ANNUAL REPORT **FY2017**

Investing in the Future

Cobble Mountain Reservoir | Granville, MA

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Mission Statement

Our mission is to provide an adequate, uninterrupted, high-quality supply of water to our customers, to collect and treat wastewater, and return clean water to the environment.

While fulfilling our mission, we strive to:

- Conserve and protect our reliable, high-quality water supply for present and future generations
- Meet or surpass public health standards, environmental standards, and support fire protection
- Operate, maintain, improve and manage our water and wastewater infrastructure in a cost-efficient manner
- Manage finances to support Commission needs and maintain reasonable water and wastewater rates
- Maintain an adequate, safe, and professional workforce
- Understand and respond to customers' expectations for service

Message From the Commissioners

The Commissioners are pleased to present Springfield Water and Sewer Commission's Fiscal Year 2017 (FY17) Annual Report, which covers July 2016 through June 2017. As always, our mission is to deliver the highest-quality water and sewer service to our customers at affordable rates, while maintaining public health and environmental quality. In FY17, we continued to fulfill that mission, delivering over 10 billion gallons of drinking water to our customers, and returning over 12 billion gallons of clean water back into the environment. This document highlights the hard work that went in to keeping the clean water flowing in FY17.

Despite this success, decades of national and state underinvestment have resulted in a need for significant renewal of the Commission's water infrastructure – renewal that can no longer wait. As of 2017, 44% of the Commission's water and sewer pipes were over 75 years old, and 25% of those were older than a century. The Commission is also committed to ensuring that all necessary infrastructure investment is balanced with maintaining affordable rates and uninterrupted service. In FY17, the Commission advanced strategic plans and policies that directly addressed the challenging era into which the Commission is entering, with the goal of building long-term sustainability for the system and our customers.

Proactive planning is the Commission's approach to ensure ratepayer dollars are invested strategically, and to extend the life of existing infrastructure whenever possible. For example, during the previous fiscal year, the Commission completed Phase 1 of the Facilities Plan for the West Parish Filters Water Treatment Plant. Several projects related to safety and enhancing the long-term resiliency of the 1974 plant were recommended as an outcome of that process, and their implementation in FY17 bolstered the aging treatment plant for continued service. Planning at the treatment plant now continues to Phase 2 to identify the treatment and capital investment upgrades necessary to meet upcoming regulatory changes.

The Commission also adopted several new financial policies in FY17, with a goal of establishing long-term financial sustainability and accountability. The benefits of implementing these financial policies have already been realized, as they resulted in an upgrade to the Commission's bond rating by Standard & Poor's, which will save Commission customers an estimated $2.43 million in borrowing costs over the next 12 years. With the projected level of needed reinvestment in our systems, financial strength and stability is fundamental to the Commission's ability to continue to provide our critically important services.

Through the accomplishments and progress achieved in FY17, the Commission is well positioned to meet the challenges of the future. As illustrated throughout this document, informed, targeted investment, and a commitment to our current and future customers, is how the Commission aims to steadily and responsibly steward our century-old water and wastewater system into the 21st century.

From left to right: *Commissioner William Leonard, Commission Chairwoman Vanessa Otero, and Commissioner Dan Rodriguez.*

Message From the Executive Director

Executive Director Joshua D. Schimmel

If you have any questions about the content of this report, please contact the Commission at 413-452-1300.

Reflecting on this first full fiscal year as executive director, I am proud of the hard work and dedication that Commission staff performed in delivering the highest quality water and sewer services to our 250,000 customers in the lower Pioneer Valley. It is my fundamental belief that accountability to our present and future customers should drive everything we do at the Commission. This is particularly important in an era of little to no federal or state investment in water infrastructure. For that reason, as Commission staff complete daily projects – no matter how ordinary – we are incorporating a vision of the future into our work.

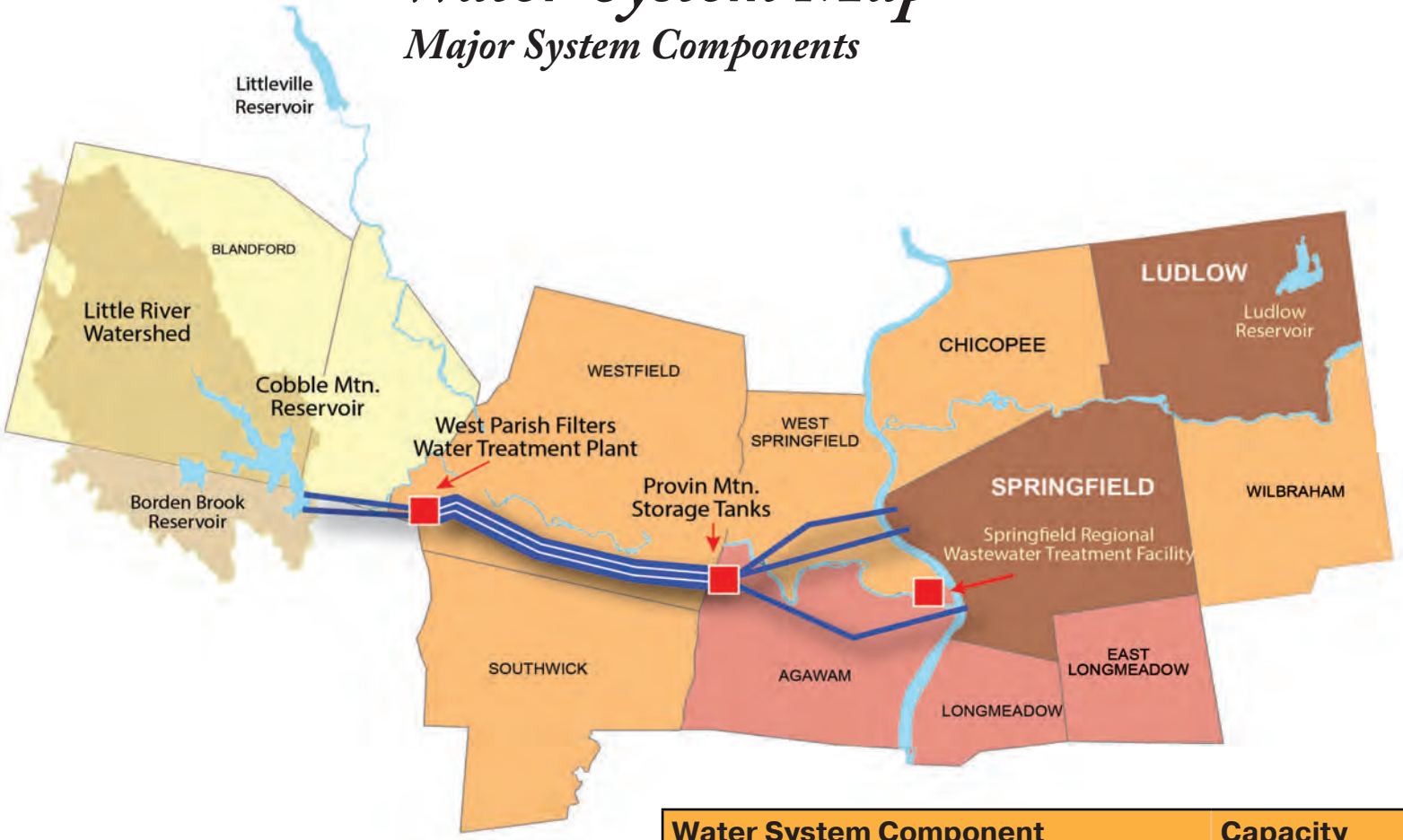
As an example, in FY17, the Commission made strategic investments in geographic information system (GIS) mapping technology to capture specific data – such as types and locations of water main breaks, response times, and locations and durations of service loss – to support various new performance metrics. This provides powerful analytics that will help prioritize capital investments and achieve gains in operational efficiency and risk mitigation.

In FY17 we also kept our focus on the future by replacing deteriorating power transmission towers in extremely difficult terrain at the Cobble Mountain Hydro-Electric Power Plant. This will sustain our ability to generate environmentally friendly energy for the grid. Meanwhile, the years-long work of rehabilitating the Main Intercepting Sewer project neared completion in FY17, giving another 50-75 years of life to the critical pipe, while design of the new York Street Pump Station and Connecticut River Crossing advanced significantly. This project will replace a key but aging pumping station as well as add redundancy to the two existing sewer mains that run under the Connecticut River, and will also reduce combined sewer overflows. In addition to these forward-looking projects, the Commission continues to strategically renew "everyday" water and sewer infrastructure. In FY17, a total of 15,087 feet of water and sewer mains – close to three miles – was replaced or rehabilitated.

As we move ahead to adapt the Commission to new challenges and demands, we build on, respect, and learn from the work of previous generations, which designed and built the water and sewer systems that drive the growth of this region to this day. A reminder of this came in the summer of 2016, when an extreme drought took hold in New England. By November, Cobble Mountain Reservoir reached 65% capacity, but no water restrictions were necessary. This was due to the visionary design and construction of the 1930s-era water supply system, but also to the proactive work Commission staff undertake daily to manage water resources through land protection, capital improvements, and planning. Through our innovation, investments, and stewardship, we are committed to honoring and advancing the Commission's legacy and vision into the future.

