



MASSACHUSETTS
CLEAN WATER TRUST

2020 GREEN BOND REPORT

Office of the State Treasurer
Massachusetts Clean Water Trust

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A Note from the Treasurer

As Chair of the Massachusetts Clean Water Trust (the Trust) Board of Trustees, I am pleased to continue the Commonwealth and the Trust's policy of openness and transparency by submitting our third annual Green Bond Report. To date, the Trust has completed five Green Bond issuances totaling approximately \$1 billion to support 229 local water infrastructure projects.

The Green Bond market is expanding rapidly. According to the Climate Bond Initiative, between 2013-2017, US Municipal Green Bond issues grew to comprise 27% of the total US Green bond market. Fundamentally, US municipalities are in a strong market position to issue Green Bonds, and as this marketplace continues to mature, issuers must commit to transparent and accurate reporting for the Green Bond label to continue to instill investor confidence.

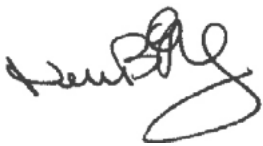
The Trust, with its AAA credit rating by all three major credit agencies, provides low interest loans to local governments and other eligible entities for water infrastructure projects across the Commonwealth. These vital projects enhance ground and surface water resources, ensure the safety of drinking water, protect public health, and develop resilient communities. Since its establishment, the Trust has financed approximately \$7.6 billion in projects for nearly three hundred borrowers, serving 97% of the Commonwealth's population.

We are pleased to contribute to this innovative marketplace and stay committed to improving our communications and transparency. We ask that you let us know if there are any additional ways that we can meet your informational needs. Your feedback is much appreciated and always welcome.

Finally, I am deeply thankful to the dedicated staff of the Trust and our program partners for their tireless work and commitment to the communities of the Commonwealth in these unprecedented times. The Trust has managed and is managing the hurdles of COVID-19 while remaining dedicated to their mission.

The impact of these investments may not always be visible to the public, but it is felt in every glass of water poured, in restored water bodies, and in homes and businesses that receive safe and reliable water.

Sincerely,



Deborah B. Goldberg
Treasurer and Receiver-General
Commonwealth of Massachusetts
mass.gov/treasury



Introduction to the Trust

The Massachusetts Clean Water Trust (the Trust), in collaboration with the Massachusetts Department of Environmental Protection (MassDEP), helps communities build or replace water quality infrastructure that enhances ground and surface water resources, ensures the safety of drinking water, protects public health and develops resilient communities. It accomplishes these objectives by providing low-interest loans and grants to cities, towns and water utilities through the Massachusetts State Revolving Funds (SRFs). The SRF programs are partnerships between the United States Environmental Protection Agency (EPA) and the Commonwealth. SRFs function like an environmental infrastructure bank by financing water infrastructure projects.

The Trust administers two SRFs, the Clean Water and Drinking Water SRFs. The Clean Water SRF (CWSRF) was established in 1987 under the Clean Water Act. The Drinking Water SRF (DWSRF) was established in 1996 under the Safe Drinking Water Act. MassDEP manages project development and oversight while the Trust manages the flow of funds to borrowers.

SRFs receive funding from the EPA in the form of annual capitalization grants, supplemented by state matching grants and the repayment of loans. When loans to local governments are paid back, the funds are then loaned out again, which is how the fund “revolves.”

The Trust uses a “leveraged model” to provide funding in excess of the federal and state grants. Bonds are issued in the capital markets and are secured by borrower repayments and reserve funds. The proceeds from bonds are used to provide capital for new below market rate loans to borrowers for water infrastructure. This model has allowed the Trust to finance approximately \$7.6 billion in water infrastructure projects from nearly \$2.6 billion in federal grants and state matching funds.

The Trust is administered by a three-member board of trustees that is chaired by the Treasurer of the Commonwealth. The Secretary of the Executive Office for Administration and Finance and the Commissioner of MassDEP serve as trustees. The Board of Trustees approves all financial commitments and program decisions during monthly meetings. Meeting agendas, minutes, and other board materials can be found on the Trust’s website.

About this Report

This report is separated into three sections. The first section, the Trust’s Green Bond Process, covers program specific project categories, how projects are selected and an overview of how the Trust operates. The second and third sections provide full project descriptions from the Trust’s latest issuance (Series 22), organized by the CWSRF and DWSRF programs. The appendices at the end of this report lists all loans by active Green Bond series, and additional information such as the percent of project funding drawn, loan numbers and other relevant information. Readers should note that the main report sections are organized by projects that in some cases were financed by multiple loans spanning multiple series of Green Bonds.

Full project descriptions, in this report, are limited to Series 22 Green Bonds. For full descriptions of projects financed in previous Green Bond issues, then please review previous editions of the Green Bond Report, the Trust’s Annual Reports, or the specific bond series official statements.

All reports and documents may be found on the Trust’s website:

www.mass.gov/orgs/the-massachusetts-clean-water-trust





Section 1 | The Trust's Green Bond Process

Since 2015, the Trust has issued over \$998.4 million of its bonds as Green Bonds in compliance with the federal Clean Water Act and the Safe Drinking Water Act. The Bonds were issued to finance 280 loans for 229 water infrastructure projects through the CWSRF and DWSRF programs. These projects protect public health, protect valuable aquatic resources, and help communities support local businesses while also ensuring that vital infrastructure meets environmental and health standards.

Green Bonds Issued			
Series	Year	Issue Amount	Total Loans
Series 18	2015	\$228,155,000	81
Series 19	2016	207,805,000	66
Series 20	2017	207,350,000	51
Series 21	2018	163,460,000	38
Series 22	2019	191,610,000	44
Totals		\$998,380,000	280

Frequently Asked Questions

Q. Are Green Bond Proceeds Separated from Traditional Bond Proceeds?

Yes, all Green Bond proceeds are deposited into segregated Clean Water and Drinking Water accounts within the Project Fund for each individual series of bonds. The accounts are individually tracked for each project internally at the Trust and MassDEP. If it is determined that a project no longer needs loan proceeds that have been permanently financed with bonds, the remaining bond proceeds will be reallocated to additional green projects. Those new projects will be included in the Green Bond reporting.

Q. How Often Will the Trust Prepare Green Bond Reports?

The Trust will track the progress of projects and use of proceeds in its Annual Report along with this Green Bond report. The Trust will report on the bonds until the proceeds have been fully expended.

Q. Where Can I Find Your Green Bond Reports?

You may find this and previous reports in the *Investor Resources* section of the Trust's website. The Trust also posts all annual reports and this report to the MSRB's EMMA website, attached to their associated CUSIPs.

Q. Do You Make Use of Third-Party Opinions or Other "Green Certifications"?

Not currently. The Trust is in regular dialogue with investors and groups active in the green space. Based on continued and consistent feedback, due to our repeat-issuer status and robust reporting regimen, we have determined that third-party opinions are not necessary for our issuances. The Trust reports on the selection of projects, management of proceeds and use of proceeds following a bond sale. The Trust is committed to full disclosure and will continue to monitor the market and make any necessary changes to our approach as needed.

Project Selection

The Trust's loan process is dictated by an annual list of projects the Trust commits to finance called the Intended Use Plan (IUP). MassDEP compiles two IUPs annually, one for each SRF program. Project eligibility is determined by the Clean Water Act and Safe Drinking Water Act for the CWSRF and DWSRF, respectively. Projects that apply for financing are selected during an annual solicitation process. MassDEP engineers review detailed project specifications and rank them using an established set of criteria that measures the severity of the problem, the sensitivity of the environmental hazard, the public health risk, and the appropriateness of the proposed solution.

For CWSRF projects, the program emphasizes watershed management priorities, stormwater management, green infrastructure, and encourages communities to undertake projects with meaningful water quality and public health benefits. DWSRF projects emphasize compliance with federal and state water requirements to protect the public health while addressing the Commonwealth's drinking water needs. MassDEP compiles the annual IUPs using this rigorous selection process that establishes the Commonwealth's priorities for the upcoming year.

Project Categories

The SRF programs fund a wide range of projects. Eleven categories of projects are eligible to receive CWSRF assistance and six categories are eligible to receive DWSRF assistance. For the purposes of this report, the Trust has consolidated similar and related categories and omitted categories with no current projects to streamline the report's contents. Below the Trust has provided an overview of the categories listed within this report.

Clean Water Categories

Wastewater Treatment Projects

These projects involve the maintenance, upgrade, or construction of wastewater treatment facilities. A wastewater treatment facility receives all the sewage from a municipality or utility district service area and treats the water before releasing it back into the environment in accordance with National Pollutant Discharge Elimination System permits. The goal of these projects is to reduce or eliminate pollutants and nutrients found in wastewater for cleaner water ways.

Infiltration/Inflow (I/I) and Sewer System Rehabilitation Projects

These projects involve removing infiltration and inflow (i.e. water other than wastewater) from a sewer system, including construction associated with I/I rehabilitation. I/I is when groundwater or stormwater enters a dedicated wastewater or sanitary sewer system either by direct connections or through damaged parts of sewer pipes. I/I increases the flow to wastewater treatment facilities and leads to back-ups or overflows of the system. Sewer system rehabilitation and I/I correction projects are concerned with removing sources of water that are either illicitly being added to a sewer system, or from sources entering via defective pipes or manholes. Eliminating I/I and replacing sewer systems reduces the occurrences of overflows, meaning less untreated wastewater is released into the environment.

