local construction projects. The table below details funds distributed by project phase for both completed and ongoing projects.

<u>PROJECT PHASE</u>	<u>COMPLETE PROJECTS</u> <u>(\$ millions)</u>	<u>ONGOING PROJECTS</u> <u>(\$ millions)</u>	<u>TOTAL</u> <u>(\$ millions)</u>
Planning/Study:	\$ 11.0	\$ 7.7	\$ 18.7 (19%)
Design:	2.9	2.3	5.2 (5%)
Construction:	49.8	21.2	71.0 (71%)
Eng. Services During Const.:	4.1	1.4	5.5 (5%)
TOTAL	\$ 67.8 (68%)	\$ 32.6 (32%)	\$ 100.4 (100%)

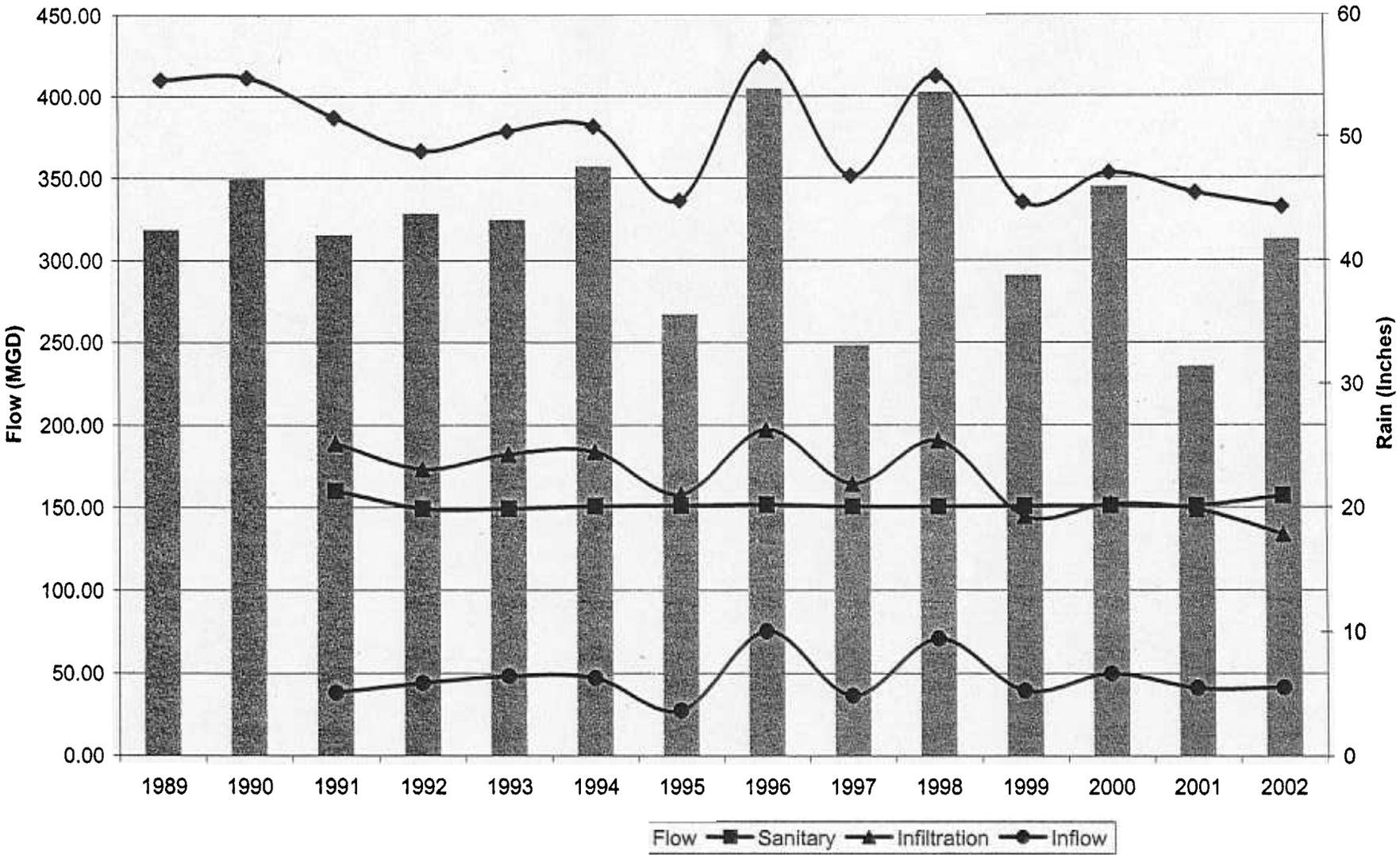
Estimated I/I Removal

The estimated average daily flow reduction associated with all MWRA funded I/I reduction projects that have been completed is about 45 mgd. This flow reduction “ballpark” figure is based on the communities’ (or their consultants’) peak I/I reduction estimates. MWRA staff have prorated the peak I/I reduction estimates to estimate the average I/I reduction. The estimated I/I removals noted here represent groundwater and stormwater that no longer enter the collection system. Regional wastewater flow reductions resulting from specific local I/I reduction projects are difficult to substantiate through end-of-the-collection-system meter data, due to factors noted below:

- 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 80 mgd from year to year. Small flow reductions for individual projects (typically less than one mgd) are dwarfed by regional flow fluctuations.
- Sewer capacity gained by elimination of I/I in one subsystem may, in some cases, allow for other I/I to enter the collection system at a different location, resulting in no net flow reduction at the end of the collection system.
- The consequence of ongoing pumping and interceptor upgrades, as well as combined sewer overflow and system optimization projects is an increase in the capture and treatment of wastewater flow and the reduction of raw sewage discharges. These increased flows offset I/I reductions.

Long-term wastewater flow metering and rainfall records are presented in Figure 1. Recognizing the limitations noted above for analysis of regional flow data, and accounting for varying annual rainfall, the data show a general decreasing trend in community wastewater flows for the regional system.

Figure 1
Total System
Annual Flow Data



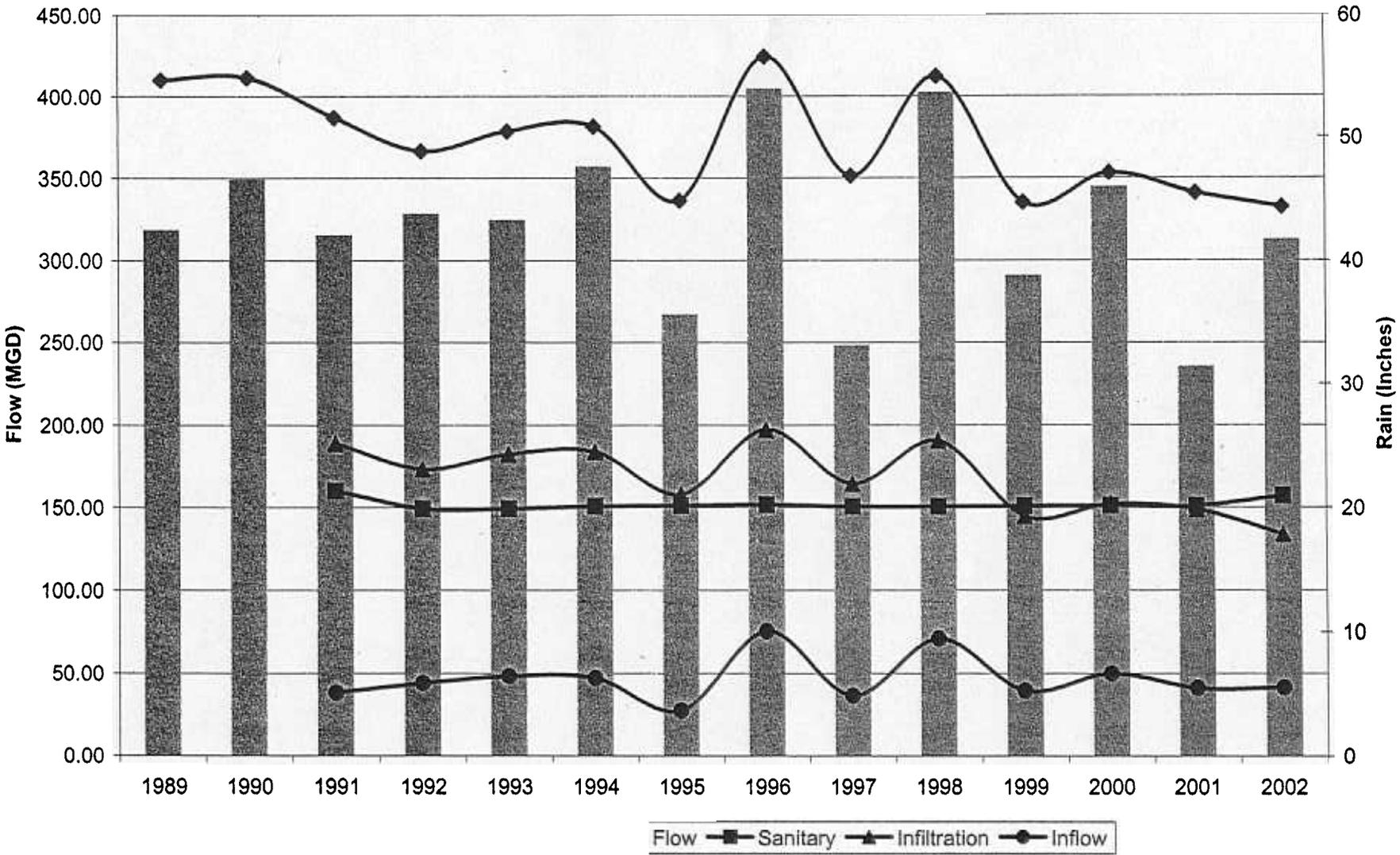
Projects Funded During FY04

Local projects are funded quarterly by MWRA. Available upon request are funding summaries for the four quarterly funding distributions during FY04: August and November 2003, February and May 2004. To obtain printed copies, call the Environmental Quality Department at 617-788-4601 or send an e-mail to web.enquad@mwra.state.ma.us.

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Figure 1
Total System
Annual Flow Data



**MWRA I/I LOCAL FINANCIAL ASSISTANCE PROGRAM
FUNDING SUMMARY AS OF JUNE 2004**

Community	Total Allocations (Phases 1/2/3/4/5)	Total Distributions (Phases 1/2/3/4/5)	Funds Remaining
Arlington	\$3,449,000	\$1,277,200	\$2,171,800
Ashland	\$734,500	\$550,500	\$184,000
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Hingham	\$589,500	\$445,500	\$144,000
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Newton	\$8,265,400	\$4,545,700	\$3,719,700
Norwood	\$2,715,400	\$1,744,600	\$970,800
Quincy	\$7,665,000	\$5,985,000	\$1,680,000
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Revere	\$3,750,900	\$1,331,500	\$2,419,400
Somerville	\$6,155,800	\$889,700	\$5,266,100
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Watertown	\$2,581,800	\$322,565	\$2,259,235
Wellesley	\$2,255,700	\$455,940	\$1,799,760
Westwood	\$973,300	\$733,300	\$240,000
Weymouth	\$4,529,900	\$3,206,941	\$1,322,959
Wilmington	\$968,000	\$740,000	\$228,000
Winchester	\$1,704,000	\$952,300	\$751,700
Winthrop	\$1,342,400	\$287,100	\$1,055,300
Woburn	\$4,302,500	\$3,322,500	\$980,000
Totals	\$180,750,000	\$100,439,310	\$80,310,690

ATTACHMENT 5
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY04
Reporting Period – July 2003 Through June 2004

**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 \$180.75 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 FY04, MWRA has distributed over \$100 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 comply with required annual I/I reduction program status reporting. All 43 member sewer communities have submitted the latest I/I status report; the information is summarized in the following paragraphs.

1. ARLINGTON: North System

Background Information:

- Miles of Sewer: 106
- Sewered Population: 42,089
- Three Year ('01 - '03) Annual Average I/I: 3.16 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: Grove/Brattle St. Area I/I Reduction Study

Private Source Inflow Removal Program: East End Sewer Study metering identified areas that will require additional study to identify possible sump pump/drain leader connections to the sewer.

I/I Rehabilitation Projects in Design or Construction: Main line inspections performed in utility construction and roadway rehabilitation areas. Ongoing service line CCTV inspections in suspected problem areas.

Reporting Period Activity: Construction completed for the replacement of 700 feet of 8-inch sewer on Indian Hill Road.

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 \$3,449,000 allotted through the Program's Phases 1-5, the community has \$2,171,800 remaining in funding assistance.

2. ASHLAND: South System

Background Information:

- Miles of Sewer: 43
- Sewered Population: 10,774
- Three Year ('01 - '03) Annual Average I/I: 0.53 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: I/I Investigation and Repair 2001 (Sub-Basins I & II)

Private Source Inflow Removal Program: The Town will be performing I/I removal from residential/commercial properties in Sub-Basins II and III. One private inflow source identified/removed on Church Court.

I/I Rehabilitation Projects in Design or Construction: Completed clear flow investigation and manhole frame/cover replacement in Sub-Basin II. Completed internal TV inspection and manhole rehabilitation in Sub-Basin III. Internal TV inspection on-going in Sub-Basin IV.

Reporting Period Activity: The Town has a sewer moratorium on new sewer connections at this time. New connections are only added if I/I removal has been achieved. Pond Street and Downtown sewer extension projects have been approved. Brackett Road Lift Station construction on-going.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. Of the \$734,500 allotted through the Program's Phases 1-5, the community has \$184,000 remaining in funding assistance.

3. BEDFORD: North System

Background Information:

- Miles of Sewer: 68
- Sewered Population: 11,256
- Three Year ('01 - '03) Annual Average I/I: 1.73 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: I/I Study, May 2000

Private Source Inflow Removal Program: No additional inspections were reported this period.

I/I Rehabilitation Projects in Design or Construction: Sanitary Sewer Investigation and Rehabilitation for sewers in Harvard Drive, Evergreen Avenue and Wiggins Avenue was completed. Thirteen sewer manholes have been rehabilitated with an estimated I/I removal of 10,750 gpd.

Reporting Period Activity: Internal inspection of sewers in various areas of suspected excessive infiltration.

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 \$1,383,600 allotted through the Program's Phases 1-5, the community has \$834,300 remaining in funding assistance.

4. BELMONT: North System

Background Information:

- Miles of Sewer: 78
- Sewered Population: 23,450
- Three Year ('01 - '03) Annual Average I/I: 2.09 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: SSES, Phase II Final, April 1988

Private Source Inflow Removal Program: FS&T completed home inspections on over 300 properties to determine the extent of sump pump connections to the Town's sanitary sewer system.

I/I Rehabilitation Projects in Design or Construction: The contract for connecting private inflow sources to the town's storm drain system was awarded in February 2004. This project will remove approximately 1,165,000 gpd of peak daily inflow from the existing sewer.

Reporting Period Activity: The Contractor has commenced the construction associated with connecting the private inflow sources to the storm drain system. The projected completion date of this work is May 2005.

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 \$2,108,100 allotted through the Program's Phases 1-5, the community has \$940,700 remaining in funding assistance.

5. BOSTON: North and South Systems

Background Information:

- Miles of Sewer: 858
- Sewered Population: 588,692
- Three Year ('01 - '03) Annual Average I/I: 45.65 mgd
- Massachusetts DEP Administrative Order: None (Cooperative agreement exists)

Latest I/I or SSES Report: Upper Neponset Valley Sewer Inflow Survey (On-going)

Private Source Inflow Removal Program: Since 1994, the Downspout Disconnection Program has conducted approximately 36,000 building surveys and 10,000 dye water tests. Approximately 6,000 building (12,000 downspouts) have been disconnected. During CY04, a total of 75 large impervious areas were surveyed to identify inflow sources. To date, 70 of these 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 rehabilitation projects. To date, forty-seven (47) projects have received funding through the MWRA I/I Local Financial Assistance Program. In CY03/04, BWSC completed the following rehabilitation projects: Washington Street Drainage Improvements, Talbot Avenue I/I Removal, Commercial Street I/I Removal, Shawmut Avenue Drainage Improvements, D Street/West Second Street Sewer/Drainage Improvements and Causeway Street Sewer Separation.