Water System Map

Major System Components



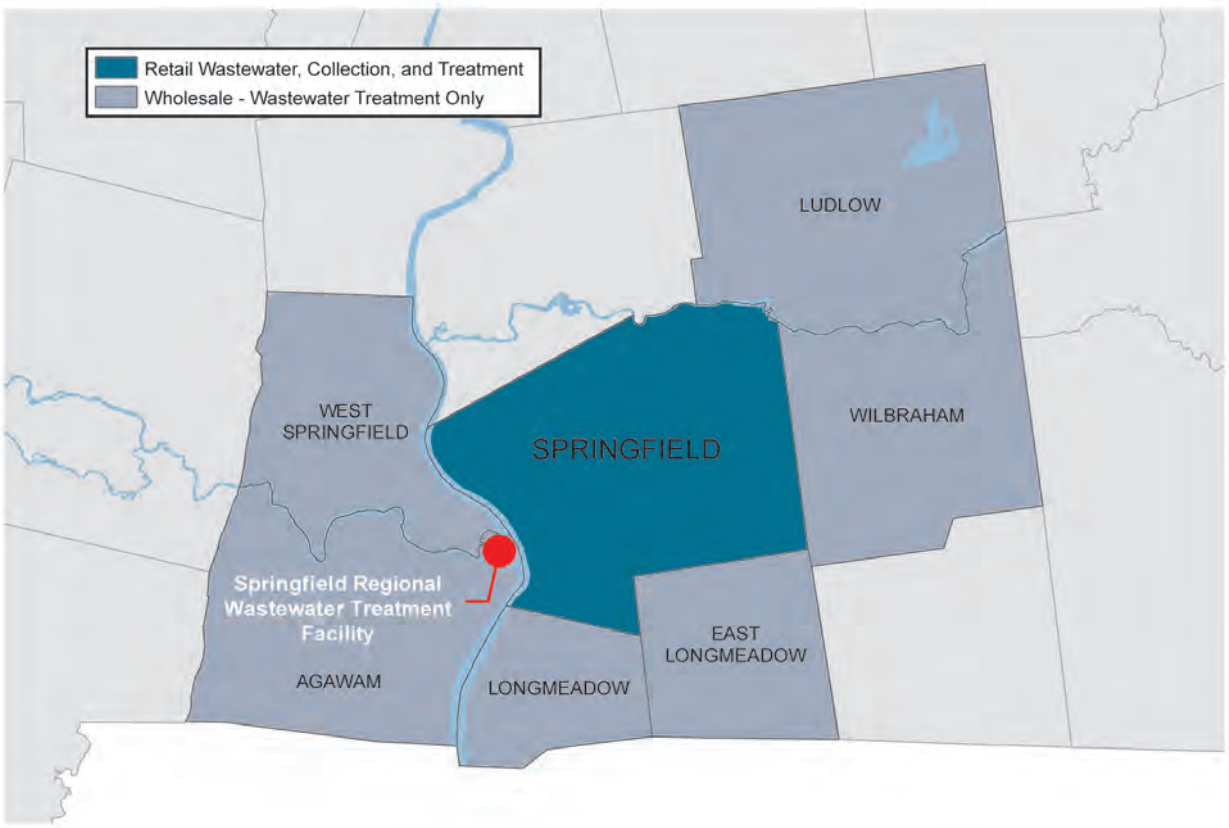
Retail Water Communities

Wholesale Water Communities

Peak Emergency Water Communities

Water System Component	Capacity
Cobble Mountain Reservoir	22 Billion Gallons
Springfield Water Distribution System	500 miles of pipe
Ludlow Water Distribution System	80 miles of pipe
Borden Brook Reservoir	2 Billion Gallon Capacity
Ludlow Reservoir (Standby System)	2.2 Billion Gallon Capacity
Provin Mountain Storage Tanks	60 Million Gallon Capacity
West Parish Filters Water Treatment Plant	100 Million Gallons/Day

Wastewater Service Communities



Wastewater System Component	Capacity
Springfield Regional Wastewater Treatment Plant	67 Million Gallons/Day
Sewer Collection System (Springfield)	450 miles of pipe

Investing in the Future

The Commission oversees an extensive water and wastewater system that dates back to the late 1800s in many locations. The longevity of the system speaks to the foresight, engineering ability, and craftsmanship of previous generations, and the Commission takes its role as a steward of the system for the future seriously and with pride. Aging water and wastewater infrastructure presents significant challenges, and even in the absence of federal and state funding, capital improvements can no longer be deferred. Therefore the Commission is committed to ensuring that each investment in infrastructure renewal is thoroughly planned, prioritized, and maximized to meet multiple goals with ratepayer dollars. The below list highlights the extent of the Commission's capital investments in FY17:

Capital Investments FY17

- $1.1 million in electrical distribution upgrades at SRWTF
- $9.7 million in the Main Interceptor Project
- $200,000 in hydrant projects
- $800,000 in meter replacements
- $2 million in York Street and Connecticut River Crossing project design
- $3.1 million in sewer main rehabilitation projects
- $2.5 million in transmission system rehabilitations
- $2.6 million in collection system assessment and rehabilitation
- $2.1 million in distribution system assessment and rehabilitation

Above: *The Cobble Mountain Hydro-Energy Power Plant, located in Granville.*

Regional Economic Development

Any type of project, ranging from single-family home construction to an entirely new factory, requires water and sewer service. The Commission's Engineering and Technical Services (ETS) group is charged with protecting the integrity of the water and sewer system as new connections are made. In FY17 there were 55 residential and 31 commercial projects reviewed, including Pope Francis High School, the new American International College Exercise Science Building, and MassDOT's North End Pedestrian Underpass Project. In addition, in FY17 ETS performed 2,363 utility markouts, of which 346 were for emergencies.

Above: *The new raw water inlet chamber is installed at West Parish Filters. The chamber modulates water flow into the treatment plant.* ***Below:*** *The new emergency shower chamber at West Parish Filters.*

Cobble Mountain Hydro-Power Plant

The Cobble Mountain Hydro-Power Plant in Granville turns stored water at the Cobble Mountain Reservoir Dam into green energy as water is transported to the Commission's West Parish Filters Water Treatment Plant. The generated power is sold to the ISO New England electricity market. In FY17, plant output was 11,300 Megawatts, worth $1.6 million in revenue and enough to power 1,600 homes. While Holyoke Gas & Electric (HG&E) operates the plant under a ten-year contract, the Commission still controls and limits the amount of water available for power generation to ensure safe-yield water storage under various conditions.

Six aging transmission poles associated with the power plant were replaced in FY17. The project required innovation due to the steep terrain and underground penstocks (water transmission pipes) in the area. A helicopter was used to facilitate the pole removal in order to eliminate the need for heavy vehicles and protect both personnel and utilities. In addition, in FY17 an inlet valve at the generation unit was removed and rehabilitated.

West Parish Filters Facilities Plan

The first phase of facilities planning for the West Parish Filters Treatment Plant was completed in FY17. In particular, a measurement system for the level of organic substances in raw and filtered water was calibrated to begin illustrating the formation of disinfection by-products in the transmission, storage, and distribution system. Best practices for chlorine use, treatment capacity, water quality parameters, and the performance of the slow and rapid sand filters were also examined. Work completed under Phase I is the foundation for the upcoming Phase II facilities planning process, which will address treatment process optimization and continued regulatory compliance.

Improvements at West Parish Filters in FY17 were high-priority projects based on the recommendations of Phase I. An inlet modulating valve was replaced with an upgraded valve with advanced SCADA capabilities and less energy consumption, which allows for better modulating operation and lower energy costs. Other improvements were made to the chemical containment areas by replacing day tanks and metering pumps, and an emergency shower chamber was installed for added safety near the chlorine facility.

Provin Mountain Reservoir No. 1 Decommissioning

Due to water quality and service life considerations, the underground Reservoir No. 1 at Provin Storage Facilities was decommissioned. The reservoir tank is the oldest of the four at Provin, dating from 1909, and has reached the end of its service life. Taking the tank offline also reduces water detention time, thus assisting with meeting disinfection byproduct regulatory compliance.

Dams and Reservoirs

The Commission oversees and maintains 10 dams, ranging in ages dating from the late 1800s to the 1960s. The Commission's Dam Operations & Maintenance (O&M) Program directs regular maintenance and inspections of its dams.

Above: *The Intake Dam Road was widened to allow for better maintenance and emergency access.*

In FY17, vegetation control took place at slopes and spillways, and dam-specific O&M manuals were updated. Additionally, the Commission widened the Intake Dam Road to 14 feet, reduced steep slopes, and installed a drainage system along the road. These improvements allow access for construction or emergency equipment as needed.

