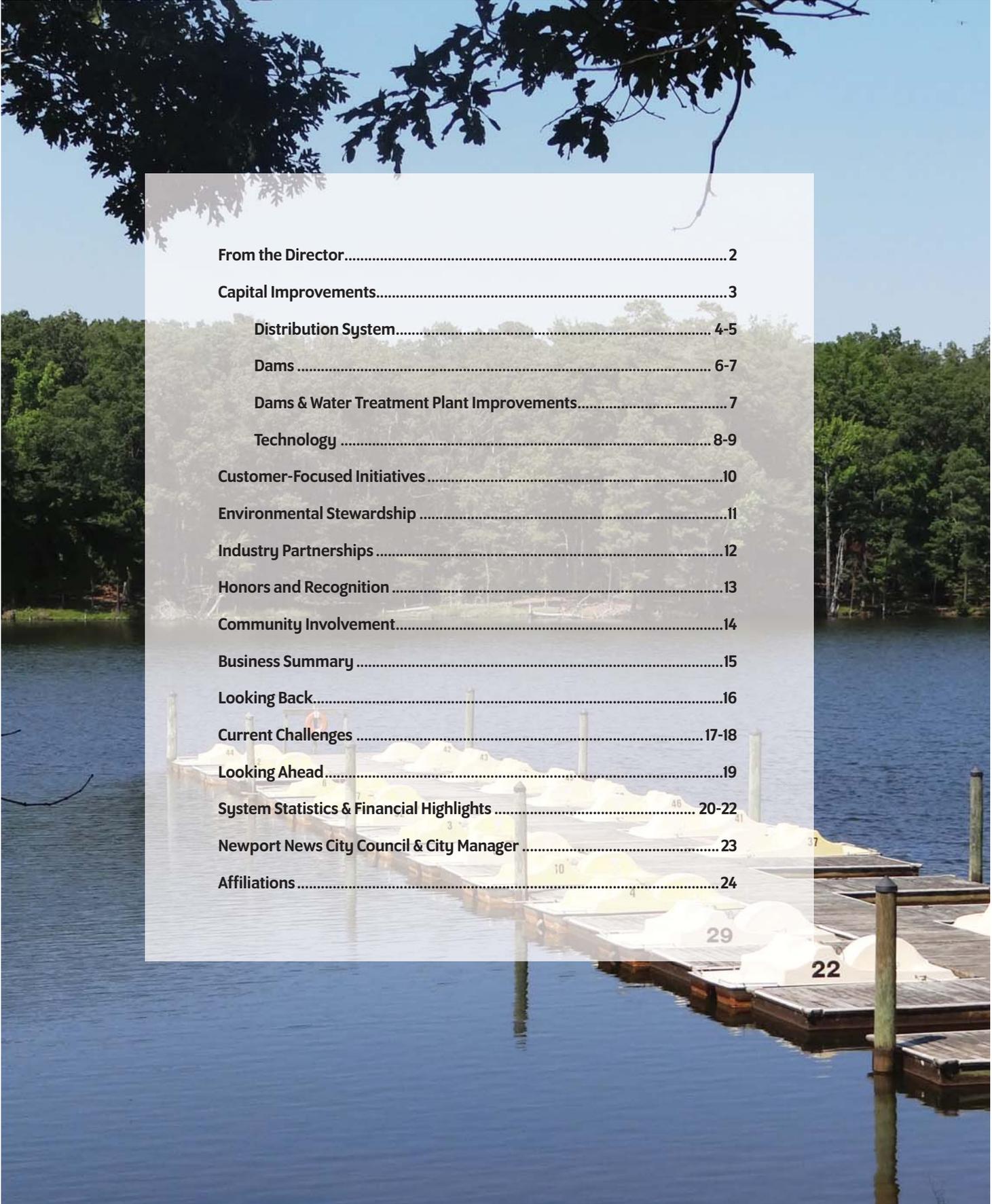


2017 ANNUAL REPORT



CONTENTS



From the Director.....	2
Capital Improvements.....	3
Distribution System.....	4-5
Dams	6-7
Dams & Water Treatment Plant Improvements.....	7
Technology	8-9
Customer-Focused Initiatives	10
Environmental Stewardship	11
Industry Partnerships	12
Honors and Recognition	13
Community Involvement.....	14
Business Summary	15
Looking Back.....	16
Current Challenges	17-18
Looking Ahead.....	19
System Statistics & Financial Highlights	20-22
Newport News City Council & City Manager	23
Affiliations	24

FROM THE DIRECTOR

As you will see in this Annual Report, Newport News Waterworks continues to deliver clean, safe and high quality water, to replace aging infrastructure, to focus on customer service, and to increase operational performance effectiveness and efficiency. For more than a century, we have been committed to our mission to remain a model utility, which now provides water to more than 407,000 customers in Newport News, Hampton, York County, Poquoson, and parts of James City County.

Operating a water utility of our scale and complexity is not an inexpensive endeavor. However, as a result of strategic forethought and financial prudence, we are positioned to be able to continue to deliver water to your tap at an affordable cost well into the next century. Additionally, for many years, Waterworks has maintained very strong municipal credit ratings from the two leading credit rating agencies, including AAA rating from S&P (their highest rating). Strong credit ratings allow Waterworks to secure very low interest rates when we issue debt, which helps minimize the impact of annual interest cost associated with funding programmed for the maintenance and improvement of our distribution system, dams, treatment facilities, source water assets and environmental protection areas, and for the replacement and upgrade of vehicles, special equipment and information technology assets.

While we may not have a crystal ball to predict precisely where we will be in 100 years, we continue to earnestly, enthusiastically, and diligently evaluate our current system and plan improvements for the future to ensure that our water utility will always satisfy our mission. Waterworks will continue to focus on Smart City technologies and solutions, rely on data-driven decision making processes, encourage innovation, embrace technology, and recruit and train an outstanding workforce to be best prepared to address the challenges and opportunities that lie ahead. The Waterworks team will effect good stewardship to protect our rivers, reservoirs and dams, will remain focused on the continued integrity of our infrastructure and assets throughout the system and the effective and efficient treatment and distribution of water to our customers throughout the region.



A handwritten signature in blue ink that reads "Louis Montez". The signature is fluid and cursive, with the first name "Louis" and last name "Montez" clearly legible.

Director, Newport News Waterworks Department

CAPITAL IMPROVEMENTS

The Newport News Waterworks Department (Waterworks) operates a City-owned water system that serves a population of more than 400,000 people in five localities on the Virginia Peninsula. These localities include the cities of Hampton, Newport News, and Poquoson, as well as York County, and part of James City County.

The Department was founded in 1889 as the Newport News Light and Water Company by Colis P. Huntington and his partners to bring utility services to the Virginia Peninsula. It was operated as a private company until 1926, when the Waterworks was purchased by the City of Newport News. For 32 years, it was operated as a City Commission. With the consolidation of the City of Newport News and Warwick County in 1958, the Waterworks Commission became the Department of Public Utilities. In 2015, it was renamed the Waterworks Department.

Capital Improvement Plan

The Waterworks Capital Improvement Plan (CIP) is a five-year roadmap that establishes a schedule and funding strategy for present and future infrastructure needs. It is the vehicle for purchasing, installing, maintaining, rehabilitating, and upgrading our facilities and infrastructure, including major equipment such as computer systems and vehicles. Waterworks' financial policies (see page 15) call for cash contributions to the CIP of at least 25% of total CIP costs over any given rate period. The remainder of the CIP is bond funded with the potential for some future grant funding.

The overriding goal of the CIP is to assure that the water system is properly managed so we can reliably deliver high-quality, safe drinking water to customers, protect the environment, and comply with

\$83 MILLION
PROJECTED CIP INVESTMENT
2017-2021

regulations. A strategic and well-balanced CIP will preserve and enhance existing facilities; protect and conserve the region's environmental resources; and provide new assets to respond to community growth and changing service needs.

Waterworks CIP can be divided into the following focus areas:

Distribution System - Repair, upgrade, rehabilitation, and replacement of water lines, pump stations, tanks, and other facilities that are part of the distribution system.

Dams - Maintenance, repair, and improvement of dams and spillways to safeguard the public and ensure supply reliability.

