FY2021

ANNUAL REPORT

Tapping Our Future

SPRINGFIELD WATER AND SEWER COMMISSION

Mission Statement

Our mission is to provide an 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:

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

Message From the Commissioners

The Board of Commissioners is pleased to present this review of the Commission's work and progress in Fiscal Year 2021 (FY21). Though the year was marked by the pervasive impacts of the Covid-19 pandemic, the Commission was undeterred in its mission. Maintaining the affordability of our essential services while making necessary reinvestments in our aging system remained a top priority. In FY21 the Commission prepared and submitted an application for EPA's highly competitive Water Infrastructure Finance and Innovation Act (WIFIA) Program for a $250 million low-interest loan to support 27 critical infrastructure renewal projects. The ultimately successful effort, which was finalized at the start of FY22 and will save ratepayers $60 million in borrowing costs over 30 years, illustrates the proactive and creative way the Commission is addressing its commitment to maintain reliable services and stable rates into the future. To support affordability the Commission also launched a new Customer Assistance Program in FY21, which provides low-income homeowners with an annual credit on their water and sewer bill and is the first of its kind in Massachusetts.

In the coming years the Commission will tap a generational re-investment in the future of the region's water and wastewater infrastructure. This follows years of project and financial planning that positioned the Commission to receive national low-cost financing that is only available through a competitive process. The Board of Commissioners is proud of the Commission's FY21 achievements and remains committed to carrying out its essential mission to deliver clean, safe and affordable water and wastewater services.

From left, Commissioners William E. Leonard, Vanessa Otero, and Daniel Rodriguez in February 2020. This was the last picture of the Commissioners together before the pandemic. All Board meetings in FY21 were virtual.

Message From the Executive Director

FY21 demonstrated the value of the essential services we provide. As the pandemic waxed and waned throughout the year, Commission crews and staff remained on-site and on-the-job, adjusting their practices as necessary to keep customers and colleagues safe. Knowing that safe drinking water and reliable wastewater services were paramount to public health efforts throughout our communities lent reinforced purpose to our day-to-day operations.

In addition to our daily activities was the continual advancement of our 20-year capital improvement program, which aims to address the many challenges and risks presented by aging infrastructure, changing regulations, and climate change. While our cornerstone York Street Pump Station and Connecticut River Crossing Project progressed above-ground and below-river, assessments and planning produced more detail for several of our other critical-need projects in the capital plan. Due to the scale of reinvestment necessary to maintain reliability and public safety, in the fall of 2020 Commission staff prepared a comprehensive application to EPA's competitive Water Infrastructure Finance and Innovation Act (WIFIA) for low-interest financing. The full capital improvement program as submitted totaled $550 million – a high value in terms of dollars, but relatively low when compared to the costly risks presented by end-of-life or obsolete infrastructure.

Perhaps no event in FY21 illustrated the value of our essential services and the need for renewal more clearly than early one morning in August 2020. Our crews were called to East Columbus Avenue (see page 26), where a large water main break had temporarily closed Interstate 91 and thousands of customers awoke without water. Coincidentally, storms overnight had left power outages and interrupted cell phone service, further disrupting life in the city. Despite the lack of typical communication channels and the size of the break, our crews restored water within a matter of hours, a pride-filling display of teamwork and preparedness.

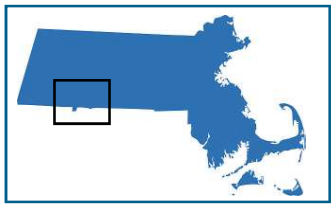
When the flood of water drained away, the main that had ruptured was open to sunlight for the first time since it was installed in 1909. It was hard not to wonder, what other types of critical infrastructure interrupted that day – the roads, electricity, telecommunications – were 111 years old? Everyday life depends on water: in 1909, now, and tomorrow. The high caliber of our water professionals at the Commission is undeniably clear, but the delivery of our services is also driven by the reliability of our water and wastewater infrastructure. Pairing strategic renewal and reinvestment with the highest level of professionalism is our responsibility to our customers of today and of the future.

Joshua D. Schimmel
Executive Director

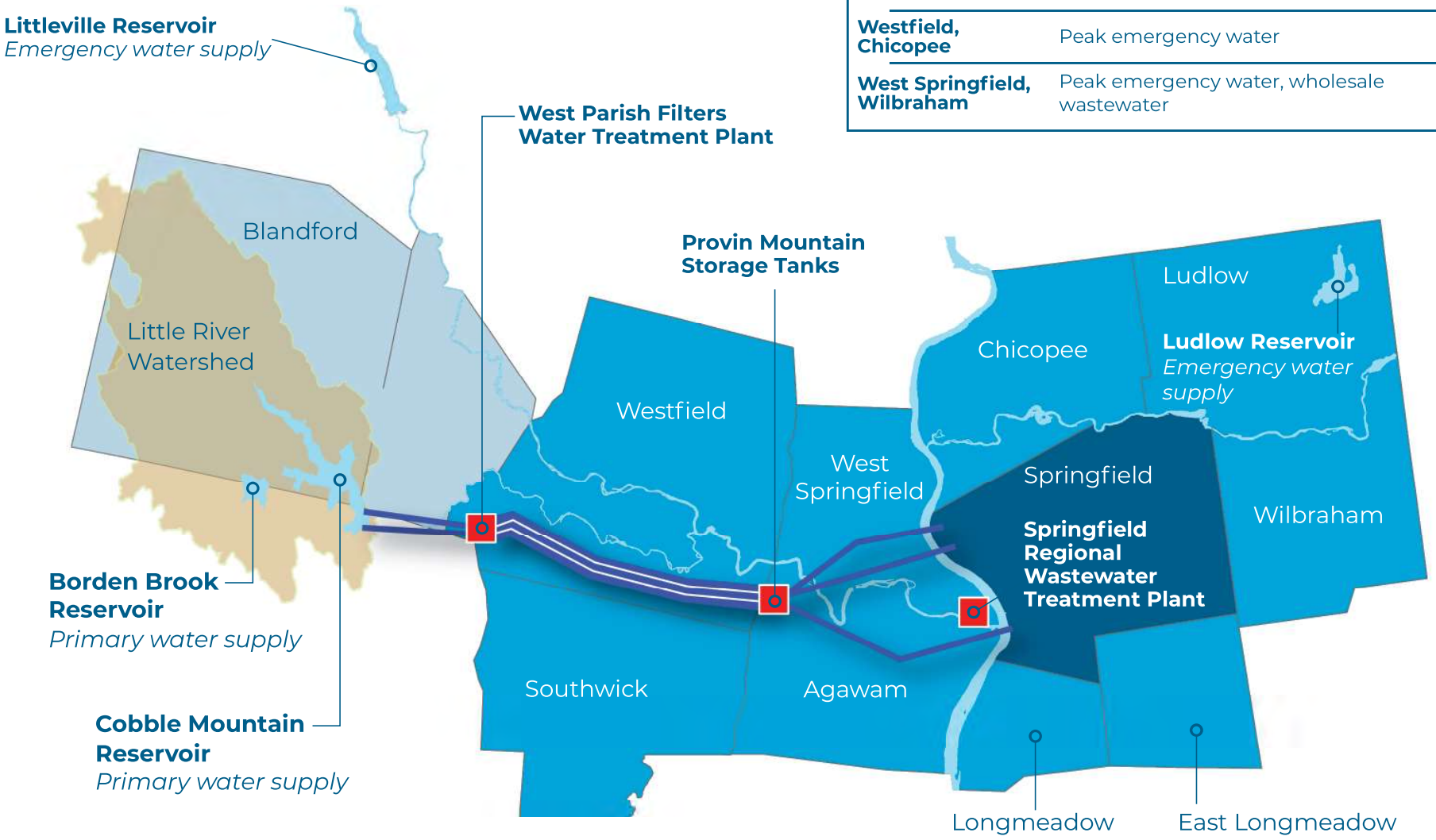
If you have any questions about the content of this report, please contact the Commission at 413-452-1300 or email info@waterandsewer.org.