Main Interceptor Rehabilitation and Combined Sewer Outfall Project

The Main Interceptor Sewer (MIS) carries more than 60% of the wastewater flows from the City of Springfield to the wastewater treatment plant on Bondi's Island. Inspection of the MIS through the Asset Management and Maintenance Program identified the need for immediate rehabilitation in order to maintain reliability of service. The project consists of repairing three combined sewer outfall structures and rehabilitating 3,200 feet of 60- and 66-inch diameter sewer pipe and associated manholes, and is approximately $23.4 million in cost. In FY17 the project neared completion with the restoration of the headwalls of three combined sewer outfalls and final lining of sewer lines. The project completion date is February 2018.

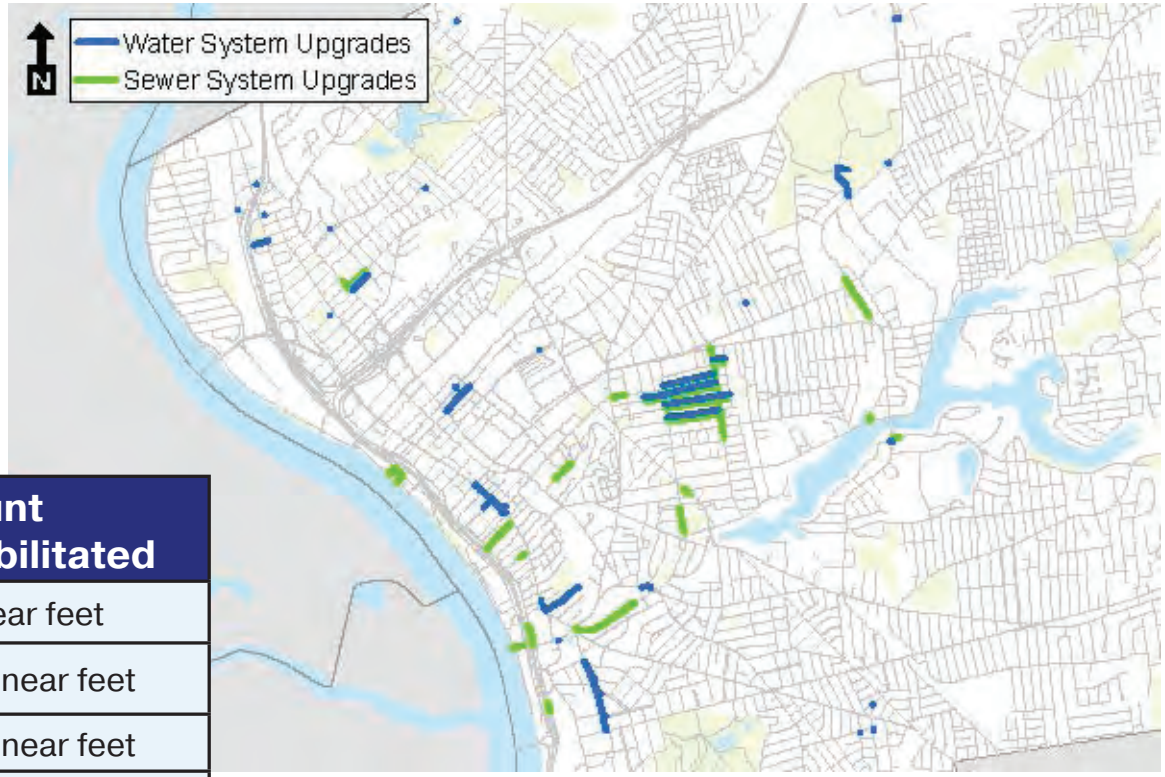
York Street Pump Station and Connecticut River Crossing Project

In FY17 design work progressed to replace an aging pump station on York Street in Springfield, and to add three new sewer lines across the Connecticut River. The new pump station will be able to send an additional 30 million gallons/day of wastewater to the treatment plant at Bondi's Island, reducing combined sewer overflows into the Connecticut River. The existing pump station will then be repurposed for flood control only. The new sewer lines will add resiliency and redundancy for the two existing sewer lines, allowing for the shutdown of a line for maintenance or emergencies. The project is estimated to cost $100 million and construction is expected to begin in spring 2019.

Infrastructure Improvements

In 2009, the Commission initiated the Asset Management and Maintenance Program to assess, map, and clean the wastewater collection system. Since then, the majority of the wastewater system has been assessed, and the Infrastructure Improvements Program now makes annual infrastructure upgrades based on a prioritized list that ranks wastewater assets by their condition along with risk and consequence of failure. Whenever possible, the Commission also coordinates necessary water distribution system upgrades in the same locations to minimize disruption to the city. In FY17, projects completed under the 2016 and 2017 Infrastructure Improvements Program resulted in 2.8 miles of rehabilitated or replaced underground infrastructure, along with other assets.

Water & Sewer System Upgrades



FY17 Project Type	Amount Rehabilitated
Drain pipe installed	190 linear feet
Sewer pipe installed	3,763 linear feet
Sewer lining installed	4,563 linear feet
Water main pipe installed	4,753 linear feet
Water service pipe installed	1,148 linear feet
New hydrants installed	3
New catch basins	2
New valves	56
New manholes installed / rehabilitated	37

The chart at left and map above describe the water and sewer main rehabilitation and replacements that were completed in FY17 through capital and operations funding. Additional upgrades took place in Ludlow (not shown).

Watershed Protection

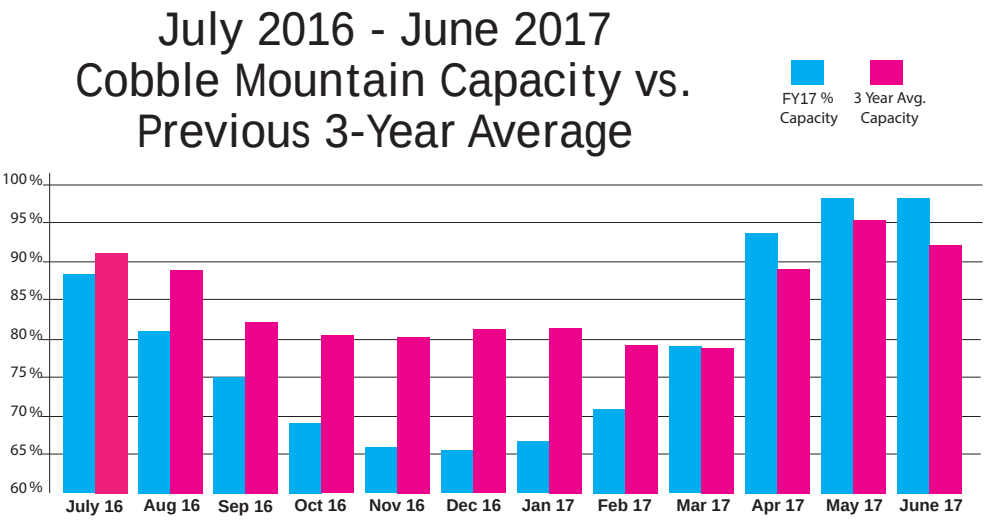
Watershed Overview

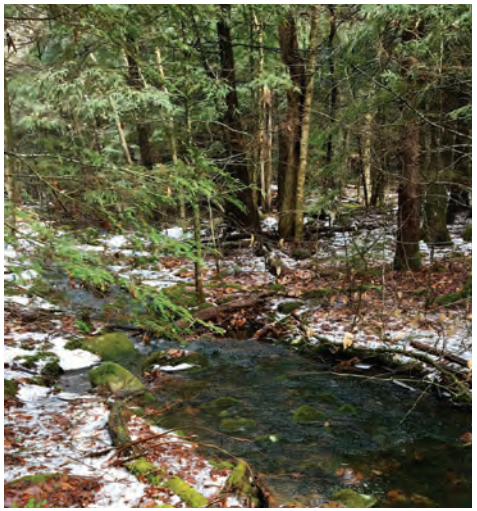
The Commission's drinking water is collected and stored in two primary reservoirs: Borden Brook and Cobble Mountain, both located in Granville, Blandford, and Russell. Water from these reservoirs flows to the Intake Reservoir and then to West Parish Filters Water Treatment Plant in Westfield. The land surrounding and upstream of the reservoirs is known as the Little River Watershed.

The Little River Watershed is comprised of 31,000 acres (48.5 square miles) of mostly rural forested landscape. Approximately 47% of the land in the Little River Watershed, which feeds Cobble Mountain and Borden Brook Reservoirs, is owned by the Commission for water supply protection purposes. An additional 10% is protected by public and non-profit land conservation organizations. The Commission has an active land acquisition program, since land protection is the best approach to reducing the susceptibility of water supplies to contamination.

Protected forest land is an important element in the water treatment process, as it naturally buffers the reservoirs from potential contaminant sources such as road runoff, agricultural operations, waste disposal, or general development. Forest land also captures, filters, stores, and releases rain water in a renewable manner that helps keep the reservoir's supplies plentiful in most conditions. In FY17 a severe drought emerged in Massachusetts, but Cobble Reservoir remained at 65% capacity due its size (22 billion gallons), the extensive network of springs and other waterways that feed into it, and the Commission's proactive management efforts.