Collector and Interceptor Sewer Projects

These projects involve the physical conveyance of wastewater. Collector sewers gather wastewater from the source, and interceptor sewers convey wastewater to a treatment facility. Extending capacity in an existing sanitary sewer system can help mitigate issues in communities that have insufficient infrastructure to meet local demand. These projects are generally implemented in conjunction with other project categories, such as combined sewer overflow correction which separates stormwater and wastewater collection systems to reduce untreated water being released into surface water bodies.

Combined Sewer Overflow (CSO) Correction Projects

These projects involve the reduction of untreated water discharged from combined sewer systems. Combined sewer systems are sewers that are designed to collect rainwater runoff, domestic sewage, and industrial wastewater in the same pipe. During wet weather events, the combined sewer systems can reach capacity and the excess overflows into surrounding waters, creating a combined sewer overflow (CSO). CSO correction projects work to reduce the amount of untreated water discharged from combined sewer systems. The elimination of CSOs is an EPA and Commonwealth priority goal that will reduce the amount of untreated wastewater that is released into the local environment.

Non-Point Source (NPS) Sanitary Landfill

These projects involve the reduction of NPS pollution from landfills by capping, installing leachate collection systems, or repairing insufficient or damaged landfill systems. NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into ground and surface waters.

Planning Projects

These projects involve developing plans to address water quality and related public health problems. Infrastructure management tracking, capital investment schedules, and the adoption of best management practices are also objectives. For example, comprehensive wastewater management plans provide strategies for addressing wastewater treatment and disposal issues in a city or town. Integrated municipal stormwater and wastewater resource management planning assists municipalities with meeting requirements that arise from distinct wastewater and stormwater programs. Fiscal sustainability and asset management planning assists communities with maintaining replacement schedules and forecasting capital needs.

Drinking Water Categories

Drinking Water Treatment Projects

These projects involve the upgrade, maintenance, and construction of water treatment facilities. These projects are meant to improve the overall quality of drinking water and are targeted at removing specific pollutants that are known health risks. Treatment plant upgrades can impact the overall efficiency of a plant's energy consumption. Replacing equipment at the end of its useful life will improve overall system efficiency. New pumping and filtering equipment are designed with energy efficiency in mind.

Drinking Water Transmission and Distribution Projects

These projects involve the infrastructure that brings raw water to treatment facilities and the infrastructure that conveys treated water for consumption. This includes everything from large transmission mains from reservoirs to the service lines that provide treated water to homes and businesses. Lines at the end of their useful life can lead to inefficiency in water transmission. Older pipes, made of lead or cast iron, can be severe health risks when corrosion occurs. Upgrades to pumping and booster stations make the transmission process more energy efficient and improve the overall efficiency of the system.

Drinking Water Source and Storage Projects

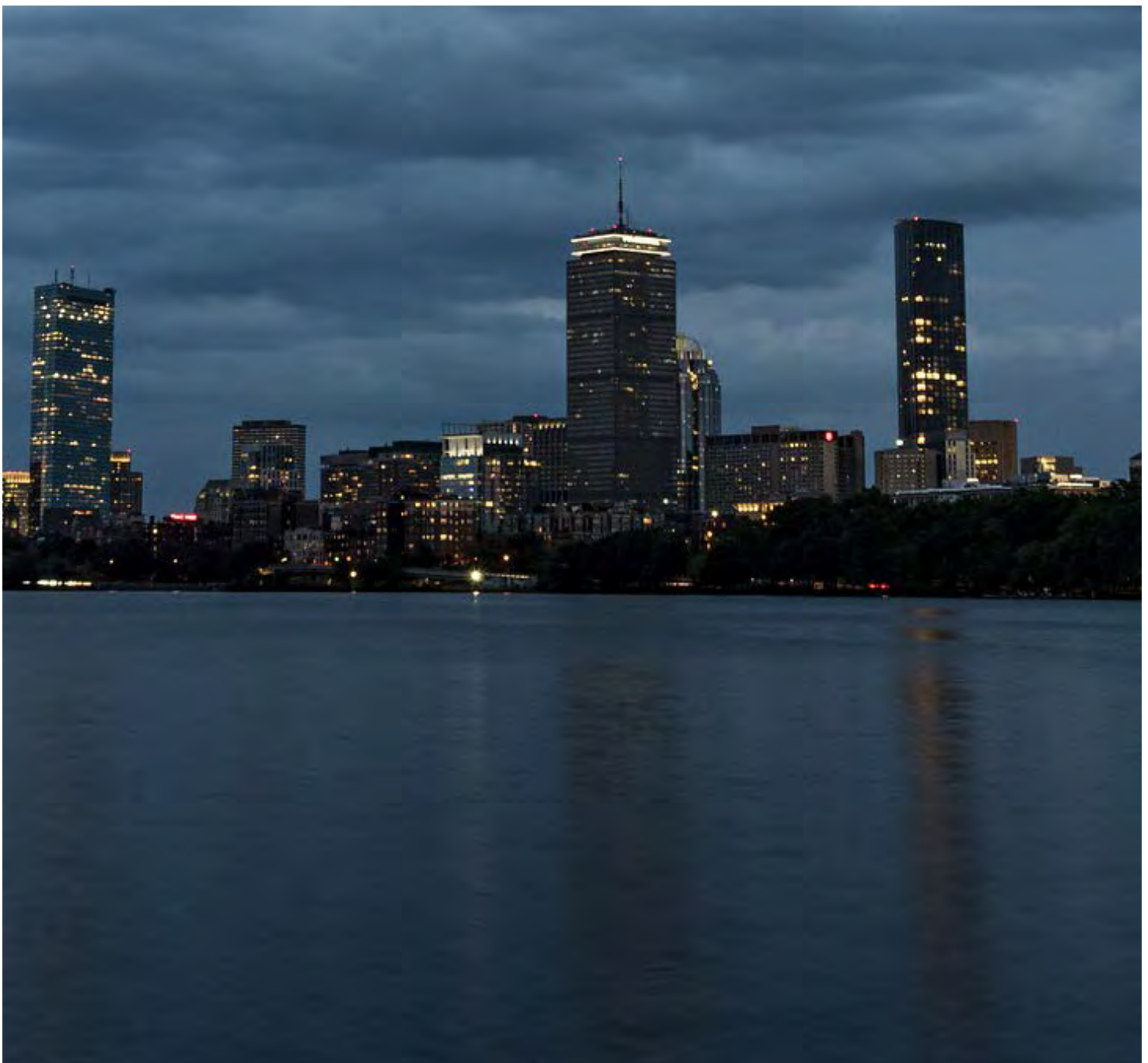
These projects involve two different categories. Source water projects are related to untreated water sources – such as rehabilitating surface water in a reservoir or drilling and maintaining wells. Storage projects deal with infrastructure for maintaining and storing treated water before it is distributed into a system.

Drinking Water Planning and Design Projects

These projects involve the activities needed to plan, design, and/or study drinking water infrastructure. Such projects are essential for maintaining and improving the key infrastructure that protects public health and water quality.

Project Funding

The Trust, MassDEP and EPA have entered into a Revolving Fund Operating Agreement for the CWSRF and the DWSRF. These agreements establish rules, procedures, and activities to be followed by the EPA and the Trust in administering federal grants. To date, the Trust has been awarded approximately \$1.6 billion in federal grants and \$308.1 million in state matching funds for the CWSRF program. Approximately \$577.1 million in federal grants and \$110.1 million in state matching funds have been awarded to the DWSRF program. Additionally, the Commonwealth appropriated \$30 million for funding or securing financing solely for local community septic management programs.



Section 2 | Clean Water State Revolving Fund Projects

Wastewater Treatment Projects

Wastewater treatment projects are eligible for SRF assistance under the Clean Water Act for facilities that provide, or are being upgraded to provide, secondary or advanced wastewater treatment. The distinction between secondary and advanced treatment projects is essentially the level of pollutant removal. For example, secondary treatment requires that a 5-day Biochemical Oxygen Demand (BOD5) be less than 30 mg/l. BOD5 is the amount of dissolved oxygen needed by organisms to break down organic materials present in a water sample over a period of 5 days and is listed as a pollutant under the Clean Water Act. Advanced treatment requires that the BOD5 level be less than 20mg/l. Advanced treatment facilities also address nitrogen, phosphorous, ammonia, metal and/or synthetic organic removal.

Water treatment facility upgrades or improvements can vary widely depending on the age of the infrastructure in question. These facilities are governed under National Pollutant Discharge Elimination System (NPDES) permits, which determine the level of water treatment required to discharge wastewater. Many of the upgrades financed by the Trust help facilities meet their NPDES requirements. These upgrades could include replacing inefficient mechanical equipment, upgrading pollutant removal systems or updating water storage facilities to reduce odor. Replacing equipment at the end of its useful life will improve overall system efficiency. New pumping and filtering equipment are designed with energy efficiency in mind.