SWSC System Map

Service Area and Major System Components

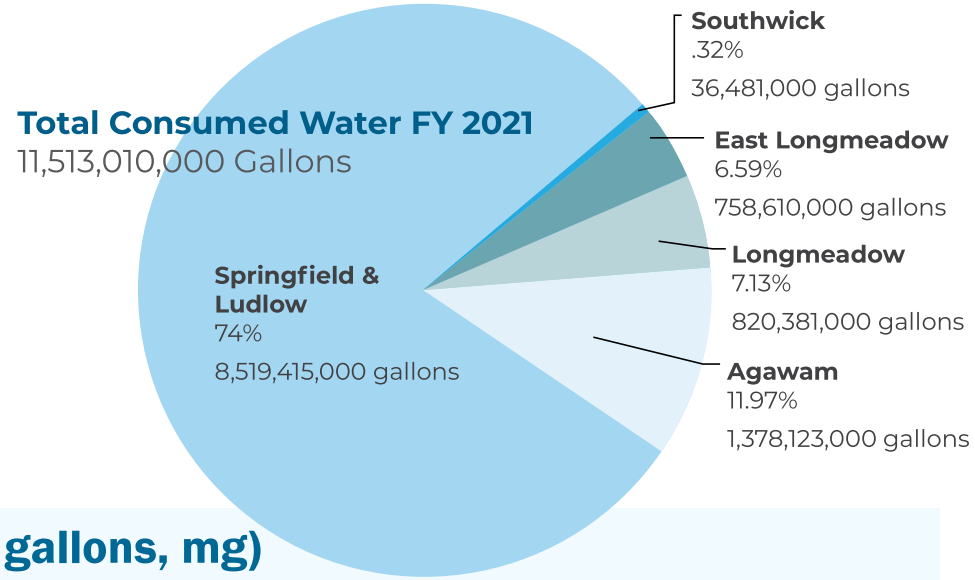


Service Categories	
Springfield	Retail water and wastewater
Ludlow	Retail water and wholesale wastewater
Agawam, Longmeadow, East Longmeadow	Wholesale water and wastewater
Southwick	Wholesale water, peak emergency water
Westfield, Chicopee	Peak emergency water
West Springfield, Wilbraham	Peak emergency water, wholesale wastewater



Water Supply & Consumption

The Commission provides drinking water to approximately 250,000 people in the lower Pioneer Valley. This includes retail customers in Springfield and Ludlow (as well as small portions of Chicopee and Wilbraham), and wholesale customers in Agawam, Longmeadow, and East Longmeadow. The Commission also provides emergency and peak drinking water supply to Southwick, Westfield, West Springfield, Chicopee, and Wilbraham. In FY21, the output from West Parish Filters Water Treatment Plant was approximately 11.5 billion gallons among all Commission customers.



Wholesale Water Consumption (million gallons, mg)

Yearly usage (mg)	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	3-year Avg
Agawam	1,261.8	1,182.5	1,100.1	1,238.3	1,378.1	1,238.8
East Longmeadow	714.7	657	625.4	726	758.6	703.3
Longmeadow	726.8	671.2	626.3	709	820.3	718.5
Southwick	17.3	22.4	17.8	28.9	36.5	27.7
Springfield et al.	8,445.1	8,269.1	8,207.5	8,508	8,519.4	8,411.6
West Parish Output	11,165.7	10,802.2	10,577	11,210.2	11,513	11,100

% of output	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	3-year Avg
Agawam	11.3	11	10.4	11.1	12	11.2
East Longmeadow	6.4	6.1	5.9	6.5	6.6	6.3
Longmeadow	6.5	6.2	5.9	6.3	7.1	6.5
Southwick	0.2	0.2	0.2	0.3	.3	.3
Springfield et. al.	75.6	76.6	77.6	75.9	74	75.8
	100%	100%	100%	100%	100%	100%

Infrastructure Renewal

Parts of the Commission's water and wastewater systems date back to nearly a century — or older — and have continued to remain in service since their installation. As part of a 20-year capital plan to update major system components, the Commission has been reinvesting in infrastructure renewal to improve and ensure the reliability of the water system, and to adequately respond to the demands of today and those in the future.

York Street Pump Station and Connecticut River Crossing Project

The York Street Pump Station and River Crossing project hit the 51% completion mark at the close of FY21. The pipe crossing the Connecticut River will be placed in two seasons with a new project completion date of June 5, 2023. Progress includes:

- Station foundation and walls set
- Utility installation around the pump station
- Bypass pipe installed around various structures to ensure existing service is maintained during construction
- Completion of new influent structure on the Bondi's Island side of the project (including bypass pipe for existing flow and piping awaiting connection to the new pump station)
- Construction of trestle to aid in the loading and offloading of barges

Phase 2 Facilities Plan for West Parish Filters

In FY21, work continued on the Phase 2 Facilities Plan for West Parish Filters. The recommendations for the future treatment plant processes from the Pilot Plant Study were added to the Facilities Plan. In January 2021, the Environmental Protection Agency invited the Commission to apply for credit assistance under the Water Infrastructure Finance and Innovation Act (WIFIA). In anticipation of the final award of WIFIA financing, the approach to treatment plant improvements was modified in the Facilities Plan. With WIFIA financing taking shape, it became financially feasible to construct all the treatment plant process improvements as one large construction project, rather than a series of three construction packages over a decade or more.

The ability to expedite construction of a new treatment plant was incorporated into the Facilities Plan, where new plant layouts were completed and cost estimates were prepared. Other elements of the Facilities Plan continued including the evaluation of hydropower alternatives and alternatives to provide adequate reliability and redundancy for raw water delivery.

Two New Bridges – West Parish Filters

Two bridges (No. 1 and No. 2) at West Parish Filters that span Cook Brook were constructed around 1925 and degraded over time. Both bridges had moderate to severe deterioration of the reinforced concrete components, exhibiting signs of failure including cracking and spalling. The bridge improvements were needed to support day-to-day needs of West Parish Filters and to support safe access for construction vehicles used for future treatment plant projects.

Highlights of Major FY21 Capital Improvements ($)

Water treatment system improvements projects	$540,000
Transmission system rehabilitations	$207,000
Water distribution system assessment and rehabilitation	$570,000
Hydrant projects	$108,000
Meter replacements	$735,000
Wastewater collection system assessment and rehabilitation	$1.2 million
Wastewater treatment system improvement projects	$674,000
York Street and Connecticut River Crossing project	$26.4 million
Water and sewer main rehabilitation projects	$2.0 million
Provin Reservoir tank projects	$384,000
Various other rehabilitation and improvement projects	$2.7 million

FY21 Water and Sewer System Upgrades

Water Main Replacement	3,710 linear feet
Sewer Pipe Installed	1,887 linear feet
Sewer (Rehabilitation) Lining	1,767 linear feet

This page: *Digging takes place in Prospect Street.*
Opposite page, top: *A crew member assists in spreading large rocks at the base of York Street Pump Station to help with drainage;* ***bottom:*** *The bridges outside the West Parish Filters Water Treatment Plant were replaced concurrently with construction completed in Fall 2020.*

*The York Street Pump Station's foundation is poured in November 2020, **top**, and June 2021, **bottom**.*

Top: *Crews work on the preliminary stages of the York Street Pump Station dock on the Connecticut River in June 2021;* ***bottom:*** *the dock is being built in October 2021.*

The bridges at West Parish Filters were replaced concurrently using a buried metal plate arch construction technique. Construction was completed in Fall 2020 with a total project cost of $1.2 million.

Cobble Mountain Reservoir - Diversion Gate Modifications

In January 2021, the Commission began building improvements to the diversion gates and outlet works at the Cobble Mountain Reservoir and dam.

The diversion gatehouse valves are used to transfer water from the Cobble Mountain Reservoir downstream to the Intake Reservoir and, ultimately, to West Parish Filters Water Treatment Plant. This is an important alternative route for raw water delivery when the power plant is offline.

However, when the diversion gates are open during winter months, the gatehouse stairwell can become covered in a layer of ice, potentially preventing access to the valves. To serve as a redundant, alternative route for raw water year-round, modifications were designed to seal off the flow of water from the air shaft and stairwell to prevent cold air from rushing into the structure and freezing the surfaces. Air piping was also designed to carry air directly into the pipes. Construction was nearly completed by June 2021.

42-inch Raw Water Conduit

The Commission relies on a 42-inch conduit that runs 1.5 miles from the Cobble Mountain Reservoir to West Parish Filters to deliver raw water for treatment. In September 2019, a plunger valve at the outlet works failed and damaged the conduit. Engineering field investigations completed in March 2020 concluded that various joint and pipeline repairs were needed, and options were provided for prioritizing repairs relative to the desired design life of the pipeline. The design of repairs to the 42-inch pipeline is ongoing.