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.

Boston is one of MWRA's four combined sewer service communities. As part of the MWRA CSO Facilities Upgrade Project, Boston's flows are being evaluated for volume and discharge locations.

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 over this period.

MWRA I/I Local Financial Assistance Program: The community has financed forty-seven (47) I/I reduction projects through the Authority's funding assistance program. Of the \$51,618,200 allotted through the Program's Phases 1-5, the community has \$27,256,474 remaining in funding assistance.

6. BRAINTREE: South System

Background Information:

- Miles of Sewer: 133
- Sewered Population: 33,794
- Three Year ('01 - '03) Annual Average I/I: 4.45 mgd
- Massachusetts DEP Administrative Order: No. 546 (Issued April 1, 1985), ACO-NE-01-1001 (March 27, 2001)

Latest I/I or SSES Report: Flow Isolation / TV Inspection of Allen St. Interceptor (April 2003)

Private Source Inflow Removal Program: Seven private source sump pump removal contracts have redirected 109 sump pumps to date. Developer Flow Reduction Program is now 6:1 per DEP ACO.

I/I Rehabilitation Projects in Design or Construction: The Allen Street interceptor lining and infiltration work in Sub-Areas HC-2 and M-2 is complete.

Reporting Period Activity: Contract 2001-S2, completed May 2003. The project had an estimated I/I removal of 39,600 gpd. Commercial Street sewer reconstruction complete.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. Of the \$3,109,000 allotted through the Program's Phases 1-5, the community has \$1,125,873 remaining in funding assistance.

7. BROOKLINE: North and South Systems

Background Information:

- Miles of Sewer: 111
- Sewered Population: 56,462
- Three Year ('01 - '03) Annual Average I/I: 5.81 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: Phase II I/I Investigation (April 2002)

Private Source Inflow Removal Program: Town is in the process of developing a Private flow Source Identification and Removal Program.

I/I Rehabilitation Projects in Design or Construction: Sewer Rehabilitation Project No. 3, including various locations townwide, has lined 2,100 LF of sewer. The project has removed approximately 30,000 gpd of Infiltration.

Reporting Period Activity: I/I Reduction Project No. 1, including the investigation and rehabilitation of Sub-area NI-1 and NI-2, is ongoing. The Town completed (Sewer Separation Project No. 3) installing 4,500 LF of drain on Emerson Street, Davis Street, Elm Street and Washington Street. The project removed approximately 300,000 gpd of Peak Inflow.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. Of the \$5,112,200 allotted through the Program's Phases 1-5, the community has \$1,132,000 remaining in funding assistance.

8. BURLINGTON: North System

Background Information:

- Miles of Sewer: 115
- Sewered Population: 22,510
- Three Year ('01 - '03) Annual Average I/I: 2.17 mgd
- Massachusetts DEP Administrative Order: ACO-NE-01-1004 (7/25/01)

Latest I/I or SSES Report: Sewer System Evaluation Survey (January 2003)

Private Source Inflow Removal Program: 268 house-to-house inspections have been conducted. 18 sump pump have been identified. 8 sump pumps have been redirected

I/I Rehabilitation Projects in Design or Construction: The sealing of sewer manholes in the Wayside Road area is expected to be completed by the fall.

Reporting Period Activity: Two sump pumps have been redirected. The lining of 315 l.f. of sewer in South Bedford St. has been completed.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. Of the \$1,949,800 allotted through the Program's Phases 1-5, the community has \$1,188,600 remaining in funding assistance.

9. CAMBRIDGE: North System

Background Information:

- Miles of Sewer: 194
- Sewered Population: 101,705
- Three Year ('01 - '03) Annual Average I/I: 9.45 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: Phase II Analysis / Fast Track Design of I/I Rehabilitation Projects (March 2003)

Private Source Inflow Removal Program: Fawcett Street area building inspections complete.

I/I Rehabilitation Projects in Design or Construction: The City continues its implementation of Stormwater Management Program. DPW continues to require developers to handle as much stormwater as possible on their sites by using dry wells and other storm water retention/detention devices.

Reporting Period Activity: Common Manhole Contract No. 3 is ongoing; (common manholes have been separated). South Massachusetts Avenue sewer manholes and pipe lining is ongoing.

Separated 3 common manholes on Matignon Road. Four (4) common manholes were removed on Washburn St. and Cameron Ave. Beacon Street Flood Alleviation project is ongoing. Cambridgeport Roadways Project, which includes common manhole separation and sewer/drain separation, is ongoing. The two (2) new storm drain outfalls at Pearl St. & Amesbury St. have been constructed.

MWRA I/I Local Financial Assistance Program: The community has financed five (5) I/I reduction projects through the Authority's funding assistance program. Of the \$9,323,100 allotted through the Program's Phases 1-5, the community has \$3,319,645 remaining in funding assistance.

10. CANTON: South System

Background Information:

- Miles of Sewer: 62
- Sewered Population: 15,579
- Three Year ('01 - '03) Annual Average I/I: 1.93 mgd
- Massachusetts DEP Administrative Order: No. 537 (Issued April 3, 1984)

Latest I/I or SSES Report: Comprehensive Water Resources Management Plan (On-going)

Private Source Inflow Removal Program: No additional inspections were reported during this period.

I/I Rehabilitation Projects in Design or Construction: The Additional Investigations Project based on the 1994 SSES is progressing. Design work for the replacement of Green Lodge Interceptor is on-going.

Reporting Period Activity: Ward Well Pump Station Replacement contract awarded July 2004. Construction to be complete December 2004.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. Of the \$1,645,900 allotted through the Program's Phases 1-5, the community has \$364,000 remaining in funding assistance.

11. CHELSEA: North System

Background Information:

- Miles of Sewer: 41
- Sewered Population: 34,913
- Three Year ('01 - '03) Annual Average I/I: 1.78 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: Inflow Evaluation for area tributary to CSO CHE-007 (March 2003)

Private Source Inflow Removal Program: Private inflow source identification is complete for CHE-007 tributary areas.

I/I Rehabilitation Projects in Design or Construction: Sewer replacement on Chestnut Street of approximately 1,200 feet of 8 and 12-inch sewers is ongoing. I/I rehabilitation and sewer separation in the tributary to CSO CHE-008 is ongoing. Design of sewer separation in Vale Street, which includes 300 l.f of drain to redirect 3 catch basins, is ongoing. Design for one of the three drainage outfalls under Phase 1 of the CHE007 Tributary Area Sewer Separation Plan. Design of approximately 2,300 l.f. of storm drain to separate approximately 8 acres of drain in the Eastern Ave. area is ongoing.

Chelsea is one of MWRA's combined sewer service communities. As part of the MWRA CSO Facilities Upgrade Project, Chelsea's flows are being evaluated for volume and discharge locations.

Reporting Period Activity: Construction for Sewer and Drain Improvements on Parker Street and Lafayette Avenue was completed in the Fall 2003. Sewer Separation on Vila Street, Dudley Street and Spencer Street was completed in the Fall 2003.

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 \$2,469,100 allotted through the Program's Phases 1-5, the community has \$859,836 remaining in funding assistance.

12. DEDHAM: South System

Background Information:

- Miles of Sewer: 76
- Sewered Population: 23,378
- Three Year ('01 - '03) Annual Average I/I: 3.70 mgd
- Massachusetts DEP Administrative Order: No. 547 (Issued October 1, 1985).

Latest I/I or SSES Report: Internal TV Inspection of Sewers (Letter Report - June 2004)

Private Source Inflow Removal Program: Review of the past inspection work in the Glenway/Hamilton Avenue area was performed. Final report issued April 2004.

I/I Rehabilitation Projects in Design or Construction: Sewer replacement design along East Street from Endicott Street rotary to High Street complete. Work incorporated into Miscellaneous Sewer Improvements Contract 2003-1, currently under construction. Lower Brook Interceptor rehabilitation in design.

Reporting Period Activity: The Town has completed the inspection of three sewer subareas, totaling approximately 43,000 LF of sewer. Approximately 41,000 LF requires rehabilitation. A new phase of internal TV inspection is scheduled for Fall 2004.

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 \$2,381,000 allotted through the Program's Phases 1-5, the community has \$548,000 remaining in funding assistance.

13. EVERETT: North System

Background Information:

- Miles of Sewer: 57
- Sewered Population: 37,734
- Three Year ('01 - '03) Annual Average I/I: 3.64 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: I/I Investigation (February 2000)

Private Source Inflow Removal Program: No additional inspections were reported during this period.

I/I Rehabilitation Projects in Design or Construction: The City is in the process of designing another construction contract based upon smoke testing and TV inspection performed during Fall 1999.

Reporting Period Activity: The separation work consisting of the redirection of six catch basins from the sewer system to the drainage system on Hamilton Street, Hoyt Street, Perry Place and Silver Street has been completed. The sewer rehabilitation work consisted of the replacement of complete sewer segments and small spot repairs in Sewer Area 3.

MWRA I/I Local Financial Assistance Program: The community has financed five (5) I/I reduction projects through the Authority's funding assistance program. Of the \$3,141,500 allotted through the Program's Phases 1-5, the community has \$716,000 remaining in funding assistance.

14. FRAMINGHAM: South System

Background Information:

- Miles of Sewer: 275
- Sewered Population: 62,817
- Three Year ('01 - '03) Annual Average I/I: 2.52 mgd
- Massachusetts DEP Administrative Order: No. 592 (Issued January 8, 1986)

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

Private Source Inflow Removal Program: The SSES will include a house-to-house inspection component initiating at properties along the Howard Street Sewer Rehabilitation Project. Sewer use regulations are being updated to strengthen penalties levied to private source inflow. The Town is also undertaking a Storm Water Management Study that will provide mapping of the town-wide sewer (completed April 2004) and storm water drainage (on-going) systems.

I/I Rehabilitation Projects in Design or Construction: The Sudbury River Interceptor Rehabilitation project is complete. Approximately 100 manholes and 6,500 feet of sewers was rehabilitated. Cleaning and TV inspection of 18,940 LF of sewer was conducted in the downtown area of the community (primarily near Waverly Street and Howard Street). Design work for the Howard Street Sewer Rehabilitation Project is on-going.

Reporting Period Activity: No system modifications were reported during this period. Town-wide sewer/drain mapping on-going. Wet well debris cleaned from eight pumping stations.

MWRA I/I Local Financial Assistance Program: The community has financed five (5) I/I reduction projects through the Authority's funding assistance program. Of the \$5,003,000 allotted through the Program's Phases 1-5, the community has \$3,120,605 remaining in funding assistance.

15. HINGHAM: South System

Background Information:

- Miles of Sewer: 31
- Sewered Population: 6,126
- Three Year ('01 - '03) Annual Average I/I: 0.85 mgd
- Massachusetts DEP Administrative Order: No. 536 (Issued November 15, 1985)

Latest I/I or SSES Report: TV Inspection (October 1987)

Private Source Inflow Removal Program: The house-to-house sump pump inspection program continues. Based on these inspections, five sump pumps and one roof leader were located and redirected. Three house laterals have been replaced.

I/I Rehabilitation Projects in Design or Construction: Sewer relining along North Street is complete. Adjacent chimney repair work is on-going. An estimated I/I reduction of 160,000 gpd was reported.

Reporting Period Activity: The Town will use Developer Flow Reduction Program funds to identify I/I sources in conjunction with the forthcoming Comprehensive Wastewater Management Study. Twenty-five new sewer connections were added from the Baker Hill and Lincoln Hill subdivisions.

MWRA I/I Local Financial Assistance Program: The community has financed three (3) I/I reduction projects through the Authority's funding assistance program. Of the \$589,500 allotted through the Program's Phases 1-5, the community has \$144,000 remaining in funding assistance.

16. HOLBROOK: South System

Background Information:

- Miles of Sewer: 31
- Sewered Population: 8,484
- Three Year ('01 - '03) Annual Average I/I: 0.46 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: I/I Identification Plan (August 2004)

Private Source Inflow Removal Program: A proposed SSES will include a house-to-house inspection component. Inspections to begin Summer 2004. Town officials will continue to inspect new residential/commercial properties for illicit connections during the installation of water meters.

I/I Rehabilitation Projects in Design or Construction: The proposed SSES calls for the inspection of 445 manholes, house-to-house investigation of 2,700 properties and smoke testing of 40,000 LF of sewer.

Reporting Period Activity: The Town has completed its yearly check of all cross-country sewer manholes. The Holbrook collection system is being extended under the present Phase II-VI Sewer Project.

MWRA I/I Local Financial Assistance Program: The community has financed one (1) I/I reduction project through the Authority's funding assistance program. Of the \$640,600 allotted through the Program's Phases 1-5, the community has \$144,000 remaining in funding assistance.

17. LEXINGTON: North System

Background Information:

- Miles of Sewer: 151
- Sewered Population: 29,130
- Three Year ('01 - '03) Annual Average I/I: 3.36 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: Sewer System GPS Mapping (April 2002)

Private Source Inflow Removal Program: The Town is in the process of preparing a public education brochure.

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

Reporting Period Activity: Sewer lining project 04-04, that included 1628 linear feet of 12-inch and 8-inch cured in place liner and replacement of a portion of 12-inch VC pipe, was completed in April 04.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. Of the \$2,827,300 allotted through the Program's Phases 1-5, the community has \$1,293,700 remaining in funding assistance.

18. MALDEN: North System

Background Information:

- Miles of Sewer: 100
- Sewered Population: 56,099
- Three Year ('01 - '03) Annual Average I/I: 5.58 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: Malden Sewer System Survey Report (April 2004)

Private Source Inflow Removal Program: No additional inspections were reported during this period.

I/I Rehabilitation Projects in Design or Construction: Bids are scheduled to be taken in August 2004 for the Sewer Rehabilitation Contract No. 2004-S-1.

Reporting Period Activity: The design for the Sewer Rehabilitation Contract No. 2004-S-1 was completed with the bids scheduled for August. This rehabilitation project, which is estimated to remove 0.43 mgd of I/I, was recommended by the Sewer System Survey Report of April 2004.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. Of the \$4,593,900 allotted through the Program's Phases 1-5, the community has \$1,366,903 remaining in funding assistance.

19. MEDFORD: North System

Background Information:

- Miles of Sewer: 113
- Sewered Population: 55,082
- Three Year ('01 - '03) Annual Average I/I: 5.11 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: I/I Analysis / Limited SSES – Part 2 (October 2002)

Private Source Inflow Removal Program: No additional inspections were reported during this period.

I/I Rehabilitation Projects in Design or Construction: Design associated with the Sydney St. Inflow Removal and Drainage Improvement Project. Once constructed, this project is estimated to remove 7.0 mgd of Peak Inflow.

Reporting Period Activity: In March 2004, cleaning & TV inspection was completed in 11,200 l.f. of sewer at various locations. Also, in July & August 2004, sewer point repairs were completed at various locations.

MWRA I/I Local Financial Assistance Program: The community has financed seven (7) I/I reduction projects through the Authority's funding assistance program. MWRA has distributed the entire \$4,794,600 of phase 1-5 funding assistance to Medford.

20. MELROSE: North System

Background Information:

- Miles of Sewer: 74
- Sewered Population: 26,936
- Three Year ('01 - '03) Annual Average I/I: 2.64 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: I/I Rehabilitation Project Recommendations (November 2001)

Private Source Inflow Removal Program: No additional inspections were reported during this period.

I/I Rehabilitation Projects in Design or Construction: There have been no modifications or extensions to the collection system over the last year.

Reporting Period Activity: The City is continuing its public and private inflow source identification and removal program. The design of an I/I Rehabilitation Project as recommended by the 1995 SSES Report is being completed with bids being accepted in the fall. This rehabilitation work will involve approximately 24,000 l.f. of sewer in various sections of the City. The estimated infiltration removal is 1.13 mgd.

MWRA I/I Local Financial Assistance Program: The community has financed three (3) I/I reduction projects through the Authority's funding assistance program. Of the \$2,301,300 allotted through the Program's Phases 1-5, the community has \$1,721,500 remaining in funding assistance.