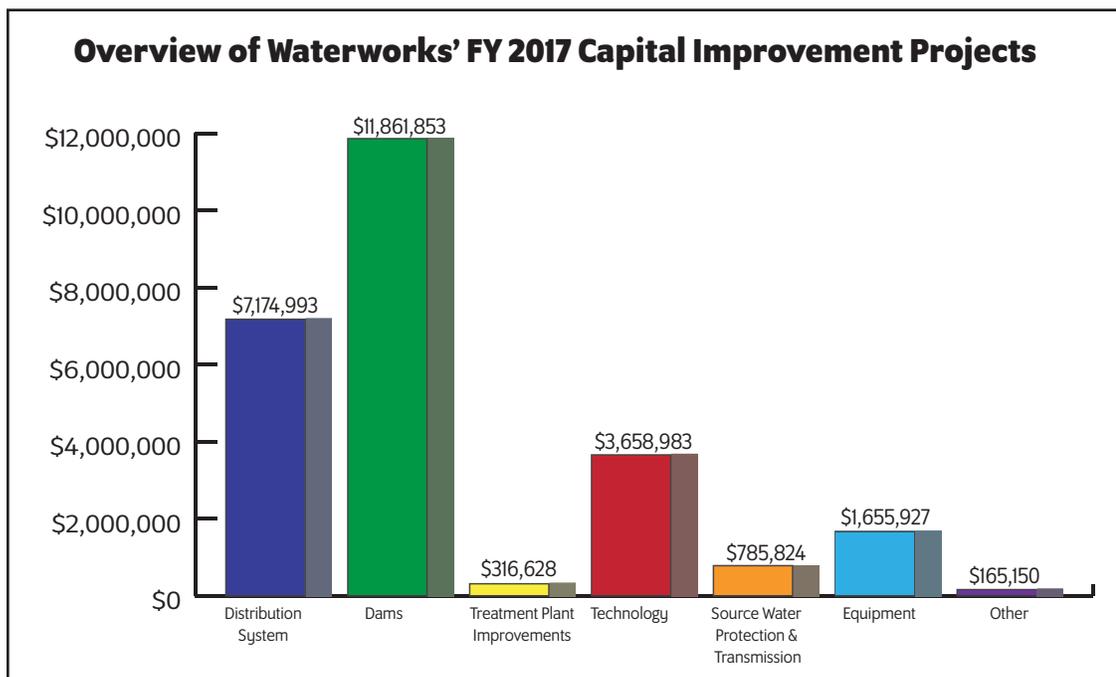
Treatment Plant Improvements - Design, construction, and repair of water treatment facilities to meet customer and environmental service levels and to comply with state and federal drinking water regulations.

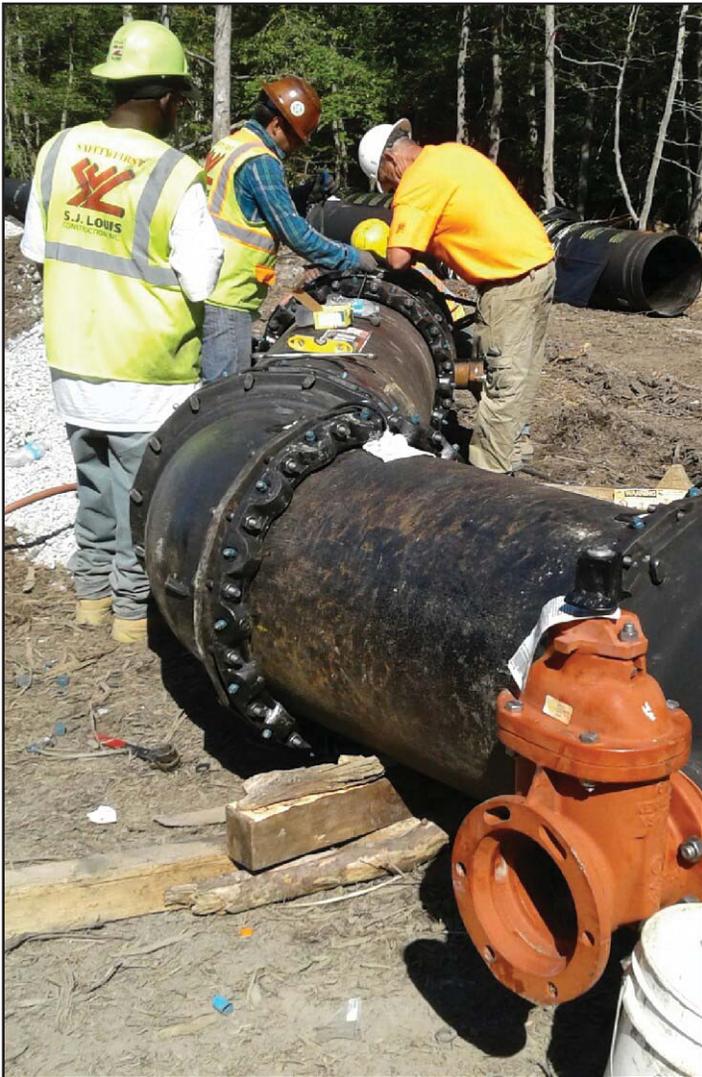
Technology - Purchase, installation, and upgrade of information technology assets needed to increase efficiency and productivity and/or to improve customer service.

Source Water Protection & Transmission - Protection of our raw water sources and the repair and upgrade of large transmission pipelines and associated pump stations that bring untreated water to the treatment facilities.

Equipment - Regular replacement of capital assets such as vehicles, lab equipment, radio/communications equipment, tools, etc.

Other - Unusual projects that do not appropriately fall under other categories.





By the Numbers

42

**AVERAGE AGE,
IN YEARS,
OF PIPES IN
WATERWORKS
SYSTEM**

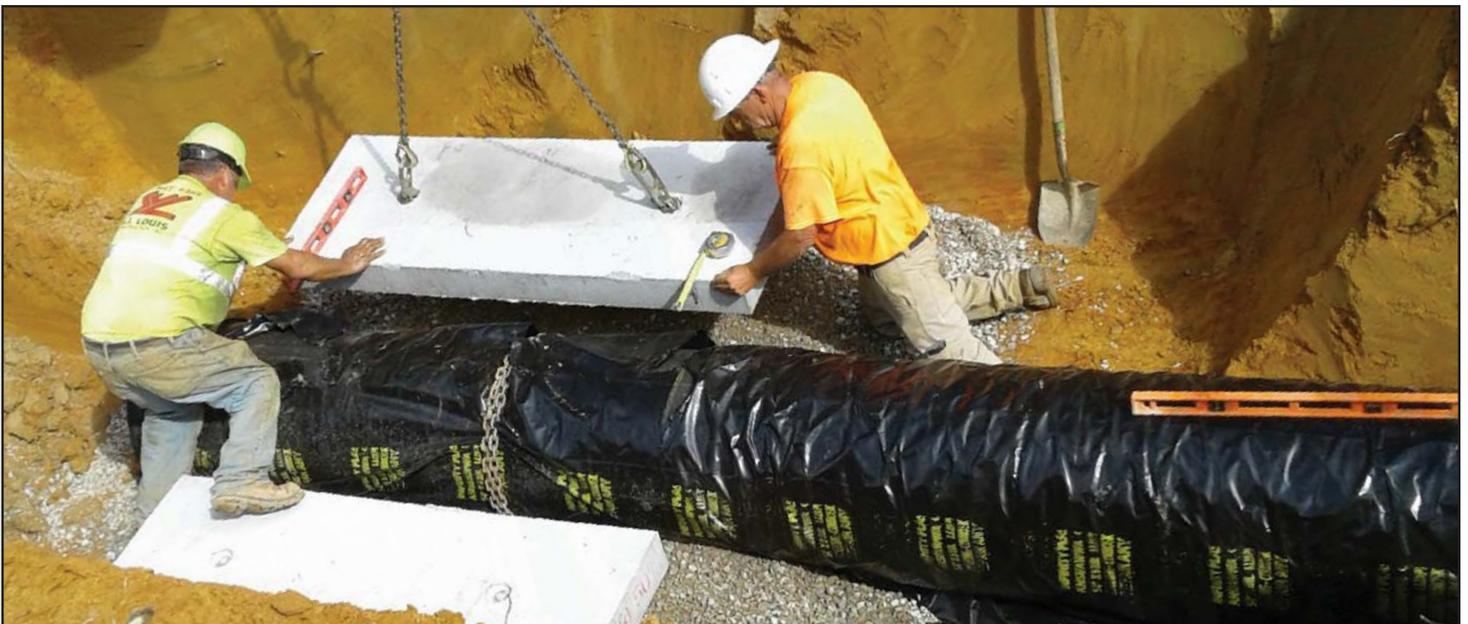
Lightfoot (York County) Transmission Main

As 2017 came to a close, Waterworks was wrapping up a multi-year project to run a 24" transmission main from Hubbard Lane to Moore-town Road in York County. This main will eventually provide surface water to customers currently served by the existing Lightfoot ground-water system that was acquired by Waterworks in 2009.

This two-phase project was a partnership between Waterworks, the Colonial Williamsburg Foundation, and York County. The foundation provided the design of the pipeline from Hubbard's Lane to the planned Powell Plantation subdivision (also known as the Carr's Hill Tract), as well as \$125,000 in funding toward the design and construction of the first phase of the pipeline.

The total cost of the project, including design and construction was approximately \$7.5 million, which was divided equally by Waterworks and York County. The county also paid for and assisted with obtaining easements along the corridor.