Clearwell and Backwash Pump Station Project

During FY21, the Commission undertook important procurement steps for the design and construction of a new clearwell and backwash pump station. Reliable backwash pumps provide operators the ability to remove accumulated material from the filters in order to produce the highest water quality possible. The current pumps were installed in 1972 and have reached the end of their useful life. In addition, replacement parts are no longer available for repairs if the pumps should break. The clearwell stores filtered water both for use at West Parish Filters and prior to transmission. The filtered water clearwell has been identified as a potential “single point of failure” within the Commission’s water system. The project will replace the existing filtered water clearwell and backwash pumps into a combined facility suited to operate with the future water quality process improvements. Procurement was completed in June 2021, and construction began the following months in FY22.

Remote SCADA Systems

The Commission installed new Supervisory Control and Data Acquisition (SCADA) instrumentation systems for the booster pump stations in Ludlow and Springfield in FY21. The systems allow for remote monitoring of pump station functionality and water pressure in real time, which in turn allows for a more rapid response to mechanical and system problems that may arise.

Provin Mountain Storage Tanks

FY21 projects included completing the construction of a new cover and drainage system for Tank 2, the permanent structural isolation of Tank 1 for future demolition, and modifications to the yard transmission main piping. The total project cost was $3.5 million. The maintenance and cleaning of Provin Tanks 3 and 4, maintenance and evaluation of tank valves and access structures, and replacement of two primary effluent flow meters were also completed in FY21 at a cost of $134,487.

Provin Tank Cleaning and Valve Inspection Program

A diving contractor inspected and cleaned finished water storage tanks 3 and 4 at Provin Mountain in FY21. Valves were also inspected and evaluated at the facility.

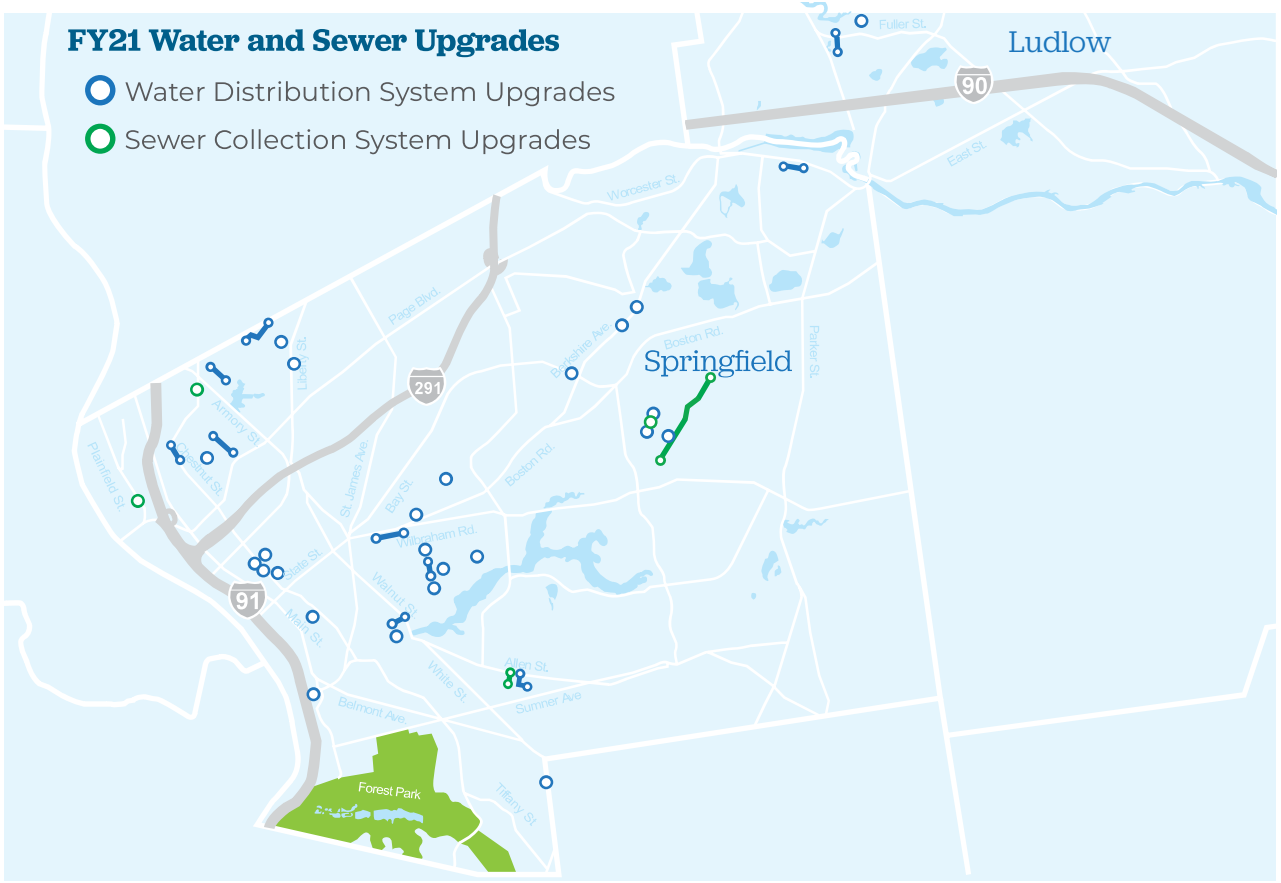
Notable Inspection Projects

The Commission supported 49 water and sewer service applications and at additional notable developments, including the North End Pedestrian Path, Walsh Park, Westminster Park, Kenefick Park, and DeBerry School.

Distribution and Collection System Upgrades

Sewer rehabilitation took place on Fort Pleasant Avenue near Belmont Avenue with new manholes and access structures, along with 4,700 feet of rehabilitation of Mill River Valley Intercepting Sewer near Grayson Avenue, totaling $1.9 million. A total of 5,402 linear feet of sewer pipe was upgraded in FY21. Water main was replaced on Farnsworth Street, among others, with a total of 8,749 linear feet of water pipe upgrades around Springfield in FY21.

Above: Water main is replaced on Farnsworth Street. ***Opposite page, top:*** *A crew inspects the diversion gates at Cobble Mountain Reservoir;* ***Bottom:*** *An aerial view of slow sand manholes and blue DigSafe paint in preparation for construction of the new clearwell.*



Drinking Water Treatment

Top: *The Process Control Manager consults with the Half-Plant Coagulation Trial contractor at West Parish Filters.*
Bottom: *A temporary tarp is placed over the clearwell to limit leaks through the existing concrete roof structure.*

Safe, clean drinking water is vital to public health. Providing reliable water treatment before it reaches consumers in the region is one of the Commission's most critical functions.

Pilot Plant Operation and Water Treatment Study

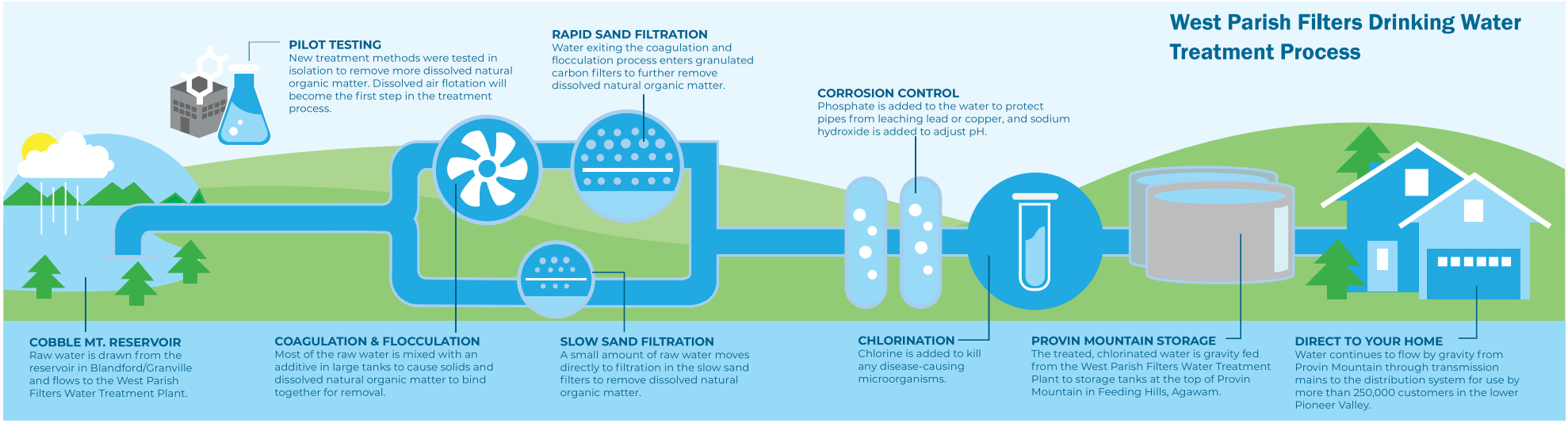
Working with AECOM and UMASS-Amherst, the Commission conducted a pilot water treatment study at West Parish Filters to address regulatory non-compliance issues relative to disinfection by-products (DBPs), specifically haloacetic acids (HAA5). The pilot study was conducted over three seasons beginning October 2019 and concluding November 2020.