Though protected watershed land provides immense passive value by reducing the amount (and cost) of treatment the water needs to undergo, the land must be actively managed to maintain forest health, address encroachments, and





Above: *Perennial streams flowing in the Little River Watershed.*

prevent sources of contaminants. In FY17 the Commission hired a new Water Resources Manager and began reviewing and updating several watershed plans to bring them into alignment with current best management practices.

Source Water Protection Plan

The Source Water Protection Plan for the Little River Watershed was updated in May 2017. The document identifies potential threats to source water quality and provides monitoring protocols or mitigation measures to address them. It also allows the Commission to set goals, actions, and timelines to achieve watershed protection. By completing a Source Water Protection Plan, and based upon a watershed inspection, MassDEP granted the Commission a credit towards meeting the Federal Surface Water Treatment Rule of 99.9% total inactivation of Giardia cysts.

Forest Management Program

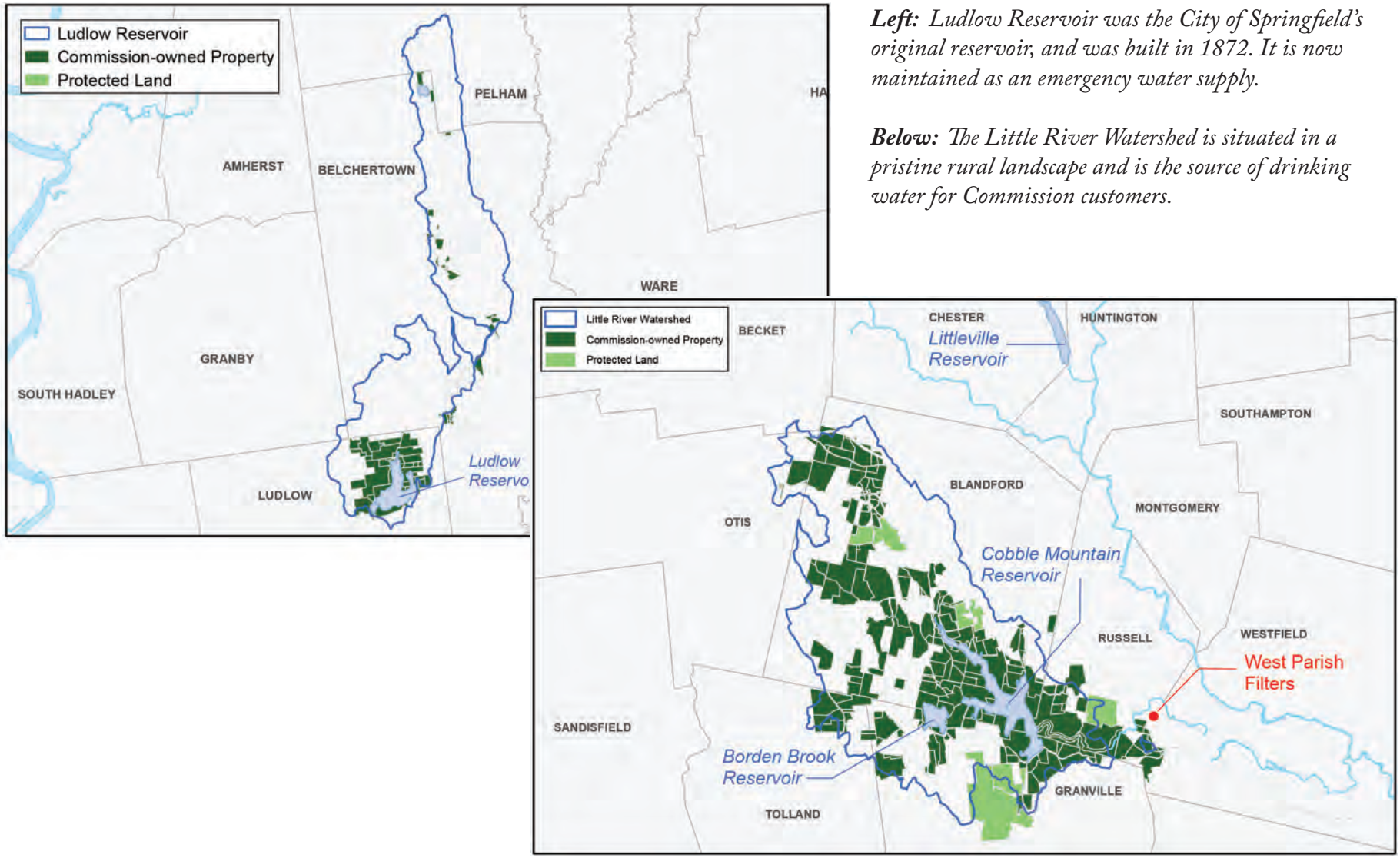
Forest management is a large component of the Source Water Protection Plan. A comprehensive review of the Commission's forestry program was conducted in FY17 and found that existing forest management plans dating from 1981 and 2004 must be updated to reflect current forest management concepts. Today's goals for a forest management program include minimizing interference with forest regeneration such as invasive species, pests, pathogens, and browsing pressure from deer and moose so that the forest may continue to provide fundamental source water functions. Current challenges facing the Commission's watershed include overcrowding in some stands, an even-age distribution of trees, as well as a need for more detailed maps. These issues will be addressed in a series of forest stewardship plans. The Middle Brook Forest Stewardship Plan, which will commence in FY18, will serve as a prototype for all future forest stewardship plans and plantation assessments.

Ludlow Reservoir

The Ludlow Reservoir was Springfield's first water supply, developed in 1872. Today the Commission maintains it as an emergency water supply and recreational resource for the public. In FY17, 24,282 recreational visitors utilized the land around Ludlow Reservoir.

Above: *The dock at Ludlow Reservoir.*
Below: *Ludlow Reservoir Trail in winter.*