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

Background Information:

- Miles of Sewer: 83
- Sewered Population: 24,449
- Three Year ('01 - '03) Annual Average I/I: 2.70 mgd
- Massachusetts DEP Administrative Order: No. 580 (Issued June 13, 1985)

Latest I/I or SSES Report: I/I Rehabilitation - Year 2 (August 2004)

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.

I/I Rehabilitation Projects in Design or Construction: Town-Wide Sewer Evaluation Program - Year 1 rehabilitation construction was completed December 2003. This project removed an estimated 10,000 gpd of I/I from the sewer system. Town-Wide Sewer Evaluation Program - Year 2 rehabilitation construction began August 2004. Estimated infiltration removal is 80,000 gpd. Television and manhole inspection for Year 3 of the Town-Wide Sewer Evaluation Program was conducted in Spring 2004.

Reporting Period Activity: The developer for the Milton Landing Project at Wharf Street is conducting an evaluation of Sewer Sub-System S-17.

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 \$2,279,500 allotted through the Program's Phases 1-5, the community has \$81,000 remaining in funding assistance.

22. NATICK: South System

Background Information:

- Miles of Sewer: 107
- Sewered Population: 27,332
- Three Year ('01 - '03) Annual Average I/I: 1.75 mgd
- Massachusetts DEP Administrative Order: No. 593 (Issued November 15, 1985)

Latest I/I or SSES Report: Town-Wide I/I Study (August 2003)

Private Source Inflow Removal Program: A proposed SSES will include a house-to-house inspection component. Home inspections will continue to be conducted during water meter replacement. The Town is scheduled to replace all water meters in the next two years.

I/I Rehabilitation Projects in Design or Construction: The proposed SSES calls for manhole inspection, house-to-house private source investigation and sewer line smoke testing. Replaced 1,200 LF of 12-inch sewer on Sherman Street. I/I removal estimated at 15,000 gpd.

Reporting Period Activity: Town-Wide I/I Study is complete.

MWRA I/I Local Financial Assistance Program: The community has financed three (3) I/I reduction projects through the Authority's funding assistance program. Of the \$2,270,600 allotted through the Program's Phases 1-5, the community has \$1,113,600 remaining in funding assistance.

23. NEEDHAM: South System

Background Information:

- Miles of Sewer: 115
- Sewered Population: 27,854
- Three Year ('01 - '03) Annual Average I/I: 3.33 mgd
- Massachusetts DEP Administrative Order: No. 549 (Issued November 21, 1984)

Latest I/I or SSES Report: Smoke Testing Report (On-going)

Private Source Inflow Removal Program: No additional inspections were reported during this period.

I/I Rehabilitation Projects in Design or Construction: Sewer Sub-Areas 1, 3 and 4 were TV inspected. A two phase rehabilitation project was designed/constructed. Phase 1 is complete and included root treatment, heavy cleaning, testing and sealing of joints, spot CIP repair and full length (manhole-to-manhole) CIP liner. Phase 2 is on-going and includes spot repairs requiring excavation and manhole-to-manhole pipe replacement.

Reporting Period Activity: Upgrade/rehabilitation at Kendrick Street, Reservoir B, Milo Circle, Great Plain Avenue and Richardson Drive Pumping Stations.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. Of the \$2,630,600 allotted through the Program's Phases 1-5, the community has \$1,152,300 remaining in funding assistance.

24. NEWTON: North and South Systems

Background Information:

- Miles of Sewer: 271
- Sewered Population: 83,202
- Three Year ('01 - '03) Annual Average I/I: 8.83 mgd
- Massachusetts DEP Administrative Order: ACO-NE-00-1001

Latest I/I or SSES Report: Cheesecake/Laundry Brook Drainage Area Study

Private Source Inflow Removal Program: The City continues home inspections for illicit connections to the sanitary sewer collection system. A sewer task force has been created to develop and implement a Private Inflow Removal Program.

I/I Rehabilitation Projects in Design or Construction: Infiltration removal continued in Sewer Area C. The estimated amount of infiltration removed was 117,000 gpd.

Reporting Period Activity: The City added 85 new sewer connections to the sanitary system. Smoke testing & Dye Testing has been completed in Sewer Areas A & C. Installed 1,000 l.f. of cured-in-place liner in 20"x30" sewer interceptor along the Charles River. Tested and Sealed 950 l.f. of 8" sewer in Nahanton Park off Winchester St.

MWRA I/I Local Financial Assistance Program: The community has financed fourteen (14) I/I reduction projects through the Authority's funding assistance program. Of the \$8,265,400 allotted through the Program's Phases 1-5, the community has \$3,719,700 remaining in funding assistance.

25. NORWOOD: South System

Background Information:

- Miles of Sewer: 83
- Sewered Population: 28,815
- Three Year ('01 - '03) Annual Average I/I: 3.85 mgd
- Massachusetts DEP Administrative Order: No. 534 (Issued July 25, 1983)

Latest I/I or SSES Report: Pellana Road PS Area I/I Reduction Report (December 2003)

Private Source Inflow Removal Program: As part of the Pellana Road PS Area I/I Reduction Report, a total of 235 buildings were inspected and 17,900 LF of sewer line was smoke tested. Potential inflow sources totaled 162. Dye water tracing/flooding/TV inspection will be performed.

I/I Rehabilitation Projects in Design or Construction: The Pellana Road Pumping Station Area I/I Reduction Report is complete. Design recommendations are forthcoming. Norwood Gardens Service Area SSES began July 2004. The Meadowbrook Basin project to identify sewer system I/I, as well as sources of wastewater pollution in storm drains, is on-going. The Town has repaired 650 feet of sewer within the basin.

Reporting Period Activity: Norwood Gardens Service Area SSES began July 2004. The study will include the inspection of 20 manholes, house-to-house investigation of 56 properties and sewer line smoke testing.

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 \$2,715,400 allotted through the Program's Phases 1-5, the community has \$749,800 remaining in funding assistance.

26. QUINCY: South System

Background Information:

- Miles of Sewer: 202
- Sewered Population: 89,098
- Three Year ('01 - '03) Annual Average I/I: 8.59 mgd
- Massachusetts DEP Administrative Order: No. 644 (Issued October 22, 1986)

Latest I/I or SSES Report: Montclair Bog Area TV Inspection (August 2003)

Private Source Inflow Removal Program: No additional inspections were reported during this period.

I/I Rehabilitation Projects in Design or Construction: North Quincy Lateral Sewer Improvements (Phase I) is scheduled for completion in Fall 2004. Area 7 Sewer and Water Improvements Project and Quincy Shore Drive Sewer Improvement Project (Phase I) are ongoing.

Reporting Period Activity: Construction of 60 LF of 8-inch sewer from Sea Street to Meade Street easement completed May 2004.

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 \$7,665,000 allotted through the Program's Phases 1-5, the community has \$1,680,000 remaining in funding assistance.

27. RANDOLPH: South System

Background Information:

- Miles of Sewer: 101
- Sewered Population: 30,858
- Three Year ('01 - '03) Annual Average I/I: 1.75 mgd
- Massachusetts DEP Administrative Order: No. 548 (Issued July 29, 1985)

Latest I/I or SSES Report: Amelian Road SSES (January 2003)

Private Source Inflow Removal Program: House-to-house inspections in the Amelian Road area.

I/I Rehabilitation Projects in Design or Construction: The Amelian Road SSES contract is ongoing.

Reporting Period Activity: The Town is developing a sump pump removal plan/policy along with expanding its Developer Flow Reduction Plan.

MWRA I/I Local Financial Assistance Program: The community has financed five (5) I/I reduction projects through the Authority's funding assistance program. Of the \$2,354,800 allotted through the Program's Phases 1-5, the community has \$1,023,900 remaining in funding assistance.

28. READING: North System

Background Information:

- Miles of Sewer: 96
- Sewered Population: 22,330
- Three Year ('01 - '03) Annual Average I/I: 1.23 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: Pilot House-to-House Inspection Program Summary Report (July 2002)

Private Source Inflow Removal Program: The Town has received proposals to complete the Town-wide House-to-House Inspection Program.

I/I Rehabilitation Projects in Design or Construction: No activity during this period. Town Meeting approved the use of MWRA I/I Local Financial Assistance Program funding. Currently developing a program for the use of these funds.

Reporting Period Activity: Cleaned approximately 16,000 l.f. of sewer; TV inspected approximately 7,000 l.f. of sewer; tested and sealed joints on approximately 7,000 l.f. of sewer; sealed and cement-lined 39 sewer manholes.

MWRA I/I Local Financial Assistance Program: The community has financed one (1) I/I reduction project through the Authority's funding assistance program. Of the \$1,736,100 allotted through the Program's Phases 1-5, the community has \$760,700 remaining in funding assistance.

29. REVERE: North System

Background Information:

- Miles of Sewer: 78
- Sewered Population: 47,449
- Three Year ('01 - '03) Annual Average I/I: 4.06 mgd
- Massachusetts DEP Administrative Order: No. 837 (Issued April 21, 1991)

Latest I/I or SSES Report: SSES Phase 3 (August 1999)

Private Source Inflow Removal Program: No additional inspections were reported during this period.

I/I Rehabilitation Projects in Design or Construction: No activity during this period.

Reporting Period Activity: Sewer extension along Furlong Drive and Lee Burbank Highway for the new shopping center across from Suffolk Downs.

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 \$3,750,900 allotted through the Program's Phases 1-5, the community has \$2,419,400 remaining in funding assistance.

30. SOMERVILLE: North System

Background Information:

- Miles of Sewer: 128
- Sewered Population: 76,845
- Three Year ('01 - '03) Annual Average I/I: 6.19 mgd
- Massachusetts DEP Administrative Order: NON-NE-00-1006 (Issued January 21, 2000)

Latest I/I or SSES Report: Sewer System Rehabilitation Design (Final - April 2002)

Private Source Inflow Removal Program: No activity during this period.

I/I Rehabilitation Projects in Design or Construction: As part of the I/I Rehabilitation Contract, 15,369 l.f of sewer was cleaned and 10,569 l.f. of storm drain was cleaned. The preliminary design associated with the Tannery Brook Drain Separation Project is ongoing

Somerville is one of MWRA's combined sewer service communities. As part of the MWRA CSO Facilities Upgrade Project, Somerville's flows are being evaluated for volume and discharge locations.

Reporting Period Activity: Installed cured-in-place liner in 274 l.f. of 36" brick sewer; 244 l.f. of 24"VC sewer; 994 l.f. of 48" brick sewer; 1,059 l.f. of 10" VC sewer. Cleaned and CCTV'd over 5,000 l.f. of 15" to 54" sewer. The estimated Infiltration reduction is 62,700 gpd.

MWRA I/I Local Financial Assistance Program: The community has financed three (3) I/I reduction projects through the Authority's funding assistance program. Of the \$6,155,800 allotted through the Program's Phases 1-5, the community has \$4,958,400 remaining in funding assistance.

31. STONEHAM: North System

Background Information:

- Miles of Sewer: 63
- Sewered Population: 21,700
- Three Year ('01 - '03) Annual Average I/I: 1.42 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: CCTV Report in Study Areas V & VI (June 2004) & Phase II Aqua Zoom Assessment (June 2004)

Private Source Inflow Removal Program: No additional inspections were reported during this period.

I/I Rehabilitation Projects in Design or Construction: Total replacement of the sewer main, manholes and service connections (as needed) on Summer Street between Main Street and Pond Street and a segment of the Pond Street sewer has been completed and Record Drawings delivered in Spring 2004.

Reporting Period Activity: Aqua Zoom inspections and sewer system condition assessment in the Phase II Aqua Zoom Study Area was completed and a report outlining CCTV and rehabilitation recommendations was submitted on August 4, 2004. CCTV inspections and sewer system condition assessment in Study Areas 5 & 6 was completed and a report outlining sewer rehabilitation recommendations was submitted on August 4, 2004.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. Of the \$2,043,900 allotted through the Program's Phases 1-5, the community has \$408,000 remaining in funding assistance.

32. STOUGHTON: South System

Background Information:

- Miles of Sewer: 60
- Sewered Population: 17,698
- Three Year ('01 - '03) Annual Average I/I: 2.30 mgd
- Massachusetts DEP Administrative Order: No. 538 (Issued June 17, 1984)

Latest I/I or SSES Report: Phase VI SSES (February 2003)

Private Source Inflow Removal Program: TV inspection of service connections on-going.

I/I Rehabilitation Projects in Design or Construction: Phase VI sewer rehabilitation on-going.

Reporting Period Activity: Phase V rehabilitation construction complete.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. Of the \$1,852,900 allotted through the Program's Phases 1-5, the community has \$416,000 remaining in funding assistance.

33. WAKEFIELD: North System

Background Information:

- Miles of Sewer: 82
- Sewered Population: 23,757
- Three Year ('01 - '03) Annual Average I/I: 3.05 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: Subarea 6 Flow Monitoring and Manhole Inspection Final Report (June 2004)

Private Source Inflow Removal Program: SSES work that commenced on September 2003 will be investigating sources in Sub-Area 6. Commercial properties in the Audubon Rd. area are being investigated. Inspection at the Colonial Hilton is ongoing.

I/I Rehabilitation Projects in Design or Construction: The Town rebuilt sewer manhole on Teri Road to remove the inflow source.

Reporting Period Activity: Smoke testing in Gauging Areas 2 & 4 of Subarea 6 identified 897,000 gpd of design storm inflow. Flow isolation of approximately 35,000 l.f. of sewer in Gauging Areas 2, 4 & 5 of Subarea 6 identified approximately 285,000 gpd of infiltration.

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 \$2,356,900 allotted through the Program's Phases 1-5, the community has \$825,300 remaining in funding assistance.

34. WALPOLE: South System

Background Information:

- Miles of Sewer: 59
- Sewered Population: 15,079
- Three Year ('01 - '03) Annual Average I/I: 1.28 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: SSES Phases 1 and 2 (June 2002)

Private Source Inflow Removal Program: There have been 85 suspect roof leaders identified. Town working with property owners for redirection design. Town may include house-to-house inspection program as part of its upcoming water meter replacement program.

I/I Rehabilitation Projects in Design or Construction: The Phase II I/I removal project is currently under investigation by a new consulting firm to achieve the most cost effective plan.

Reporting Period Activity: Construction of 1,300 LF of 8-inch sewer within Hollowdale Farm Subdivision.

MWRA I/I Local Financial Assistance Program: The community has financed three (3) I/I reduction projects through the Authority's funding assistance program. Of the \$1,447,000 allotted through the Program's Phases 1-5, the community has \$308,000 remaining in funding assistance.

35. WALTHAM: North System

Background Information:

- Miles of Sewer: 138
- Sewered Population: 58,482
- Three Year ('01 - '03) Annual Average I/I: 6.18 mgd
- Massachusetts DEP Administrative Order: ACOP-NE-02-1003 (5/7/03)

Latest I/I or SSES Report: Infiltration/Inflow Investigation Draft Report (June 2004)

Private Source Inflow Removal Program: No activity during this period.

I/I Rehabilitation Projects in Design or Construction: Sewer Rehabilitation (Contract 02-2) has been completed. The construction of the Beaver Brook Sewer Rehabilitation is ongoing. Sewer Rehabilitation for Hobbs Brook, Metropolitan State Hospital, Roberts Trunk Sewer Rehabilitation, and Carter/Felton/Elm Streets are in preparation to go to bid.

Reporting Period Activity: The City is in the early stages of the development of a Sewer Bank Program. The City's Private Inflow Source Removal Program will finish the inspection stage this summer and begin notifying property owners of illicit connections.

MWRA I/I Local Financial Assistance Program: The community has financed five (5) I/I reduction projects through the Authority's funding assistance program. Of the \$5,392,400 allotted through the Program's Phases 1-5, the community has \$1,180,000 remaining in funding assistance.

36. WATERTOWN: North System

Background Information:

- Miles of Sewer: 75
- Sewered Population: 32,857
- Three Year ('01 - '03) Annual Average I/I: 1.84 mgd
- Massachusetts DEP Administrative Order: ACOP-NE-97-5004

Latest I/I or SSES Report: I/I and SSES Analysis Draft Report (September 2000)

Private Source Inflow Removal Program: During this period, the Town performed smoke testing of 20,900 linear feet of sanitary sewer, used to help identify storm drain and sanitary conductivity issues in various sections of the Town.