The goal of the study was to evaluate treatment process alternatives for removing natural organic matter (NOM) from the raw water from Cobble Mountain Reservoir. The study determined that clarification of the water using dissolved air flotation (DAF) and dual media filtration produced the highest-quality finished water. These findings were incorporated into the Facilities Plan, where conceptual layouts of new treatment plant upgrades were prepared.

Half-Plant Coagulant Trial

During the pilot plant study, it was discovered that a different coagulant was more effective at removing NOM and reducing DBPs than the coagulant currently used at West Parish Filters. A half-plant coagulant trial was recommended to determine if the pilot-scale findings could be replicated in the plant and provide an interim solution to elevated DBPs.

In November 2020, MassDEP approved a protocol to evaluate the alternative coagulant. The approved protocol involved the use of the alternative coagulant to treat half the water while the other half used the current coagulant. The half-plant trial was initiated on January 5, 2021. The water treated with both coagulants during the trial met all regulatory standards for safe drinking water.



The half-plant trial confirmed that the alternative coagulant could improve NOM removal and reduce HAA5 formation compared to current treatment processes, but jeopardized the efficiency of the filters and their ability to meet water production demands, posing an unacceptable risk. As a result, it was determined that the alternative coagulant was not suitable for full-scale use in the existing water treatment process.

Temporary Clearwell Cover

The concrete roof structure of the existing filtered water clearwell has potential leaks, which may result in infiltration that introduces organics and contaminants into the water. To mitigate this risk, Commission staff installed a 1-acre reinforced polyethylene tarp over the clearwell in June 2021. Sandbags were used to anchor the tarp down, in addition to the construction of an anchor trench around the perimeter of the clearwell. This tarp will protect water quality while a new clearwell is being constructed. The construction work completed by Commission staff saved tens of thousands of dollars because a contractor was not needed.

DID YOU KNOW?

More than 1,000 50-pound sandbags were used to anchor the tarp down over the clearwell.

This page: *An aerial view of West Parish Filters Treatment Facility.*

Above: *Commission staff received the MWWA Water Works Pride Awards in November 2020 for putting forth extra effort to make a difference in the water works profession.* ***Below:*** *A lab technician collects a water sample.*

Chemical Filter Cleaning

In March 2019, the Commission completed a trial project to chemically clean the filter media in one of the rapid sand filters. The cleaning removed organic and inorganic deposits and improved filter run times, backwash water distribution, and unit filter run volume. Cleaning the filters in this manner:

- Restores media to near-new conditions
- Leaves media in place to minimize impacts to operations
- Is far less costly than actual media replacement

Due to the documented improvement to the filter media, Commission staff performed chemical cleaning on the remaining five rapid sand filters during April and May 2021.

Laboratory Services

The Commission collects water quality samples from locations throughout the distribution system in Springfield and Ludlow and the watershed on weekdays, weekends, and holidays.

Laboratory service highlights in FY21 include:

- **Tests analyzed:** More than 50,000 water quality tests were analyzed, even amid pandemic-related staffing constraints.
- **Enhanced analytical capacity:** The Commission purchased and implemented a chlorophyll-a probe, which measures chlorophyll as an indicator of potential algal growth in the reservoir.
- **Complying with new PFAS regulations:** Quarterly sampling found that the Commission complies with Massachusetts regulations related to Per- and Polyfluoroalkyl Substances (PFAS) that went into effect October 1, 2020.

Clockwise from top left: *An operator in the filter gallery; Rapid sand filtration is conducted as part of the water treatment study; A water sample is collected on the campus of West Parish Filters.*

Top: *The Commission conducts high-pressure cleaning in sewer pipes.* ***Bottom:*** *Construction of the temporary pier to support construction of the new river crossing project is well underway. The City of Springfield is pictured in the distance.*
Opposite page: *A look at the Springfield Regional Wastewater Treatment Facility.*

Wastewater Collection & Treatment

Sanitation once consisted of rivers and streams carrying away human waste in its raw form. Today, the Springfield Regional Wastewater Treatment Facility (SRWTF) cleans the region's wastewater, then directs the treated water to the Connecticut River, reducing pollution and protecting public health.

Wastewater travels to the SRWTF from the City of Springfield through a network of 470 miles of collection pipes, some of which date to the late 1880s. Agawam, East Longmeadow, Longmeadow, Ludlow, Wilbraham, West Springfield, and part of Chicopee also direct wastewater to the SRWTF after collection in their own respective municipal sewer systems. SUEZ Water Environmental Services 20-year contract to operate and maintain the wastewater treatment plant for the Commission was renewed in FY21. The SRWTF treated nearly 12.4 billion gallons of wastewater, for an average of 34 million gallons/day (MGD). In FY21, the Commission spent approximately $14,263,600 on wastewater treatment.

Springfield Wastewater Collection System

The Commission owns, operates, and maintains the extensive wastewater collection system that runs beneath the City of Springfield. The Commission's Sewer Division addresses sewer backups that may occur and the repairs and inspections of the system must be conducted. SUEZ maintains the 34 pump stations, 23 combined sewer outfalls, and intercepting sewers (large transmission pipes) associated with the collection system.

Asset Management and Maintenance Program (AMMP)

To prioritize the repair and rehabilitation of resources, the Commission performs systematic high-pressure cleaning and remote camera/robotic assessments of the sewer system. In FY21, for example, the Commission assessed and cleaned 233 miles of pipe. Since 2008, this totaled 93% of the entire collection system. The remaining 7% of unassessed pipes is mostly under 30 years old, of low criticality, or is geographically isolated from large groups of other unassessed pipes. In FY21, the Commission began re-assessing pipes that had been inspected and cleaned at the beginning of the program or were prioritized due to high risk of failure or need of significant maintenance.

The AMMP provides important data and reserves resources for areas in the collection system most in need of repair. The program also supports compliance with federal and state environmental regulations. In FY21, there were two sanitary sewer overflows (SSOs), which can be caused by defects in the sewer system, blockages, stormwater or groundwater infiltration and are reported to EPA and MassDEP. This is a decrease from 13 SSOs in FY20 and is part of a downward surge in SSOs since the AMMP began in 2008.

DID YOU KNOW?

There were 122 sanitary sewer overflows when the asset management and maintenance program began in 2008. In FY21, only two occurred.

NPDES Permit Renewal

In FY21, EPA finalized a new NPDES permit for the Commission, 21 years after the previous one was adopted. The NPDES permit influences the number and amount of capital investments that must be made to the SRWTF to comply with regulations. The Commission has incorporated the requirements of the new NPDES permit into its capital improvement planning.

Nitrogen Monitoring

In March 2021, SWSC was awarded $290,000 in grant funding from the National Fish and Wildlife Foundation - Long Island Sound Futures Fund. Funding will be used to purchase and install additional nitrogen monitoring instrumentation at the SRWTF to support efforts to reduce nitrogen loads discharged into the Connecticut River. The instrumentation will optimize the Biological Nutrient Removal (BNR) process at the plant and will capture data on the amount of nitrogen in the wastewater. This data will be integrated into the treatment system to automatically adjust settings to match real-time oxygen demands in the aeration basins, in which micro-organisms break down the nitrogen products. It is expected that this advanced optimization will reduce nitrogen loads, discharged by the SRWTF, into the Connecticut River by up to 3,000 pounds per year.


SILVER AWARD

Peak Performance AWARDS

The National Association of Clean Water Agencies is pleased to present this award to

Springfield Water & Sewer Commission, MA

Springfield Regional Wastewater Treatment Facility

in recognition of its complete and consistent permit compliance during the calendar year 2020

Adam Krantz

NACWA

The Commission was awarded a Silver in the Peak Performance Awards, which recognizes NACWA member agency facilities for excellence in permit compliance.

Watershed Protection

Maintaining a strong, diverse, resilient forest is critical to providing a high-quality drinking water supply. The Commission's Watershed Management Department actively monitors watershed property for water quality threats to nurture this natural filter for source water. Efforts include:

- Maintaining watershed roads and culverts to prevent erosion and sedimentation issues
- Developing forest management plans with the goal of having a diverse and resilient forest
- Strategically acquiring property within the Little River Watershed to protect watershed land from development

Land Conservation Efforts

The Commission owns, protects, and maintains approximately 49% of the forestland in the Little River Watershed, with an additional 9% protected by public or non-profit land protection organizations. While the Commission did not purchase land during FY21, a Drinking Water Supply Protection Grant was submitted for a future purchase of 12 acres off Gibbs Road in Blandford.