Watershed Lands

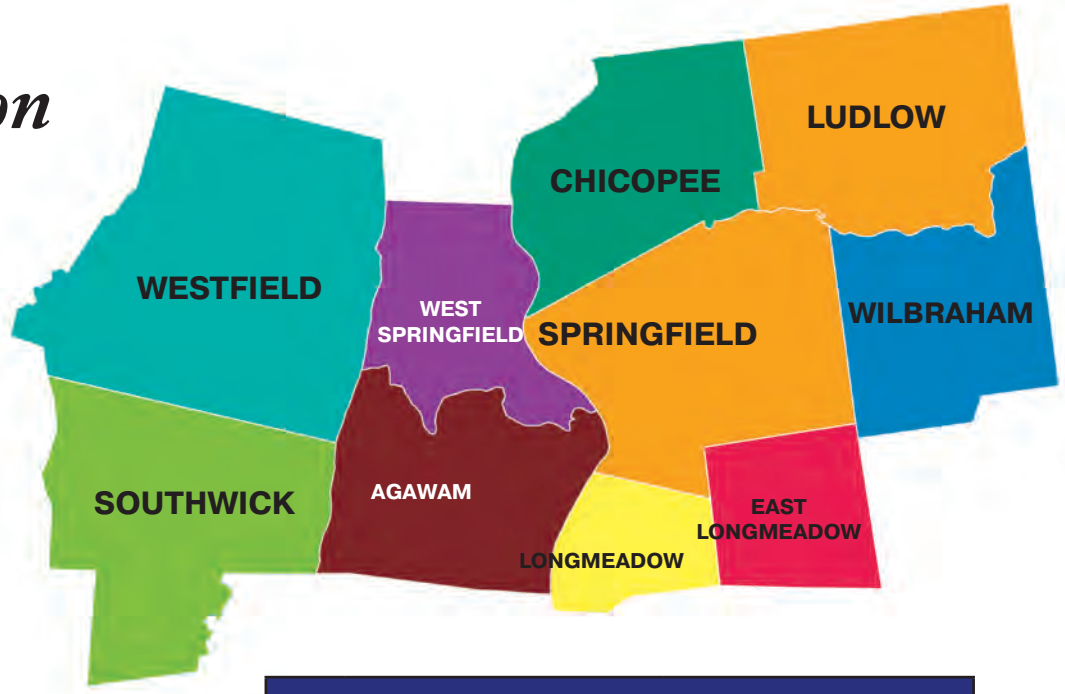


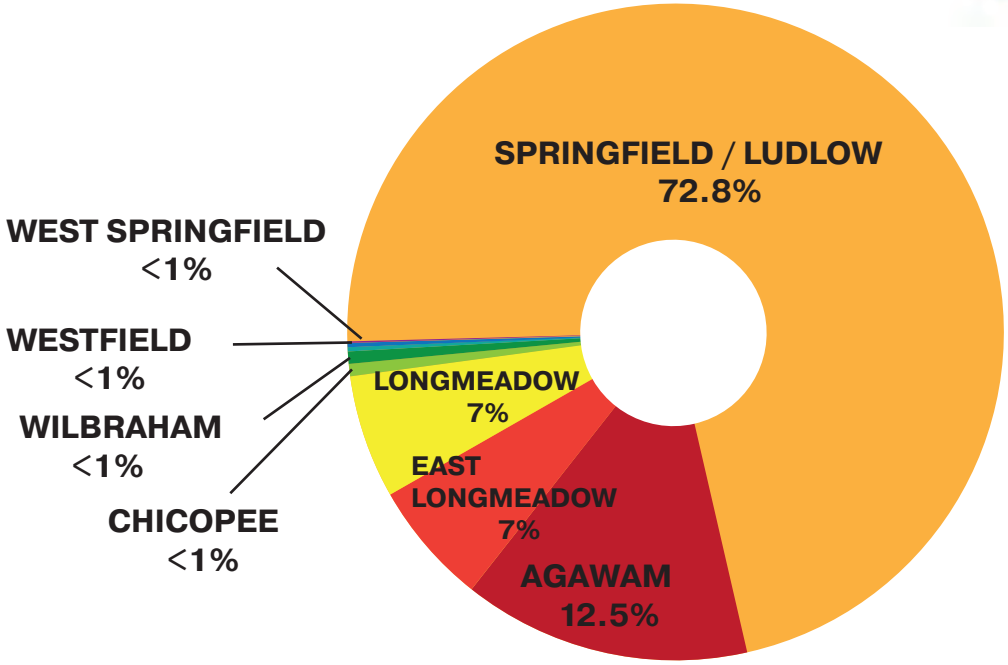
Left: *Ludlow Reservoir was the City of Springfield's original reservoir, and was built in 1872. It is now maintained as an emergency water supply.*

Below: *The Little River Watershed is situated in a pristine rural landscape and is the source of drinking water for Commission customers.*

Water Supply & Consumption

Approximately 250,000 residents depend on the Commission on a daily basis for their drinking water, including retail customers in Springfield and Ludlow, and wholesale customers in Agawam, East Longmeadow, and Longmeadow. In addition, there are small amounts of retail customers in some areas of Westfield, Chicopee, and Wilbraham. Other public water system customers in Southwick, Westfield, West Springfield, Chicopee, and Wilbraham also depend on the Commission for partial, peak, or emergency water supply. In FY17, Commission customers used 10.1 billion gallons of water.





FY17 Water Consumption By Town (Gallons)	
Agawam	1,262,490,000
East Longmeadow	716,233,000
Longmeadow	734,211,000
Southwick	17,312,000
West Springfield	1,000
Westfield	1,406,000
Wilbraham	14,125,000
Chicopee	12,820,000
Springfield/Ludlow	7,381,052,000
Total Consumed	10,139,650,000

Water Treatment

Water draining from the forested streams and springs into Borden Brook and Cobble Mountain Reservoirs is treated at the West Parish Filters Water Treatment Plant in Westfield. Slow sand filters were first constructed in 1909, and the plant has undergone numerous upgrades since, including the construction of a new direct filtration treatment facility in 1974.

Water is treated in the 40 million gallons-per-day (GPD) slow sand filters (in service since 1909) or 60 million GPD rapid dual-media filters to remove organic impurities and particles. The pH is then adjusted and corrosion inhibitors are added to protect against the leaching of lead and copper in home plumbing. Chlorine is also added for the disinfection of any pathogens (such as typhoid and cholera) before flowing into transmission mains and on to customers.

Water Treatment Plant Master Planning

Though some of the fundamentals of water treatment remain in place since the plant first opened in 1909 – the use of sand filters and chlorine, for example – advanced scientific knowledge, regulatory changes, and evolving environmental conditions require proactive adaptation and innovation at the treatment plant. In this context, the absence of any federal or state funding to upgrade aging water infrastructure presents a significant challenge. But the Commission recognizes it must move ahead to renew its water plant and treatment processes to support its mission of delivering safe, reliable, and high-quality water.

In FY16, the Commission initiated and completed a comprehensive master planning process to evaluate the treatment plant for safety and resiliency (Phase 1) and prioritize upgrades. In FY17, several small projects were quickly completed to upgrade elements of the aging 1974 plant. Based on the recommendations from Phase 1, the Commission wrapped critical water pipes to arrest corrosion; installed a campus-wide alarm system for chlorine releases to protect employees and the surrounding area; rehabilitated a backwash pump; and replaced filter troughs, air nozzles, and actuators. Work on Phase 2 of the master plan began in FY18 and is focusing on treatment process upgrades needed for future regulatory compliance.

Treatment Upgrades

Since 2012, the Commission has periodically performed treatment trials to optimize the removal of organic matter, the reduction of which reduces disinfection byproduct (DPB) formation. In response to the Stage 2 DPB Rule, treatment trials using a new coagulant to capture and settle out organic substances took place in half of the rapid sand filters in the fall of 2016, moving on to a full plant trial through FY17. The results were successful with a documented reduction in organic matter. This treatment method will assist with the ongoing challenge of achieving compliance with the Stage 2 DPB Rule.

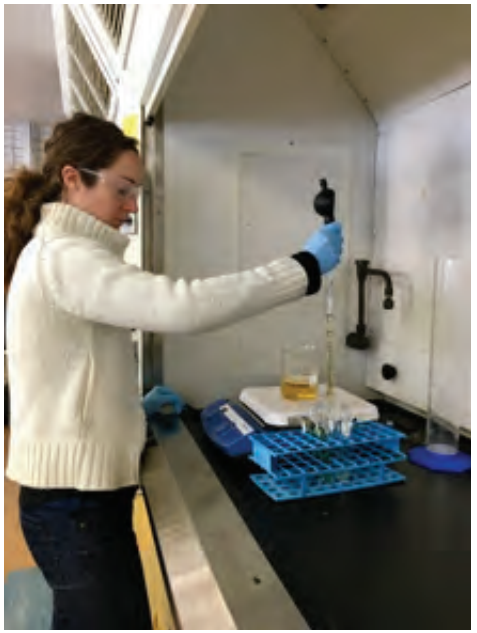
Customers in Springfield and Ludlow may have noticed increased hydrant flushing during the summer of 2017, which was part of an innovative strategy to optimize water quality and to reduce the amount of chlorine added to the water. As treated water ages in its journey from the treatment plant to the user, chlorine levels decrease, reaching the lowest levels in the outer reaches of the distribution system. Flushing hydrants in these areas pulls newer water to the outer limits faster. Staff at the West Parish Filters Treatment Plant coordinated closely with the Water Quality Group to orchestrate flushing based on daily sampling results. This strategy preserved safe chlorine levels without having to add more chlorine to the entire supply at the treatment plant.

Laboratory Services

The Commission monitors the effectiveness of the water treatment process using its on-site state-certified drinking water laboratory. In FY17, approximately 50,000 water quality tests were completed. Samples are collected and tested daily from water entering and leaving each treatment process at the water treatment plant, and throughout the distribution system. In addition, the laboratory performs bacteria testing on new water mains, water main extensions, and replacement water main projects.

The Commission is committed to protecting public health and to complying with all current and future federal health standards for tap water. In 2017 these included the Total Coliform Rule, the Stage 2 Disinfectants/Disinfection Byproduct Rule, and the Consumer Confidence Reporting Rule. The Commission was in compliance with all state and federal regulatory requirements in FY17. The laboratory completed a second round of sampling for the Long Term Enhanced Surface Water Rule 2, which looks for a microscopic parasite called *Cryptosporidium*. No evidence of the parasite was found in two years of monthly sampling.

The Commission will complete a round of tap water sampling for the Lead and Copper Rule in 2018.



Above left: *In FY17 the Commission acquired new equipment that enables testing for total trihalomethanes (THMs), which are byproducts from the disinfection process. The Commission can now test for THMs on a weekly basis in addition to the required quarterly testing. More frequent samples of THMs will allow for faster adjustments to the treatment process as necessary to keep THM levels in compliance.*

Above right: *A Commission lab employee makes the media for microbiology testing.*

Water Distribution

The three transmission mains, 598 miles of water mains, 19,322 valves, and 6,227 hydrants that deliver water to our customers in Springfield and Ludlow are owned and maintained by the Commission. Ensuring that safe and reliable water arrives to customer faucets and city hydrants – through infrastructure that dates from the 1880s in places – requires thoughtful planning for new infrastructure and extensive daily maintenance. The following activities are funded through the Commission's operations budget.

Storing and Conveying Treated Water

Commission staff stationed at Provin Mountain in Agawam oversee the four underground reservoir tanks that control water pressure and maintain adequate storage levels in the event of sudden large-scale water use. Staff also regularly inspect three high-pressure transmission mains that travel through Westfield, Agawam, and West Springfield to deliver treated water to customers. Staff, often assisted by watchful neighbors in those towns, also monitor the transmission main easements for leaks, encroachments, and excessive vegetation growth. In FY17 notable work included 4.5 miles of vegetation removal and the use of divers to move an aerating mixer from one tank to another at Provin Mountain.

Protecting Water Quality

The Commission's Water Quality Group (WQG) is responsible for ensuring that water remains moving through the distribution system as needed for service, safety, and water quality purposes. This includes exercising valves and inspecting and repairing hydrants, which is vital in the event that a main needs to be isolated to make repairs, or that a hydrant is needed to combat a fire. The WQG also cleans sediment out of mains through the Unidirectional Flushing (UDF) Program in order to increase water flow and reduce chlorine demand. In FY17 the WQG worked closely with engineers at the West Parish Filters water treatment plant to strategically flush hydrants to ensure that chlorine levels remained at consistent, safe levels throughout the 580-mile distribution system.