Highlighted Project

Upper Blackstone Water Pollution Abatement District - Nutrient Removal Improvements - \$17,100,000

The Upper Blackstone Water Pollution Abatement District (UBWPAD) serves roughly 250,000 people in the greater Worcester area and manages biosolids for an additional 14 communities. The UBWPAD is currently under Administrative Order on Consent (AOC) with the EPA to comply with the 2012 National Pollutant Discharge Elimination System (NPDES) permit limits for total nitrogen and total phosphorus that may be discharged into the Blackstone River. The Blackstone River watershed has an area of approximately 480 square miles and originates at the confluence of Middle River and Mill Brook in Worcester and flows southeast for 46 miles into Rhode Island where it joins the Seekonk and Providence Rivers, which discharge to Narragansett Bay. The Blackstone river was impacted by its industrial past when it was dotted with mills that regularly discharged waste into the river. More recently, the river has been affected by sanitary sewer overflows and water temperature spikes that cause algal blooms and non-point source pollution.



Source: Telegram.com, Rick Sinclair

This project upgraded the treatment facility to meet these nutrient limits including the construction of a tertiary phosphorus removal system, secondary system improvements, sludge handling, chemical system improvements, and numerous ancillary systems and physical site improvements.

Borrower	Project Description	Amount
Dartmouth	<p>Installation of New UV Disinfection System</p> <p>This project consists of providing treatment upgrades to the existing Water Pollution Control Facility. The scope includes upgrading the existing low pressure, low intensity ultraviolet (UV) disinfection system to a low pressure, high intensity UV system to improve bacterial kill. Upgrading the existing system will allow the facility to meet current National Pollutant Discharge Elimination System permit requirements, and consistently provide a high-quality effluent to Buzzards Bay.</p>	\$1,879,624
Massachusetts Water Resources Authority (MWRA)	<p>Wastewater Treatment Plant and Sewer Improvements</p> <p>This project included upgrades to the Deer Island Wastewater Treatment Plant automation and central control systems as well as improvements and upgrades to several existing interceptors and pump stations that needed replacement and/or modernization. The project extended current asset life and improved system operability.</p>	\$2,971,701
Upper Blackstone Water Pollution Abatement District	<p>Nutrient Removal Improvements</p> <p><i>Highlighted Spending Project</i></p>	\$17,100,000



Infiltration/Inflow (I/I) and Sewer System Rehabilitation Projects

These projects correct sewer system infiltration and inflow problems. Infiltration includes water (usually groundwater) penetrating a sanitary or combined sewer system from the ground through defective pipes or manholes. Inflow includes controlling the penetration of water (usually stormwater) into a system from sump pumps, drains, storm sewers, and other improper entries.

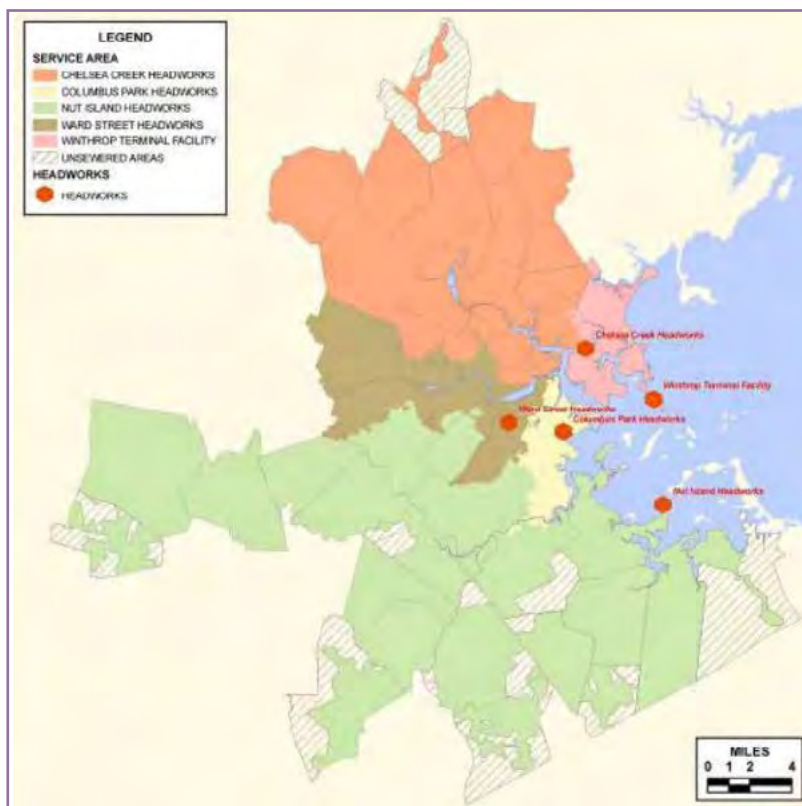
Sewer system rehabilitation projects maintain, reinforce, or reconstruct deteriorating or undersized sewer systems. The corrective actions are necessary to maintain the functional integrity of the system.

Highlighted Project

Massachusetts Water Resources Authority (MWRA) - Remote Headworks Upgrade - \$28,727,859

The MWRA operates three remote headworks facilities that provide preliminary treatment and flow control of the wastewater from MWRA's Northern Service Area before reaching the Deer Island Treatment Plant. The Chelsea Creek, Columbus Park, and Ward Street headworks were built and placed into operation in the 1960's, with major equipment replaced in 1987. In 2009, a Concept Design Report that included a complete inventory and evaluation of equipment and components at each headwork found that there was an urgent need for extensive upgrading of all three facilities.

This project will upgrade the influent gates used for managing flows, replace the odor control system and HVAC system, automate all solids handling equipment including screens, grit collector systems, and solids conveyance systems. Improvements to the building exterior, grounds, and security will be completed with all requirements needed to meet applicable Massachusetts State Building Codes. All this construction, repair, and replacement must be completed while facilities maintain full capacity and remain fully operational.



Source: MWRA.com

Borrower	Project Description	Amount
Chicopee	<p>Phase 5B Sewer Separation Project</p> <p>This project is a part of a long-term control plan created by the City to address the environmental and public health impacts caused by combined sewer overflows into the Connecticut and Chicopee Rivers. The Phase 5B of this project includes approximately 100 acres of the City, which encompasses a total of 20,530 linear feet of combined sewer. Sewer separation will be achieved by providing a new storm drainpipe and catch basins and utilizing the existing combined sewer pipe for the conveyance of sewage. This should significantly relieve the capacity problem in the existing sewer. The separation of the combined sewer systems in Phase 5B will eliminate sewage backups as well as eliminate the mixing of sanitary sewage with stormwater resulting in a much cleaner stormwater release to receiving waters.</p>	\$832,718
Lowell	<p>West St. Flood Protection, Storage, and Stations</p> <p>This project is for flood protection upgrades at the West Street Pump Station, in-line storage of wet weather flows in the Read Street interceptor and remote station improvements. The West Street flood pump station improvements will address the potential for neighborhood flooding upstream of the station, while the in-line storage and remote station upgrades will address combined sewer overflow (CSO) mitigation in the overall system as identified in the CSO Long-Term Control Plan.</p>	\$12,168,345
MWRA	<p>Facility Asset Protection</p> <p>The MWRA Contract for Cottage Farm CSO Facility Improvements was one of the most critical wastewater system improvements projects identified by MWRA. The Cottage Farm CSO Improvements Project addressed critical needs for system rehabilitation, reliability, and optimization of the MWRA wastewater collection system.</p>	\$1,070,733
MWRA	<p>Remote Headworks Upgrade <i>Highlighted Spending Project</i></p>	\$28,727,859
Nantucket	<p>Sea Street Pump Station Upgrade</p> <p>This project replaced the existing pumps and internal discharge piping and valves, provided provisions for additional pumping capacity, new electrical and instrumentation control systems, heating, ventilation, and air conditioning and plumbing systems, and required internal and external structural and architectural improvements, thereby bringing the facility up to local building codes. The pump station provides reliable and redundant sewage pumping capacity for the downtown area, thereby preventing potential failures that would cause raw sewage backups from the municipal collection system.</p>	\$5,873,812
Revere	<p>Illicit Connection & Sump Pump Removal Program</p> <p>The continuation of the implementation through construction contracts of the Illicit Connection and Sump Pump Removal Program is essential for the City of Revere to meet its goals and comply with the US EPA Consent Decree. There is a significant number of illicit sump pumps, roof drains, roof leaders, driveway drains, yard drains connections from private homes and businesses that must be removed from the sewer in order to remove inflow and increase the wastewater capacity of the City's sewer system.</p>	\$783,027

Saugus

Sewer System and Pump Station Rehab/Improvements

\$829,583

This project involved the rehabilitation of pipelines, manholes, and the removal of private inflow sources to eliminate infiltration/inflow from the sewer system. The project aimed to significantly reduce or eliminate sewer system overflows from occurring at the Lincoln Avenue Pumping Station. Approximately 34,000 feet of 8-inch and 12-inch pipe and 1,500 feet of 15-inch pipe was rehabilitated using cured-in-place pipe lining. Approximately 865 sewer services and 222 manholes were lined as part of the project. The replacement of the existing Morris Place Pump Station and improvements to the Bristol Street Pump Station was completed. The equipment within many of the Town's wastewater pump stations was operating beyond its useful life and exhibited signs of failure in some cases. Replacing the existing Morris Place Pump Station was required due to the poor structural conditions and the need to restore useful life and the station's proximity to environmental receptors. Improvements to the Bristow Street Pump Station were required to restore the useful life of the station, improve operator safety, alleviate flooding concerns, and improve system reliability.