The new main positions Waterworks to better meet future demand and fire protection needs as development increases in the area. In addition, it will be a major supply line for the potential wholesale purchase of water by James City County or the City of Williamsburg.



Capital Improvements: Distribution System



Fox Hill and Grandview Pipeline Improvements

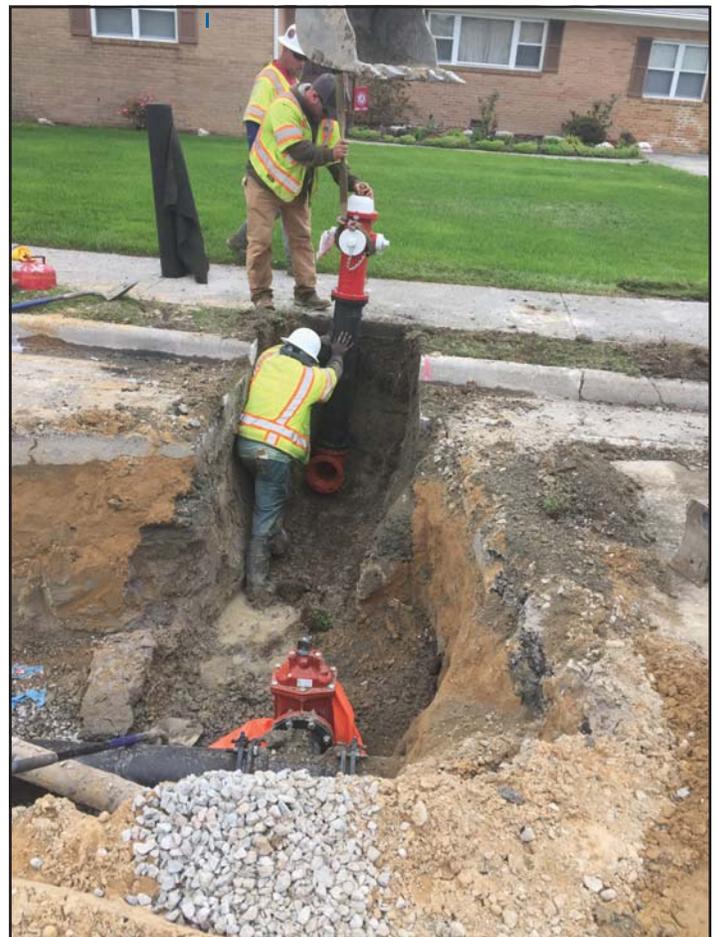
In the Fox Hill and Grandview areas of Hampton, Waterworks replaced approximately 7,500 linear feet of aging water mains dating from 1938, providing additional capacity and improved fire flow to the area. Construction started in September 2016 and took eight months to complete. The project came in \$36K under budget.

Despite having a narrow corridor to work in, the contractor was able to safely install the new water main parallel to the old main, often in the same excavated trench. Waterworks and its contractor worked with the City of Hampton and local residents to keep the streets open and passable throughout the construction period.

This was the first time Waterworks used a message board to alert residents of a planned water shutdown. This was done during the final tie-in of the Grandview Area.

When the project was completed, area residents reported a noticeable difference in pressure and quality.

In addition to more than 10,000 linear feet (LF) of new pipe, including 10,000 LF of 12" and 315 LF of 8" ductile iron pipe, crews installed 14 fire hydrants, 28 valves, and 30 LF of 24" steel casing, and transferred 140 service lines. ▼



Water Crossings

Pipelines in marine environments, such as those that cross large waterways are particularly susceptible to corrosion and deterioration. In 2016-2017, Waterworks completed improvements to pipelines and support structures (piles) on three transmission mains. Repairs to raw water transmission mains at Diascund Creek and Lee Hall Reservoir were completed in 2016, while a 20-inch pipeline across the Hampton River at Mercury Boulevard was rehabilitated in 2017.

The restoration process involves multiple steps. First, cracked concrete and rust on the rebar supports are removed. Then a coating and sealing agent is applied. Once this is complete, a polyurethane 'jacket/sleeve' is placed around the support pilings. To further reinforce the pilings, a concrete injection is inserted in the sleeve. This builds up the support and makes the piling firmer and larger. Because the support pilings are visible to the public, care is taken to ensure the restoration is aesthetically pleasing and that each piling is the same height and width.

Distribution System Statistics	
	Operated and maintained 11,100 fire hydrants in five localities on the Peninsula
	Operated and maintained six elevated storage tanks and five ground storage tank
	Operated and maintained 1,750 miles of pipeline & 32,500 valves
	Operated and maintained more than 136,000 meters



Lee Hall Dam Replacement

In December 2017, the \$16.7 million project to replace the Lee Hall Dam was deemed essentially complete, bringing the dam into compliance with the more stringent dam safety regulations enacted by the Commonwealth in recent years. The investment in this critical infrastructure should provide many decades of protection to the Peninsula's water supply as well as flood protection for downstream properties.

This two-year project was divided into four phases to sequence the work in a way that mitigated flood risks while still allowing for shared uses of the reservoir by stakeholders. The project included construction of a 165-foot wide concrete principal spillway channel, a 1,115 foot armored emergency spillway embankment, and an outlet works. The final phase of the project also included removal of the old hydraulic controls from the CSX embankment.



Harwood's Mill Dam Improvements

As the Lee Hall Dam project was coming to a close, design work was beginning for modifications to the Harwood's Mill Dam to meet the state's new dam safety regulations. The dam has a principal and an auxiliary spillway, both of which convey water downstream to the Poquoson River and which are no longer considered large enough to handle the overflow from a probable maximum flood event. (A probable maximum flood is the most severe flood possible in a particular watershed and is calculated by combining information about the precipitation, geology, and water management strategies of the area.) Waterworks and its consulting engineers are currently in the preliminary stages of the design process to address this issue. The total cost and timeline for this project will depend on the final design and other project specifications.

In May 2017, the Virginia Department of Conservation and Recreation (DCR) awarded Waterworks an \$82,500 grant from its Virginia Dam Safety, Flood Prevention, and Protection Assistance Fund for preliminary studies and engineering design services for the Harwood's Mill Dam project. The DCR makes grant funds available to dam owners and local governments who have eligible projects to improve dam facilities, satisfy regulatory requirements, or enact flood prevention and protection measures. The grants are reimbursements and require a 50 percent match.

Clarifiers at the Harwood's Mill Water Treatment Plant are being rehabilitated to provide service for another 30 years. ▼



▲ *The Harwood's Mill spillway is no longer large enough to handle the overflow from a probable maximum flood event.*

Harwood's Mill Water Treatment Plant Improvements

The Harwood's Mill Water Treatment Plant has provided high quality drinking water to the Peninsula for nearly 30 years. Designed as a state-of-the-art facility when it was built in 1989, the plant has undergone relatively few modernization and process changes in its lifetime, and parts of the plant are reaching the end of their estimated lifespans. The clarifiers in particular, which are responsible for 90% of the plant's sediment and organics removal, are in need of rehabilitation due to corrosion of components and potential structural problems.

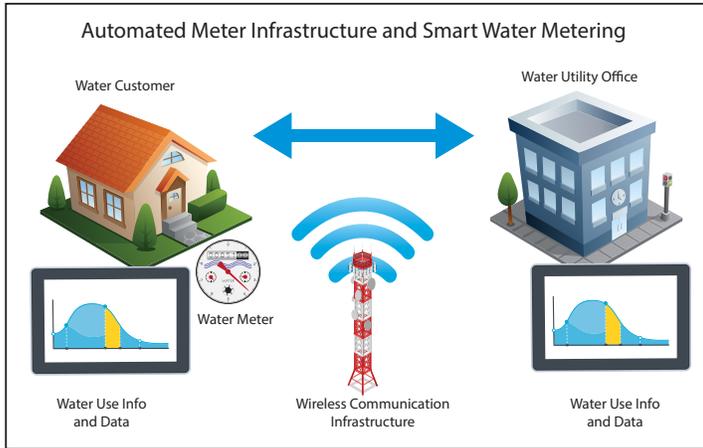
Clarifiers work by allowing contaminants in the water to settle out, leaving clearer, cleaner water. Chemically coagulated water enters the clarifiers through lateral pipes along the bottom of the basins and moves upwards through settling plates. The heavy clumps of organics and sediment are caught within the clarifier while the clean water leaves through the top. Due to corrosion and movement over the years, the settling plates need to be replaced and the lateral pipes reattached. In addition, the current filter design does not allow plant operators easy access to the filters for inspections and observations.

To remedy these problems, Waterworks is rehabilitating the clarifiers and installing a new filter catwalk, which will allow for better filter operation and keep the plant functional for another 30 years. The scope of the project includes complete structural and mechanical rejuvenation of the clarifiers by replacing or rehabilitating each functional component within the basins and installation of a catwalk over the filters to allow easier assessment of the filtration process.