FY17 Water Quality Activities	
Hydrants Inspected	2,373
Hydrants Rebuilt/Repaired	355
Valves Exercised	3,488
Mains Flushed (UDF Program)	60 miles

Maintaining and Upgrading Water Infrastructure

The Commission's Water Construction Group (WCG) responds to maintenance needs for the water distribution system 24 hours a day, 7 days a week, and includes the Commission staff customers are most likely to see working in city streets on any given day. Their work includes responding to breaks in water mains or service lines, replacing aging water mains, repairing valves, rebuilding hydrants, or conducting restoration work such as repaving. Homeowners can also call on the WCG to assist with private water service line repairs, replacements, or inspections.

FY17 Water Construction Activities	
New Hydrants	19
Replacement Hydrants	120
New Valves Installed	212
Valves Replaced	26
Water Service Repairs/Replacements	111
Water Main Replaced (feet)	2008
Water Main Breaks Repaired	36

Measuring and Assessing Water Consumption

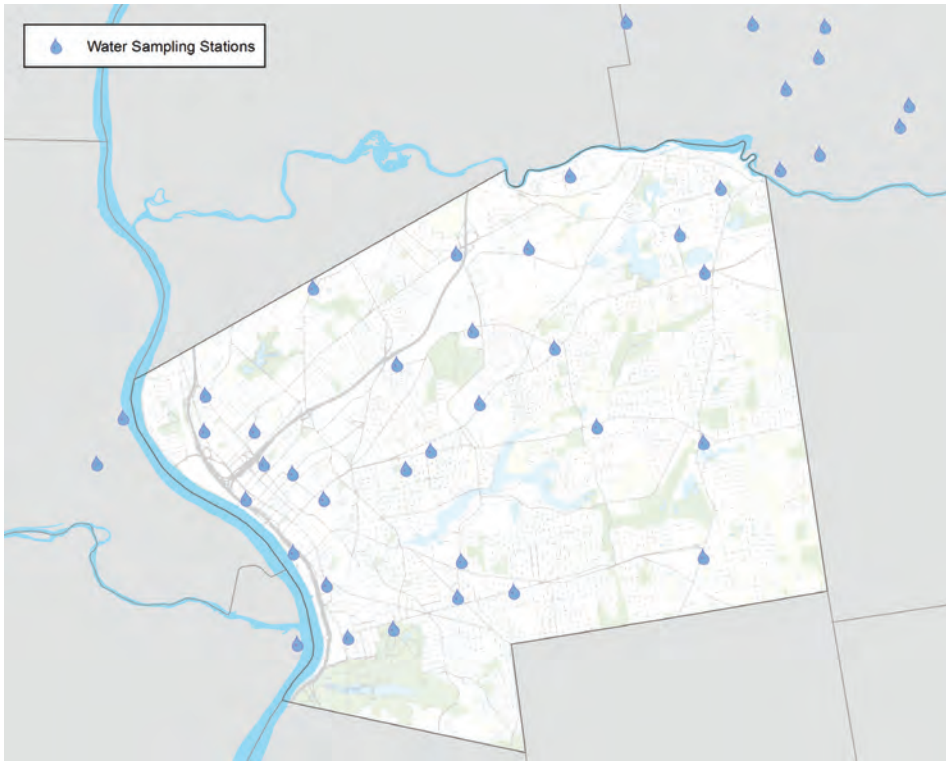
Water consumption is tracked by water meters in every retail customer's building, and this data is reported through radio signals collected by the Meter and Field Services Group (MFSG) on a monthly basis. Customers are most likely to encounter Commission MFSG members during appointments for meter change-outs, water consumption assessments, or various other water inquiries. Water consumption assessments are conducted if residential customers become concerned about high water usage. MSFG staff assess household water uses, check for leaks, and provide recommendations for leak repairs or water conservation techniques.

FY17 Meter and Field Services Activities	
Meters Installed (Primary & Secondary)	5,370
Water Consumption Assessments	404

Preventing Contamination

When a water line is connected to equipment or a system containing chemicals or water of questionable quality, there is a risk that a back-flow event (due to reduced water pressure) may draw these contaminants into the drinking water system. This situation is known as a cross connection, and the Commission adopted a Cross Connection Control Program in 1998 according to MassDEP regulations. The program involves inspecting commercial, industrial, or institutional plumbing for cross connection hazards, requiring the installation of backflow devices, and inspecting and testing all active devices (2,811 total at 840 locations in FY17) in the distribution system on an annual or semi-annual basis in order to protect the water supply.

FY17 Cross Connection Control Program	
Total Annual Tests Conducted	1,056
Total Semi-Annual Tests Conducted	1,755



Above: *The Water Quality Group maintains approximately 40 sampling stations for water quality testing throughout the distribution system in Springfield and Ludlow.*

Wastewater Collection & Treatment

Water flowing down customers' drains eventually makes its way as wastewater to the Springfield Regional Wastewater Treatment Facility (SRWTF), located on Bondi's Island in Agawam. The wastewater (sewer) collection system in the City of Springfield is owned and maintained by the Commission, while Agawam, East Longmeadow, Longmeadow, Ludlow, Wilbraham, West Springfield, and part of Chicopee maintain their own collection systems but send their wastewater to SRWTF. The SRWTF is one of the largest wastewater treatment facilities in New England and has a design capacity of 67 million gallons/day. In FY17, approximately 12.2 billion gallons of wastewater were treated, averaging 33.4 million gallons/day. Treated water is discharged from the SRWTF to the Connecticut River.

Springfield Wastewater Collection System Maintenance

The Commission is responsible for the operations, maintenance, and regulatory compliance associated with the 470-mile wastewater collection system in the City of Springfield. Commission staff perform maintenance, upgrades, and repairs to and provide emergency response services for the system and individual sewer service lines for 35,298 retail sewer accounts. Operations and maintenance of the Commission's 34 wastewater and flood control pumping stations, intercepting sewers (large transmission pipes to the SRTWF), and 23 combined sewer overflow outfalls is conducted by SUEZ Water Environmental Services, the Commission's contract operator.

As part of operations activities, the Commission's Sewer Group jets (cleans) sewer mains, clears sewer service line blockages to buildings, washes and cleans manholes, and flushes and clear siphons (which pull wastewater under roads, rivers, etc.). The Sewer Group also responds to customer calls 24/7, and assists with emergency backups or scheduled service line repairs and replacements.

Wastewater Collection System Asset Management and Maintenance Program

Investments in sewer system repairs or replacements are based on data obtained through the Wastewater Collection System Asset Management and Maintenance Program. The program conducts high-pressure cleaning, Geographic Information System (GIS) mapping, and visual assessment of the condition of sewer pipes and assets in the City of Springfield. These actions optimize system performance and allow the Commission to target problem areas for repair or rehabilitation in the system. Assessments involve closed-circuit, high-definition television robotic inspections, Sonar, and laser profiling. In FY17, 20,426 linear feet of sewer pipe were assessed through this program, totaling approximately 382 miles since the program began in 2008.

Above: *High-pressure cleaning of a sewer line through a manhole (seen at left in the picture) in the Sixteen Acres area of Springfield, April 2017.*

Above: *Grit, oils, grease, and other debris removed from the South Branch Sewer main in the Sixteen Acres area of Springfield, April 2017.*

FY17 Wastewater Collection System Activities	
Sewer Backup Responses	647
Sanitary Pipe Repairs	22
Residential Sewer Line Repairs	107
Cave-ins Repaired	554

Above: *The headwall of a combined sewer overflow outfall is reinforced as part of the Main Interceptor Sewer and Combined Sewer Overflow Outfall Improvements Project.*

Regulatory Compliance

The Commission's sewer system and the SRWTF are regulated by laws administered by the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP). Sanitary sewer overflows (SSOs) and combined sewer overflows (CSOs) are reportable events due to their potential impact on the environment, particularly water quality. The Commission takes a proactive and data-driven approach to minimize these occurrences. SSOs can occur due to sewer line disruptions, blockages, stormwater or groundwater infiltration, or other system defects. The Commission's Asset Management and Maintenance Program helps identify such problems to minimize SSOs. As a result, in FY17, there were 18 SSOs (compared with 122 in FY08).

CSOs are associated with Springfield's combined sewer system, a common feature in older cities. In Springfield there are 150 miles of combined sewer pipe. Combined sewers collect wastewater and stormwater, and in rainstorms the volume of the combined wastewater and stormwater can exceed pipe capacity. Combined sewer systems include outfalls that are designed to discharge this excess volume into waterbodies to prevent backups into basements and streets. Springfield has 23 combined sewer overflow outfalls that discharge into the Connecticut, Mill, and Chicopee Rivers. In 1994, EPA mandated the reduction of CSOs in cities nationwide, and since then the Commission has worked with EPA, DEP, and regional partners to reduce or remove CSOs while maintaining affordable rates. To date, the Commission has invested more than $100 million in its CSO reduction program, resulting in an approximate 30% volume reduction of CSO discharges. In FY17, the Commission lobbied for and received $687,500 in funding through the Commonwealth's 2014 Environmental Bond Bill for CSO projects including a flow regulator modification at five CSO outfalls and the design of the new York Street Pump Station.