Collector and Interceptor Sewers Projects

According to the EPA, millions of gallons of human and industrial waste are sent through complex underground collections systems. These systems operate all day, every day and most municipal sewer systems are at least 60 years old. Many communities have sewers that are more than 100 years old. Collection systems consist of pipelines, conduits, pumping stations, force mains, and other components to collect wastewater and convey it to treatment facilities before being discharged into the environment. Design, operation, and maintenance are critical for system efficiency and public health. System expansions can be used to mitigate issues with combined sewer overflows and septic systems.

New Collector Sewers

These are projects associated with new pipes used to collect and carry wastewater from a sanitary or industrial wastewater source to an interceptor sewer that will convey the wastewater to a treatment facility.

New Interceptor Sewers

These are projects for constructing new interceptor sewers and pumping stations that convey wastewater from collection sewer systems to a treatment facility or to another interceptor sewer. This category includes costs for relief sewers, which are designed to handle the excess capacity of an existing system.

Highlighted Project

Nantucket - Shimmo & PLUS Parcels Sewer Extension - \$1,587,750

The Massachusetts Estuaries Project was created to help identify current nitrogen loads to southeastern Massachusetts estuaries and evaluate local control solutions for reducing the nitrogen loading. The data from this analysis is utilized by MassDEP to establish the total maximum daily loads for the area. In 2006, MEP reported that septic system reduction could greatly reduce nutrient enrichment and degradation of the Nantucket Harbor Watershed and increase the water quality.

A 2014 MassDEP-approved comprehensive wastewater management plan (CWMP) update identified the Nantucket Harbor Shimmo and Nantucket planning and land use services needs areas (these areas are either within or directly abutting the Town's sewer district that were left out of the sewer district and includes 4 infill areas) as the highest rated needs areas. Both needs areas are within the Nantucket Harbor Watershed and contribute nutrient load to the Harbor via septic systems. The CWMP recommended that the Town collect, treat, and discharge the wastewater from these two adjacent needs areas at the Town's Surfside Wastewater Treatment Facility (WWTF).

Connecting these needs areas with the Surfside WWTF requires a hybrid approach of gravity sewers and low-pressure sewers to connect approximately 360 properties. For areas served by gravity sewers approximately 13,000 feet of sewer, two pump stations, and an additional 5,000 feet of force sewer mains will be installed. For areas served by low pressure sewers, 32,000 feet of sewer will be installed, and each property will be required to install an individual pump unit. The low-pressure approach was required due to the area topography.

Borrower	Project Description	Amount
Nantucket	Shimmo & PLUS Parcels Sewer Extension <i>Highlighted Spending Project</i>	\$1,587,750

Combined Sewer Overflows Correction Projects

Combined sewer overflows (CSOs) are events where a combined sewer system fails to collect rainwater, domestic sewage, and industrial wastewater in the same pipe as intended. When these systems exceed their capacity, untreated water can discharge directly into a water body. CSOs are a major source of water pollution for approximately 772 cities in the US that have combined sewer systems. CSO correction projects are associated with measures used to achieve water quality objectives by preventing or controlling periodic discharges that occur when the capacity of a sewer system is exceeded during a wet weather event.

Highlighted Project

Lowell - CIP Phase - WWTF and Infrastructure Upgrades - \$12,666,941

The City of Lowell water's sewer system consists of approximately 220 miles of gravity sewers and 12 sewage pumping stations. Ten miles of large-diameter (48" to 120") interceptors that run along the banks of the Merrimack and Concord Rivers collect wastewater from the sewer system and convey it to the Duck Island Wastewater Treatment Facility (WWTF). According to the City, on a dry day, Lowell's collection system conveys an average 23 million gallons of wastewater to the treatment facility for reclamation. On a wet day, flow rates of greater than 100 million gallons are possible causing CSO events. These flows can take a toll on the aging infrastructure used to convey wastewater through the system. The City has implemented a capital improvement program to address equipment life cycle and maintenance requirements to improve overall reliability for treatment of sewage and wet weather flow. This project made improvements to the WWTF as part of an ongoing phased implementation program. The focus of the work includes replacing equipment in the WWTF and six wastewater pumping stations, which have outlived their expected service life and are no longer reliable.



Source: Lowellma.gov

Borrower	Project Description	Amount
Fall River	<p>Cress Brook Drainage Improvements</p> <p>The proposed project involves modifications of storm drain infrastructure, including: enlargement and rerouting of storm drains to relieve public health risks and nuisance flooding; reactivation of abandoned drainage swale; sewer separation; and water quality improvements with best management practices retrofits where possible. The project will increase storm drain capacity for a future sewer separation project.</p>	\$699,886
Lowell	<p>CIP Phase - WWTF and Infrastructure Upgrades</p> <p><i>Highlighted Spending Project</i></p>	\$12,666,941



Non-Point Source (NPS) Sanitary Landfill

NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into ground and surface waters. Ensuring that landfills are properly capped, maintained, and monitored are necessary steps to avoid water contaminants leaching into local waters. Projects could include purchase, installation, and repair of capping systems (gas venting layer, geosynthetics, barrier layer, top cover, etc.), leachate collection, storage, and treatment systems (onsite or off-site), side slope seepage prevention and control systems, gas condensation systems, monitoring wells and equipment, and stormwater runoff controls.

Highlighted Project

Goshen - Landfill Cap Repair - \$615,336

The Town of Goshen determined that the Town's sanitary landfill was experiencing erosion damage to the landfill capping system that prevents water from carrying pollutants into the nearby ground and surface water. This project progressed with the removal and replacement of unsuitable material, geosynthetic installation, drainage layer replacement, drainage pipe installation, and toe drain replacement, drainage berm/swale replacement, and downslope swale installation. This project included survey services before, during, and after construction. This project helped maintain the physical integrity of the cap and replaced the drainage and monitoring system. Work for this project was completed in 2019.

Borrower	Project Description	Amount
Goshen	Goshen Landfill Cap Repair <i>Highlighted Spending Project</i>	\$615,336



Source: Goshen Cap Repair Monthly Report October 2018

Planning Projects

Projects in this category are for developing plans to address water quality and water quality-related public health problems. Planning projects can consist of multiple types of investigations. Field investigations are used to view the state of current water infrastructure assets to identify and prioritize design, maintenance and replacement activities. Sensor and field analysis can be used as part of a larger analysis that consists of plans to adopt best management practices and capital improvements. These projects assist municipalities with determining environmental issues that may be affecting local water sources or endangering public health.

For example, comprehensive wastewater management plans provide strategies for addressing wastewater treatment and disposal issues in a municipality or utility district. Integrated municipal stormwater and wastewater resource management planning assists municipalities with meeting requirements that arise from distinct wastewater and stormwater programs. Fiscal sustainability and asset management planning assists communities with maintaining replacement schedules and forecast capital needs in the future.

Highlighted Project

Revere - Phase IX Field Investigations-I/I and Illicit Discharge Detection and Elimination (IDDE) - \$1,200,000

The City of Revere had been experiencing sewer blockages and capacity limitations in their wastewater sewers and wastewater treatment plant. The results were wastewater backing up into basements and untreated wastewater being discharged to surface waters. These events led to a violation of National Pollutant Discharge Elimination System permit requirements. In 2010, the City of Revere and the EPA entered a Consent Decree (CD) to remediate these issues. The CD required the removal of illicit and cross connections to its sanitary system and municipal separate storm sewer system to detect and eliminate sanitary sewer overflows. Additionally, the CD required the City to develop and implement a comprehensive wastewater management plan) and a comprehensive stormwater management plan. The City has launched several initiatives to come into compliance with these terms by the December 31, 2022 deadline.

The City's phased field Infiltration and Inflow (I/I) investigations and Illicit Discharge Detection and Elimination (IDDE) are vital planning projects for the City in its assessment of the City's wastewater and stormwater systems. The field investigations include IDDE, closed circuit television of both drains and sewers, dye testing, smoke testing, and private building inspections. These measures locate compromised pipes, discover illicit drainage connections to sump pumps and roof downspouts, and track flow rates. Deficiencies discovered in the system during the investigations are addressed and corrected by the City in future construction projects.