I/I Rehabilitation Projects in Design or Construction: In July 2004, the Town issued a contract for catch basin cleaning and rebuilding.

Reporting Period Activity: During this period, 250 l.f. of sewer on Auburn St was lined; 6 sanitary sewer laterals were repaired; one repair to sewer main.

MWRA I/I Local Financial Assistance Program: The community has financed one (1) I/I investigation project through the Authority's funding assistance program. Of the \$2,581,800 allotted through the Program's Phases 1-5, the community has \$2,259,235 remaining in funding assistance.

37. WELLESLEY: South System

Background Information:

- Miles of Sewer: 130
- Sewered Population: 25,684
- Three Year ('01 - '03) Annual Average I/I: 2.52 mgd
- Massachusetts DEP Administrative Order: No. 579 (Issued May 23, 1985)

Latest I/I or SSES Report: Phase 2 SSES (November 1994)

Private Source Inflow Removal Program: The DPW is contacting the owners of illegal sump pumps, based on previous private source inflow studies. To date, 18 sump pumps have been removed from the sanitary system.

I/I Rehabilitation Projects in Design or Construction: Contract No. 04C-50-05 (Sewer Rehabilitation in the Wellesley Farms Area) is on-going. The project includes the cleaning and television inspection of approximately 57,660 feet of sanitary sewer to determine the structural condition of the pipe.

Reporting Period Activity: The replacement/rehabilitation of 15 existing pneumatic ejector stations and 4 package sewage pump stations is on-going.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. Of the \$2,255,700 allotted through the Program's Phases 1-5, the community has \$1,799,760 remaining in funding assistance.

38. WESTWOOD: South System

Background Information:

- Miles of Sewer: 77
- Sewered Population: 13,472
- Three Year ('01 - '03) Annual Average I/I: 1.12 mgd
- Massachusetts DEP Administrative Order: No. 578 (Issued May 23, 1985)

Latest I/I or SSES Report: SSES Phases 1 and 2 (January 1991)

Private Source Inflow Removal Program: House-to-house inspection survey, as part of the FY03 Annual Inspection Program, has been completed. Six properties were identified with illicit connections.

I/I Rehabilitation Projects in Design or Construction: The maintenance program for FY03 has been completed. The program included television inspection of five miles of sewer, the testing

and sealing of sewer manholes, and house-to-house inspection surveys to identify illicit connections to the sewer system. The manhole sealing eliminated an estimated 12,300 gpd of I/I.

Reporting Period Activity: The construction of 1,700 LF of new sewer laterals on Grove Street is complete.

MWRA I/I Local Financial Assistance Program: The community has financed four (4) I/I reduction projects through the Authority's funding assistance program. Of the \$973,300 allotted through the Program's Phases 1-5, the community has \$240,000 remaining in funding assistance.

39. WEYMOUTH: South System

Background Information:

- Miles of Sewer: 238
- Sewered Population: 51,852
- Three Year ('01 - '03) Annual Average I/I: 5.16 mgd
- Massachusetts DEP Administrative Order: No. 543 (Issued November 14, 1984)
A new ACO was signed in 1999.

Latest I/I or SSES Report: I/I Identification Sub-Basin Reports (February 2004)

Private Source Inflow Removal Program: The Town completed the redirection of 299 sump pumps (for an estimated 150,000 gpd of inflow removal) with approximately 21 sump pumps pending.

I/I Rehabilitation Projects in Design or Construction: Contract S02-1 I/I Rehabilitation Construction was completed in December 2003. Ft. Point Road I/I Rehabilitation Construction complete. CIP I/I Rehabilitation Construction Contract Nos. 2 and 5 complete. CIP I/I Rehabilitation Design Contract No. 3 out for bid. Lower Central/Old Swamp River CIP I/I Rehabilitation Design Contract No. 3 out for bid. Southeast/Landing I/I Rehabilitation Design Contract out for bid.

Reporting Period Activity: Completed the conversion of four ejector stations (Belmont/Island View/Mathewson/Holmes) into submersible pumping station. Completed septage receiving facility enclosure. The Town has replaced 2,670 LF of 8-inch sewer and 311 LF of 3-inch force main in the past year.

MWRA I/I Local Financial Assistance Program: The community has financed twelve (12) I/I reduction projects through the Authority's funding assistance program. Of the \$4,529,900 allotted through the Program's Phases 1-5, the community has \$1,012,000 remaining in funding assistance.

40. WILMINGTON: North System

Background Information:

- Miles of Sewer: 20
- Sewered Population: 3,699
- Three Year ('01 - '03) Annual Average I/I: 0.74 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: Infrastructure Maintenance & Management Program (IMMP) - Phase I Study Area Final Report (June 2003)

Private Source Inflow Removal Program: No additional inspections were reported during this period.

I/I Rehabilitation Projects in Design or Construction: Bids were accepted on January 14, 2004 for the Sewer System Rehabilitation project. As of August 2004, the construction is substantially complete.

Reporting Period Activity: The Town is continuing with the next phase of their Infrastructure Maintenance and Management Program (IMMP). This includes the internal inspection of the sewers and manholes, analysis of the results and recommendations for sewer rehabilitations.

MWRA I/I Local Financial Assistance Program: The community has financed three (3) I/I reduction projects through the Authority's funding assistance program. Of the \$968,000 allotted through the Program's Phases 1-5, the community has \$228,000 remaining in funding assistance.

41. WINCHESTER: North System

Background Information:

- Miles of Sewer: 83
- Sewered Population: 21,072
- Three Year ('01 - '03) Annual Average I/I: 1.67 mgd
- Massachusetts DEP Administrative Order: Draft ACO in 2001.

Latest I/I or SSES Report: I/I Removal Report (April 1994)

Private Source Inflow Removal Program: Under the Town Private Inflow Source Removal Program approximately 130 private inflow sources have been disconnected to date.

I/I Rehabilitation Projects in Design or Construction: No design work is currently being prepared. See below for construction work.

Reporting Period Activity: Allstate Power Vac in currently cleaning and TV inspecting 52,00 l.f. of sewers and testing and sealing 11,300 pipe joints.

MWRA I/I Local Financial Assistance Program: The community has financed three (3) I/I reduction projects through the Authority's funding assistance program. Of the \$1,704,000 allotted through the Program's Phases 1-5, the community has \$751,700 remaining in funding assistance.

42. WINTHROP: North System

Background Information:

- Miles of Sewer: 36
- Sewered Population: 18,235
- Three Year ('01 - '03) Annual Average I/I: 1.14 mgd
- Massachusetts DEP Administrative Order: None

Latest I/I or SSES Report: Preliminary Design Report/Shirley Street Sewer Rehab. (July 2002)

Private Source Inflow Removal Program: No additional inspections were reported during this period.

I/I Rehabilitation Projects in Design or Construction: There was no activity during this period.

Reporting Period Activity: The Town is preparing a construction contract to eliminate cost-effective inflow sources.

MWRA I/I Local Financial Assistance Program: The community has financed three (3) I/I reduction projects through the Authority's funding assistance program. Of the \$1,342,400 allotted through the Program's Phases 1-5, the community has \$1,055,300 remaining in funding assistance.

43. WOBURN: North System

Background Information:

- Miles of Sewer: 141
- Sewered Population: 36,103
- Three Year ('01 - '03) Annual Average I/I: 5.59 mgd
- Massachusetts DEP Administrative Order: ACO-NE-01-1005 (August 16, 2001)

Latest I/I or SSES Report: Dix Road SSES Final Report (July 2004)

Private Source Inflow Removal Program: A new Sewer Use Ordinance and Private Inflow Program was adopted in June 2004. Numerous sources of Inflow were removed at the request of the plumbing Inspector and recorded in the Sewer Bank. Building inspections are being completed in both the Dix Road Pumping Station tributary area and the West Side Interceptor tributary area.

I/I Rehabilitation Projects in Design or Construction: Design of the Dix Road Area sewer rehabilitations as recommended by the SSES Report of July 2004 is ongoing with construction anticipated to begin by late Fall 2004. This project will also include recommended rehabilitations of Sylvania Interceptor.

Reporting Period Activity: Many projects are currently ongoing such as: Dix Road Area Building Inspections; West Side SSES; Horn Pond Hydraulic Modeling; Public Education Program related to the Private Inflow Removal Program

MWRA I/I Local Financial Assistance Program: The community has financed five (5) I/I reduction projects through the Authority's funding assistance program. Of the \$4,302,500 allotted through the Program's Phases 1-5, the community has \$980,000 remaining in funding assistance.

ATTACHMENT 6
TO
MWRA ANNUAL I/I REDUCTION REPORT FOR FY04
Reporting Period – July 2003 Through June 2004

CY03 COMMUNITY WASTEWATER FLOW DATA

This attachment contains calendar year 2003 wastewater flow data for the 43 MWRA member sewer communities. There are three separate data tables. The first table (one page) presents the CY03 monthly total wastewater flow estimates for each community derived from MWRA's wastewater metering system. Each community's percent average daily flow and percent maximum month flow are used as components of MWRA's annual wholesale sewer charge. The second table (one page) presents the CY03 community flow components (sanitary flow, infiltration, and stormwater inflow) as estimated by MWRA. The third table (three pages) presents the estimated community flow components in two formats: (1) alphabetically and (2) sorted (ranked) from high to low.

CY03 MWRA WASTEWATER METERING SYSTEM COMMUNITY FLOW ESTIMATES

30-Jan-04

Page 1

Community	Total Population	Sewered Population	CY03 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	42,140	42,098	6.92	5.77	8.51	9.49	6.31	6.94	4.56	4.92	4.07	4.91	5.37	7.85	6.30	1.8%	9.49	1.9%
Ashland	15,392	10,774	1.32	1.20	1.68	1.66	1.33	1.51	1.10	1.09	1.05	1.13	1.34	1.54	1.33	0.4%	1.68	0.3%
Bedford	12,647	11,256	3.24	2.96	4.38	5.01	3.29	3.69	2.62	2.62	2.38	2.48	2.64	3.23	3.21	0.9%	5.01	1.0%
Belmont	24,045	23,540	4.59	3.69	5.33	6.39	3.59	4.23	2.77	3.13	2.41	2.79	3.03	4.95	3.91	1.1%	6.39	1.3%
BWSC	589,281	588,692	105.47	100.88	115.38	135.75	98.38	117.17	92.06	90.29	88.12	98.27	88.58	124.75	104.59	29.2%	135.75	27.1%
Braintree	33,917	33,883	9.09	6.92	9.27	11.09	7.22	8.58	5.46	4.83	4.28	4.77	5.45	8.77	7.14	2.0%	11.09	2.2%
Brookline	57,032	56,462	12.06	10.27	12.89	13.94	10.21	12.04	8.43	9.58	8.67	9.71	10.11	13.35	10.94	3.1%	13.94	2.8%
Burlington	22,923	22,510	4.34	3.81	5.43	5.54	4.08	4.57	3.27	3.41	2.95	3.09	3.20	4.19	3.99	1.1%	5.54	1.1%
Cambridge	101,807	101,705	19.29	18.92	20.39	21.94	17.41	19.62	14.85	16.14	13.50	14.39	13.92	19.19	17.45	4.9%	21.94	4.4%
Canton	21,341	15,579	3.41	2.78	3.81	4.63	2.94	3.21	2.35	2.33	2.16	2.35	2.75	4.68	3.12	0.9%	4.68	0.9%
Chelsea	34,913	34,913	3.84	3.32	4.38	4.85	3.80	4.45	3.36	4.00	3.23	4.25	3.28	5.08	3.99	1.1%	5.08	1.0%
Dedham	23,378	21,975	6.90	5.67	8.06	9.54	5.95	7.25	4.16	4.11	3.16	3.64	4.86	8.52	5.99	1.7%	9.54	1.9%
Everett	37,772	37,734	6.33	5.84	6.90	7.81	5.98	6.83	5.46	5.64	4.96	5.91	6.05	7.71	6.29	1.8%	7.81	1.6%
Framingham	66,827	62,817	8.18	7.20	10.21	9.74	6.77	8.28	6.04	6.21	5.93	6.14	6.34	7.79	7.40	2.1%	10.21	2.0%
Hingham	6,782	6,126	1.97	1.23	2.08	2.63	1.37	1.61	0.94	0.99	0.77	0.82	1.09	1.95	1.46	0.4%	2.63	0.5%
Holbrook	10,877	8,484	1.08	0.95	1.18	1.34	1.04	1.07	0.79	0.80	0.79	0.84	0.93	1.21	1.00	0.3%	1.34	0.3%
Lexington	30,663	29,130	7.36	6.16	9.82	10.83	6.70	7.94	5.03	5.01	4.10	4.31	5.26	7.59	6.68	1.9%	10.83	2.2%
Malden	56,155	56,099	11.19	9.33	11.10	13.25	8.98	10.03	7.18	7.47	6.10	6.77	7.44	10.69	9.12	2.5%	13.25	2.6%
Medford	55,137	55,082	10.76	8.57	10.80	12.80	9.22	10.15	7.36	7.99	7.09	8.26	8.18	11.16	9.37	2.6%	12.80	2.6%
Melrose	26,963	26,936	5.60	3.68	6.05	9.07	5.04	5.63	3.12	3.63	2.88	3.53	4.47	8.09	5.07	1.4%	9.07	1.8%
Milton	26,010	24,449	5.91	4.18	6.39	7.96	4.31	5.37	3.02	2.73	2.28	2.49	3.00	6.27	4.49	1.3%	7.96	1.6%
Natick	32,384	27,332	4.13	3.65	5.38	5.64	3.91	4.67	3.35	3.28	2.94	2.99	3.45	4.55	4.00	1.1%	5.64	1.1%
Needham	29,197	27,854	5.76	4.84	7.09	8.29	5.15	6.38	4.26	4.10	3.76	4.06	4.82	6.94	5.46	1.5%	8.29	1.7%
Newton	83,880	82,202	17.70	14.08	20.33	24.12	18.57	21.60	13.69	13.30	11.06	11.89	14.96	23.73	17.10	4.8%	24.12	4.8%
Norwood	28,844	28,815	8.02	5.84	8.72	10.09	5.99	7.74	4.28	4.84	3.66	4.22	5.08	8.74	6.44	1.8%	10.09	2.0%
Quincy	89,187	89,098	16.75	13.16	16.74	20.44	14.49	16.14	12.62	12.34	11.23	11.74	12.36	17.97	14.67	4.1%	20.44	4.1%
Randolph	31,044	30,858	4.72	3.40	5.05	6.32	3.96	4.36	3.26	3.05	2.68	2.85	3.28	5.28	4.02	1.1%	6.32	1.3%
Reading	23,680	22,330	3.30	2.77	4.14	4.53	2.78	3.10	2.28	2.19	1.94	2.23	2.50	3.91	2.97	0.8%	4.53	0.9%
Revere	47,496	47,449	7.74	5.96	8.11	9.10	6.31	8.08	6.03	6.64	5.62	7.02	6.88	9.68	7.27	2.0%	9.68	1.9%
Somerville	76,922	76,845	10.95	9.24	10.00	11.03	9.09	10.95	7.36	9.24	8.30	10.80	10.39	15.71	10.26	2.9%	15.71	3.1%
Stoneham	22,165	21,700	3.82	3.08	4.07	4.52	3.77	4.24	3.25	3.65	2.67	3.09	3.38	4.18	3.65	1.0%	4.52	0.9%
Stoughton	27,227	17,698	4.82	3.71	4.98	5.68	3.85	4.19	3.02	2.91	2.51	2.59	3.04	4.57	3.82	1.1%	5.68	1.1%
Wakefield	24,817	23,757	6.25	5.20	7.31	6.82	4.75	4.99	3.53	3.75	2.83	3.36	3.89	5.69	4.86	1.4%	7.31	1.5%
Walpole	23,199	15,079	2.68	2.11	2.78	3.47	2.51	2.78	2.02	2.01	1.78	1.84	2.08	2.95	2.42	0.7%	3.47	0.7%
Waltham	59,073	58,482	11.47	10.22	13.67	14.12	9.98	11.44	8.50	8.71	7.74	8.41	9.32	12.45	10.50	2.9%	14.12	2.8%
Watertown	32,857	32,857	4.61	3.71	4.98	5.85	3.88	4.40	3.29	3.56	3.12	3.35	3.79	5.06	4.14	1.2%	5.85	1.2%
Wellesley	26,671	25,684	4.93	4.19	7.09	7.73	4.73	6.03	3.50	3.68	3.07	3.20	3.86	6.06	4.84	1.4%	7.73	1.5%
Westwood	14,181	13,472	2.42	1.83	2.66	2.83	1.90	2.41	1.64	1.66	1.33	1.35	1.60	2.51	2.01	0.6%	2.83	0.6%
Weymouth	54,754	51,852	10.70	8.31	11.79	14.49	9.07	10.28	6.81	6.86	5.85	6.52	7.84	11.91	9.21	2.6%	14.49	2.9%
Wilmington	21,629	3,699	1.59	1.51	1.79	1.93	1.72	1.86	1.39	1.26	1.29	1.30	1.34	1.46	1.54	0.4%	1.93	0.4%
Winchester	21,093	21,072	3.65	2.86	4.75	5.19	2.83	3.56	2.04	2.23	1.79	1.92	2.30	3.90	3.09	0.9%	5.19	1.0%
Winthrop	18,235	18,235	2.36	1.94	2.26	2.42	1.87	2.15	1.81	1.83	1.73	1.93	1.90	2.46	2.06	0.6%	2.46	0.5%
Woburn	38,003	36,103	11.11	10.57	13.76	15.41	11.09	13.07	7.43	9.80	7.47	7.61	8.95	13.39	10.80	3.0%	15.41	3.1%
Total/Average	2,122,540	2,042,718	388.33	335.51	431.49	495.28	346.12	404.59	289.29	297.81	265.25	295.12	304.30	441.66	357.98	100%	501.84	100%