The project is expected to cost approximately \$1.8 million. Construction started in November 2017, with completion expected in November 2018.

Smart Metering

Looking to the future, Waterworks initiated a three-phase Advanced Metering Infrastructure (AMI) project. AMI is a metering system that allows two-way communication between the meter and the business office. In an AMI system, “smart” meters record consumption data every hour (or more frequently) and send that data directly to the utility via a wireless communications network, thus eliminating the need for manual meter reading.



Phase I of the project, completed in 2016, was a feasibility study to determine the costs and benefits of deploying an AMI system. The study identified potential customer service improvements and operational benefits for Waterworks and found that an AMI system would align with Waterworks and the City’s strategic and operational goals.

Customer-focused benefits include access to more timely, detailed consumption data to address customer inquiries, the ability to identify high usage incidents and contact customers before they receive a high bill, and a streamlined process for transferring accounts when customers move in or out.

With AMI, Waterworks would be able to provide a higher level of customer service while keeping long-term operating costs low. Many functions that require sending crews out to the field today would be performed remotely with AMI, saving labor, fuel and vehicle costs, in addition to being more environmentally friendly.

In 2017 Waterworks initiated Phase II of the AMI project, which will include design and planning activities in support of a subsequent procurement process. During this phase, Waterworks will define the project requirements and an implementation approach if/when Waterworks decides to move to Phase III, project implementation.

Mobile Workforce

Waterworks is in the process of implementing a mobile workforce system for our field service technicians. The new system will handle electronic work orders on a mobile device, giving Waterworks the ability to schedule and route work in an orderly manner, track field personnel and vehicles, handle dispatch duties, and provide real-time updates. With this system, scheduled work will be uploaded overnight onto each technician’s mobile device, virtually eliminating the use of paper work orders.

The system will reduce radio traffic, provide real-time updates to customer service representatives at the call center, and eliminate hard copy work orders that are sometimes lost or returned for rework due to improper documentation. Because the system is designed to be easy to use, workers in the field will be better able to manage their daily workloads, making them more productive and efficient.

Waterworks’ Meter Operations group will conduct a pilot program in 2018 to test the software. Once it has been successfully tested, the field mobility system will be implemented in other work groups in the Department.



A technician levels a meter box.

By the Numbers

125,066

**AVERAGE NUMBER OF
METERS READ DURING
EACH BILLING PERIOD**

Phone System Upgrade

With the replacement of an obsolete digital phone system with a state-of-the-art voice over IP (VOIP) system, Waterworks is now positioned to offer several Customer Service improvements.

The new system provides many advanced features at a cost savings over the old system. These features include robust reporting, centralized management, and integration with desktop computers.

Although our Customer Service group began using the system in 2014, the conversion to VOIP in all our Peninsula facilities was not completed until 2016.

In 2017, Waterworks began working toward implementing some of the system's customer service features, including call back (customers can leave a call back number instead of waiting on hold) and a customer survey at the end of a call.



Asset Management System

Waterworks is in the process of selecting an Asset Management Software solution (AMS) for use in operating and managing all Waterworks' owned infrastructure including water treatment plants, raw and finished water facilities, fleet operations, the distribution system, and inventory and procurement.

Asset management helps a utility make better decisions on when it is most appropriate to repair, replace, or rehabilitate its assets. This leads to more efficient operation and improved emergency response, which in turn helps ensure the long-term sustainability of the utility.

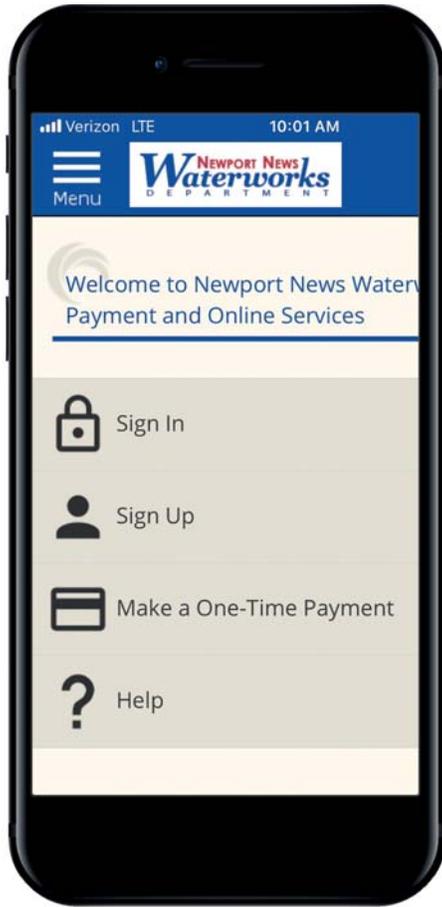
Waterworks' AMS will replace a Cobol-based main-frame system that has been in use for over 30 years. This system has limited capabilities and has reached the end of its useful life. Moreover, the cost of main-

taining this aging system is prohibitive and finding qualified programmers to work on it has become nearly impossible.

The new system will keep track of equipment and inventory vital to the department's day-to-day operations and will handle all types of condition assessments, work orders, pick tickets, and procurement documents.

Waterworks is working with the consulting firm Hazen & Sawyer to identify the proposed system's functional and technical requirements. Together, they have researched several AMS solutions and seen demonstrations by leading firms in the field. A competitive selection process for one or more vendors to implement AMS will be conducted in the coming year.

CUSTOMER-FOCUSED INITIATIVES



Mobile App

Following the launch of a new customer web portal for online account management in 2016, Waterworks took the next step in improving customer service with the introduction of its first ever mobile app in March 2017.

Available for Android and iOS devices, the app is compatible with most mobile electronic devices and allows customers to conveniently create online accounts, view and pay their bills, view account summaries, make or schedule payments, and sign up for paperless billing.

Third Party Payments

Another advance in customer service was initiated last year when Waterworks began accepting payments through a third-party payment system that makes paying utility bills easier for customers who prefer to pay with cash.

Cash-paying customers can download an app and pay their bills at a retail store in their own neighborhoods. Payments can be made at ACE Cash Express, CVS Pharmacy, 7-11, and Family Dollar stores, eliminating the need to fill out and mail money orders or spend precious time and gas driving to a Waterworks office during business hours.



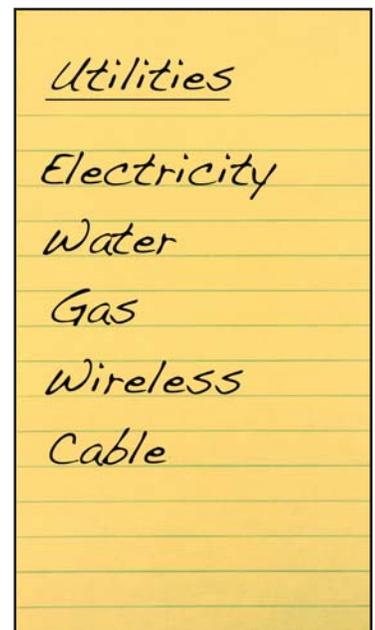
Customer Assistance Program

On July 1, 2017, Waterworks initiated a customer assistance program called Local Interventions for Financial Empowerment through Utility Payments (LIFT-UP). The program provides financial education and training through a third party to assist certain qualified customers in budgeting for their utility bill. The primary goal of the program is to provide financial education and training to customers who are experiencing severe difficulty in staying current on their utility bills.

The program consists of a one-on-one review of the participants' specific financial health and circumstances, and four hours of classroom training in topics such as: Managing Your Money, Banking, and Managing and Maintaining Your Credit. Participants work with a counselor to establish payment plans for current and past due amounts that better align with their financial means.

During the first month of the program, one of the financial counselor reported: "After the appointment with [the customer], she realized that her income could not support her expenses. She began looking for a better paying job. [The customer] was hired as a CNA and has increased her household income. Due to the increase in income she plans to bring her delinquent bill current sooner than what her plan was set for."

Waterworks hopes the program will reduce the number of involuntary water disconnections, as well as the number and amount of late payment fees and past due bills.



ENVIRONMENTAL STEWARDSHIP

Baptist Run Stream Restoration

To mitigate for stream and wetland impacts of the Lee Hall Dam renovation project, Waterworks restored part of Baptist Run, a tributary stream that flows through the Lee Hall Reservoir Watershed.

The project included repair of 1,700 linear feet of stream channel and floodplain that had been degraded by increased stormwater flow associated with years of upstream residential development. Mitigation included the addition of larger storm drain piping and a deep basin to reduce channel velocity. The project also reshaped and widened the stream channel and associated flood plain to help reduce sediment and nutrient loads and improve aquatic habitat.



Part of the restored Baptist Run stream channel and floodplain.

Watershed Protection Through Emergency Preparedness

In October, first responders from Newport News and York County met with Waterworks staff and personnel from Colonial Pipeline (CP) to conduct a tabletop exercise at which they practiced an emergency fuel spill response and reviewed spill management policies. Colonial Pipeline personnel were informed about potential staging areas, and Waterworks staff learned about resources that Colonial Pipeline has at its disposal for spill clean-ups.