Integrated Wastewater Plan

Since FY10, there has been no federal funding available to remediate CSOs, leaving local utilities and municipalities to find alternative sources of funding to meet these well-intentioned but extremely expensive EPA regulatory mandates. The Commission responded to this new fiscal environment in 2014 with its Integrated Wastewater Plan (IWP), one of only a handful of such plans in the nation that incorporate the CSO abatement program with a larger long-term Capital Improvement Program for wastewater functions, and a financial capability and affordability analysis to guide implementation. The IWP enables the Commission to better balance and adjust all wastewater infrastructure needs (not only CSOs) with an evolving regulatory and fiscal landscape over a timeframe of 40 years. The results are projects that

meet multiple objectives, such as CSO remediation along with renewal of aging infrastructure and system resiliency. Examples of such projects include the Main Interceptor Rehabilitation and Combined Sewer Overflow Outfall Improvements Project, which neared completion in FY17, and the Connecticut River Crossing and York Street Pump Station Project, which was under design in FY17.

Wastewater Treatment

SUEZ Water Environmental Services, Inc., is the contracted operator of the SRWTF and associated sewage and flood control pumping stations. In FY17, SUEZ completed its 17th year of a 20-year service contract with the Commission. This included day-to-day facility operations as well as overseeing the completion of energy efficiency upgrades to the Washburn Street Pump Station as well as upgrades to the power distribution system at the SRWTF.

Industrial Pretreatment Program

Industries that generate wastewater more contaminated than that of typical users are subject to federal regulation and local limits set by the Commission's Industrial Pretreatment Program (IPP). Examples include metal finishing, steam electric, laundry, and dairy facilities. This program aims to protect the collection system, treatment plant, and environment from harmful pollutants. IPP staff perform regular audits and inspections at relevant industries in all eight communities that use the SRWTF to ensure compliance with additional treatment requirements before discharging into the Commission's wastewater system. In FY17, 50 industries and 53 wastewater discharge permits were regulated under the IPP, representing an average of 5.9 million gallons/day, with 203 samples taken.

Above: *The aeration basins at the Springfield Regional Wastewater Treatment Facility.*

Technology Modernization

Along with maintaining century-old infrastructure, in FY17 the Commission made large advances on the deployment and integration of new 21st century technology to meet today's customer needs. This proactive approach will help the Commission deliver better water and better service to its customers, both by offering customer tools and portals, and by supporting Commission employees in carrying out their work.

In FY17, the Information Technology team partnered with the Customer Service and Finance departments to roll out a new online bill payment system, Paymentus, which also enables customers to track their water usage and billing. In the first three months of the rollout in FY17 (May-June), an average of 23% of account holders were paying by phone or online, reflecting in only a few months that the new system was responding to latent customer demand.

As the Commission's work becomes increasingly integrated with technology, the protection of customer data and Commission resources and assets is now a top priority. To ensure data security in FY17, new Payment Card Industry (PCI) security policies and network standards were adopted, and Customer Service staff were trained in security awareness and proper documentation techniques. In FY17 the Commission also invested in data governance and advanced intrusion detection and prevention technologies. Mobile field devices were also calibrated to prevent unnecessary downloads and applications to prevent network intrusions.

Mapping through geographic information systems (GIS) was expanded in FY17 in order to analyze customer input and support Commission staff in the field. GIS capacity was moved from Engineering into the Information Technology department to provide more synergy with all technological initiatives. The Commission's GPS team was also activated to begin collecting infrastructure location data to an accuracy of 2 centimeters.

Major FY17 GIS projects included the mapping of sampling stations and water quality results to support more effective maintenance of the distribution system and improve water quality, as well as a new critical customer map to help Commission staff expedite notification to schools, hospitals, etc., in the event of a water emergency. In addition, in FY17 all work orders and asset management became tied to the central GIS system, providing a powerful analysis tool for system investment decisions and the tracking and resolution of work orders. Commission staff are steadily making progress in digitizing all distribution system asset records, many of which are decades old and still hand-written.

In addition, in FY17 the IT team modernized its helpdesk software, better positioning Commission staff to communicate with employees, track and control change, and see trends and forecast growth. The helpdesk software is integrated with technology asset management and network monitoring systems, allowing for better insight into the network environment and detailed incident analysis. Such an integrated system protects Commission assets and customer data and enables smarter investment of ratepayer dollars.

Above: *Commission Information Technology / GIS staff collect GPS points of assets and boundaries located in the watershed.*

Below: *Upgraded server equipment was installed to better handle data storage and transmission across the Commission network.*

Education & Community

Behind every drop that leaves the faucet or makes its way down the drain, there is a vast collection of infrastructure and natural resources that the Commission manages and maintains to make it happen. These resources present a fascinating and important opportunity to engage with customers of all ages and to build an understanding of what it actually takes to deliver clean water. The Commission hosts ongoing educational programs throughout the year, since education is critical to the Commission's stewardship of the system for the future and also serves as a community benefit.

Springfield Public School students are frequent visitors to Commission facilities through two hands-on educational programs administered by local non-profit organization and Commission partner The World is Our Classroom (WIOC). The programs, "A Day at Bondi's Island" and "A Day at Cobble Mountain," bring fifth and seventh graders, respectively, to interactive educational visits to the Commission's treatment plants and watershed lands.

"A Day at Bondi's Island," operated at the Springfield Regional Wastewater Treatment Facility, provides day-long instruction to fifth-graders in physical, earth, and life sciences, as well as in technology and engineering design. The workshop, funded for the past 17 years by Suez Foundation in collaboration with the Commission and Springfield Public Schools, served 1,672 fifth grade students and 172 adults in FY17. During the visit, students tour the facility and receive instruction that follows the Massachusetts Science Curriculum Framework. The program is highly interactive, and includes a variety of activities designed to make scientific and technological learning engaging and relevant. Activities include a Scavenger Hunt game, which teaches about the makeup and operation of technological machinery, and Design Challenge, an engineering design exercise for which students are tasked with creating a wastewater treatment plant.

"A Day at Cobble Mountain" brought 792 seventh-graders and 73 adults in FY17 to Cobble Mountain Reservoir to learn about the watershed ecosystem, the interconnection between organisms, and the principles of safe and effective water management. The program is designed to improve students' science MCAS scores. Students are also able to see and interact with the source and treatment of their drinking water – 46 tours of the water treatment plant were conducted as part of this program in FY17. In addition to an enhanced understanding of environmental science, participants are also introduced to the wide variety of water-related careers available in their own backyard.

Beyond these educational programs, the Commission also hosts numerous tours of its drinking water and wastewater treatment plants to interested groups ranging from after-school clubs to social organizations.

The Commission *in* the Community

There is a lot happening in Springfield and Ludlow, and Commission staff enjoy being part of the action by providing free drinking water at concerts, festivals, or other events throughout the year. During the summer of 2017 the Commission provided a water fill-up station at 26 events, handing out 6,456 re-usable water bottles. Providing water at these events is a fun way for customers to meet staff and ask questions, and for our staff to make a personal connection with the customers we serve.

Opposite left: *Students visit the watershed surrounding Cobble Mountain Reservoir.*

Top right: *Students work on a classroom activity at the Springfield Regional Wastewater Treatment Plant.*

Bottom right: *Visitors receive a tour of the slow sand filters at West Parish Filters Treatment Plant.*

Customer Service

Questions about bill payments, concerns about leaks, inquiries about water quality, requests for service repairs, or reports of water and sewer emergencies – when any of these issues arise for our customers, the Commission's Customer Service (CS) group answers the call. From account balances to an in-progress emergency sewer backup, the Commission CS group is trained and experienced to handle any situation with professionalism, knowledge, and empathy. The CS group is divided into two teams but coordinates closely, covering accounts/billing and operations for over 42,000 accounts. In FY17, the two teams answered close to 64,000 calls, with 48% of them answered within 15 seconds or less.

The Commission knows that water and sewer service is essential to keeping business and day-to-day life flowing. So the CS group regularly goes above and beyond to work with customers to meet important timelines such as property closings or construction schedules, or to simply follow up after a disruption in water service has been restored. One of the greatest assets of the Commission's CS group is its experience and knowledge – many of those answering customer calls have been with the Commission for well over a decade, and thus can clearly communicate various situations to customers and offer reassurance in even the most stressful water or sewer emergencies.

The Commission also aims to assist customers and neighborhoods proactively, *before* the calls come in. The Commission's Leak Detection Program monitors customer accounts for unusual spikes or drops in activity. A sudden spike in winter, for example, may indicate a water leak. The CS group will try to contact the owner or, if unsuccessful, send a crew to check the property for signs of flooding. Sudden drops in water usage may indicate property abandonment, and in those cases the CS group will notify city authorities. In FY17, the CS group identified 426 accounts through the Leak Detection Program.