2003 MWRA COMMUNITY WASTEWATER FLOW COMPONENT ESTIMATES (CY03-12 MONTHS)

30-Jan-04

COMMUNITY	2003 Averages (1)					Components of Average Daily Flow (Estimated) (2)						O		P		
	Community Demographics		C No. of Connects to MWRA System	D Miles of Local Sewers (3)	E No. of Meters for Permanent System	F Average Daily Flow ADF (MGD)	G Percent Average Daily Flow (6)	H Selected Dry Day ADF (MGD)	I Average Daily Infiltration (MGD)	J Infiltration As a % of Average Daily Flow	K Average Sanitary Flow (MGD)	L Sanitary As a % of Average Daily Flow	M Average Daily Inflow (4) (MGD)	N Inflow As a % of Average Daily Flow	Peak Month ADF (MGD)	Percent Peak Month ADF (6)
	A Total Population	B Sewered Population														
Arlington	42,140	42,098	321	106	7	6.30	1.76%	5.65	3.04	48.3%	2.61	41.4%	0.65	10.3%	9.49	1.89%
Ashland	15,392	10,774	2	43	2	1.33	0.37%	1.23	0.63	47.4%	0.60	45.1%	0.10	7.5%	1.68	0.33%
Bedford	12,647	11,256	2	68	2	3.21	0.90%	3.02	1.77	55.1%	1.25	38.9%	0.20	6.2%	5.01	1.00%
Belmont	24,045	23,540	2	78	2	3.91	1.09%	3.41	1.98	50.6%	1.43	36.6%	0.50	12.8%	6.39	1.27%
BWSC (5)	589,281	588,692	234	840	33	104.59	29.22%	86.53	34.31	32.8%	52.22	49.9%	18.06	17.3%	135.75	27.05%
Braintree	33,917	33,883	15	133	7	7.14	1.99%	6.14	3.85	53.9%	2.29	32.1%	1.00	14.0%	11.09	2.21%
Brookline	57,032	56,462	9	102	12	10.94	3.06%	9.65	5.35	48.9%	4.30	39.3%	1.29	11.8%	13.94	2.78%
Burlington	22,923	22,510	0	115	1	3.99	1.11%	3.73	2.31	57.9%	1.42	35.6%	0.26	6.5%	5.54	1.10%
Cambridge (5)	101,807	101,705	116	150	9	17.45	4.87%	14.28	5.92	33.9%	8.36	47.9%	3.17	18.2%	21.94	4.37%
Canton	21,341	15,579	63	62	6	3.12	0.87%	2.65	1.51	48.4%	1.14	36.5%	0.47	15.1%	4.68	0.93%
Chelsea (5)	34,913	34,913	40	41	5	3.99	1.11%	2.94	0.66	16.5%	2.28	57.1%	1.05	26.3%	5.08	1.01%
Dedham	23,378	21,975	25	76	6	5.99	1.67%	5.03	3.53	58.9%	1.50	25.0%	0.96	16.0%	9.54	1.90%
Everett	37,772	37,734	20	57	7	6.29	1.76%	5.62	3.20	50.9%	2.42	38.5%	0.66	10.5%	7.81	1.56%
Framingham	66,827	62,817	4	275	4	7.40	2.07%	6.75	2.38	32.2%	4.37	59.1%	0.65	8.8%	10.21	2.03%
Hingham	6,782	6,126	1	31	1	1.46	0.41%	1.20	0.77	52.7%	0.43	29.5%	0.26	17.8%	2.63	0.52%
Holbrook	10,877	8,484	2	31	2	1.00	0.28%	0.91	0.53	53.0%	0.38	38.0%	0.09	9.0%	1.34	0.27%
Lexington	30,663	29,130	17	151	4	6.68	1.87%	6.16	3.70	55.4%	2.46	36.8%	0.52	7.8%	10.83	2.16%
Malden	56,155	56,099	242	99	6	9.12	2.55%	8.17	5.14	56.4%	3.03	33.2%	0.96	10.5%	13.25	2.64%
Medford	55,137	55,082	71	113	6	9.37	2.62%	8.27	4.38	46.7%	3.89	41.5%	1.10	11.7%	12.80	2.55%
Melrose	26,963	26,936	187	74	5	5.07	1.42%	4.07	2.38	46.9%	1.69	33.3%	1.00	19.7%	9.07	1.81%
Milton	26,010	24,449	45	83	14	4.49	1.25%	3.67	2.35	52.3%	1.32	29.4%	0.82	18.3%	7.96	1.59%
Natick	32,384	27,332	27	107	4	4.00	1.12%	3.55	1.79	44.8%	1.76	44.0%	0.44	11.0%	5.64	1.12%
Needham	29,197	27,854	21	115	2	5.46	1.53%	4.81	3.01	55.1%	1.80	33.0%	0.65	11.9%	8.29	1.65%
Newton	83,880	82,202	51	271	7	17.10	4.78%	15.48	8.82	51.6%	6.66	38.9%	1.62	9.5%	24.12	4.81%
Norwood	28,844	28,815	30	83	6	6.44	1.80%	5.22	3.37	52.3%	1.85	28.7%	1.22	18.9%	10.09	2.01%
Quincy	89,187	89,098	56	202	6	14.67	4.10%	12.88	7.42	50.6%	5.46	37.2%	1.80	12.3%	20.44	4.07%
Randolph	31,044	30,858	2	101	2	4.02	1.12%	3.65	1.81	45.0%	1.84	45.8%	0.37	9.2%	6.32	1.26%
Reading	23,680	22,330	2	86	2	2.97	0.83%	2.72	1.22	41.1%	1.50	50.5%	0.25	8.4%	4.53	0.90%
Revere	47,496	47,449	3	78	1	7.27	2.03%	6.05	3.54	48.7%	2.51	34.5%	1.22	16.8%	9.68	1.93%
Somerville (5)	76,922	76,845	43	107	7	10.26	2.87%	7.68	4.02	39.2%	3.66	35.7%	2.58	25.1%	15.71	3.13%
Stoneham	22,165	21,700	23	63	3	3.65	1.02%	3.30	1.36	37.3%	1.94	53.2%	0.34	9.3%	4.52	0.90%
Stoughton	27,227	17,698	1	60	2	3.82	1.07%	3.41	2.35	61.5%	1.06	27.7%	0.41	10.7%	5.68	1.13%
Wakefield	24,817	23,757	10	82	2	4.86	1.36%	4.37	2.68	55.1%	1.69	34.8%	0.49	10.1%	7.31	1.46%
Walpole	23,199	15,079	1	56	2	2.42	0.68%	2.16	1.25	51.7%	0.91	37.6%	0.26	10.7%	3.47	0.69%
Waltham	59,073	58,482	3	138	3	10.50	2.93%	9.72	5.76	54.9%	3.96	37.7%	0.79	7.5%	14.12	2.81%
Watertown	32,857	32,857	14	75	3	4.14	1.16%	3.76	1.69	40.8%	2.07	50.0%	0.37	8.9%	5.85	1.17%
Wellesley	26,671	25,684	2	130	3	4.84	1.35%	4.07	2.45	50.6%	1.62	33.5%	0.77	15.9%	7.73	1.54%
Westwood	14,181	13,472	3	77	3	2.01	0.56%	1.76	1.06	52.7%	0.70	34.8%	0.25	12.4%	2.83	0.56%
Weymouth	54,754	51,852	17	238	4	9.21	2.57%	8.17	4.99	54.2%	3.18	34.5%	1.04	11.3%	14.49	2.89%
Wilmington	21,629	3,699	2	19	1	1.54	0.43%	1.48	0.58	37.7%	0.90	58.4%	0.06	3.9%	1.93	0.38%
Winchester	21,093	21,072	72	83	7	3.09	0.86%	2.72	1.46	47.2%	1.26	40.8%	0.36	11.7%	5.19	1.03%
Winthrop	18,235	18,235	21	36	6	2.06	0.58%	1.81	0.97	47.1%	0.84	40.8%	0.24	11.7%	2.46	0.49%
Woburn	38,003	36,103	18	141	13	10.80	3.02%	9.66	5.47	50.6%	4.19	38.8%	1.14	10.6%	15.41	3.07%
Totals/Averages	2,122,540	2,042,718	1,840	5,076	234	357.98	100.00%	307.51	156.76	43.8%	150.75	42.1%	50.44	14.1%	501.84	100.00%

FOOTNOTES:

- (1) Figures tabulated using data from the MWRA Wastewater Metering System for Calendar Year 2003.
- (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 2003 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

2003 Final Community Wastewater Flow Component Estimates (Alphabetical)

04-Jun-04

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	42,098	106	896	6.30	3.04	0.65	2.61	7,031	4,118	3,393	725	6,118	62
Ashland	10,774	43	390	1.33	0.63	0.10	0.60	3,410	1,872	1,615	256	2,331	56
Bedford	11,256	68	552	3.21	1.77	0.20	1.25	5,815	3,569	3,207	362	2,941	111
Belmont	23,540	78	708	3.91	1.98	0.50	1.43	5,523	3,503	2,797	706	6,443	61
BWSC	588,692	840	14,024	104.59	34.31	18.06	52.22	7,458	3,734	2,447	1,288	21,497	89
Braintree	33,883	133	1,215	7.14	3.85	1.00	2.29	5,877	3,992	3,169	823	7,542	68
Brookline	56,462	102	1,090	10.94	5.35	1.29	4.30	10,037	6,092	4,908	1,183	12,707	76
Burlington	22,510	115	1,042	3.99	2.31	0.26	1.42	3,829	2,466	2,217	250	2,261	63
Cambridge	101,705	150	2,344	17.45	5.92	3.17	8.36	7,445	3,878	2,526	1,352	21,131	82
Canton	15,579	62	567	3.12	1.51	0.47	1.14	5,503	3,492	2,663	829	7,584	73
Chelsea	34,913	41	618	3.99	0.66	1.05	2.28	6,456	2,767	1,068	1,699	25,381	65
Dedham	21,975	76	712	5.99	3.53	0.96	1.50	8,413	6,306	4,958	1,348	12,570	68
Everett	37,734	57	686	6.29	3.20	0.66	2.42	9,169	5,627	4,665	962	11,488	64
Frammingham	62,817	275	2,519	7.40	2.38	0.65	4.37	2,938	1,203	945	258	2,364	70
Hingham	6,126	31	270	1.46	0.77	0.26	0.43	5,407	3,815	2,852	963	8,387	70
Holbrook	8,484	31	312	1.00	0.53	0.09	0.38	3,205	1,987	1,699	288	2,903	45
Lexington	29,130	151	1,487	6.68	3.70	0.52	2.46	4,492	2,838	2,488	350	3,442	84
Malden	56,099	99	876	9.12	5.14	0.96	3.03	10,411	6,963	5,868	1,096	9,668	54
Medford	55,082	113	982	9.37	4.38	1.10	3.89	9,542	5,580	4,460	1,120	9,715	71
Melrose	26,936	74	635	5.07	2.38	1.00	1.69	7,984	5,323	3,748	1,575	13,596	63
Milton	24,449	83	680	4.49	2.35	0.82	1.32	6,603	4,662	3,456	1,206	9,877	54
Natick	27,332	107	954	4.00	1.79	0.44	1.76	4,193	2,338	1,876	461	4,113	64
Needham	27,854	115	1,075	5.46	3.01	0.65	1.80	5,079	3,405	2,800	605	5,649	65
Newton	82,202	271	2,579	17.10	8.82	1.62	6.66	6,630	4,048	3,420	628	5,978	81
Norwood	28,815	83	763	6.44	3.37	1.22	1.85	8,440	6,016	4,417	1,599	14,733	64
Quincy	89,098	202	1,956	14.67	7.42	1.80	5.46	7,500	4,714	3,793	920	8,911	61
Randolph	30,858	101	1,138	4.02	1.81	0.37	1.84	3,533	1,916	1,591	325	3,663	60
Reading	22,330	86	747	2.97	1.22	0.25	1.50	3,976	1,968	1,633	335	2,908	67
Revere	47,449	78	832	7.27	3.54	1.22	2.51	8,738	5,721	4,255	1,466	15,641	53
Somerville	76,845	107	1,523	10.26	4.02	2.58	3.66	6,737	4,334	2,640	1,694	24,016	48
Stoneham	21,700	63	517	3.65	1.36	0.34	1.94	7,060	3,288	2,631	658	5,397	89
Stoughton	17,698	60	621	3.82	2.35	0.41	1.06	6,151	4,444	3,784	660	6,879	60
Wakefield	23,757	82	842	4.86	2.68	0.49	1.69	5,772	3,765	3,183	582	5,957	71
Walpole	15,079	56	577	2.42	1.25	0.26	0.91	4,194	2,617	2,166	451	4,643	60
Waltham	58,482	138	1,289	10.50	5.76	0.79	3.96	8,146	5,081	4,469	613	5,720	68
Watertown	32,857	75	616	4.14	1.69	0.37	2.07	6,721	3,344	2,744	601	4,930	63
Wellesley	25,684	130	1,271	4.84	2.45	0.77	1.62	3,808	2,533	1,928	606	5,923	63
Westwood	13,472	77	627	2.01	1.06	0.25	0.70	3,206	2,089	1,691	399	3,247	52
Weymouth	51,852	238	2,272	9.21	4.99	1.04	3.18	4,054	2,654	2,196	458	4,370	61
Wilmington	3,699	19	259	1.54	0.58	0.06	0.90	5,946	2,471	2,239	232	3,176	243
Winchester	21,072	83	633	3.09	1.46	0.36	1.26	4,882	2,875	2,306	569	4,337	60
Winthrop	18,235	36	309	2.06	0.97	0.24	0.84	6,667	3,916	3,139	777	6,719	46
Woburn	36,103	141	1,393	10.80	5.47	1.14	4.19	7,753	4,745	3,927	818	8,084	116
Total	2,042,718	5,076	55,398	357.97	156.76	50.44	150.75	265,732	162,069	127,973	34,096	354,941	3,064
Average	47,505	118	1,288	8.32	3.65	1.17	3.51	6,180	3,769	2,976	793	8,254	71