The exercise was conducted in a simulated National Infrastructure Management System (NIMS), with the Newport News Fire Department's HazMat Team taking the lead. Everyone was focused on minimizing impacts to the public, sharing resources, and communicating accurate and timely information.

Because CP owns and operates transmission lines near the Lee Hall and Harwood's Mill reservoirs, the company facilitates a fuel spill exercise like this every three years to coordinate response activities and update and educate local staff. Thanks to these periodic exercises, Waterworks, CP, and our partners in Newport News and York County are better prepared to handle an incident in the unlikely event that one should occur.

By the Numbers

12,000

WATERSHED

ACRES OWNED

AND MANAGED

BY WATERWORKS

Continuing Land Conservation and Restoration

Waterworks continually looks for properties that drain to its reservoirs to consider for purchase when water quality improvements can be made. When we make a purchase, impervious surfaces, structures, underground tanks, and trash are removed, and the land is reforested. Over the past ten years, Waterworks has acquired ten properties totaling more than 177 acres.

In 2017, we purchased an 11.71 acre parcel located in York County on a tributary of the Poquoson River headwaters, which drains to the Harwood's Mill Reservoir. The parcel contained an abandoned house, a shed, a barn, a septic tank, and trash. All the structures were demolished, the septic tank was removed, and all debris and trash were removed from the site. The demolition project took one week, and 72 loads of debris (approximately 250 tons) were removed from the site. All the metal and tires collected were recycled, while some furniture left in the house was given to the Newport News Fire Department for use as training aids in their burn building.

Waterworks' purchase of this property will prevent it from being developed. Instead, the area will be reforested with approximately 4,500 tree seedlings and returned to a natural site that will help to protect the water quality of the reservoir.



◀ *Approximately 250 tons of trash and debris were removed from the site during demolition.*

▶ *The cleared site will be reforested to help protect water quality in Harwood's Mill Reservoir.*



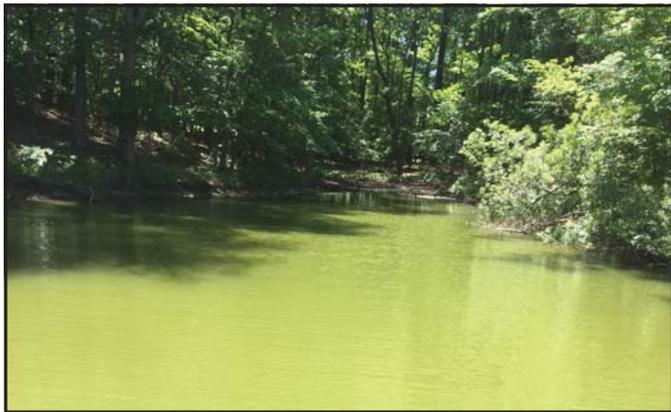
INDUSTRY PARTNERSHIPS

Cyanobacteria Research

Waterworks regularly participates in industry research projects to stay abreast of advancements and share information with the water industry at large. Requests for participation come from The Water Research Foundation, an internationally-recognized leader in water research dedicated to advancing the science of water by sponsoring cutting-edge research and promoting collaboration.

Last year Waterworks participated in a project to evaluate the risk of cyanotoxins in surface water reservoirs and develop educational public service messages for utilities to use should they need to communicate with customers about the risks of cyanotoxins in their drinking water supplies.

Cyanobacteria, also known as blue-green algae, naturally occur in marine and fresh water ecosystems. Some cyanobacteria are capable of producing toxins, called cyanotoxins, which can pose a risk to human health. Normally these bacteria co-exist with other phyto-



Blue-green algae naturally occur in marine and fresh water ecosystems.

plankton at low concentrations, but under certain conditions they can rapidly increase into excessive concentrations known as “blooms.” It is not possible to determine solely by visual observation if a bloom is producing toxins.

Waterworks monitors for algae and indicator parameters in its reservoirs and follows U.S. Environmental Protection Agency (EPA) recommended protocols for treating the blooms, if needed. In addition to conducting field monitoring, Waterworks staff take weekly samples that are analyzed in our laboratory for cyanobacteria and cyanotoxins. Based on the field and lab results, Waterworks acts swiftly to prevent growth and/or contain blooms using targeted treatments in the reservoirs.

Waterworks has developed a testing and communication program in accordance with the EPA’s Health Advisory and plans to continue participating in the research initiative.



THE Water Research FOUNDATION

Fostering Innovation

Utilities across the country have been embracing innovation as a business practice to provide more value to customers. Waterworks is excited to be partnering with the national Water Research Foundation and more than 50 other water utilities in a project to collaborate and share experiences that foster new ideas and implement new approaches to help transform their organizations and enhance their ability to meet future challenges.

The term innovation, as used in this project, is defined as the application of new ideas resulting in increased value to a utility’s customers and/or increased utility staff productivity. This definition includes concepts that are novel and represent incremental improvements to current practices.

The project has four specific objectives:

- 1) Characterize existing innovation activities,
- 2) Define the value of those activities,
- 3) Develop a transferable framework for fostering innovation activities,
- 4) Assemble a guidance document for water and wastewater utilities.

This value comes in many forms: streamlining existing workflows, utilizing new technology, and collaboration with industry and organizations outside the utility.

Waterworks hopes to supplement our existing culture of innovation with the guidance and shared experience from the Water Research Foundation.

Waterworks will be establishing an internal innovation team to explore the ideas with the focus on evaluating the ideas and concepts and applying those ideas through implementation.

Steps to Innovation



HONORS AND RECOGNITION



The VA AWWA named its award for leadership in honor of Waterworks' Water Quality Manager, Sherry Williams.

Sherry L. Williams Leadership Award

At its annual conference in September 2017, the Virginia Section of the American Waterworks Association (AWWA) conferred the inaugural Sherry L. Williams Leadership Award, named in honor of Sherry Williams, who has been Waterworks' Water Quality Manager since 1984. The award acknowledges the contributions and achievements of a VA AWWA member who has shown exceptional leadership skills, professional expertise, and dedication to the Section.

Sherry has served the Section for more than 30 years, during which time she has served on the Board of Trustees as the Section Chair, Secretary (for 11 years), Council Trustee, and Director. In addition to serving on the board, she has been a member of eleven different committees, serving as the committee chair for several of them. Sherry was instrumental in developing the Joint Annual Meeting (WaterJAM) and served as its first co-chair.

Her dedication to the organization was previously recognized in 2001, when she received the George Warren Fuller award — AWWA's highest award; in 2004 when she was honored with the Herb W. Evans Jr. Distinguished Service award; and in 2006, when she was named an AWWA Honorary member.

Sherry holds a Bachelor of Science Degree in Environmental Technology from Florida Institute of Technology and a Masters Degree in Chemistry from Old Dominion University.

Her extraordinary dedication and leadership to the Virginia Section has been remarkable and serves as an example to all its leaders, both current and future.

EcoAdapt Climate Adaptation Study

The Southeastern United States and U.S. Caribbean is highly vulnerable to a variety of climatic factors and extreme weather events, including heavy downpours, floods, and droughts, all of which can influence water resources in this region. Over the last 30 years, the Southeast has been affected by more billion-dollar weather-related disasters than any other region, with coastal states experiencing more hurricanes, and inland states experiencing ice storms and tornadoes.

Over the past decade, Waterworks has engaged in a number of impact studies, capital improvement projects, and water conservation outreach efforts to help improve its operations in light of a changing climate.

Because of those efforts, Waterworks was one of 18 utilities featured in a 2017 climate change study published by Eco Adapt, a non-profit environmental organization that works to help integrate climate adaptation strategies into planning and management efforts. The report provides case studies (including Waterworks), tools, and useful information on climate change adaptation in the Southeastern United States and U.S. Caribbean.

The State of Climate Adaptation in Water Resources Management: Southeastern United States and U.S. Caribbean

2017

Rachel M. Gregg, Whitney Reynier, Alessandra Score, and Laura Hilberg

COMMUNITY INVOLVEMENT

Make -a-Wish Golf Tournament

Waterworks held its 25th Annual Make-A-Wish® Foundation Charity Golf Tournament last October at Newport News Golf Club at Deer Run. 108 golfers participated in the “captain’s choice” golf tournament, which concluded with a dinner and raffle with all proceeds benefiting Make-A-Wish® Greater Virginia. This year’s tournament raised \$4,400 for the organization. Waterworks employees and their guests have supported Make-A-Wish® and the children they serve since 1992, raising a total of \$170,725.



Our “wish kid” gets some pointers from a Waterworks employee.