Watershed Maintenance and Monitoring

To ensure that the watershed land is adequately protected and conserved, the Commission must include vigorous monitoring efforts. Its land stewards monitored a total of 4,340 acres of Commission water supply property in 2021. An additional 1,418 acres of watershed property not owned by the Commission was monitored for compliance with existing conservation restrictions held by the Commission.

The Commission's watershed crews and land stewards continued to maintain watershed infrastructure, including mowing of facilities and maintenance of Commission access roads, culverts, and gates. Work in 2020 included a culvert replacement and road improvements along North Lane in Granville and Blandford.

Forest Management Activities

In 2020, the Commission entered into a contract to harvest trees on North Lane in Granville and Blandford. The harvest areas totaled 13.6 acres and is consistent with the management recommendations in the Borden Brook Forest Stewardship Plan, which addresses 1,700 acres of forestland near the headwaters of Borden Brook Reservoir.

The stands were thinned to reduce crowding around existing white pines and to facilitate their growth, and to diversify the overall forest structure by creating small group openings that will regenerate into a new mix of trees.

DID YOU KNOW?

Thinning a forest can help seeds become established, thereby promoting more tree diversity and growth in the future.

Due to a gypsy moth infestation, in FY19 and FY20 the Commission conducted forest management activities in the watershed forest adjacent to the Ludlow Reservoir. The consulting forester completed a final forest management activities report, which is available on the Commission's website.

Forest Management Planning

The Commission contracted with a consulting forester in FY18 to develop a Watershed Forest Vision that serves as an overarching framework necessary to organize multiple Forest Stewardship Plans that are being developed now and over the next few years.

The Cobble Mountain North Forest Stewardship Plan covers 1,913 acres and was completed in June 2021. A preliminary Forest Inventory Report was also completed in 2020.

Implementation of management recommendations for areas with completed Forest Stewardship Plans will occur simultaneously with planning.

Surface Water Sampling

The long-term objective of the water sampling program is to track water quality changes in the reservoirs over time.

Covid-19 restrictions in 2020 limited the amount of water sampling that took place. Samples were taken at three locations in Cobble Mountain Reservoir to represent different reservoir conditions. Samples were taken once per month in June, July, and August, and testing parameters were expansive. Samples were also taken at the Broome Gate House intake in May, September, and November due to low water levels and the inability to launch the boat.

This page: *Borden Brook Reservoir.* ***Opposite page, top:*** *A boat is launched for water quality sampling on Borden Brook Reservoir.* ***Middle:*** *The Commision hosted a Massachusetts DCR-led Forestry For The Birds Training at Ludlow Reservoir as part of the Commission's outreach activities.* ***Bottom:*** *Land stewards closely monitor the water supply property.*

Public Access

In 2020, the Commission debuted online interactive public access maps for the public to learn more about recreational areas within the Cobble Mountain watershed that are open for passive recreation. These maps are available on the Commission website, and help direct the public to recreational areas on Commission property and within the watershed at large.

The Commission manages a paved recreational path at Ludlow Reservoir. After a period of closure in the initial months of the pandemic, the path was reopened for public use with social distancing protocols in place. In FY21, 47,601 visitors utilized Ludlow Reservoir.

To prevent damage to critical watershed ecosystems and water infrastructure, strategic areas of the Commission's Cobble Mountain and Ludlow Reservoir watersheds remain closed to the public. Commission staff, in partnership with the Massachusetts State Police and Environmental Police, continually monitored the watershed in FY21 to deter and intercept unauthorized activity when necessary.

DID YOU KNOW?

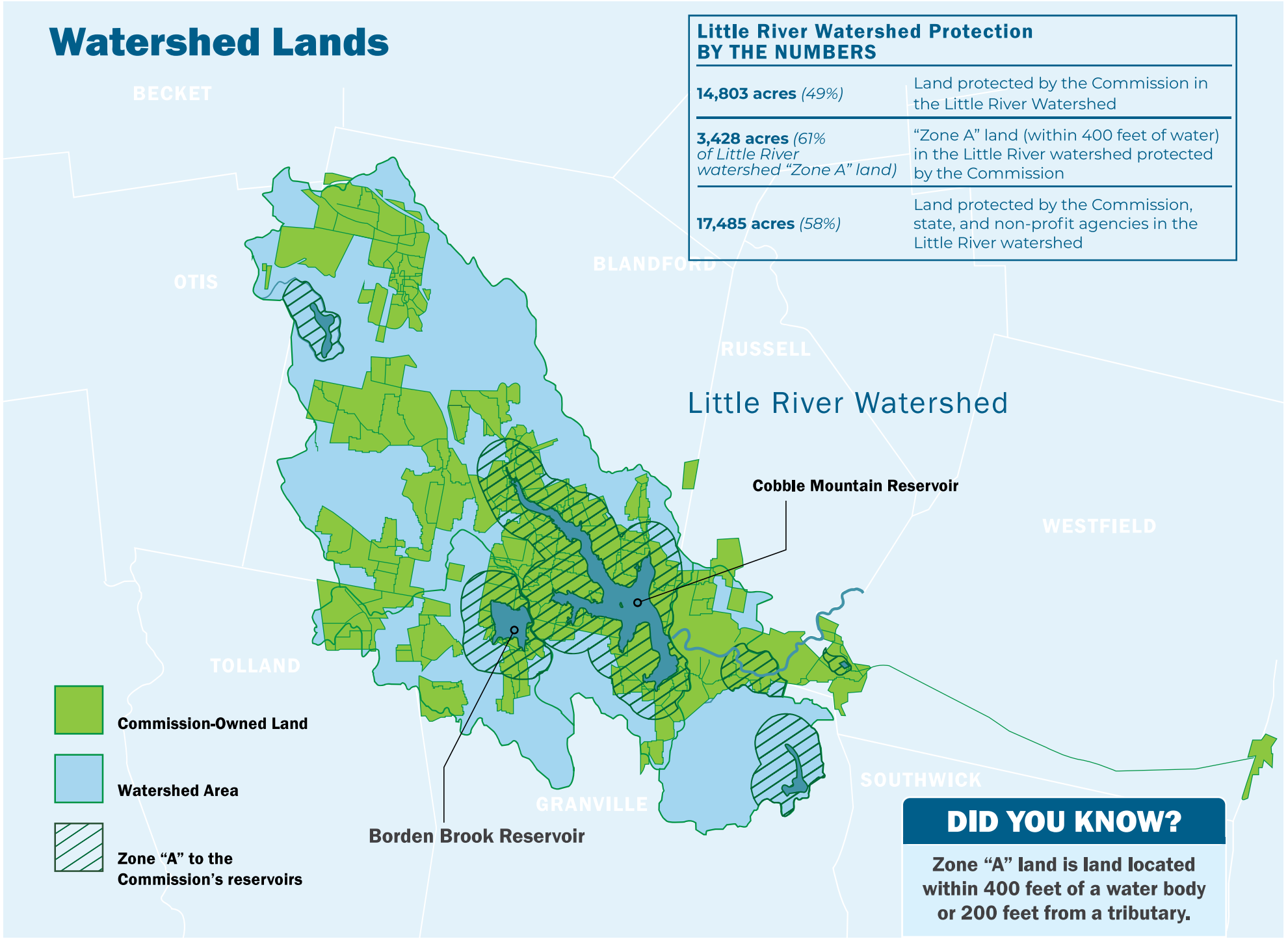
The Commission allows public access to more than 1,300 acres of designated water supply property.

Wildlife Impacts

Forestry Stewardship Plans completed in 2019, 2020, and 2021 have noted excessive browsing by deer and moose in certain areas of the forested watershed. These plans propose mitigation strategies including the installation of deer barriers or slash walls.