Above: *Accounts / Billing Customer Service Representatives (Bondi's Island, Agawam)*
Below: *Operations Customer Service Representatives (Colton Street, Springfield)*

Awards & Achievements

Standard & Poor Bond Rating Upgrade

The Commission's bond rating was upgraded to "AA Stable" from "AA- with Stable Outlook" in FY17. The Commission sells bonds to finance its Capital Improvements Program, which includes infrastructure improvement projects. The Commission's strong bond rating is significant because it translates to lower financing costs for these projects, a financial benefit to Commission customers. The Commission will realize a present value savings of $2.43 million over the next twelve years as the result of refinancing current outstanding bonds. Standard & Poor's based the rating upgrade on the Commission's continued strengthening and formalization of strong financial and operational practices and policies.

Comprehensive Annual Finance Report Award

The Commission is required to complete financial reports in accordance with Massachusetts General Laws Chapter 40N. But the Commission also opts to issue a Comprehensive Annual Financial Report (CAFR), which contains additional financial information over a longer period of time.

For the fourth consecutive year, the Commission was nationally recognized for its CAFR with a Certificate of Achievement for Excellence in Financial Reporting award from the Government Finance Officers Association, the highest form of recognition in governmental financing and accounting.

Executive Director Josh Schimmel Participates in White House Infrastructure Summit

In May 2017, Executive Director Josh Schimmel was invited to represent the Commission and the water sector in general at a White House Infrastructure Summit. The summit was held to find ways to reduce regulatory and permitting barriers to infrastructure projects.

Mr. Schimmel's recommendations regarding the financing of projects through the federal Clean Water State Revolving Fund was further advanced in discussions with EPA.

NACWA Gold Peak Performance Award

SUEZ Water Environmental Services, Inc., received a Gold Peak Performance Award from the National Association of Clean Water Agencies (NACWA) for zero permit exceedances in FY17 for the Springfield Regional Wastewater Treatment Facility.

Financial Analysis

The management of the Springfield Water and Sewer Commission provides this narrative overview of the financial activities of the Springfield Water and Sewer Commission for the fiscal year ended June 30, 2017 (FY17). A full accounting and analysis of all financial activities is available in the Commission's FY17 Comprehensive Annual Financial Report (CAFR), available on the Commission's website or by request.

Financial Highlights

The Commission ended the year with operating income of approximately $12.9 million. The following paragraphs give an overview of the year's activities.

It has been the practice of the Commission to establish its rates and charges for water and wastewater services at levels sufficient to produce revenues adequate to defray all operation and maintenance expenses, debt service and reserve deposits projected by the Commission's Consulting Engineers and to maintain net revenues available for debt service in excess of the coverage requirements mandated by the General Bond Resolution. Until fiscal year 2010, the Commission had historically adjusted its rates and charges for water and wastewater services on a basis which stabilized rates and charges over a multi-year period. Beginning in FY11, the Commission has adopted single-year rate schedules to more closely match revenues to expenditures.

In FY17, there was again an increase in collection efforts and an increase in rates, and in most cases, overall usage was more than anticipated. As a result, wastewater charges revenue and fees were approximately $180,000 more than budget. Wholesale water charges and fees were also more than budget by approximately $320,000. Power generation revenues were more than estimates by approximately $150,000. These and other factors resulted in total operating revenue of approximately $71 million in FY17, approximately $430,000 more than

SUMMARY OF NET POSITION			
YEAR		**2017**	**2016**
Current Assets	$	94,452,567	106,746,813
Non-Current Assets		2,840,055	2,948,216
Capital Assets		317,429,679	297,552,240
Total Assets		414,722,301	407,247,269
Deferred Outflows		83,682,679	84,918,426
Total Assets and Deferred Outflows	$	**498,404,980**	**492,165,695**
Current Liabilities		19,667,073	36,521,963
Non-Current Liabilities		250,985,194	238,558,430
Total Liabilities		270,652,267	275,080,393
Deferred Inflows		103,858,483	90,740,635
Total Liabilities and Deferred Inflows	$	**374,510,750**	**365,821,028**
Net Investment in Capital Assets		140,096,489	124,851,184
Restricted - Other Purposes		46,627,990	37,694,132
Unrestricted		(62,830,249)	(36,200,649)
Total Net Position	$	**123,894,230**	**126,344,667**
Operating Revenues		71,080,673	69,046,482
Operating Expenses		(58,206,763)	(58,405,991)
Operating Income	$	**12,873,910**	**10,640,491**
Non-Operating Revenues (Expenses)		(4,289,220)	(4,143,687)
Special Items		(11,035,127)	(328,509)
Increase in Net Position after Transfers	$	**(2,450,437)**	**6,168,295**
Beginning Net Position		126,344,667	120,176,372
Ending Net Position	$	**123,894,230**	**126,344,667**

budget, and $2 million more than the prior year.

Operating expenses were less than budget by approximately $2.8 million, primarily as a result of vacant positions and less overtime needed than anticipated. In addition, there was conservative budgeting for general operational expenses and debt service interest.

Financial Policies

In FY17 the Commission adopted several new financial policies with the intent of establishing long-term financial sustainability and accountability. The adoption of these policies was a contributing factor in the upgrade of the Commission's bond rating from AA- to AA.

New financial policies included the formalization and adoption of a planning and budgeting process, which defines a balanced budget for rate-setting purposes; the formalization of a five-year projection, which provides predictability for rates; and the adoption of new accounting and reporting standards.

Budgetary Highlights

In FY17 the Commission established a stabilization fund to provide reserves to protect the financial condition of the Commission. As a result, the original budget was increased by $5 million, which represents a transfer to the newly created fund. This transfer was funded by surplus.

Capital Asset and Debt Administration

Total investment in capital assets at year-end amounted to $317,429,679 (net of accumulated depreciation), an increase of approximately $20 million from the prior year. This investment in capital assets includes land, buildings and improvements, machinery and equipment, and infrastructure.

During FY17, the Commission credit rating was upgraded by S&P from AA- to AA.

Major capital asset events during FY17 included the following:

- Depreciation expense of $(8.8 million).
- $1.1 million in electrical distribution upgrades at SRWTF.
- $9.7 million in Main Interceptor project.
- $200,000 in hydrant projects.
- $800,000 in meter replacements.
- $2 million in York Street and river design projects.
- $3.1 million in sewer main rehabilitation projects.
- $2.5 million in transmission system rehabilitations.
- $2.6 million in collection system assessment and rehabilitation.
- $2.1 million in distribution system assessment and rehabilitation.
- New vehicles and equipment purchases of $2 million.
- Computer software and equipment purchases of $300,000.
- Various other projects of $2.4 million.

Additional information on the Commission's capital assets can be found in the FY17 CAFR.

At the end of FY17, total bonded debt outstanding was $185,598,197, all of which was backed by dedicated revenues of the Commission.

Additional information on the Commission's long-term debt can be found in the FY17 CAFR.

Financial Analysis

Requests For Information

The FY17 Comprehensive Annual Financial Report is available at: http://waterandsewer.org/about-the-commission/commission-reports/.

Questions concerning any of the financial information provided in this report or requests for additional financial information should be addressed to:

Communications Manager
Springfield Water and Sewer Commission
P.O. Box 995
Springfield, MA 01101-0995
413-452-1300

WATER AND SEWER RATES - LAST 5 FISCAL YEARS					
WATER RATES (PER 100 CUBIC FEET)	**2018**	**2017**	**2016**	**2015**	**2014**
Residential	$3.01	$2.89	$2.78	$2.66	$2.50
Commercial	$3.01	$2.89	$2.78	$2.66	$2.50
Municipal	$2.24	$2.15	$2.07	$1.98	$1.86
Industrial	$2.24	$2.15	$2.07	$1.98	$1.86
Solutia contract	$2.11	$1.99	$1.88	$1.76	$1.60
Town contracts (per million gallons)	$1,637.14	$1,178.06	$1,033.95	$1,481.78	$1,186.59
Residential Water % Change	4.2%	4.0%	4.5%	6.4%	4.2%
SEWER RATES (PER 100 CUBIC FEET)	**2018**	**2017**	**2016**	**2015**	**2014**
Residential	$4.93	$4.74	$4.56	$4.34	$3.82
Commercial	$5.42	$5.21	$5.01	$4.77	$4.20
Industrial	$5.92	$5.69	$5.46	$5.20	$4.58
Municipal	$4.93	$4.74	$4.56	$4.34	$3.82
Food Service	$6.41	$6.16	$5.92	$5.64	$4.97
Medical	$5.42	$5.21	$5.01	$4.77	$4.20
Solutia contract (per million gallons)	$1,145.39	$1,060.86	$1,108.27	$1,099.26	$993.00
Town contracts (per million gallons)	$1,145.39	$1,060.86	$1,108.27	$1,099.26	$993.00
Residential Sewer % Change	4.0%	3.9%	5.1%	13.6%	4.9%

Borden Brook Reservoir | Blandford & Granville, MA