Make-A-Wish® Greater Virginia was founded in 1986 and granted its first wish in 1987. Since that first wish, over 4,200 wishes have been granted for eligible children in the Commonwealth. Last year alone, 170 wishes were granted, with five of these wishes for children living within the City of Newport News. Make-A-Wish® Greater Virginia grants the wishes of children with life-threatening medical conditions to enrich the human experience with hope, strength and joy. The organization is headquartered in Richmond and serves children across the Commonwealth with the exception of four Northern Virginia counties.

Any child over the age of 2½ and under the age of 18 who is diagnosed with a life-threatening medical condition may qualify for a wish regardless of the family’s race, gender, creed, socio-economic or cultural background. Wishes are not intended to be a “last wish,” but an endorsement of life and a gift of hope. Wishes produce not only hope, strength and joy for the child, but have beneficial effects in improving



140 golfers turned out for the tournament benefiting Make-A-Wish®.

health outcomes and bonding families. “We are extremely grateful for the long-standing support of Newport News Waterworks employees through their annual golf tournament to benefit Make-A-Wish® Greater Virginia. Their contributions over the years have helped grant wishes for so many children locally, and across the state. The joy of a wish has many positive effects on the child and their family, and these experiences would not be possible without such generous employees and event participants,” said Sheri Lambert, Make-A-Wish® Greater Virginia President & CEO.

Working for a Cleaner Community

Waterworks proudly participates in the Adopt a Spot Program sponsored by the City of Newport News Public Works Department and has been an active member of the program for nearly eight years.



Waterworks is one of more than 60 City-wide teams that help Newport News stay clean of litter and trash. Waterworks’ “spot” is approximately one mile of Industrial Park Dr. between Jefferson Ave. and Warwick

Blvd. This stretch of road passes in front of our Maintenance and Operations Center.

The team cleans the area four times a year, generally filling about 23 bags of trash each time. In addition to the typical collection of cans, bottles, and fast food bags, they’ve found clothing, car parts, and even pieces of furniture.

The team consists of 26 employees who represent all six of our operational divisions and the Director’s Office. Team membership is voluntary, and members donate their lunch breaks to conduct the clean-ups.

◀ *Members of the Waterworks Adopt-A-Spot team pose with their haul from a recent cleanup.*

BUSINESS SUMMARY

Rate Setting Policy

Waterworks typically requests nominal rate or fee increases each year rather than periodic, larger increases over an inconsistent period. These smaller increases are generally easier for customers to manage than large increases.

Waterworks did not request an increase in consumption-based (volumetric) water rates for the FY-2018 budget, keeping them stable through June 2018. We did, however, request a small increase to the fixed service fee, which the City Council approved. For single-metered residential customers, this increase amounted to \$1 per month. Fees for multi-family, commercial, and industrial accounts were progressively higher, depending on the size of the meter.

Water Revenue Bond Sale

In May, Waterworks issued \$27,930,000 in Water Revenue Bonds to fund capital improvements. The bond sale was competitively bid and well-received by the municipal bond market. Reflecting Waterworks' strong management and financial stability, the bonds sold at a true interest cost of 2.60% and yielded a bond premium (an amount paid by investors in excess of the amount of principal required to be repaid by Waterworks over the term of the bonds) of \$3,074,374.

As part of the bond sale process, Waterworks' bond rating was reviewed by Standard & Poor's Global Ratings (S&P) and Moody's Investors Service (Moody's). S&P reaffirmed Waterworks' AAA rating, (S&P's highest rating), noting Waterworks' history and projection of annual rate adjustments, strong financial performance, ample liquidity and reserve levels, and strong financial and operational management. S&P first assigned Waterworks its AAA rating in March 2011.

Moody's upgraded Waterworks' revenue bond rating from Aa2 to Aa1

By the Numbers

4,100

GALLONS USED
EACH MONTH
BY AN AVERAGE
WATERWORKS
CUSTOMER

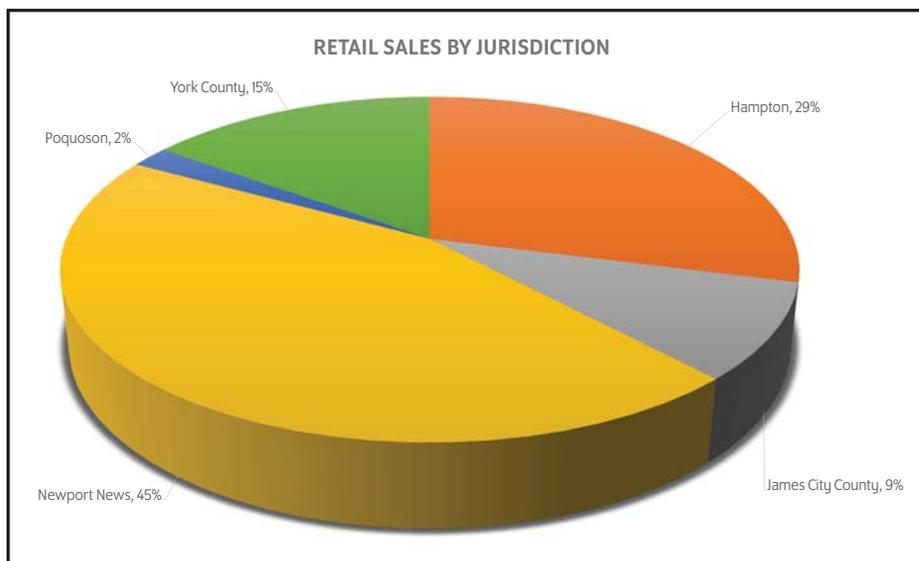
(the second highest Moody's rating), indicating in their credit opinion that, "the Aa1 rating reflects solid debt service coverage levels, satisfactory liquidity, low debt burden and a stable, regionally important service area." Waterworks' formalized financial policies and capital planning strategy were also identified as strengths.

Financial Policies

In the interest of fiscal responsibility and prudent spending, Waterworks has adhered to the following long-standing financial practices that align with the Department's business goals. Because of these practices, Waterworks has maintained a high credit rating for many years. In 2016, the Newport News City Council formalized these practices as departmental policies.

- The Waterworks Department Fund will be self-supporting.
- Waterworks will maintain revenues available annually to pay debt service, net of transfers, of at least 1.20 times annual debt service.
- In order to cover emergencies and revenue shortfalls within the Waterworks Department Fund, at the end of each fiscal year, the Waterworks Department Fund will maintain a Revenue Fund with unrestricted cash and short-term investments equal to a minimum of 90 days of operating expenses and transfers.
- The Waterworks Department Fund will maintain a Renewal and Replacement Fund (in accordance with its bond requirements) with a targeted balance equal to a minimum of 25% of average 5-year CIP.
- The Waterworks Department Fund will maintain a Rate Stabilization Fund (in accordance with its bond requirements) with a targeted balance equal to 30 days of annual operating expenses and transfers.
- If the Waterworks Department Fund uses balances in the Revenue Fund, Renewal and Replacement Fund, or the Rate Stabilization Fund such that the funds fall below the minimum, the City will develop a plan to replenish such funds over a period not to exceed three years.
- The Waterworks Department Fund will fund at least 25% of its 5-year CIP in cash.

RETAIL SALES BY JURISDICTION



LOOKING BACK

Major Waterworks Milestones

- 
- 1889 Newport News Light & Water Company is chartered
 - 1893 Lee Hall Reservoir is completed
 - 1907 Lee Hall Water Treatment Plant is completed (Plant #1)
 - 1919 Harwood's Mill Reservoir is completed
 - 1919 Skiffe's Creek Reservoir is completed
 - 1926 City of Newport News purchases the Newport News Light & Water Company
 - 1943 Chickahominy River Pumping Station is completed
 - 1943 Lee Hall Water Treatment plant is completed (Plant #2)
 - 1943 Harwood's Mill Water Treatment Plant is completed (Plant #3)
 - 1958 Waterworks Commission becomes the City of Newport News Department of Public Utilities
 - 1963 Diascund Creek Reservoir is completed
 - 1981 Little Creek Reservoir is completed
 - 1989 Harwood's Mill Water Treatment Plant is completed (Plant #4)
 - 1994 Residuals Management Facilities is completed/Land Application Program begins
 - 1996 Emergency Power Facilities completed at Harwood's Mill Water Treatment Plant
 - 1998 Disinfection treatment process is converted to chloramines
 - 1998 Brackish Groundwater Desalting Facility is completed
 - 2002 Lee Hall Maintenance & Operations Center is completed
 - 2005 Lee Hall Water Treatment Plant is completed
 - 2007 Waterworks' new Customer Information System (CIS) implementation is completed
 - 2007 Reconstruction of Harwood's Mill principal spillway and construction of emergency spillway is completed
 - 2009 Agreements for long term water supply are completed with James City County and the City of Williamsburg
 - 2009 Harwood's Mill manganese filtration system is completed
 - 2009 Waterworks acquires the Lightfoot water system in York County
 - 2009 Virginia Department of Health recognizes Waterworks for Excellence in Waterworks Operations/Performance
 - 2010 Waterworks receives the 2010 Platinum Award from the Association of Metropolitan Water Agencies
 - 2010 Waterworks becomes the first water utility in Virginia to earn DEQ's E4 designation for environmental excellence
 - 2010 Waterworks receives the U.S. EPA's National Partnership for Environmental Priorities (NPEP) award
 - 2011 Waterworks receives inaugural VA AWWA Public Information Award for its Crisis Communication Guidebook
 - 2011 Standard & Poor's (S&P) awards Waterworks its highest (AAA) bond rating
 - 2014 Chickahominy River barrie dam, boat lock, and fish ladder replacement is completed
 - 2014 Langley View elevated water tank rehabilitation is completed
 - 2015 Harwood's Mill Water Treatment Plant modernization is completed
 - 2016 Diascund and Walkers Dam rehabilitation projects completed
 - 2017 Lee Hall Reservoir Dam Improvement is completed
 - 2017 Installation of 24" finished water pipeline to Lightfoot is completed

CURRENT CHALLENGES

Workforce Concerns

Nationally, the safe operation of water utilities hinges upon a pool of qualified workers, in particular, certified operators and trained, experienced, utility workers. While limited national information is available about the specific effects unmet future labor needs will have on regulatory compliance, it is nevertheless a well-known issue facing the entire industry.