Borrower	Project Description	Amount
Brockton	<p>Sewer Flow Monitoring Program</p> <p>This project provides an update to the infiltration/inflow (I/I) study conducted by the City in 1998. There have been significant upgrades to the sewer system, but the system flow data shows that the collection system is still susceptible to both infiltration and inflow (I/I). The purpose of this project is to redevelop estimates of I/I contribution from the same drainage sub-areas within the City's sewer collection system which were metered in 1997 and 1998. The flow monitoring program will identify the general location and extent of I/I entering the sewer system. The findings will help prioritize and phase the follow-up sewer system evaluation survey work, which will identify areas throughout the sewer collection system which need to be rehabilitated or replaced. Reductions in I/I will create additional capacity for future connections to the wastewater collection system and treatment plant and minimize sanitary sewer overflows within the sewer collection system.</p>	\$1,100,000
Brockton	<p>Stormwater Management Plan</p> <p>The goal of this planning project is to address the bacterial water quality impairments in the Taunton River watershed by constructing improvements to the drainage and/or sewer systems. The first step in addressing the bacteria within the stormwater discharges will involve the City developing a comprehensive watershed wide plan that provides recommendations to address and prioritize water quality concerns. It is intended that this planning project will develop the plan that identifies sources of cross contamination and allow for the development of further recommendations.</p>	\$400,000
Fall River	<p>Combined Sewer Overflow Facilities Plan</p> <p>The City is under federal court order to control its combined sewer overflows (CSOs) to its receiving waters. This program, known as the Fall River CSO Abatement Program, is intended to provide a 3-month storm level of control. Discharges from two CSO outfalls, Alton Street and City Pier, have not yet been controlled. Additionally, the City Pier area experiences chronic street flooding in low-lying areas. The proposed facilities plan advanced previous planning efforts for sewer separation of the area's tributary to these outfalls and addressed flooding issues.</p>	\$1,000,000
Lawrence	<p>Sewer System Evaluation Survey</p> <p>This project will evaluate up to 20% of the City's collection system using a combination of manhole inspections, closed circuit television inspection, smoke testing, dye tracing, dye flooding, flow isolation, and building inspections. The system will be assessed for structural, operational, and maintenance defects. Findings will be summarized in a database that will assist with capital improvement prioritization. Up to 100 municipal separate storm sewer system drainage catchment areas will be investigated to pinpoint illicit connections by means of rapid visual and olfactory inspections, wet and dry-weather sampling and bracketed ammonia, chlorine, and surfactant sampling to isolate pipe segments for follow up closed circuit television and confirmatory dye testing investigations.</p>	\$2,700,000

Borrower	Project Description	Amount
New Bedford	<p>Supplemental Wastewater and Stormwater Plan</p> <p>The City of New Bedford's collection system is over 100 years old. Many of its critical components had far exceeded their useful life. This project developed the required planning documents and field investigations necessary to begin implementing future system rehabilitation efforts, address regulatory requirement needs, eliminate illicit connections, and reduce combined sewer overflows.</p>	\$4,646,600
Revere	<p>Illicit Connection & Sump Pump Removal Investigations</p> <p>The continuation of the illicit connections and sump pump detection program is important in the City's efforts to remove inflow from the sanitary sewer system. This program will continue the inspections of private homes and businesses to identify sources of inflow from sump pumps, roof leaders, roof drains, driveway drains, yard drains, etc.</p>	\$600,000
Revere	<p>Phase IX Field Investigations - I/I and Illicit Discharge Detection and Elimination (IDDE)</p> <p><i>Highlighted Spending Project</i></p>	\$1,200,000
Taunton	<p>Comprehensive Water Resources Planning</p> <p>The project carried out comprehensive planning for all issues pertaining to the city's wastewater and stormwater systems. The specific project elements consisted of completing the Environmental Impact Report and Comprehensive Wastewater Management Plan that went through the draft stage several years ago. The City has a permitted combined sewer overflow that required planning for future operation. The project addressed the current municipal separate storm sewer system needs. The treatment plant was required to meet a new nitrogen limit, which was addressed for the technical issues. An update of the infiltration/inflow and sewer system evaluation study of the collection system, and an anti-degradation study were completed.</p>	\$760,000
Tyngsborough	<p>Tyngsborough Infiltration/Inflow Program</p> <p>The Tyngsborough sewer system is comprised of approximately 116,000 linear feet of 8" to 24" separate sanitary sewers and 12 pump stations located in two major areas, one on either side of the Merrimack River. The project consisted of developing a 2018 Infiltration/Inflow (I/I) analysis program to comply with MassDEP regulations. The Town performed a metering program and prepared an I/I analysis report. This project reviewed an existing I/I study completed in 2009 by Stantec and identified potential sewer system rehabilitation work.</p>	\$250,000



Section 3 | Drinking Water State Revolving Fund Projects

Drinking Water Treatment Projects

Treatment projects include the construction, expansion, and rehabilitation of drinking water infrastructure that reduces contamination through various treatment processes. Such processes aim to condition water or remove contaminants. Treatment processes include filtration of surface water, pH adjustment, softening, disinfection, waste handling and other treatment needs (i.e., granular activated carbon which filters out chemicals, particularly organic chemicals, aeration and iron/manganese removal) along with chemical storage tanks.

Upgrades and maintenance to water treatment plants leads to improved water quality and system efficiency. Replacing equipment that has reached the end of its useful life along with upgrading filtering and purifying equipment makes these facilities less susceptible to failures that could endanger public health. Additionally, system improvements such as corrosion control, help keep the public safe from issues related to older cast iron pipes and lead service lines. Upgraded equipment generally leads to more efficient facilities that consume less power and improves worker safety.

Highlighted Project

Norton - New Water Treatment Plant - \$10,300,000

The Town of Norton's drinking water supply is ground water which comes from the Taunton River Basin. Iron and manganese are natural elements commonly found in ground water. High concentrations of these elements can lead to water discoloration and may have adverse health effects for infants and pregnant women. The Town used corrosion control and hydrant flushing to reduce the overall buildup of these elements. To help remedy this issue, the Town of Norton constructed a 2.5 MGD pressure filtration plant to remove high levels of iron (0.9 to 3.28 mg/l) and manganese (0.18 to 0.35 mg/l) from three wells that provide over 75% of the Town's water. All three wells have combined iron and manganese levels above the sequestering limit of 1.0 mg/l. The raw water pipeline from one well will be drilled directly under the Canoe River to reach the plant.



Source: Methuenconstruction.com

Borrower	Project Description	Amount
Adams Fire District	<p>Chemical Feed and SCADA Upgrades</p> <p>This project includes the installation of sodium hypochlorite chemical feed systems to Wells 4, 2a, and 3 stations including day tanks, chemical metering pumps, chemical feed piping, instrumentation, and controls. Additional activities include integrating the new chemical feed systems with the existing supervisory control and data (SCADA) acquisition system by installing a programmable logic controllers based control system at Wells 2a and 3 sites, adding a communication system to connect the three well sites, the Maple Street Storage Tank, and provide an alarm dialer and a connection to a human machine interface at the District’s office. This project is in accordance with two EPA Administrative Consent Orders – for unaccounted water and coliform hits. The completed project will install disinfection and provide for more accurate supply readings.</p>	\$766,794
Dedham-Westwood Water District	<p>Bridge Street Water Treatment Plant Upgrades</p> <p>The Bridge Street Water Treatment Plant has performed reliably in the District for over one hundred years but needs significant rehabilitation and updating. This project will also improve the conditions and worker safety within the facility that include renovations to the existing treatment facility along with the addition of a new multi-purpose treatment building.</p>	\$8,841,400
Haverhill	<p>Haverhill Water Treatment Plant Upgrades</p> <p>The Haverhill Water Treatment Plant has provided the city with service far more than its planned useful life. This project includes an upgrade to treatment capacity from approximately 10 million MGD to 12.1 MGD to provide much needed redundancy of primary treatment components and to replace outdated systems. The updated plant will meet the needs of the City under a variety of existing and future conditions.</p>	\$31,094,762
New Bedford	<p>Quittacas Water Treatment Plant Rehabilitation</p> <p>This project will perform needed rehabilitation and upgrades at New Bedford's 40-year old Quittacas Water Treatment Plant. The Plant is the sole facility that treats water for the City’s water and is the backbone of the entire system. The upgrades will ensure the continued safety and reliability of the City’s drinking water supply.</p>	\$8,912,740
Norton	<p>New Water Treatment Plant <i>Highlighted Spending Project</i></p>	\$10,300,000



Borrower	Project Description	Amount
Wareham Fire District	<p>Maple Springs Water Purification Plant</p> <p>This project includes the construction of a 3.0MGD ground water treatment plant, expandable to 4.5MGD, which includes: iron and manganese removal for compliance with secondary standards; disinfection with ultraviolet light, and/or free chlorine to address the groundwater rule or possible reclassification as groundwater under the influence of surface water; and corrosion control. The project may also include treatment for pesticides and herbicides from nearby agricultural activity that have been detected in groundwater sources. This work will remove the public health threats posed by various contaminants and ensure excellent drinking water quality. The project will also include alternative energy generation using wind or solar power to reduce energy consumption from fossil fuel sources and will include passive solar design elements to reduce energy consumption.</p>	\$6,346,096
Webster	<p>Memorial Beach Wells Water Treatment Plant</p> <p>This project includes the construction of the Memorial Beach Wells Water Treatment Plant and associated appurtenances. This project will return compromised drinking water sources to operation and will mitigate potential long-term public health threats by reducing elevated levels of manganese and ensuring corrosion control at the new entry point into the distribution system. In addition, this project will address elevated levels of iron above the secondary maximum contaminant limit, provide 4-log disinfection and additional system redundancy to ensure availability and flow capacity.</p>	\$9,688,617
Whatley	<p>Manganese Removal</p> <p>The Whatley Water Department serves approximately 1,500 total residents along with a small number of retail businesses. The system is experiencing manganese levels in the water, exceeding 0.3 mg/L. Consequently, a manganese removal system is to be installed at the supply to bring the Town into compliance with current MassDEP Public Water Supply requirements.</p>	\$440,000



Drinking Water Transmission and Distribution Projects

These projects are for installing, replacing, or rehabilitating transmission lines that carry drinking water from the source to the treatment plant or from the treatment plant to the consumer. Items such as pipes for raw and finished water transmission, service lines, valves, backflow prevention, water meters, and pumping stations may be components of these projects.