At left, top and bottom: *Alder Brook feeds into Cobble Mountain Reservoir.* ***Opposite page, clockwise from top left:*** *A bear cub follows an adult bear (out of frame) on watershed land; Stowe Stream feeds into Cobble Mountain Reservoir; A stand of trees begins to fill out in leaves in Spring 2021; A watershed staff member surveys a property boundary.*

Watershed Lands



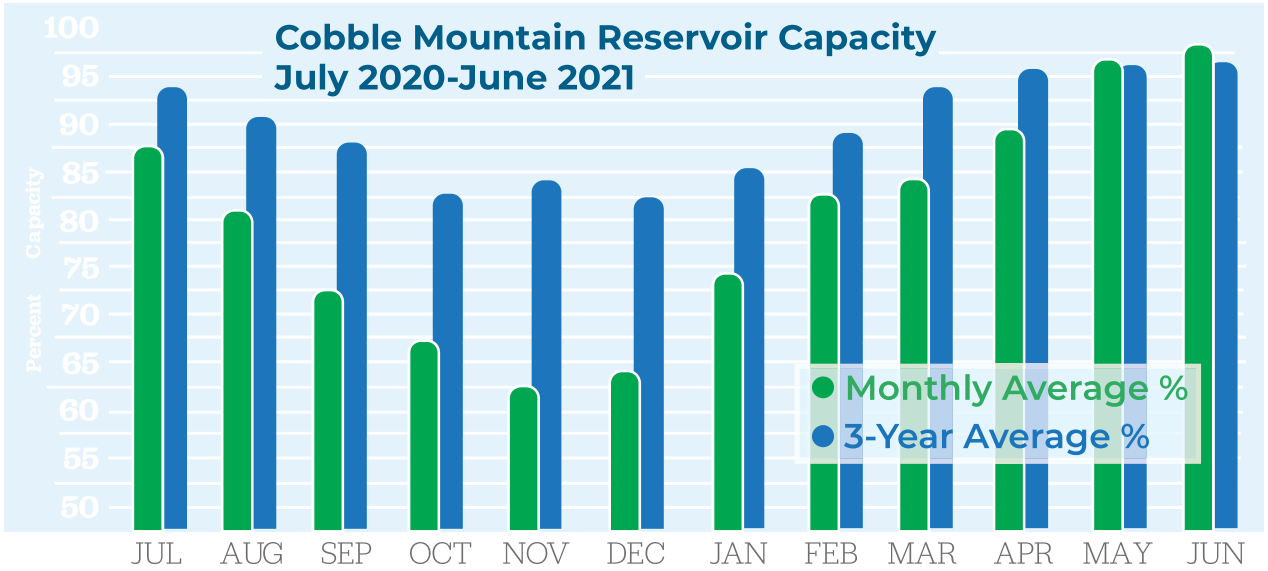
Little River Watershed Protection BY THE NUMBERS

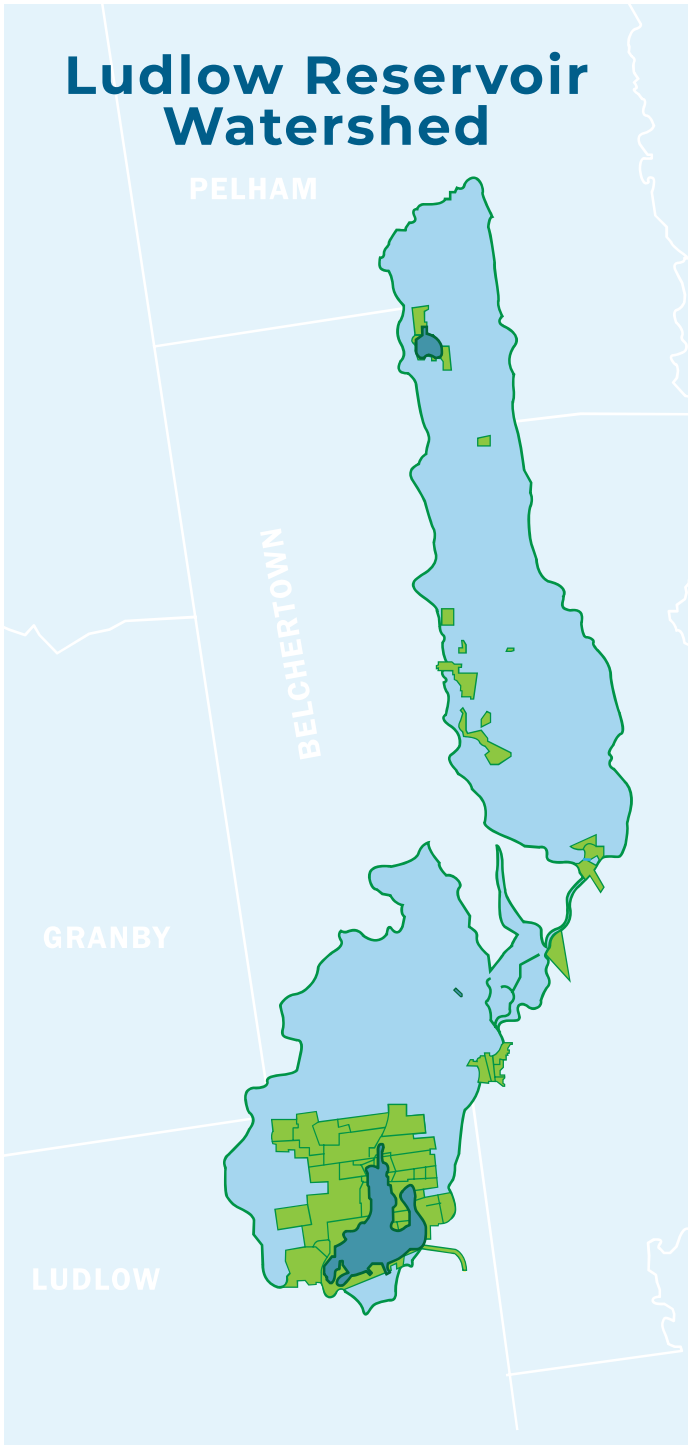
14,803 acres *(49%)*	Land protected by the Commission in the Little River Watershed
3,428 acres *(61% of Little River watershed "Zone A" land)*	"Zone A" land (within 400 feet of water) in the Little River watershed protected by the Commission
17,485 acres *(58%)*	Land protected by the Commission, state, and non-profit agencies in the Little River watershed

DID YOU KNOW?

Zone "A" land is land located within 400 feet of a water body or 200 feet from a tributary.

Above: *A look at Borden Brook Reservoir with the gatehouse in the foreground.*





Top: *A SWSC sewer main is repaired.* ***Middle and bottom:*** *The Field Services Division maintains every inch of the Commission's system infrastructure.* ***Opposite page:*** *A vactor truck cleans sewer pipes.*

Field Services

The system infrastructure comprises hundreds of miles of water and sewer pipes, buried beneath city streets. The Commission's Field Services Division is responsible for maintaining every inch - from pipes, to valves, to hydrants, and more. Field Services crews also assist customers with installation, repairs, and replacements of water and sewer service lines at individual properties, and provide additional services such as water consumption surveys and water quality checks. All these activities are funded through the Commission's operations budget. In FY21, approximately $17.6 million was spent on these activities.

Transmission System Maintenance

Treated water from West Parish Filters Water Treatment Plant is stored in three storage tanks at Provin Mountain in Agawam. Each tank has the capacity to store 12 to 17 million gallons of treated water to maintain pressure and provide emergency supply. Water then flows through three transmission mains passing through Westfield, Agawam, and West Springfield.

Commission staff stationed at Provin Mountain are responsible for the maintenance of the tanks and any Commission property or easements under which the mains are buried. Staff monitor for leaks, encroachments, and excessive vegetation growth along the transmission mains. In FY21, 16 miles of transmission easements were cleared of vegetation.

DID YOU KNOW?

Water distribution mains span 590 linear miles. Straightened out, the mains roughly equal the distance from Springfield to Baltimore, Maryland, and back.

Water Quality Protection

To provide the highest level of drinking water quality, the Commission's Water Quality Group (WQG) thoroughly inspects and maintains the entire drinking water distribution system, regularly inspecting valves and hydrants. The Water Quality Group's Unidirectional Flushing (UDF) Program cleans sediment out of mains and increases water flow through high-powered flushing of mains and hydrants. To ensure safe chlorine levels and water age throughout the system, UDF is conducted in coordination with engineers and operators at West Parish Filters. In FY21, 118 miles of pipe were flushed.