2003 Final Community Wastewater Flow Component Estimates (Ranked)

04-Jun-04

Community	Sewered Population	Community	Miles of Local Sewers	Community	IDM of Local Sewers	Community	Average Daily Flow ADF (MGD)	Community	Average Annual Infiltration (MGD)	Community	Average Annual Inflow (MGD)
BWSC	588,692	BWSC	840	BWSC	14,024	BWSC	104.59	BWSC	34.31	BWSC	18.06
Cambridge	101,705	Frammingham	275	Newton	2,579	Cambridge	17.45	Newton	8.82	Cambridge	3.17
Quincy	89,098	Newton	271	Frammingham	2,519	Newton	17.10	Quincy	7.42	Somerville	2.58
Newton	82,202	Weymouth	238	Cambridge	2,344	Quincy	14.67	Cambridge	5.92	Quincy	1.80
Somerville	76,845	Quincy	202	Weymouth	2,272	Brookline	10.94	Waltham	5.76	Newton	1.62
Frammingham	62,817	Lexington	151	Quincy	1,956	Woburn	10.80	Woburn	5.47	Brookline	1.29
Waltham	58,482	Cambridge	150	Somerville	1,523	Waltham	10.50	Brookline	5.35	Norwood	1.22
Brookline	56,462	Woburn	141	Lexington	1,487	Somerville	10.26	Malden	5.14	Revere	1.22
Malden	56,099	Waltham	138	Woburn	1,393	Medford	9.37	Weymouth	4.99	Woburn	1.14
Medford	55,082	Braintree	133	Waltham	1,289	Weymouth	9.21	Medford	4.38	Medford	1.10
Weymouth	51,852	Wellesley	130	Wellesley	1,271	Malden	9.12	Somerville	4.02	Chelsea	1.05
Revere	47,449	Needham	115	Braintree	1,215	Frammingham	7.40	Braintree	3.85	Weymouth	1.04
Arlington	42,098	Burlington	115	Randolph	1,138	Revere	7.27	Lexington	3.70	Braintree	1.00
Everett	37,734	Medford	113	Brookline	1,090	Braintree	7.14	Revere	3.54	Melrose	1.00
Woburn	36,103	Somerville	107	Needham	1,075	Lexington	6.68	Dedham	3.53	Dedham	0.96
Chelsea	34,913	Natick	107	Burlington	1,042	Norwood	6.44	Norwood	3.37	Malden	0.96
Braintree	33,883	Arlington	106	Medford	982	Arlington	6.30	Everett	3.20	Milton	0.82
Watertown	32,857	Brookline	102	Natick	954	Everett	6.29	Arlington	3.04	Waltham	0.79
Randolph	30,858	Randolph	101	Arlington	896	Dedham	5.99	Needham	3.01	Needham	0.77
Lexington	29,130	Malden	99	Malden	876	Needham	5.46	Wakefield	2.68	Everett	0.66
Norwood	28,815	Reading	86	Wakefield	842	Melrose	5.07	Wellesley	2.45	Arlington	0.65
Needham	27,854	Milton	83	Revere	832	Wakefield	4.86	Frammingham	2.38	Frammingham	0.65
Natick	27,332	Winchester	83	Norwood	763	Wellesley	4.84	Melrose	2.38	Needham	0.65
Melrose	26,936	Norwood	83	Reading	747	Milton	4.49	Milton	2.35	Lexington	0.52
Wellesley	25,684	Wakefield	82	Dedham	712	Watertown	4.14	Stoughton	2.35	Belmont	0.50
Milton	24,449	Revere	78	Belmont	708	Randolph	4.02	Burlington	2.31	Wakefield	0.49
Wakefield	23,757	Belmont	78	Everett	686	Natick	4.00	Belmont	1.98	Canton	0.47
Belmont	23,540	Westwood	77	Milton	680	Burlington	3.99	Randolph	1.81	Natick	0.44
Burlington	22,510	Dedham	76	Melrose	635	Chelsea	3.99	Chelsea	1.79	Stoughton	0.41
Reading	22,330	Watertown	75	Winchester	633	Belmont	3.91	Bedford	1.77	Randolph	0.37
Dedham	21,975	Melrose	74	Westwood	627	Stoughton	3.82	Watertown	1.69	Watertown	0.37
Stoneham	21,700	Bedford	68	Stoughton	621	Stoneham	3.65	Canton	1.51	Canton	0.36
Winchester	21,072	Stoneham	63	Chelsea	618	Bedford	3.21	Winchester	1.46	Stoneham	0.34
Winthrop	18,235	Canton	62	Watertown	616	Canton	3.12	Stoneham	1.36	Burlington	0.26
Stoughton	17,698	Stoughton	60	Walpole	577	Winchester	3.09	Walpole	1.25	Hingham	0.26
Canton	15,579	Everett	57	Canton	567	Reading	2.97	Reading	1.22	Walpole	0.26
Walpole	15,079	Walpole	56	Bedford	552	Walpole	2.42	Westwood	1.06	Reading	0.25
Westwood	13,472	Ashland	43	Stoneham	517	Winthrop	2.06	Winthrop	0.97	Westwood	0.25
Bedford	11,256	Chelsea	41	Ashland	390	Westwood	2.01	Hingham	0.77	Winthrop	0.24
Ashland	10,774	Winthrop	36	Holbrook	312	Wilmington	1.54	Chelsea	0.66	Bedford	0.20
Holbrook	8,484	Hingham	31	Winthrop	309	Hingham	1.46	Ashland	0.63	Ashland	0.10
Hingham	6,126	Holbrook	31	Hingham	270	Ashland	1.33	Wilmington	0.58	Holbrook	0.09
Wilmington	3,699	Wilmington	19	Wilmington	259	Holbrook	1.00	Holbrook	0.53	Wilmington	0.06
Total	2,042,718	Total	5,076	Total	55,398	Total	357.97	Total	156.76	Total	50.44
Average	47,505	Average	118	Average	1,288	Average	8.32	Average	3.65	Average	1.17

2003 Final Community Wastewater Flow Component Estimates (Ranked)

04-Jun-04

Community	Average Sanitary Flow (MGD)	Community	ADF (GPD) Per IDM	Community	I/I (GPD) Per IDM	Community	Infiltration (GPD) Per IDM	Community	Inflow (GPD) Per IDM	Community	Inflow (GPD) Per Sewer Mile	Community	Average Sanitary (GPD) Per Sew. Pop.
BWSC	52.22	Malden	10,411	Malden	6,963	Malden	5,868	Chelsea	1,699	Chelsea	25,381	Wilmington	243
Cambridge	8.36	Brookline	10,037	Dedham	6,306	Dedham	4,958	Somerville	1,694	Somerville	24,016	Woburn	116
Newton	6.66	Medford	9,542	Brookline	6,092	Brookline	4,908	Norwood	1,599	Norwood	21,497	Bedford	111
Quincy	5.46	Everett	9,169	Norwood	6,016	Everett	4,665	Melrose	1,575	Melrose	21,131	Stoneham	89
Framingham	4.37	Revere	8,738	Revere	5,721	Waltham	4,469	Revere	1,466	Revere	15,641	BWSC	89
Brookline	4.30	Norwood	8,440	Everett	5,627	Medford	4,460	Cambridge	1,352	Norwood	14,733	Lexington	84
Woburn	4.19	Dedham	8,413	Medford	5,580	Norwood	4,417	Dedham	1,348	Melrose	13,596	Cambridge	82
Waltham	3.96	Waltham	8,146	Melrose	5,323	Revere	4,255	BWSC	1,288	Brookline	12,707	Newton	81
Medford	3.89	Melrose	7,984	Waltham	5,081	Woburn	3,927	Milton	1,206	Dedham	12,570	Brookline	76
Somerville	3.66	Woburn	7,753	Woburn	4,745	Quincy	3,793	Brookline	1,183	Everett	11,488	Canton	73
Weymouth	3.18	Quincy	7,500	Quincy	4,714	Stoughton	3,784	Medford	1,120	Milton	9,877	Wakefield	71
Malden	3.03	BWSC	7,458	Milton	4,662	Melrose	3,748	Malden	1,096	Medford	9,715	Medford	71
Arlington	2.61	Cambridge	7,445	Stoughton	4,444	Milton	3,456	Hingham	963	Malden	9,668	Hingham	70
Revere	2.51	Stoneham	7,060	Somerville	4,334	Newton	3,420	Everett	962	Quincy	8,911	Framingham	70
Lexington	2.46	Arlington	7,031	Arlington	4,118	Arlington	3,393	Quincy	920	Hingham	8,387	Dedham	68
Everett	2.42	Somerville	6,737	Newton	4,048	Bedford	3,207	Canton	829	Woburn	8,084	Waltham	68
Braintree	2.29	Watertown	6,721	Braintree	3,992	Wakefield	3,183	Braintree	823	Canton	7,584	Braintree	68
Chelsea	2.28	Winthrop	6,667	Winthrop	3,916	Braintree	3,169	Woburn	818	Braintree	7,542	Reading	67
Watertown	2.07	Newton	6,630	Cambridge	3,878	Winthrop	3,139	Winthrop	777	Stoughton	6,879	Chelsea	65
Stoneham	1.94	Milton	6,603	Hingham	3,815	Hingham	2,852	Arlington	725	Winthrop	6,719	Needham	65
Norwood	1.85	Chelsea	6,456	Wakefield	3,765	Needham	2,800	Belmont	706	Belmont	6,443	Natick	64
Randolph	1.84	Stoughton	6,151	BWSC	3,734	Belmont	2,797	Stoughton	660	Arlington	6,118	Norwood	64
Needham	1.80	Wilmington	5,946	Bedford	3,569	Watertown	2,744	Stoneham	658	Newton	5,978	Everett	64
Natick	1.76	Braintree	5,877	Belmont	3,503	Canton	2,663	Newton	628	Wakefield	5,957	Burlington	63
Melrose	1.69	Bedford	5,815	Canton	3,492	Somerville	2,640	Waltham	613	Wellesley	5,923	Wellesley	63
Wakefield	1.69	Wakefield	5,772	Needham	3,405	Stoneham	2,631	Wellesley	606	Waltham	5,720	Watertown	63
Wellesley	1.62	Belmont	5,523	Watertown	3,344	Cambridge	2,526	Needham	605	Needham	5,649	Melrose	63
Dedham	1.50	Canton	5,503	Stoneham	3,288	Lexington	2,488	Watertown	601	Stoneham	5,397	Arlington	62
Reading	1.50	Hingham	5,407	Winchester	2,875	BWSC	2,447	Wakefield	582	Watertown	4,930	Weymouth	61
Belmont	1.43	Needham	5,079	Lexington	2,838	Winchester	2,306	Winchester	569	Walpole	4,643	Quincy	61
Burlington	1.42	Winchester	4,882	Chelsea	2,767	Wilmington	2,239	Natick	461	Weymouth	4,370	Belmont	61
Milton	1.32	Lexington	4,492	Weymouth	2,654	Burlington	2,217	Weymouth	458	Winchester	4,337	Walpole	60
Winchester	1.26	Walpole	4,194	Walpole	2,617	Weymouth	2,196	Walpole	451	Natick	4,113	Stoughton	60
Bedford	1.25	Natick	4,193	Wellesley	2,533	Walpole	2,166	Westwood	399	Randolph	3,663	Winchester	60
Canton	1.14	Weymouth	4,054	Wilmington	2,471	Wellesley	1,928	Bedford	362	Lexington	3,442	Randolph	60
Stoughton	1.06	Reading	3,976	Burlington	2,466	Natick	1,876	Lexington	350	Westwood	3,247	Ashland	56
Walpole	0.91	Burlington	3,829	Natick	2,338	Holbrook	1,699	Reading	335	Wilmington	3,176	Malden	54
Wilmington	0.90	Wellesley	3,808	Westwood	2,089	Westwood	1,691	Randolph	325	Bedford	2,941	Milton	54
Winthrop	0.84	Randolph	3,533	Holbrook	1,987	Reading	1,633	Reading	288	Reading	2,908	Revere	53
Westwood	0.70	Ashland	3,410	Reading	1,968	Ashland	1,615	Framingham	258	Holbrook	2,903	Westwood	52
Ashland	0.60	Westwood	3,206	Randolph	1,916	Randolph	1,591	Ashland	256	Framingham	2,364	Somerville	48
Hingham	0.43	Holbrook	3,205	Ashland	1,872	Chelsea	1,068	Burlington	250	Ashland	2,331	Winthrop	46
Holbrook	0.38	Framingham	2,938	Framingham	1,203	Framingham	945	Wilmington	232	Burlington	2,261	Holbrook	45
Total	150.75	Total	265,732	Total	162,069	Total	127,973	Total	34,096	Total	354,941	Total	3,064
Average	3.51	Average	6,180	Average	3,769	Average	2,976	Average	793	Average	8,254	Average	71