Replacing or repairing transmission lines improve water quality, system pressure and reliability. Additionally, the replacement and relocation of lines may be needed to improve the overall efficiency of a system that was designed for a smaller and less expansive community. The older practice of grouping transmission lines can lead to water distribution issues if one begins to leak and causes physical damage to the surrounding soil and adjacent transmission lines. Replacement of lead service lines reduces the risk of lead exposure and removes a public safety risk.

Highlighted Project

Eastham - Phase 2A Town-Wide Water System - \$7,685,012

The Town of Eastham, in its 2014 annual meeting, approved the establishment of a municipal water system for one third of the Town. This would replace the small community public water systems and individual private wells that were previously in use. Sampling of the water in the Town had indicated impaired water quality. To meet the standards of the Safe Drinking Water Act, a municipal system had to be created. A second vote in 2015 expanded the project to be town wide. Starting in 2015, the first phase of water system development included the construction of two well fields, a 750,000-gallon storage tank, and 45 miles of water distribution piping.



Source: Easthamwaterproject.weebly.com

Phase 2 was used to construct the remainder of the distribution system so every property in the Town can connect to the water system. This included the installation of new well field equipment and approximately 19 miles of distribution system piping. Phase 2 expands upon Phase 1 by installing laterals to the transmission mains which will provide service to the remaining two-thirds of the Town's properties (approximately 4,600 parcels).

Borrower	Project Description	Amount
Brockton	<p>Transmission Main and Valve Replacement Project</p> <p>The City of Brockton has been working to locate, clean, and operate all crossover and mainline valves within the 24" transmission mains connecting Silver Lake Water Treatment Plant and the Brown's Crossing Pump Station (East Bridgewater). This assessment was ordered in response to a pipe failure within this line and the crossover valves could not be operated to isolate the pipe break. This caused a shutdown of the plant for a day and great concern for the integrity of these pipes and their valves. Through their assessment, several crossing locations have been identified that will be replaced to prevent these issues.</p>	\$1,402,890
Eastham	<p>Phase 2A Town-Wide Water System <i>Highlighted Spending Project</i></p>	\$7,685,012

Borrower	Project Description	Amount
Fall River	<p>Water Main Rehabilitation - Phase 17</p> <p>The Phase 17 water main improvements included the rehabilitation or replacement of approximately 16,100 linear feet of cast iron water mains and the removal of 30 lead service lines. The cast iron mains were severely deteriorated and needed to be replaced to ensure adequate flow and capacity for supply and fire protection. Replacement of lead service lines addressed the critical health threats presented by lead in drinking water. This project will prevent a serious problem in the distribution system and will provide safe and reliable drinking water to customers of the City of Fall River.</p>	\$2,930,713
Gloucester	<p>Babson Water Treatment Plant- Raw Water Systems Improvements</p> <p>The Babson Water Treatment Plant (WTP) Emergency Project is designed to address issues that were leading to unacceptable WTP shutdowns. These include problems with the generator transfer switch, the actuated WTP intake valve and meter vaults, and with eels clogging the pumps and sedimentation basin blow down valves. The scope of work encompasses the installation of a new generator automatic transfer switch, of a new accessible vault containing a new battery backed-up intake valve and inflow meter, and a new eel control vault with accessible screens and instrumentation. Ancillary work considered appropriate to complete in this project included new meters and vaults for the Goose Cove-Babson Reservoir Connector and for the Babson Waste Line, rehabilitation of the low lift pumps, and provision of a spare low lift pump.</p>	\$1,830,012
Lawrence	<p>Water Main Replacement</p> <p>This project involves the replacement of approximately 45,000 linear feet of water mains, while also replacing broken and malfunctioning hydrants and valves.</p>	\$12,130,925
Leominster	<p>Rehabilitation of Pump Stations</p> <p>This project rehabilitated the City of Leominster's Pond Street Pump Station and Wachusett Reservoir Pump Station. The Pond Street Pump Station is located at a hub of the City's three pressure zones and through this station, the City can transfer water between all three pressure zones as needed to meet demand. The Wachusett Reservoir Pump Station can withdraw about 5 MGD of water from the Wachusett Reservoir on an emergency basis. Equipment within both pump stations was well beyond its useful life. Rehabilitating these facilities ensures they are readily available for routine or emergency use and increase the overall reliability of the water system when needed.</p>	\$1,450,565
MWRA	<p>Wachusett Aqueduct Pump Station</p> <p>This project constructed an emergency pump station to pump water from the Wachusett Aqueduct to the Carroll Water Treatment Plant (WTP). The pump station provides redundancy in the event of failure at the Cosgrove Tunnel or Intake and for the inspection/rehabilitation of the Cosgrove Tunnel. The pump station will be able to deliver 240 MGD of raw water to the WTP during a planned or emergency shutdown of the Cosgrove Tunnel.</p>	\$5,363,933

Borrower	Project Description	Amount
New Bedford	<p>Lead Service Line Replacement Program - Phase I</p> <p>The Lead Service Line Replacement Program – Phase I is the first phase of an aggressive, multi-year program to replace all lead service lines in the City. The first phase of this program will replace 1,000 to 1,500 LSLs in a two-year period throughout the City’s water distribution system. The City is committed to protecting public health and continuing to provide safe drinking water to all its customers.</p>	\$5,698,174
Revere	<p>The Water Meter AMR System</p> <p>The Automatic Meter Reading (AMR) system will fully replace the aging residential water meter system throughout the City with approximately 10,000 new residential meters, plus a city-wide fixed based AMR system. The system will provide automated readings of every new meter in the system which will minimize or eliminate the need for mobile or hand readings. The City of Revere has unaccounted-for water of 18.6%, well above the Massachusetts Standard of 10%. The current metering system uses handheld meter reading equipment that was installed between 1993 and 1994. The handheld equipment is labor intensive for City employees and only allows for meter readings biannually. Under the current system, the City is unable to reach the meters at certain commercial locations due to meter placement. Estimating the water usage at these locations may also be a contributing factor to the high unaccounted-for water. With the new AMR system, Revere will have the capability of retrieving daily (or hourly) readings of all meters. Revere can also receive leak detection indications, meter tampering warnings, meter malfunction warnings, and unaccounted-for water percentages.</p>	\$779,057
Wayland	<p>Wayland 2018 Water Main Improvements</p> <p>The project will replace 2,500 linear feet of existing 6” unlined cast iron water main with new 12” ductile iron water main in Wayland. This major transmission main provides service to Wayland Town Center. The water main is classified as being in poor condition due to its size, material, installation year, and corrosive soils. The project will address potential public health threats from water quality issues associated with corrosion of the water main.</p>	\$700,000



Drinking Water Source and Storage

These projects are used for developing or improving sources of water used in public water systems. Project costs include those for constructing or rehabilitating surface water intake structures, drilled wells, wellhead pumps and spring collectors. Having multiple sources of raw water is a standard precaution to make sure that water supplies are not endangered or cut off. Source protection and testing are necessary to confirm that raw water quality can be properly purified at the intended water treatment plant. Excessive amounts of toxins or pollutants in raw water can cause efficiency issues once raw water reaches a water treatment plant. Pumping, well maintenance and water extraction must be monitored to ensure that water quality at the source is not impacted by these activities.

Storage projects in this category aim to provide finished water storage for public water systems. Examples may include systems involving elevated and ground level storage for treated water and covers for existing storage. Storage tanks and the systems they employ are vital components of a water distribution system. Tanks are used to ensure water supply when there may be issues with supply lines or when maintenance is being performed. Upgraded systems that chlorinate water or monitor water quality are more efficient with advanced systems. This means that water quality is more consistent and requires less human maintenance.

Highlighted Project

West Springfield - Drinking Water System Improvements Project - \$6,699,639

The Town of West Springfield undertook a major refit of its drinking water storage and metering system. These updates were due to sections of the water system experience extremely low pressure. This project created a new pressure zone while also updating the existing pumping station to service the existing high-pressure zone. A new 300,000-gallon elevated water storage tank was installed with a transmission main from the existing high-pressure service area to supply the new pressure zone. This project involved the replacement of approximately 2,200 existing meters and a Town wide leakage testing plan and implementation. This enables the Town to recover costs of under-registering meters and significantly reduce the amount of unaccounted for water while ensuring the town has the water and pressure to supply expanded housing, businesses, and fire department.