The Commission's Cross Connection Control Program performs inspections in buildings throughout Springfield and Ludlow to ensure backflow prevention devices are in place for water service lines that are connected to equipment or other systems containing chemicals or water of questionable quality (such as HVAC equipment). All backflow prevention devices in commercial, industrial, and institutional plumbing are inspected

Field Services Statistics and Activities FY 2021

Water and Sewer System

Miles of Water Main	590
Number of Valves	19,833
Number of Hydrants	6,237
Number of Meters	46,727
Miles of Wastewater Mains	472
Number of Wastewater Manholes	11,448
Number of Wastewater Pump Stations	27

Water Quality Group

Hydrants Inspected	2,720
Hydrants Repaired/Rebuilt	105
Valves Exercised	4,966
Miles of Mains Flushed (UDF Program)	118.2

Water Construction Group

New Hydrants Installed	19
Hydrants Replaced	65
Water Main Breaks Repaired	23
Water Service Replacements	128
New Valves Installed	134
Valves Replaced	14

Meter and Field Services Group

Meters Installed (Primary and Auxiliary)	2,470
Water Consumption Assessments	504

Sewer Group

Manholes Cleaned	203
Sewer Jetted (feet)	1,229,442
Sewer Backup Responses	648
Sewer System Repairs	7
Sewer System Repair Pipe Installed (feet)	21
Residential Service Line Repairs	105

Top and Bottom: *Crews responded to a water main break on East Columbus Avenue in August 2020. The broken main dated from 1909.*

regularly. This effort helps further protect water quality. The Commission adopted the Cross Connection Control Program in 1998 in accordance with MassDEP regulations. In FY21, the Cross Connection Control Program conducted 4,879 backflow inspections at 870 sites.

Water Infrastructure Maintenance and Upgrades

The Commission's Water Construction Group (WCG) maintains hundreds of miles of water pipes (some dating back to the late 1800s) and thousands of hydrants. The WCG is charged with responding to unpredictable water main breaks, replacing aging water mains, rebuilding hydrants, and performing other routine or emergency repairs and maintenance within the distribution system in Springfield and Ludlow. WCG crews are ready to respond to emergencies 24 hours a day, 7 days a week. The WCG also works with customers on water service line replacements (128 in FY21) and inspections. In FY21, the WCG responded to 23 water main breaks, including two large breaks within days of each other on E. Columbus Avenue and the intersection of Taylor and Dwight Streets. The broken pipes dated from 1909 and 1910, respectively.

Water Consumption Tracking and Assessments

The Commission services water meters that are installed at all residential and commercial properties. The meters record water consumption data and report information through radio signals that are collected monthly. The Meter and Field Services Group (MFSG) maintains the meter system and tracks and collects meter data. The MFSG also conducts water consumption surveys, which assist homeowners in identifying leaks, assessing household water use, and determining if there are any inefficient or faulty household fixtures. In FY21, the MFSG performed 504 water consumption assessments, up from 329 assessments in FY20 due to an increase in water usage.

DID YOU KNOW?

FY21 saw 175 more consumption assessments than in FY20.

Wastewater Collection System Operations

The collection (sewer) system supports sanitary conditions in homes, neighborhoods, and businesses in Springfield by conveying wastewater across the Connecticut River to the Springfield Regional Wastewater Treatment Facility on Bondi's Island. This helps prevent the spread of bacteria and disease. The Commission's Sewer Group maintains the sewer system and conducts services including jetting (cleaning) sewer mains and syphons, repairing sewer mains and services, and manhole cleaning/repair.

The Sewer Group is also accessible at any hour, year-round, to respond to emergency situations such as sewer backups. In FY21, the Sewer Group responded to 648 sewer backup calls and assisted 105 customers in the repair or replacement of their sewer service lines.

Technology Infrastructure

The IT Department performed the following improvements for the Commission in FY21:

- Deployed state-of-the-art 4G devices to pump stations to make communications more reliable and less costly
- Upgraded wastewater metering software to include 4G LTE communication devices on all wholesale wastewater meters due to discontinuation of 3G technology
- Designed specifications for new SCADA data center project

Cybersecurity Protection

Water utilities are a target of cyber threats, which is why the IT Department focuses on maintaining the Commission's IT safety to ensure the continuation of quality services. The department recently:

- Enhanced the Commission's cybersecurity profile, including hardware, software, policies, and training
- Began the replacement of SolarWinds products, including Help Desk, Network Monitoring, Asset and Log management, due to a massive worldwide breach in SolarWinds' security

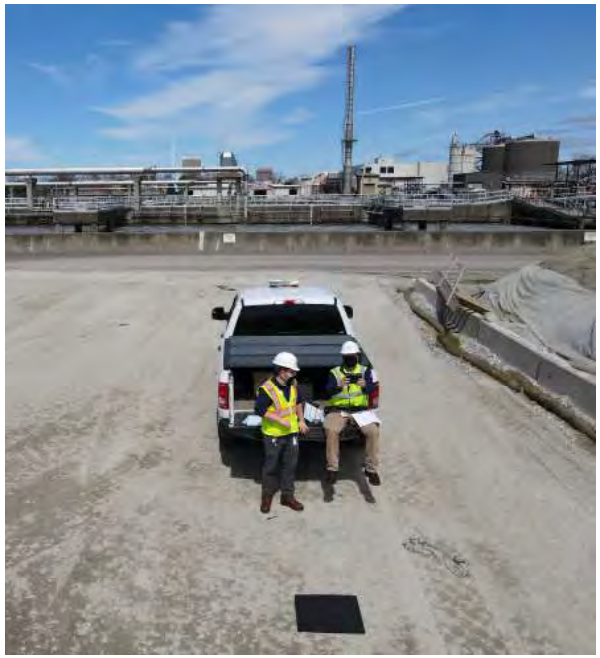
DID YOU KNOW?

In recent years, water utilities have become the target of cyber threats, which further emphasizes the importance of IT infrastructure security.

Geographic Information System (GIS) Efforts

The Commission's GIS Team is part of the IT Department. The team achieved several accomplishments in FY21 that included:

- Producing maps to assist watershed staff in providing the Source the Source Water Protection Plan for MA DEP.
- Collaborating with the Commission's Computerized Maintenance Management System (CMMS) staff to enable map editing capabilities within the Commission's asset management system.
- Collaborating with the Commission's CMMS staff to streamline the workflows that are used for capturing, documenting, and mapping water service line revisions and corrections.
- Assisting engineering staff in identifying small diameter water mains (less than 4 inches in diameter) that were previously not documented in the Commission's GIS database.
- Launching the Commission's Unmanned Aerial Vehicle (UAV) program, which allows two IT staff members with FAA UAV Pilot licensure to conduct aerial explorations of job sites.
- Deploying a high-accuracy GPS unit to the Commission's Operations Construction team that is capable of mapping features to within 3 centimeters. Features collected are immediately available to GIS staff for use in revising the Commission's GIS database.



Top and bottom: *Members of the Commission's IT department practice using the new drone and review the flight map.*

Customer Service and Community Outreach

The Commission is the largest public water utility in the region, supplying drinking water and wastewater services to more than 175,000 retail customers through roughly 43,000 service points. It is essential that the Commission provides strong customer service and outreach to its consumers.

Supporting Customers

Behind the scenes is a team of dedicated, knowledgeable, and experienced customer service representatives (CSRs) that is at the ready to respond to customers' inquiries. The Customer Service Group (CSG) is comprised of two teams: one focused on billing and accounts, and the other on field operations such as water and sewer emergencies or new connections. In FY21, the CSG answered 119,269 customer calls. CSRs tackle several tasks that include:

- Managing billing
- Responding to emergency calls
- Scheduling service appointments
- Coordinating inspections and other construction-related activities with contractors
- Administering customer assistance programs offered by the Commission

Similarly, CSRs are key to responding to customers' concerns about water quality issues. Building these positive relationships with customers is critical to the Commission's daily operations.

CSRs proactively educate customers on leak detection and timely repair, which protects customers from potential high water and sewer bills due to an ongoing leak or plumbing issue. The CSG monitors and reviews accounts for high use or possible leaks through the Leak Detection Program and alerts the customer if an account displays an unusual water meter reading, such as sudden high or low usage, which may indicate a leak or vacancy. The CSG may offer additional resources to further explore the issue. In FY21, customer service representatives reached out to 2,096 customers regarding unusual usage.

CSG also helps administer the Customer Assistance Program (CAP), a low-income water and sewer credit program launched by the Commission in November 2020. In FY21 there were 1,031 applications to the program, 539 of which were awarded credits.

Education and Community

With many (but not all) events canceled or held online due to the pandemic, FY21 was a quieter year than usual in terms of activities in the community, such as the water station. Therefore, the Commission adapted and expanded its outreach to customers and students to educate about its services and the water sector. Efforts included:

- **Development of the Customer Assistance Program** (CAP), which provides a $125 annual credit on eligible customers' bills. The Commission partnered with New England Farm Workers Council and Valley Opportunity Council to promote and implement the program, which is one of the few of its kind among water utilities across the nation.
- **Providing webinars on all available customer assistance programs**, including the CAP, senior/

disabled/disabled veteran discounts, leak audits, and more. The January 2021 webinars were recorded and posted to the website for continual access.

DID YOU KNOW?