These concerns are reinforced by the fact that the Newport News Waterworks Department's current employees are fast reaching retirement age. Over 45% of Waterworks' 350 employees (in all occupations) are currently eligible, or will be eligible, for retirement in the next five years. A substantial group of water treatment plant operators and other employees in STEM fields (Science, Technology, Engineering, Math), who are critical to our core mission, will retire between 2020 and 2022.

To understand what succession planning, training, and investments are needed to replace these highly experienced employees, Waterworks has created a decision tool that identifies, observes, and quantifies retirement patterns of key personnel. This information is used to analyze the potential risk the department will incur with the loss of the knowledge, skills, and competencies of these retiring workers. From that analysis, Waterworks can establish the appropriate level of urgency needed to capture the thousands of years of accumulated knowledge held by these employees.

The tool is a simple-to-use data base, compiled from personnel records and organizational assignments, that allows an administrator to quickly

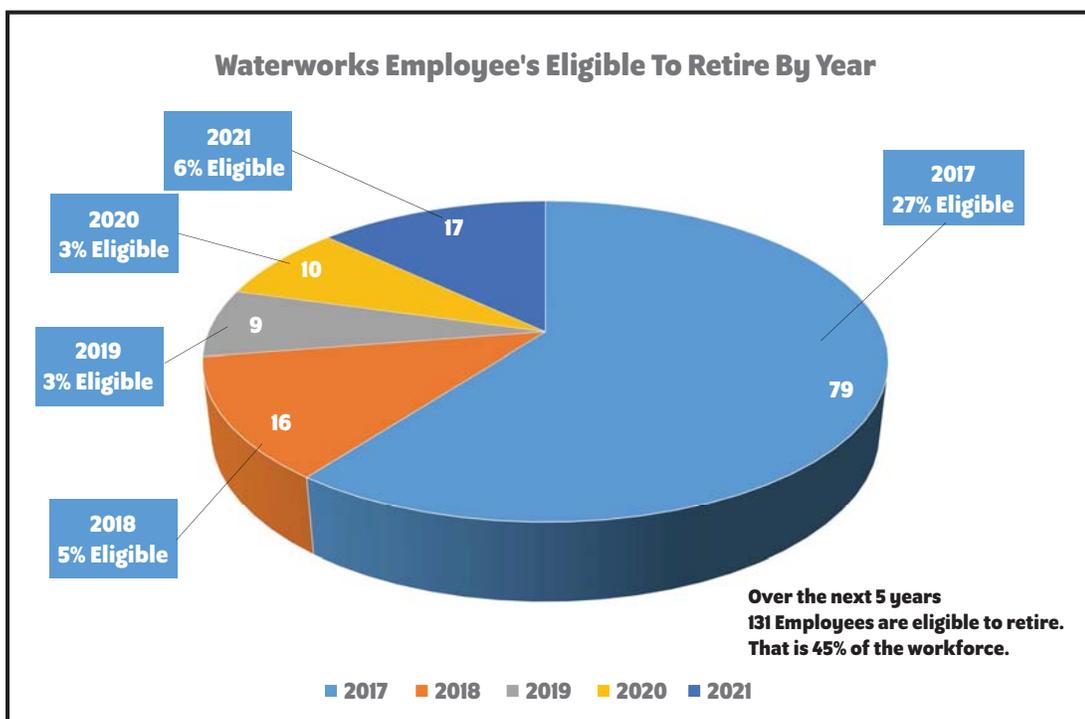
observe what valuable institutional knowledge may be lost through upcoming retirements. Using this tool, Waterworks is better able to identify employees as they become eligible for retirement and prioritize the preservation of the knowledge they possess in a digital format, through job shadowing assignments, or by other means.

Achieving Financial Stability

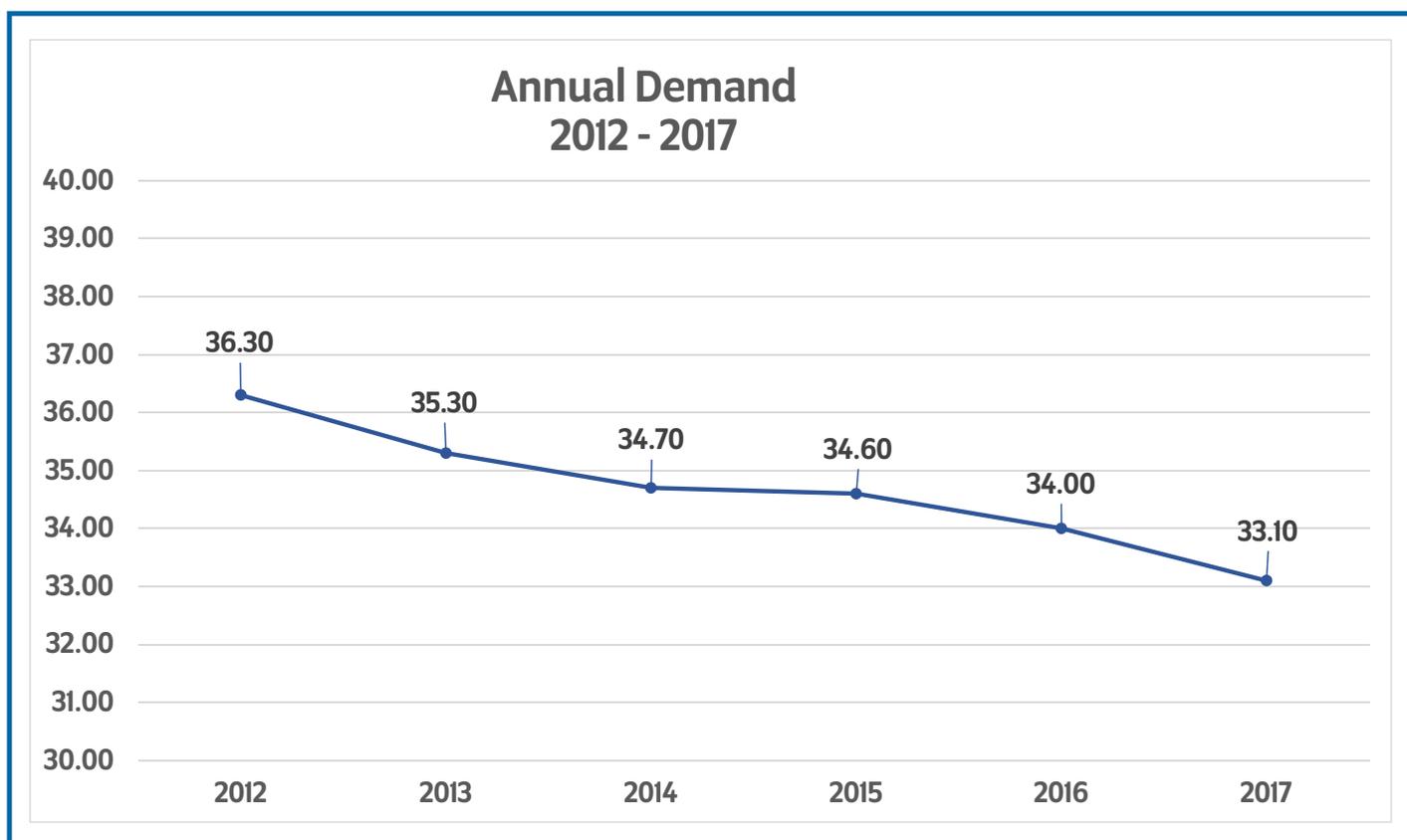
The "Waterworks 2011-2012 Report to the Community," described a change to our water rate structure that started the process of increasing revenue generated from fixed service charges and reducing reliance on water consumption driven revenue. The Newport News City Council showed great vision and support for the Department's leadership when, as part of the FY 2012 Operating Budget, it approved the transition to the new rate model to ensure Waterworks' ongoing financial health. Prior to 2012, more than 80% of water system revenue was derived from volumetric charges (tied to customer demand), while approximately 90% of the cost to operate and manage our water utility is fixed and does not vary with how much water customers use. Additionally, it is important to note that system capacity had been built to meet peak day requirements of more than 60 MGD, while we are now experiencing average daily demand at approximately half of peak demand.