Borrower	Project Description	Amount
MWRA	Southern Extra High (SEH) Redundancy and Storage The service area has been identified as being deficient in distribution storage and lacking redundant distribution pipelines. Correction of these deficiencies was a majority priority under the MWRA's 2006 and 2013 Water System Master plans due to the potential public health threat that could result from a failure in this single transmission main.	\$14,355,913
West Springfield	Drinking Water System Improvements Project <i>Highlighted Spending Project</i>	\$6,699,639

Appendix A - Series 22 Projects¹

Borrower	Loan No.	Project Name	Amount	Loan Drawn	Program	Category
Adams Fire District	DWP-18-04	Chemical Feed and SCADA Upgrades	\$766,794	97.20%	DW	Drinking Water Treatment
Brockton	CW-16-27	Sewer Flow Monitoring Program	\$1,100,000	78.59%	CW	Planning
Brockton	CW-16-28	Stormwater Management Plan	\$400,000	92.43%	CW	Planning
Brockton	DWP-17-10	Transmission Main and Valve Replacement Project	\$1,402,890	89.46%	DW	Drinking Water Transmission and Distribution
Chicopee	CWP-16-25	Phase 5B Sewer Separation Project	\$832,718	57.53%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Dartmouth	CWP-16-32	Installation of New UV Disinfection System	\$1,879,624	96.41%	CW	Wastewater Treatment
Dedham-Westwood Water District	DW-16-08	Bridge Street Water Treatment Plant Upgrades	\$8,841,400	98.59%	DW	Drinking Water Treatment
Eastham	DW-17-01	Phase 2A Town-Wide Water System	\$7,685,012	100%	DW	Drinking Water Transmission and Distribution
Fall River	CW-17-21	Combined Sewer Overflow Facilities Plan	\$1,000,000	99.08%	CW	Planning
Fall River	CWP-18-07-A	Cress Brook Drainage Improvements	\$699,886	93.02%	CW	Stormwater Infrastructure
Fall River	DWP-17-08	Water Main Rehabilitation - Phase 17	\$2,930,713	100%	DW	Drinking Water Transmission and Distribution
Gloucester	DWP-18-03	Babson WTP Raw Water Systems Improvements	\$1,830,012	97.68%	DW	Drinking Water Transmission and Distribution
Goshen	CWP-18-11	Goshen Landfill Cap Repair	\$615,336	96.01%	CW	NPS Sanitary Landfills
Haverhill	DWP-16-05-A	Haverhill Water Treatment Plant Upgrades	\$31,094,762	84.13%	DW	Drinking Water Treatment
Lawrence	CW-16-14	Sewer System Evaluation Survey	\$2,700,000	100%	CW	Planning
Lawrence	DW-13-05-A	Water Main Replacement	\$12,130,925	92.75%	DW	Drinking Water Transmission and Distribution
Leominster	DWP-16-13	Rehabilitation of Pump Stations	\$1,450,565	100%	DW	Drinking Water Transmission and Distribution
Lowell	CWP-16-13	West St. Flood Protection, Storage and Stations	\$12,168,345	92.29%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Lowell	CWP-16-15	CIP Phase - WWTF and Infrastructure Upgrades	\$12,666,941	100%	CW	Combined Sewer Overflow Correction
MWRA	CW-18-39	Facility Asset Protection	\$1,070,733	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
MWRA	CW-18-40	Remote Headworks Upgrade	\$28,727,859	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
MWRA	CW-18-41	Wastewater Treatment Plant and Sewer Improvements	\$2,971,701	100%	CW	Wastewater Treatment
MWRA	DW-16-06-A	SEH Redundancy and Storage	\$14,355,913	100%	DW	Drinking Water Source and Storage
MWRA	DW-18-16	Wachusett Aqueduct Pump Station	\$5,363,933	100%	DW	Drinking Water Transmission and Distribution
Nantucket	CW-16-35	Sea Street Pump Station Upgrade	\$5,873,812	99.97%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Nantucket	CW-17-01	Shimmo & PLUS Parcels Sewer Extension	\$1,587,750	99.20%	CW	Collector and Interceptor Sewers
New Bedford	CW-17-10	Supplemental Wastewater and Stormwater Plan	\$4,646,600	86.31%	CW	Planning
New Bedford	DWP-16-14	Quittacas Wastewater Treatment Plant Rehabilitation	\$8,912,740	100%	DW	Drinking Water Treatment
New Bedford	DWP-17-03	Lead Service Line Replacement Program - Phase I	\$5,698,174	100%	DW	Drinking Water Transmission and Distribution
Norton	DW-14-10	New Wastewater Treatment Plant	\$10,300,000	97.51%	DW	Drinking Water Treatment

Footnotes

¹ Series 22: All Amount and Loan Drawn sections are accurate as of July 31, 2020

Appendix A - Series 22 Projects¹

Borrower	Loan No.	Project Name	Amount	Loan Drawn	Program	Category
Revere	CW-17-28	Illicit Connection & Sump Pump Removal Investigations	\$600,000	92%	CW	Planning
Revere	CW-17-29	Phase IX Field Investigations-I/I and IDDE	\$1,200,000	100%	CW	Planning
Revere	CWP-17-26	Illicit Connection & Sump Pump Removal Program	\$783,027	80.85%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Revere	DW-13-09-A	Water Meters AMR System	\$779,057	58.25%	DW	Drinking Water Transmission and Distribution
Saugus	CW-16-09-A	Sewer System and Pump Station Rehab/Improvements	\$829,583	96.61%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Taunton	CW-17-08	Comprehensive Water Resources Planning	\$760,000	98.73%	CW	Planning
Tyngsborough	CW-18-04	Tyngsborough Infiltration/Inflow Program	\$250,000	100%	CW	Planning
Upper Blackstone WPAD	CWP-16-39-A	Nutrient Removal Improvements	\$15,000,000	99.96%	CW	Wastewater Treatment
Upper Blackstone WPAD	CWP-16-39-B	Nutrient Removal Improvements	\$2,100,000	82.57%	CW	Wastewater Treatment
Wareham Fire District	DWP-17-09	Maple Springs Water Purification Plant	\$6,346,096	100%	DW	Drinking Water Treatment
Wayland	DW-18-01	Wayland 2018 Water Main Improvements	\$700,000	100%	DW	Drinking Water Transmission and Distribution
Webster	DWP-17-04	Memorial Beach Wells Water Treatment Plant	\$9,688,617	96.02%	DW	Drinking Water Treatment
West Springfield	DWP-17-13	Drinking Water System Improvements Project	\$6,699,639	84.96%	DW	Drinking Water Source and Storage
Whatley	DW-16-11	Manganese Removal	\$440,000	86.77%	DW	Drinking Water Treatment

Footnotes

¹ Series 22: All Amount and Loan Drawn sections are accurate as of July 31, 2020

Appendix B - Series 21 Projects¹

Borrower	Loan No.	Project Name	Amount	Loan Drawn	Program	Category
Adams Fire District	DW-16-10	Well 4 Pump Station Rehabilitation	\$538,518	97.90%	DW	Drinking Water Transmission and Distribution
Brockton	CWP-16-29	Sewer Rehabilitation Project	\$2,975,722	91.60%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Chatham	DW-14-06	New Water Treatment Facility	\$9,274,815	90.80%	DW	Drinking Water Treatment
Fall River	CW-13-02-A	Combined Sewer Overflow Abatement Program Abatement Program	\$487,150	95.07%	CW	Combined Sewer Overflow Correction
Fall River	CWP-16-03	Globe Street Sewer Improvements Project	\$4,105,174	90.25%	CW	Combined Sewer Overflow Correction
Fall River	DWP-13-06-A	Airport Road High Service Area Improvements	\$428,194	66.22%	DW	Drinking Water Source and Storage
Fall River	DWP-14-08-A	Water Main Improvements and WTP Residual Handling	\$139,747	100%	DW	Drinking Water Transmission and Distribution
Fall River	DWP-16-09	Water Main Improvements - Phase 16	\$3,512,338	91.99%	DW	Drinking Water Transmission and Distribution
Fitchburg	CWP-16-05	Beech and Hazel Streets Sewer Separation	\$2,068,695	93.53%	CW	Combined Sewer Overflow Correction
Fitchburg	CWP-16-10	Fitchburg WWTF Secondary Systems Upgrade	\$9,017,418	100%	CW	Wastewater Treatment
Hadley	DWP-16-03	Water Infrastructure Improvement	\$172,998	100%	DW	Drinking Water Transmission and Distribution
Haverhill	DWP-16-07	Transmission Main Improvements	\$2,549,127	98.64%	DW	Drinking Water Transmission and Distribution
Haverhill	DWP-16-05	Haverhill Water Treatment Plant Upgrades	\$8,645,659	100%	DW	Drinking Water Treatment
Medway	CW-11-20	IWRMP	\$500,000	99.98%	CW	Planning
MFN Regional Wastewater District	CW-15-25-A	WPCF Upgrades and Landfill Closure	\$17,911,611	100%	CW	Wastewater Treatment
Montague	CWP-14-28	Pump Station Replacements	\$1,583,047	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
MWRA	DW-16-06	SEH Redundancy and Storage	\$4,045,484	100%	DW	Drinking Water Source and Storage
MWRA	DW-16-23	Low Service Storage	\$319,493	100%	DW	Drinking Water Source and Storage
MWRA	DW-17-15	Wachusett Aqueduct PS	\$28,249,352	100%	DW	Drinking Water Transmission and Distribution
MWRA	CW-16-42	Caruso Pump Station	\$2,194,852	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
MWRA	CW-17-35	Remote Headworks Upgrade	\$4,786,700	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
MWRA	CW-16-43	Wastewater Treatment Plant and Sewer Improvements	\$3,394,837	100%	CW	Wastewater Treatment
MWRA	CW-17-34	Wastewater Treatment Plant and Sewer Improvements	\$3,249,355	100%	CW	Wastewater Treatment
MWRA	CW-17-36	Clinton WWTP Phosphorous Removal	\$3,759,927	100%	CW	Wastewater Treatment
Nantucket	CW-16-36	Shimmo & PLUS Parcels Sewer Extension	\$14,101,765	93.98%	CW	Collector and Interceptor Sewers
Nantucket	CW-15-26	Surfside WWTF Improvements	\$8,472,975	86.62%	CW	Wastewater Treatment
New Bedford	CW-16-37	Supplemental WW and SW Plan	\$1,000,000	100%	CW	Planning
Northampton	CWP-10-14-R	Pumping Station Improvements	\$86,222	84.74%	CW	Planning
Norwood	CWP-15-08-A	Underdrain Area Sewer Rehab	\$414,356	87.64%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Quincy	CWP-15-06	PS Renovation	\$3,634,026	97.18%	CW	Infiltration/Inflow and Sewer System Rehabilitation