The Customer Assistance Program is one of the few of its kind among water utilities across the country.

- **Development of virtual field trips,** including "A Virtual Visit to Cobble Mountain" and "A Virtual Visit to Bondi's Island" as part of the World Is Our Classroom Program for fifth and seventh graders. This educational programming was used in virtual lessons at Springfield Public Schools.
- **Hosting a virtual career fair** with Renaissance School and Balliet Middle School about careers in water. Commission staff in watershed protection, IT, and water treatment shared their career paths and experiences with students.
- **Development and award of three new scholarships** toward the Basic Drinking Water Treatment online course at Springfield Community College. The course was developed in partnership with the Massachusetts Water Works Association, the Commission, and STCC in 2018 to attract new talent to the drinking water treatment field.

Above, top to bottom: *A Commission-branded water bottle at Cobble Mountain; Water bottles were delivered to students at Springfield Public Schools.* ***Right, top and bottom:*** *The Commission filmed virtual field trips including this one at Cobble Mountain.* ***Opposite page, top to bottom:*** *SWSC's Customer Service Representatives; The Commission provided a water station in spring 2021, where visitors could fill up a branded water bottle with the Commission's water.*

Financial Report

The management of the Springfield Water and Sewer Commission (Commission) provides this narrative overview of the financial activities of the Commission for the fiscal year ended June 30, 2021 (FY21). A full accounting and analysis of all financial activities is provided in the Commission's FY21 Annual Comprehensive Financial Report (ACFR), available on the Commission's website or by request.

Financial Highlights

The Commission ended the year with operating income of approximately $26.8 million. The following paragraphs give an overview of the activities in FY21.

It is a requirement that the Commission 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 fiscal year 2011, the Commission has adopted single-year rate schedules to more closely match revenues to expenditures.

The COVID-19 outbreak in the United States (and across the globe) has resulted in economic uncertainties. The disruption is expected to be temporary, but there is considerable uncertainty around the duration and scope. The extent of the impact of COVID-19 on the Commission's operational and financial performance will depend on certain developments, including the duration and spread of the outbreak, impact on employees, and vendors, all of which are uncertain and cannot be predicted. At this point, the extent to which COVID-19 may impact the Commission's financial condition or results of operations is uncertain.

The Commission is required to file each year with EMMA the Commission's Annual Comprehensive Financial Report (1) the filing is being made merely to comply with contractual commitments, not to provide all information material to an investment in the linked securities, and does not purport to provide all such information, (2) COVID-19 is expected to adversely affect the issuer's future financial performance to an extent that could be material, and (3) consequently, the information set forth in the filing should not be relied upon as indicative of future financial performance.

In fiscal year 2021, there was an increase in collection efforts and an increase in rates; also, overall usage was higher than anticipated. As a result, wastewater charges revenue and fees were approximately $55,000 higher than budget. Wholesale water charges and fees were higher than budget by approximately $2.6 million. Power generation revenues were less than estimates by approximately $223,000. These and other factors resulted in total operating revenue of approximately $90.5 million in FY21, approximately $2 million more than budget, and $9.5 million more than the prior year.

Operating expenses were less than budget by approximately $5.8 million, primarily as a result of conservative budgeting for general operational expenses and, in some cases, reduced expenditures as a result of less positions and overtime needed.

Summary of Net Position

In fiscal year 2011, the Commission implemented FASC 980, Accounting for the Effects of Certain Types of Regulation, which essentially adjusts for differences between how revenue / rates are budgeted and how they are accounted for on a Generally Accepted Accounting Principles (GAAP) basis. In the Commission's case, revenue intended to fund capital asset acquisitions is set aside (deferred) and is recognized equal to the

annual depreciation expense on those assets; depreciation expense on assets funded in other ways (such as through bonds) is removed from the income statement because those costs are not factored into the budget process; conversely, because principal debt repayment costs are funded through the budget, those costs are reflected in the income statement as a reduction to net position. The net effect of these adjustments is reported under the line "Excess revenues used to fund deferrals" on the Statement of Revenues, Expenses and Changes in Fund Net Position. This was a decrease of $(15,372,584) for FY21.

As a result of the key elements described above, the activities for the year resulted in a change in net position of $12,398,980.

Capital Asset and Debt Administration

Total investment in capital assets at year-end amounted to $405,398,449 (net of accumulated depreciation). This investment in capital assets includes land, buildings and improvements, furniture and fixtures, vehicles and equipment, and infrastructure. At the end of the current fiscal year, total bonded debt outstanding was $237,373,443, 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 Notes to the Financial Statements, Note 13, Long-Term Debt.

Requests for Information

The FY21 Annual Comprehensive Financial Report is available on the Commission's website, waterandsewer.org.

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 | info@waterandsewer.org

Major Capital Asset Events FY21

Hydrant Projects	**$108,000**
Meter Replacements	**$735,000**
West Parish Filters Water Treatment Plant Projects	**$1.6 million**
Water Treatment System Improvement Projects	**$540,000**
Wastewater Treatment System Improvements Projects	**$674,000**
York Street and CT River Design Projects	**$26 million**
Sewer Main Rehabilitation Projects	**$1.9 million**
Transmission System Rehabilitation	**$207,000**
Collection System Assessment and Rehabilitation	**$1.2 million**
Distribution System Rehabilitation Projects	**$354,000**
Provin Reservoir Tank Projects	**$384,000**
Bypass and Tunnel Construction	**$1.2 million**
New Vehicle and Equipment Purchases	**$356,000**
Computer Software and Equipment Purchases	**$424,000**
Various Other Rehab and Improvement Projects	**$2.7 million**

Additional information on the Commission's capital assets can be found in the Notes to the Financial Statements, Note 10, Capital Assets.

Opposite page: *The administrative building on Bondi's Island.*

Summary of Net Position	2021 ($)	2020 ($)
Current Assets	213,556,589	216,067,645
Non-Current Assets	3,253,779	2,523,481
Capital Assets	405,398,449	376,413,115
Total Assets	622,208,817	595,004,241
Deferred Outflows of Resources	105,775,469	107,098,137
Total Assets and Deferred Outflows	727,984,286	702,102,378
Current Liabilities	101,571,327	141,359,600
Non-Current Liabilities	320,057,192	281,425,830
Total Liabilities	421,628,519	422,758,430
Deferred Inflows of Resources	162,998,353	148,358,514
Net Investment in Capital Assets	181,781,706	159,325,678
Restricted – Other Purposes	62,948,144	59,930,406
Unrestricted	(101,372,436)	(88,297,650)
Total Net Position	143,357,414	130,958,434
Operating Revenues	90,547,174	81,063,786
Operating Expenses	(63,792,232)	(63,643,785)
Operating Income	26,754,942	17,420,001
Non-Operating Revenues (Expenses)	1,016,622	(2,258,313)
Special Items	(15,372,584)	(20,415,649)
Increase (Decrease) in Net Position	12,398,980	(5,253,961)
Beginning Net Position	130,958,434	136,212,395
Ending Net Position	143,357,414	130,958,434

Last Five Fiscal Years

Water Rates ($ per 100 CF)	2022	2021	2020	2019	2018
Residential	4.19	3.96	3.62	3.22	3.01
Commercial	4.19	3.96	3.62	3.22	3.01
Municipal	3.13	2.96	2.70	2.40	2.24
Industrial	3.13	2.96	2.70	2.40	2.24
Solutia contract (per 100 CF)	3.07	2.90	2.65	2.32	2.11
Town contracts (per million gals)	1,656.62	1,340.94	1,727.00	1,491.03	1,717.86
Residential Water % Change	5.8%	9.4%	12.4%	7.0%	4.2%

Sewer Rates ($ per 100 CF)	2022	2021	2020	2019	2018
Residential	6.62	6.25	5.71	5.32	4.93
Commercial	7.28	6.88	6.28	5.85	5.42
Industrial	7.94	7.50	6.85	6.38	5.92
Municipal	6.62	6.25	5.71	5.32	4.93
Food Service	8.61	8.13	7.43	6.92	6.41
Medical	7.28	6.88	6.28	5.85	5.42
Solutia contract (per million gals)	1,288.93	1,340.94	1,138.91	1,197.77	1,145.39
Town contracts (per million gals)	1,288.93	1,340.94	1,138.91	1,197.77	1,145.39
Residential Sewer % Change	5.9%	9.5%	7.3%	7.9%	4.0%
Average Combined Rate Increase	5.9%	9.4%	9.9%	7.4%	4.1%

Source: Fiscal Year 2021 Adopted Rules and Regulations, Chapter 5

Above: *The Cobble Mountain Reservoir spillway.*