CY03 MWRA WASTEWATER METERING SYSTEM COMMUNITY FLOW ESTIMATES

30-Jan-04

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Community	Total Population	Sewered Population	CY03 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	42,140	42,098	6.92	5.77	8.51	9.49	6.31	6.94	4.56	4.92	4.07	4.91	5.37	7.85	6.30	1.8%	9.49	1.9%
Ashland	15,392	10,774	1.32	1.20	1.68	1.66	1.33	1.51	1.10	1.09	1.05	1.13	1.34	1.54	1.33	0.4%	1.68	0.3%
Bedford	12,647	11,256	3.24	2.96	4.38	5.01	3.29	3.69	2.62	2.62	2.38	2.48	2.64	3.23	3.21	0.9%	5.01	1.0%
Belmont	24,045	23,540	4.59	3.69	5.33	6.39	3.59	4.23	2.77	3.13	2.41	2.79	3.03	4.95	3.91	1.1%	6.39	1.3%
BWSC	589,281	588,692	105.47	100.88	115.38	135.75	98.38	117.17	92.06	90.29	88.12	98.27	88.58	124.75	104.59	29.2%	135.75	27.1%
Braintree	33,917	33,883	9.09	6.92	9.27	11.09	7.22	8.58	5.46	4.83	4.28	4.77	5.45	8.77	7.14	2.0%	11.09	2.2%
Brookline	57,032	56,462	12.06	10.27	12.89	13.94	10.21	12.04	8.43	9.58	8.67	9.71	10.11	13.35	10.94	3.1%	13.94	2.8%
Burlington	22,923	22,510	4.34	3.81	5.43	5.54	4.08	4.57	3.27	3.41	2.95	3.09	3.20	4.19	3.99	1.1%	5.54	1.1%
Cambridge	101,807	101,705	19.29	18.92	20.39	21.94	17.41	19.62	14.85	16.14	13.50	14.39	13.92	19.19	17.45	4.9%	21.94	4.4%
Canton	21,341	15,579	3.41	2.78	3.81	4.63	2.94	3.21	2.35	2.33	2.16	2.35	2.75	4.68	3.12	0.9%	4.68	0.9%
Chelsea	34,913	34,913	3.84	3.32	4.38	4.85	3.80	4.45	3.36	4.00	3.23	4.25	3.28	5.08	3.99	1.1%	5.08	1.0%
Dedham	23,378	21,975	6.90	5.67	8.06	9.54	5.95	7.25	4.16	4.11	3.16	3.64	4.86	8.52	5.99	1.7%	9.54	1.9%
Everett	37,772	37,734	6.33	5.84	6.90	7.81	5.98	6.83	5.46	5.64	4.96	5.91	6.05	7.71	6.29	1.8%	7.81	1.6%
Framingham	66,827	62,817	8.18	7.20	10.21	9.74	6.77	8.28	6.04	6.21	5.93	6.14	6.34	7.79	7.40	2.1%	10.21	2.0%
Hingham	6,782	6,126	1.97	1.23	2.08	2.63	1.37	1.61	0.94	0.99	0.77	0.82	1.09	1.95	1.46	0.4%	2.63	0.5%
Holbrook	10,877	8,484	1.08	0.95	1.18	1.34	1.04	1.07	0.79	0.80	0.79	0.84	0.93	1.21	1.00	0.3%	1.34	0.3%
Lexington	30,663	29,130	7.36	6.16	9.82	10.83	6.70	7.94	5.03	5.01	4.10	4.31	5.26	7.59	6.68	1.9%	10.83	2.2%
Malden	56,155	56,099	11.19	9.33	11.10	13.25	8.98	10.03	7.18	7.47	6.10	6.77	7.44	10.69	9.12	2.5%	13.25	2.6%
Medford	55,137	55,082	10.76	8.57	10.80	12.80	9.22	10.15	7.36	7.99	7.09	8.26	8.18	11.16	9.37	2.6%	12.80	2.6%
Melrose	26,963	26,936	5.60	3.68	6.05	9.07	5.04	5.63	3.12	3.63	2.88	3.53	4.47	8.09	5.07	1.4%	9.07	1.8%
Milton	26,010	24,449	5.91	4.18	6.39	7.96	4.31	5.37	3.02	2.73	2.28	2.49	3.00	6.27	4.49	1.3%	7.96	1.6%
Natick	32,384	27,332	4.13	3.65	5.38	5.64	3.91	4.67	3.35	3.28	2.94	2.99	3.45	4.55	4.00	1.1%	5.64	1.1%
Needham	29,197	27,854	5.76	4.84	7.09	8.29	5.15	6.38	4.26	4.10	3.76	4.06	4.82	6.94	5.46	1.5%	8.29	1.7%
Newton	83,880	82,202	17.70	14.08	20.33	24.12	18.57	21.60	13.69	13.30	11.06	11.89	14.96	23.73	17.10	4.8%	24.12	4.8%
Norwood	28,844	28,815	8.02	5.84	8.72	10.09	5.99	7.74	4.28	4.84	3.66	4.22	5.08	8.74	6.44	1.8%	10.09	2.0%
Quincy	89,187	89,098	16.75	13.16	16.74	20.44	14.49	16.14	12.62	12.34	11.23	11.74	12.36	17.97	14.67	4.1%	20.44	4.1%
Randolph	31,044	30,858	4.72	3.40	5.05	6.32	3.96	4.36	3.26	3.05	2.68	2.85	3.28	5.28	4.02	1.1%	6.32	1.3%
Reading	23,680	22,330	3.30	2.77	4.14	4.53	2.78	3.10	2.28	2.19	1.94	2.23	2.50	3.91	2.97	0.8%	4.53	0.9%
Revere	47,496	47,449	7.74	5.96	8.11	9.10	6.31	8.08	6.03	6.64	5.62	7.02	6.88	9.68	7.27	2.0%	9.68	1.9%
Somerville	76,922	76,845	10.95	9.24	10.00	11.03	9.09	10.95	7.36	9.24	8.30	10.80	10.39	15.71	10.26	2.9%	15.71	3.1%
Stoneham	22,165	21,700	3.82	3.08	4.07	4.52	3.77	4.24	3.25	3.65	2.67	3.09	3.38	4.18	3.65	1.0%	4.52	0.9%
Stoughton	27,227	17,698	4.82	3.71	4.98	5.68	3.85	4.19	3.02	2.91	2.51	2.59	3.04	4.57	3.82	1.1%	5.68	1.1%
Wakefield	24,817	23,757	6.25	5.20	7.31	6.82	4.75	4.99	3.53	3.75	2.83	3.36	3.89	5.69	4.86	1.4%	7.31	1.5%
Walpole	23,199	15,079	2.68	2.11	2.78	3.47	2.51	2.78	2.02	2.01	1.78	1.84	2.08	2.95	2.42	0.7%	3.47	0.7%
Waltham	59,073	58,482	11.47	10.22	13.67	14.12	9.98	11.44	8.50	8.71	7.74	8.41	9.32	12.45	10.50	2.9%	14.12	2.8%
Watertown	32,857	32,857	4.61	3.71	4.98	5.85	3.88	4.40	3.29	3.56	3.12	3.35	3.79	5.06	4.14	1.2%	5.85	1.2%
Wellesley	26,671	25,684	4.93	4.19	7.09	7.73	4.73	6.03	3.50	3.68	3.07	3.20	3.86	6.06	4.84	1.4%	7.73	1.5%
Westwood	14,181	13,472	2.42	1.83	2.66	2.83	1.90	2.41	1.64	1.66	1.33	1.35	1.60	2.51	2.01	0.6%	2.83	0.6%
Weymouth	54,754	51,852	10.70	8.31	11.79	14.49	9.07	10.28	6.81	6.86	5.85	6.52	7.84	11.91	9.21	2.6%	14.49	2.9%
Wilmington	21,629	3,699	1.59	1.51	1.79	1.93	1.72	1.86	1.39	1.26	1.29	1.30	1.34	1.46	1.54	0.4%	1.93	0.4%
Winchester	21,093	21,072	3.65	2.86	4.75	5.19	2.83	3.56	2.04	2.23	1.79	1.92	2.30	3.90	3.09	0.9%	5.19	1.0%
Winthrop	18,235	18,235	2.36	1.94	2.26	2.42	1.87	2.15	1.81	1.83	1.73	1.93	1.90	2.46	2.06	0.6%	2.46	0.5%
Woburn	38,003	36,103	11.11	10.57	13.76	15.41	11.09	13.07	7.43	9.80	7.47	7.61	8.95	13.39	10.80	3.0%	15.41	3.1%
Total/Average	2,122,540	2,042,718	388.33	335.51	431.49	495.28	346.12	404.59	289.29	297.81	265.25	295.12	304.30	441.66	357.98	100%	501.84	100%

2003 MWRA COMMUNITY WASTEWATER FLOW COMPONENT ESTIMATES (CY03-12 MONTHS)

30-Jan-04

COMMUNITY	2003 Averages (1)					Components of Average Daily Flow (Estimated) (2)						O		P		
	Community Demographics		C No. of Connects to MWRA System	D Miles of Local Sewers (3)	E No. of Meters for Permanent System	F Average Daily Flow ADF (MGD)	G Percent Average Daily Flow (6)	H Selected Dry Day ADF (MGD)	I Average Daily Infiltration (MGD)	J Infiltration As a % of Average Daily Flow	K Average Sanitary Flow (MGD)	L Sanitary As a % of Average Daily Flow	M Average Daily Inflow (4) (MGD)	N Inflow As a % of Average Daily Flow	Peak Month ADF (MGD)	Percent Peak Month ADF (6)
	A Total Population	B Sewered Population														
Arlington	42,140	42,098	321	106	7	6.30	1.76%	5.65	3.04	48.3%	2.61	41.4%	0.65	10.3%	9.49	1.89%
Ashland	15,392	10,774	2	43	2	1.33	0.37%	1.23	0.63	47.4%	0.60	45.1%	0.10	7.5%	1.68	0.33%
Bedford	12,647	11,256	2	68	2	3.21	0.90%	3.02	1.77	55.1%	1.25	38.9%	0.20	6.2%	5.01	1.00%
Belmont	24,045	23,540	2	78	2	3.91	1.09%	3.41	1.98	50.6%	1.43	36.6%	0.50	12.8%	6.39	1.27%
BWSC (5)	589,281	588,692	234	840	33	104.59	29.22%	86.53	34.31	32.8%	52.22	49.9%	18.06	17.3%	135.75	27.05%
Braintree	33,917	33,883	15	133	7	7.14	1.99%	6.14	3.85	53.9%	2.29	32.1%	1.00	14.0%	11.09	2.21%
Brookline	57,032	56,462	9	102	12	10.94	3.06%	9.65	5.35	48.9%	4.30	39.3%	1.29	11.8%	13.94	2.78%
Burlington	22,923	22,510	0	115	1	3.99	1.11%	3.73	2.31	57.9%	1.42	35.6%	0.26	6.5%	5.54	1.10%
Cambridge (5)	101,807	101,705	116	150	9	17.45	4.87%	14.28	5.92	33.9%	8.36	47.9%	3.17	18.2%	21.94	4.37%
Canton	21,341	15,579	63	62	6	3.12	0.87%	2.65	1.51	48.4%	1.14	36.5%	0.47	15.1%	4.68	0.93%
Chelsea (5)	34,913	34,913	40	41	5	3.99	1.11%	2.94	0.66	16.5%	2.28	57.1%	1.05	26.3%	5.08	1.01%
Dedham	23,378	21,975	25	76	6	5.99	1.67%	5.03	3.53	58.9%	1.50	25.0%	0.96	16.0%	9.54	1.90%
Everett	37,772	37,734	20	57	7	6.29	1.76%	5.62	3.20	50.9%	2.42	38.5%	0.66	10.5%	7.81	1.56%
Framingham	66,827	62,817	4	275	4	7.40	2.07%	6.75	2.38	32.2%	4.37	59.1%	0.65	8.8%	10.21	2.03%
Hingham	6,782	6,126	1	31	1	1.46	0.41%	1.20	0.77	52.7%	0.43	29.5%	0.26	17.8%	2.63	0.52%
Holbrook	10,877	8,484	2	31	2	1.00	0.28%	0.91	0.53	53.0%	0.38	38.0%	0.09	9.0%	1.34	0.27%
Lexington	30,663	29,130	17	151	4	6.68	1.87%	6.16	3.70	55.4%	2.46	36.8%	0.52	7.8%	10.83	2.16%
Malden	56,155	56,099	242	99	6	9.12	2.55%	8.17	5.14	56.4%	3.03	33.2%	0.96	10.5%	13.25	2.64%
Medford	55,137	55,082	71	113	6	9.37	2.62%	8.27	4.38	46.7%	3.89	41.5%	1.10	11.7%	12.80	2.55%
Melrose	26,963	26,936	187	74	5	5.07	1.42%	4.07	2.38	46.9%	1.69	33.3%	1.00	19.7%	9.07	1.81%
Milton	26,010	24,449	45	83	14	4.49	1.25%	3.67	2.35	52.3%	1.32	29.4%	0.82	18.3%	7.96	1.59%
Natick	32,384	27,332	27	107	4	4.00	1.12%	3.55	1.79	44.8%	1.76	44.0%	0.44	11.0%	5.64	1.12%
Needham	29,197	27,854	21	115	2	5.46	1.53%	4.81	3.01	55.1%	1.80	33.0%	0.65	11.9%	8.29	1.65%
Newton	83,880	82,202	51	271	7	17.10	4.78%	15.48	8.82	51.6%	6.66	38.9%	1.62	9.5%	24.12	4.81%
Norwood	28,844	28,815	30	83	6	6.44	1.80%	5.22	3.37	52.3%	1.85	28.7%	1.22	18.9%	10.09	2.01%
Quincy	89,187	89,098	56	202	6	14.67	4.10%	12.88	7.42	50.6%	5.46	37.2%	1.80	12.3%	20.44	4.07%
Randolph	31,044	30,858	2	101	2	4.02	1.12%	3.65	1.81	45.0%	1.84	45.8%	0.37	9.2%	6.32	1.26%
Reading	23,680	22,330	2	86	2	2.97	0.83%	2.72	1.22	41.1%	1.50	50.5%	0.25	8.4%	4.53	0.90%
Revere	47,496	47,449	3	78	1	7.27	2.03%	6.05	3.54	48.7%	2.51	34.5%	1.22	16.8%	9.68	1.93%
Somerville (5)	76,922	76,845	43	107	7	10.26	2.87%	7.68	4.02	39.2%	3.66	35.7%	2.58	25.1%	15.71	3.13%
Stoneham	22,165	21,700	23	63	3	3.65	1.02%	3.30	1.36	37.3%	1.94	53.2%	0.34	9.3%	4.52	0.90%
Stoughton	27,227	17,698	1	60	2	3.82	1.07%	3.41	2.35	61.5%	1.06	27.7%	0.41	10.7%	5.68	1.13%
Wakefield	24,817	23,757	10	82	2	4.86	1.36%	4.37	2.68	55.1%	1.69	34.8%	0.49	10.1%	7.31	1.46%
Walpole	23,199	15,079	1	56	2	2.42	0.68%	2.16	1.25	51.7%	0.91	37.6%	0.26	10.7%	3.47	0.69%
Waltham	59,073	58,482	3	138	3	10.50	2.93%	9.72	5.76	54.9%	3.96	37.7%	0.79	7.5%	14.12	2.81%
Watertown	32,857	32,857	14	75	3	4.14	1.16%	3.76	1.69	40.8%	2.07	50.0%	0.37	8.9%	5.85	1.17%
Wellesley	26,671	25,684	2	130	3	4.84	1.35%	4.07	2.45	50.6%	1.62	33.5%	0.77	15.9%	7.73	1.54%
Westwood	14,181	13,472	3	77	3	2.01	0.56%	1.76	1.06	52.7%	0.70	34.8%	0.25	12.4%	2.83	0.56%
Weymouth	54,754	51,852	17	238	4	9.21	2.57%	8.17	4.99	54.2%	3.18	34.5%	1.04	11.3%	14.49	2.89%
Wilmington	21,629	3,699	2	19	1	1.54	0.43%	1.48	0.58	37.7%	0.90	58.4%	0.06	3.9%	1.93	0.38%
Winchester	21,093	21,072	72	83	7	3.09	0.86%	2.72	1.46	47.2%	1.26	40.8%	0.36	11.7%	5.19	1.03%
Winthrop	18,235	18,235	21	36	6	2.06	0.58%	1.81	0.97	47.1%	0.84	40.8%	0.24	11.7%	2.46	0.49%
Woburn	38,003	36,103	18	141	13	10.80	3.02%	9.66	5.47	50.6%	4.19	38.8%	1.14	10.6%	15.41	3.07%
Totals/Averages	2,122,540	2,042,718	1,840	5,076	234	357.98	100.00%	307.51	156.76	43.8%	150.75	42.1%	50.44	14.1%	501.84	100.00%

FOOTNOTES:

- (1) Figures tabulated using data from the MWRA Wastewater Metering System for Calendar Year 2003.
- (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 2003 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