Footnotes

¹ Series 21: All Amount and Loan Drawn sections are accurate as of July 31, 2020

Appendix B - Series 21 Projects¹

Borrower	Loan No.	Project Name	Amount	Loan Drawn	Program	Category
Revere	DW-13-10	GIS Implementation of AMR Program	\$250,000	75.30%	DW	Drinking Water Planning and Design
Revere	CW-16-19	Phase VIII Field Investigations - I/I and IDDE	\$1,500,000	92%	CW	Planning
Revere	CW-16-23	Illicit Connections & Sump Pump Detection	\$850,000	95%	CW	Planning
Saugus	CWP-16-09	Sewer System and Pump Station Rehab/Improvements	\$3,197,219	99.67%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Shrewsbury	DW-16-15	Home Farm Water Treatment Facility Upgrade	\$12,074,031	95.95%	DW	Drinking Water Treatment
Taunton	CWP-16-38	Sewer/Drain Separation and Inflow Removal	\$3,927,054	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Upper Blackstone WPAD	CWP-16-39	Nutrient Removal Improvements	\$8,842,079	100%	CW	Wastewater Treatment
Uxbridge	CW-16-26-A	Wastewater Treatment Facility - BNR and Infrastructure Upgrade	\$17,253,299	100%	CW	Wastewater Treatment

Footnotes

¹ Series 21: All Amount and Loan Drawn sections are accurate as of July 31, 2020

Appendix C - Series 20 Projects¹

Borrower	Loan No.	Project Name	Amount	Loan Drawn	Program	Category
Barnstable	CW-04-31-R	Nutrient Management Planning Project	\$255,941	100%	CW	Planning
Billerica	CW-14-21	Contract 35 Sewers	\$8,847,833	100%	CW	Collector and Interceptor Sewers
Billerica	CW-14-20	Wastewater Treatment Facility Upgrades	\$4,472,511 ²	100%	CW	Wastewater Treatment
Brockton	CWP-15-22	Sewer Rehabilitation	\$1,270,936 ²	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Charles River Pollution Control District	CW-13-09-B	Wastewater Treatment Facility Improvements Phase C	\$1,645,106 ²	100%	CW	Wastewater Treatment
Chicopee	CW-14-05	Combined Sewer Overflow	\$24,013,337	100%	CW	Combined Sewer Overflow Correction
Chicopee	CW-13-22	Integrated Municipal Stormwater and Wastewater Resource Management Plan	\$996,457 ²	100%	CW	Planning
Dracut	CW-13-24-A	Contract No. 32 Sewer Extensions	\$181,873	100%	CW	Collector and Interceptor Sewers
Eastham	DWP-16-02	Water System Phase I	\$10,289,876	100%	DW	Drinking Water Source and Storage
Eastham	DWP-15-01-A	Water System Phase I	\$2,304,545	100%	DW	Drinking Water Transmission and Distribution
Easthampton	CW-14-13	Integrated Wastewater Resource Management Plan	\$1,090,800	100%	CW	Planning
Everett	CW-08-14-A	Stormwater Illicit Discharge Detection	\$55,428	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Everett	CW-14-24	Storm Water/Sewer Evaluation	\$500,000	100%	CW	Planning
Falmouth	CWP-14-23-A	Sewer Extension and New Recharge Site	\$15,694,054 ²	100%	CW	Collector and Interceptor Sewers
Falmouth	DWP-15-02	Long Pond Water Treatment Facility	\$15,320,673	100%	DW	Drinking Water Treatment
Fitchburg	CWP-13-01-A	Combined Sewer Separation Area 4D	\$1,215,860 ²	100%	CW	Combined Sewer Overflow Correction
Gardner	CWP-15-21	Wastewater Treatment Plant Upgrade	\$4,352,204	100%	CW	Wastewater Treatment
Grafton	CW-15-14	Wastewater Treatment Plant Improvements	\$14,613,300	100%	CW	Wastewater Treatment
Great Barrington	CWP-15-24	Wastewater Treatment Facility Upgrades and Sewer Improvements	\$4,562,663 ²	100%	CW	Wastewater Treatment
Haverhill	CWP-14-15	CSO Improvements, Wastewater Treatment Facility and Sewer System	\$8,276,762	100%	CW	Combined Sewer Overflow Correction
Lawrence	CW-14-16	Sewer System Rehabilitation	\$8,978,897	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Lawrence	CW-13-13	CMOM Program and Sanitary Sewer Evaluation Survey	\$3,840,000	100%	CW	Planning
Lowell	DWP-13-03	Meter Replacement and AMR System	\$30,610 ³	100%	DW	Drinking Water Transmission and Distribution
Lynn Water and Sewer Commission	DW-13-19	Low Service Reservoir Improvements	\$1,297,810	100%	DW	Drinking Water Source and Storage
Manchester by the Sea	DW-14-03	Water System Improvements	\$1,440,000	100%	DW	Drinking Water Transmission and Distribution
Manchester by the Sea	CW-14-31	Comprehensive Wastewater Management Plan	\$234,450	100%	CW	Planning
Mashpee	CW-00-50-C	Comprehensive Wastewater Management Plan	\$78,035 ²	100%	CW	Planning
Middleborough	CWP-14-32	Wastewater Treatment Facility Upgrades	\$24,346,341	100%	CW	Wastewater Treatment
MWRA	CW-15-27	Combined Sewer Overflow Phase 16	\$3,038,178	100%	CW	Combined Sewer Overflow Correction
MWRA	DW-15-13	Low Service Storage	\$7,474,691	100%	DW	Drinking Water Source and Storage

Footnotes

¹ Series 20 projects have been fully drawn and will no longer appear in Green Bond reporting. All Amount and Loan Drawn sections are accurate as of July 31, 2020.

² Amount was reduced following the completion of the project. Excess funds were reallocated to additional green projects and are listed within the Series 20 table.

³ Amount reflects Series 20 Bond proceeds reallocated from excess funds of completed Series 20 projects.

Appendix C - Series 20 Projects¹

Borrower	Loan No.	Project Name	Amount	Loan Drawn	Program	Category
MWRA	DW-15-12	Lower Hultman Aqueduct Rehabilitation	\$516,897	100%	DW	Drinking Water Transmission and Distribution
MWRA	DW-15-04	Wachusett Aqueduct Pump Station	\$12,404,988	100%	DW	Drinking Water Transmission and Distribution
MWRA	DW-15-14	Weston Aqueduct Supply Mains and Sec 36/101	\$4,419,689	100%	DW	Drinking Water Transmission and Distribution
MWRA	CW-15-30	Caruso Pump Station	\$2,031,614	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
MWRA	CW-15-32	Clinton Wastewater Treatment Plant Phosphorous Removal	\$2,496,267	100%	CW	Wastewater Treatment
New Bedford	DWP-14-05	Transmission Main Improvements	\$4,466,812	100%	DW	Drinking Water Transmission and Distribution
Norwood	CWP-15-08	Underdrain Area Sewer Rehabilitation	\$2,212,267	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Plainville	DWP-15-09	Tank Rehabilitation	\$635,983 ²	100%	DW	Drinking Water Source and Storage
Revere	DWP-13-09	Water Meters Automatic Meter Reading System	\$6,370,373	100%	DW	Drinking Water Transmission and Distribution
Revere	CWP-15-29	Sewer Rehabilitation	\$10,340,270	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Revere	CW-13-14	Capacity Management Operations and Maintenance Program Program	\$300,000	100%	CW	Planning
Revere	CW-14-25	Illicit Connection Detection Program	\$700,000	100%	CW	Planning
Revere	CW-15-19	Illicit Connection Detection Program	\$800,000	100%	CW	Planning
Revere	CW-14-11	Comprehensive Wastewater Management Plan/CSMP Supplemental Plan	\$1,200,000	100%	CW	Planning
Revere	CW-15-18	Sanitary Sewer Evaluation Survey	\$1,700,000	100%	CW	Planning
Springfield Water and Sewer Commission	CWP-14-27	Dickinson Siphon/Main Interceptor Rehabilitation	\$3,054,020 ³	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Stockbridge	DW-15-08	Water System Improvements	\$1,771,785	100%	DW	Drinking Water Source and Storage
Taunton	CW-14-26-A	Sanitary Sewer Evaluation Survey Phases 10-12	\$4,246,535 ²	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Taunton	CWP-13-18-A	Sanitary Sewer Evaluation Survey Phases 10-12	\$95,249	100%	CW	Infiltration/Inflow and Sewer System Rehabilitation
Uxbridge	DW-14-12	Rt. 122 Water Main Replacement	\$2,499,192	100%	DW	Drinking Water Transmission and Distribution
Uxbridge	CW-16-26	Wastewater Treatment Facility - BNR and Infrastructure Upgrade	\$2,628,303 ³	100%	CW	Wastewater Treatment

Footnotes

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³ Amount reflects Series 20 Bond proceeds reallocated from excess funds of completed Series 20 projects.



MASSACHUSETTS
CLEAN WATER TRUST

2020 GREEN BOND REPORT

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Massachusetts Clean Water Trust

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