2003 Final Community Wastewater Flow Component Estimates (Alphabetical)

04-Jun-04

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	42,098	106	896	6.30	3.04	0.65	2.61	7,031	4,118	3,393	725	6,118	62
Ashland	10,774	43	390	1.33	0.63	0.10	0.60	3,410	1,872	1,615	256	2,331	56
Bedford	11,256	68	552	3.21	1.77	0.20	1.25	5,815	3,569	3,207	362	2,941	111
Belmont	23,540	78	708	3.91	1.98	0.50	1.43	5,523	3,503	2,797	706	6,443	61
BWSC	588,692	840	14,024	104.59	34.31	18.06	52.22	7,458	3,734	2,447	1,288	21,497	89
Braintree	33,883	133	1,215	7.14	3.85	1.00	2.29	5,877	3,992	3,169	823	7,542	68
Brookline	56,462	102	1,090	10.94	5.35	1.29	4.30	10,037	6,092	4,908	1,183	12,707	76
Burlington	22,510	115	1,042	3.99	2.31	0.26	1.42	3,829	2,466	2,217	250	2,261	63
Cambridge	101,705	150	2,344	17.45	5.92	3.17	8.36	7,445	3,878	2,526	1,352	21,131	82
Canton	15,579	62	567	3.12	1.51	0.47	1.14	5,503	3,492	2,663	829	7,584	73
Chelsea	34,913	41	618	3.99	0.66	1.05	2.28	6,456	2,767	1,068	1,699	25,381	65
Dedham	21,975	76	712	5.99	3.53	0.96	1.50	8,413	6,306	4,958	1,348	12,570	68
Everett	37,734	57	686	6.29	3.20	0.66	2.42	9,169	5,627	4,665	962	11,488	64
Frammingham	62,817	275	2,519	7.40	2.38	0.65	4.37	2,938	1,203	945	258	2,364	70
Hingham	6,126	31	270	1.46	0.77	0.26	0.43	5,407	3,815	2,852	963	8,387	70
Holbrook	8,484	31	312	1.00	0.53	0.09	0.38	3,205	1,987	1,699	288	2,903	45
Lexington	29,130	151	1,487	6.68	3.70	0.52	2.46	4,492	2,838	2,488	350	3,442	84
Malden	56,099	99	876	9.12	5.14	0.96	3.03	10,411	6,963	5,868	1,096	9,668	54
Medford	55,082	113	982	9.37	4.38	1.10	3.89	9,542	5,580	4,460	1,120	9,715	71
Melrose	26,936	74	635	5.07	2.38	1.00	1.69	7,984	5,323	3,748	1,575	13,596	63
Milton	24,449	83	680	4.49	2.35	0.82	1.32	6,603	4,662	3,456	1,206	9,877	54
Natick	27,332	107	954	4.00	1.79	0.44	1.76	4,193	2,338	1,876	461	4,113	64
Needham	27,854	115	1,075	5.46	3.01	0.65	1.80	5,079	3,405	2,800	605	5,649	65
Newton	82,202	271	2,579	17.10	8.82	1.62	6.66	6,630	4,048	3,420	628	5,978	81
Norwood	28,815	83	763	6.44	3.37	1.22	1.85	8,440	6,016	4,417	1,599	14,733	64
Quincy	89,098	202	1,956	14.67	7.42	1.80	5.46	7,500	4,714	3,793	920	8,911	61
Randolph	30,858	101	1,138	4.02	1.81	0.37	1.84	3,533	1,916	1,591	325	3,663	60
Reading	22,330	86	747	2.97	1.22	0.25	1.50	3,976	1,968	1,633	335	2,908	67
Revere	47,449	78	832	7.27	3.54	1.22	2.51	8,738	5,721	4,255	1,466	15,641	53
Somerville	76,845	107	1,523	10.26	4.02	2.58	3.66	6,737	4,334	2,640	1,694	24,016	48
Stoneham	21,700	63	517	3.65	1.36	0.34	1.94	7,060	3,288	2,631	658	5,397	89
Stoughton	17,698	60	621	3.82	2.35	0.41	1.06	6,151	4,444	3,784	660	6,879	60
Wakefield	23,757	82	842	4.86	2.68	0.49	1.69	5,772	3,765	3,183	582	5,957	71
Walpole	15,079	56	577	2.42	1.25	0.26	0.91	4,194	2,617	2,166	451	4,643	60
Waltham	58,482	138	1,289	10.50	5.76	0.79	3.96	8,146	5,081	4,469	613	5,720	68
Watertown	32,857	75	616	4.14	1.69	0.37	2.07	6,721	3,344	2,744	601	4,930	63
Wellesley	25,684	130	1,271	4.84	2.45	0.77	1.62	3,808	2,533	1,928	606	5,923	63
Westwood	13,472	77	627	2.01	1.06	0.25	0.70	3,206	2,089	1,691	399	3,247	52
Weymouth	51,852	238	2,272	9.21	4.99	1.04	3.18	4,054	2,654	2,196	458	4,370	61
Wilmington	3,699	19	259	1.54	0.58	0.06	0.90	5,946	2,471	2,239	232	3,176	243
Winchester	21,072	83	633	3.09	1.46	0.36	1.26	4,882	2,875	2,306	569	4,337	60
Winthrop	18,235	36	309	2.06	0.97	0.24	0.84	6,667	3,916	3,139	777	6,719	46
Woburn	36,103	141	1,393	10.80	5.47	1.14	4.19	7,753	4,745	3,927	818	8,084	116
Total	2,042,718	5,076	55,398	357.97	156.76	50.44	150.75	265,732	162,069	127,973	34,096	354,941	3,064
Average	47,505	118	1,288	8.32	3.65	1.17	3.51	6,180	3,769	2,976	793	8,254	71

2003 Final Community Wastewater Flow Component Estimates (Ranked)

04-Jun-04

Community	Sewered Population	Community	Miles of Local Sewers	Community	IDM of Local Sewers	Community	Average Daily Flow ADF (MGD)	Community	Average Annual Infiltration (MGD)	Community	Average Annual Inflow (MGD)
BWSC	588,692	BWSC	840	BWSC	14,024	BWSC	104.59	BWSC	34.31	BWSC	18.06
Cambridge	101,705	Frammingham	275	Newton	2,579	Cambridge	17.45	Newton	8.82	Cambridge	3.17
Quincy	89,098	Newton	271	Frammingham	2,519	Newton	17.10	Quincy	7.42	Somerville	2.58
Newton	82,202	Weymouth	238	Cambridge	2,344	Quincy	14.67	Cambridge	5.92	Quincy	1.80
Somerville	76,845	Quincy	202	Weymouth	2,272	Brookline	10.94	Waltham	5.76	Newton	1.62
Frammingham	62,817	Lexington	151	Quincy	1,956	Woburn	10.80	Woburn	5.47	Brookline	1.29
Waltham	58,482	Cambridge	150	Somerville	1,523	Waltham	10.50	Brookline	5.35	Norwood	1.22
Brookline	56,462	Woburn	141	Lexington	1,487	Somerville	10.26	Malden	5.14	Revere	1.22
Malden	56,099	Waltham	138	Woburn	1,393	Medford	9.37	Weymouth	4.99	Woburn	1.14
Medford	55,082	Braintree	133	Waltham	1,289	Weymouth	9.21	Medford	4.38	Medford	1.10
Weymouth	51,852	Wellesley	130	Wellesley	1,271	Malden	9.12	Somerville	4.02	Chelsea	1.05
Revere	47,449	Needham	115	Braintree	1,215	Frammingham	7.40	Braintree	3.85	Weymouth	1.04
Arlington	42,098	Burlington	115	Randolph	1,138	Revere	7.27	Lexington	3.70	Braintree	1.00
Everett	37,734	Medford	113	Brookline	1,090	Braintree	7.14	Revere	3.54	Melrose	1.00
Woburn	36,103	Somerville	107	Needham	1,075	Lexington	6.68	Dedham	3.53	Dedham	0.96
Chelsea	34,913	Natick	107	Burlington	1,042	Norwood	6.44	Norwood	3.37	Malden	0.96
Braintree	33,883	Arlington	106	Medford	982	Arlington	6.30	Everett	3.20	Milton	0.82
Watertown	32,857	Brookline	102	Natick	954	Everett	6.29	Arlington	3.04	Waltham	0.79
Randolph	30,858	Randolph	101	Arlington	896	Dedham	5.99	Needham	3.01	Needham	0.77
Lexington	29,130	Malden	99	Malden	876	Needham	5.46	Wakefield	2.68	Everett	0.66
Norwood	28,815	Reading	86	Wakefield	842	Melrose	5.07	Wellesley	2.45	Arlington	0.65
Needham	27,854	Milton	83	Revere	832	Wakefield	4.86	Frammingham	2.38	Frammingham	0.65
Natick	27,332	Winchester	83	Norwood	763	Wellesley	4.84	Melrose	2.38	Needham	0.65
Melrose	26,936	Norwood	83	Reading	747	Milton	4.49	Milton	2.35	Lexington	0.52
Wellesley	25,684	Wakefield	82	Dedham	712	Watertown	4.14	Stoughton	2.35	Belmont	0.50
Milton	24,449	Revere	78	Belmont	708	Randolph	4.02	Burlington	2.31	Wakefield	0.49
Wakefield	23,757	Belmont	78	Everett	686	Natick	4.00	Belmont	1.98	Canton	0.47
Belmont	23,540	Westwood	77	Milton	680	Burlington	3.99	Randolph	1.81	Natick	0.44
Burlington	22,510	Dedham	76	Melrose	635	Chelsea	3.99	Chelsea	1.79	Stoughton	0.41
Reading	22,330	Watertown	75	Winchester	633	Belmont	3.91	Bedford	1.77	Randolph	0.37
Dedham	21,975	Melrose	74	Westwood	627	Stoughton	3.82	Watertown	1.69	Watertown	0.37
Stoneham	21,700	Bedford	68	Stoughton	621	Stoneham	3.65	Canton	1.51	Canton	0.36
Winchester	21,072	Stoneham	63	Chelsea	618	Bedford	3.21	Winchester	1.46	Stoneham	0.34
Winthrop	18,235	Canton	62	Watertown	616	Canton	3.12	Stoneham	1.36	Burlington	0.26
Stoughton	17,698	Stoughton	60	Walpole	577	Winchester	3.09	Walpole	1.25	Hingham	0.26
Canton	15,579	Everett	57	Canton	567	Reading	2.97	Reading	1.22	Walpole	0.26
Walpole	15,079	Walpole	56	Bedford	552	Walpole	2.42	Westwood	1.06	Reading	0.25
Westwood	13,472	Ashland	43	Stoneham	517	Winthrop	2.06	Winthrop	0.97	Westwood	0.25
Bedford	11,256	Chelsea	41	Ashland	390	Westwood	2.01	Hingham	0.77	Winthrop	0.24
Ashland	10,774	Winthrop	36	Holbrook	312	Wilmington	1.54	Chelsea	0.66	Bedford	0.20
Holbrook	8,484	Hingham	31	Winthrop	309	Hingham	1.46	Ashland	0.63	Ashland	0.10
Hingham	6,126	Holbrook	31	Hingham	270	Ashland	1.33	Wilmington	0.58	Holbrook	0.09
Wilmington	3,699	Wilmington	19	Wilmington	259	Holbrook	1.00	Holbrook	0.53	Wilmington	0.06
Total	2,042,718	Total	5,076	Total	55,398	Total	357.97	Total	156.76	Total	50.44
Average	47,505	Average	118	Average	1,288	Average	8.32	Average	3.65	Average	1.17

2003 Final Community Wastewater Flow Component Estimates (Ranked)

04-Jun-04

Community	Average Sanitary Flow (MGD)	Community	ADF (GPD) Per IDM	Community	I/I (GPD) Per IDM	Community	Infiltration (GPD) Per IDM	Community	Inflow (GPD) Per IDM	Community	Inflow (GPD) Per Sewer Mile	Community	Average Sanitary (GPD) Per Sew. Pop.
BWSC	52.22	Malden	10,411	Malden	6,963	Malden	5,868	Chelsea	1,699	Chelsea	25,381	Wilmington	243
Cambridge	8.36	Brookline	10,037	Dedham	6,306	Dedham	4,958	Somerville	1,694	Somerville	24,016	Woburn	116
Newton	6.66	Medford	9,542	Brookline	6,092	Brookline	4,908	Norwood	1,599	Norwood	21,497	Bedford	111
Quincy	5.46	Everett	9,169	Norwood	6,016	Everett	4,665	Melrose	1,575	Melrose	21,131	Stoneham	89
Framingham	4.37	Revere	8,738	Revere	5,721	Waltham	4,469	Revere	1,466	Revere	15,641	BWSC	89
Brookline	4.30	Norwood	8,440	Everett	5,627	Medford	4,460	Cambridge	1,352	Norwood	14,733	Lexington	84
Woburn	4.19	Dedham	8,413	Medford	5,580	Norwood	4,417	Dedham	1,348	Melrose	13,596	Cambridge	82
Waltham	3.96	Waltham	8,146	Melrose	5,323	Revere	4,255	BWSC	1,288	Brookline	12,707	Newton	81
Medford	3.89	Melrose	7,984	Waltham	5,081	Woburn	3,927	Milton	1,206	Dedham	12,570	Brookline	76
Somerville	3.66	Woburn	7,753	Woburn	4,745	Quincy	3,793	Brookline	1,183	Everett	11,488	Canton	73
Weymouth	3.18	Quincy	7,500	Quincy	4,714	Stoughton	3,784	Medford	1,120	Milton	9,877	Wakefield	71
Malden	3.03	BWSC	7,458	Milton	4,662	Melrose	3,748	Malden	1,096	Medford	9,715	Medford	71
Arlington	2.61	Cambridge	7,445	Stoughton	4,444	Milton	3,456	Hingham	963	Malden	9,668	Hingham	70
Revere	2.51	Stoneham	7,060	Somerville	4,334	Newton	3,420	Everett	962	Quincy	8,911	Framingham	70
Lexington	2.46	Arlington	7,031	Arlington	4,118	Arlington	3,393	Quincy	920	Hingham	8,387	Dedham	68
Everett	2.42	Somerville	6,737	Newton	4,048	Bedford	3,207	Canton	829	Woburn	8,084	Waltham	68
Braintree	2.29	Watertown	6,721	Braintree	3,992	Wakefield	3,183	Braintree	823	Canton	7,584	Braintree	68
Chelsea	2.28	Winthrop	6,667	Winthrop	3,916	Braintree	3,169	Woburn	818	Braintree	7,542	Reading	67
Watertown	2.07	Newton	6,630	Cambridge	3,878	Winthrop	3,139	Winthrop	777	Stoughton	6,879	Chelsea	65
Stoneham	1.94	Milton	6,603	Hingham	3,815	Hingham	2,852	Arlington	725	Winthrop	6,719	Needham	65
Norwood	1.85	Chelsea	6,456	Wakefield	3,765	Needham	2,800	Belmont	706	Belmont	6,443	Natick	64
Randolph	1.84	Stoughton	6,151	BWSC	3,734	Belmont	2,797	Stoughton	660	Arlington	6,118	Norwood	64
Needham	1.80	Wilmington	5,946	Bedford	3,569	Watertown	2,744	Stoneham	658	Newton	5,978	Everett	64
Natick	1.76	Braintree	5,877	Belmont	3,503	Canton	2,663	Newton	628	Wakefield	5,957	Burlington	63
Melrose	1.69	Bedford	5,815	Canton	3,492	Somerville	2,640	Waltham	613	Wellesley	5,923	Wellesley	63
Wakefield	1.69	Wakefield	5,772	Needham	3,405	Stoneham	2,631	Wellesley	606	Waltham	5,720	Watertown	63
Wellesley	1.62	Belmont	5,523	Watertown	3,344	Cambridge	2,526	Needham	605	Needham	5,649	Melrose	63
Dedham	1.50	Canton	5,503	Stoneham	3,288	Lexington	2,488	Watertown	601	Stoneham	5,397	Arlington	62
Reading	1.50	Hingham	5,407	Winchester	2,875	BWSC	2,447	Wakefield	582	Watertown	4,930	Weymouth	61
Belmont	1.43	Needham	5,079	Lexington	2,838	Winchester	2,306	Winchester	569	Walpole	4,643	Quincy	61
Burlington	1.42	Winchester	4,882	Chelsea	2,767	Wilmington	2,239	Natick	461	Weymouth	4,370	Belmont	61
Milton	1.32	Lexington	4,492	Weymouth	2,654	Burlington	2,217	Weymouth	458	Winchester	4,337	Walpole	60
Winchester	1.26	Walpole	4,194	Walpole	2,617	Weymouth	2,196	Walpole	451	Natick	4,113	Stoughton	60
Bedford	1.25	Natick	4,193	Wellesley	2,533	Walpole	2,166	Westwood	399	Randolph	3,663	Winchester	60
Canton	1.14	Weymouth	4,054	Wilmington	2,471	Wellesley	1,928	Bedford	362	Lexington	3,442	Randolph	60
Stoughton	1.06	Reading	3,976	Burlington	2,466	Natick	1,876	Lexington	350	Westwood	3,247	Ashland	56
Walpole	0.91	Burlington	3,829	Natick	2,338	Holbrook	1,699	Reading	335	Wilmington	3,176	Malden	54
Wilmington	0.90	Wellesley	3,808	Westwood	2,089	Westwood	1,691	Randolph	325	Bedford	2,941	Milton	54
Winthrop	0.84	Randolph	3,533	Holbrook	1,987	Reading	1,633	Reading	288	Reading	2,908	Revere	53
Westwood	0.70	Ashland	3,410	Reading	1,968	Ashland	1,615	Framingham	258	Holbrook	2,903	Westwood	52
Ashland	0.60	Westwood	3,206	Randolph	1,916	Randolph	1,591	Ashland	256	Framingham	2,364	Somerville	48
Hingham	0.43	Holbrook	3,205	Ashland	1,872	Chelsea	1,068	Burlington	250	Ashland	2,331	Winthrop	46
Holbrook	0.38	Framingham	2,938	Framingham	1,203	Framingham	945	Wilmington	232	Burlington	2,261	Holbrook	45
Total	150.75	Total	265,732	Total	162,069	Total	127,973	Total	34,096	Total	354,941	Total	3,064
Average	3.51	Average	6,180	Average	3,769	Average	2,976	Average	793	Average	8,254	Average	71