In addition to improving the correlation of revenue generation with system expenses, the transition to increased reliance on fixed revenue sources helped address reduced revenues tied to a continued decline in water consumption. Driven largely by the impact of effective conservation measures in the residential, commercial, and industrial sectors, water demand has decreased steadily from highs of more than 42 million gallons per day (MGD) in 2008 to 33 MGD in 2017. This decrease resulted in declining sales revenue and has required reductions in spending, including staffing and program cuts, to offset the impact. Careful planning allowed Waterworks to absorb these reductions while maintaining the level and quality of service expected by our customers.

The plan to adjust water rates and fees, which was developed in conjunction with Raftelis Financial Consultants,



CURRENT CHALLENGES



established a multi-tiered structure for residential and industrial categories and reflected an incremental, multi-year approach to adjust meter fees to better balance revenue with the actual cost of maintaining the system and providing service to our customers. The transition to the new rate and fee structure, which currently generates 60% of system revenue from volume-based consumption and 40% from fixed system charges, has increased Waterworks' financial stability by arresting the sharp decline in revenue from continued decreases in water demand. Decisions regarding changes to rates and fees are all made within the context of keeping the cost of water to our customers at an affordable level. Last year, Waterworks residential water bills averaged 0.67% of median household income, which is well below the 2.5% affordability threshold identified by the federal government.

Revenue Outlook

While water demand has decreased annually for nearly a decade, there is an indication that we may be approaching the bottom of the trend (but still nearly 10 MGD below peak level in 2008). This stabilization in consumption may indicate that the major impact of conservation efforts, such as large industrial/military users retooling for water efficiency, installation of low-use appliances and low-flow toilets, and changes in landscaping practices, have been achieved. Forecasted growth for our service area remains low with some regional areas showing modest opportunity for service expansion. With demand now

settling at 30-33 MGD and the potential for only limited increases from growth in the northern portion of the system, we anticipate future annual water sales revenue to level out at approximately \$58.7 million.

Faced with aging infrastructure, competition for labor with the construction and engineering sectors, requirements to ensure the security of customer data, declining Federal grant funding, cost increases for general operations and capital projects, and rising expectations for new technology, Waterworks will need to increase revenues to deliver future balanced budgets. Anticipated future rate and fee adjustments will be offset with projected increases to non-water fees, grants, leases, rents, timber sales, increased operational efficiency, and the effective use of cash capital and strict management of project debt to limit the impact of debt service. As part of our most recent bond sale in May 2017, the two leading rating agencies performed a thorough assessment of Waterworks' creditworthiness. Very strong credit ratings were secured from both agencies (S&P: AAA; Moody's: AA1), who acknowledged the strength of our management and of our financial operations guided by comprehensive policies, strong senior debt coverage, and ample liquidity and financial reserve levels. In addition, both agencies acknowledged the importance of our continued effort to increase revenue generated from fixed rates and to reduce reliance on volumetric collections.

LOOKING AHEAD

Since its founding as the Newport News Light and Water Company in 1889, Waterworks has established a history of progress and expansion. Much of our effort to date has been focused on system growth required to satisfy increasing customer demand for water. This growth period required significant investment in infrastructure and assets, including water treatment plants, meters and valves, dams, distribution lines, pump stations, and water tanks. Currently, Waterworks manages approximately \$1.1 billion in assets.

Driven by changes in population growth, water consumption habits, customer expectations, and the general business environment, we are changing from an era of system expansion, of construction and installation of new assets, to one with greater focus on the effective and efficient long-term operation, condition assessment, maintenance, and replacement of those assets. As an example, over the next five years alone, the Department plans to invest \$83 million in upgrading and replacing aging assets.

This transition requires us to rethink how we approach our work. We must become more proactive in maintaining and preserving our infrastructure. We are committed to improving our ability to assess, plan, build, operate, maintain, and replace our assets to continue to provide exceptional customer service and access to high quality water. This effort will require diligent and thorough evaluation, along with a significant amount of innovation and progressive thinking.

To support this effort, Waterworks will codify a Strategic Plan that will be strongly based on a long-term asset management plan and a 10-year tactical plan for specific groups of critical infrastructure (pump stations, dams and reservoirs, electrical and communication system assets, pipe and transmission lines, groundwater wells, and treatment plants). In the near future, we will move forward with modest organizational changes to strengthen our environmental and regulatory compliance capabilities and improve our capital improvement planning capabilities.

Over the longer term, we will implement a comprehensive Asset Management Program (AMP). AMP is a proven and sophisticated system that will help us make better acquisition, operation, maintenance, renewal, and replacement decisions. We will use the principles of asset management to create a structured framework to address the problems of aging critical infrastructure, the changing business environment, and our future system needs.

While the fundamental responsibility of Waterworks remains to provide safe, reliable, affordable water while protecting public health, the environment, and our community's quality of life, societal changes have influenced the expectations of our customers. Today, our customers are more connected — and more informed — than ever before. They have come to expect higher levels of service and value than in the past. Because of this, we must re-imagine ourselves as a water utility and find ways to provide a higher level of customer service. Investment in new technology solutions will be a critical component of our plan to maintain and improve our customer service. Implementation of an online services portal is currently underway and will greatly expand the ability of customers to submit and track service requests on their phones, tablets, and computers via the internet. Additionally, the capital improvement plan includes the conversion to Advanced (Smart) Meter Infrastructure, which will greatly increase the efficiency of our meter reading function and provide access to real-time water consumption data to our customers.

As we move the Department forward, we remain committed to our pledge to be a model utility, valued and trusted by the community, and committed to our customers, stakeholders, and employees. We will build on the accomplishments of the past as we shape a desirable water environment for the next century and will leverage our people, processes, and technologies to successfully meet the future needs of our community.



SYSTEM STATISTICS & FINANCIAL HIGHLIGHTS

Source Water Supply

Lightfoot Groundwater Wells	1.1 MGD Capacity
Brackish Groundwater Wells	7 MGD Capacity
Chickahominy River	60 MGD Capacity
Little Creek Reservoir	6.9 billion gallon storage
Diascund Reservoir	3.1 billion gallon storage
Lee Hall Reservoir	726 million gallon storage
Harwood's Mill Reservoir	587 million gallon storage
Skiffe's Creek Reservoir	168 million gallon storage

FY-17 Metered Connections*

Single-Family Residential	119,241
Multi-Family Residential	4,971
Commercial	11,135
Industrial	1,069
Military	27
Total	136,443

* Includes Fire Sprinkler Connections

Facility Capacity in MGD*

Lee Hall Water Treatment Plant	54.0
Harwood's Mill Water Treatment Plant	31.0
Reverse Osmosis Facility	5.7

* Million Gallons Per Day

CONDENSED STATEMENT OF NET POSITION FY 2017

Current assets	105,950,249
Noncurrent assets	420,235,743
Total assets	526,185,992
Deferred Outflows of Resources	11,233,948
Total assets and deferred outflow of resources	537,419,940
Current liabilities	57,141,929
Noncurrent liabilities	158,842,031
Total liabilities	215,983,960
Deferred Inflows of Resources	29,439
Net Position	
Net investment in capital assets	312,211,263
Unrestricted	9,195,278
Total Net Position	321,406,541
TOTAL LIABILITIES, DEFERRED OUTFLOW/INFLOWS OF RESOURCES AND NET POSITION	537,419,940



FINANCIAL HIGHLIGHTS



STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET POSITION FY 2017

Operating Revenues:	
Water sales	59,838,097
Charges for services	25,445,099
Miscellaneous	6,706,949
Total operating revenues	91,990,145

Operating Expenses:	
Personal services	25,572,730
Contractual services	6,913,550
Internal services	1,063,390
Materials and supplies	11,897,428
Depreciation	14,217,465
Other	2,333,868
Total operating expenses	61,998,431

Operating income	29,991,714
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Nonoperating revenues (expenses):	
Interest revenue	454,799
Loss on disposal of capital assets	-984,229
Amortization on bond premium	1,181,902
Loss on long-term bond	-332,781
Interest expense	-4,290,270
Total nonoperating expenses, net	-3,970,579

Income before capital contributions and transfers out	26,021,135
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Capital contributions for capital assets	2,263,856
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Transfers out	9,500,000
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Change in net position	18,784,991
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NET POSITION AT JUNE 30, 2016	302,621,550
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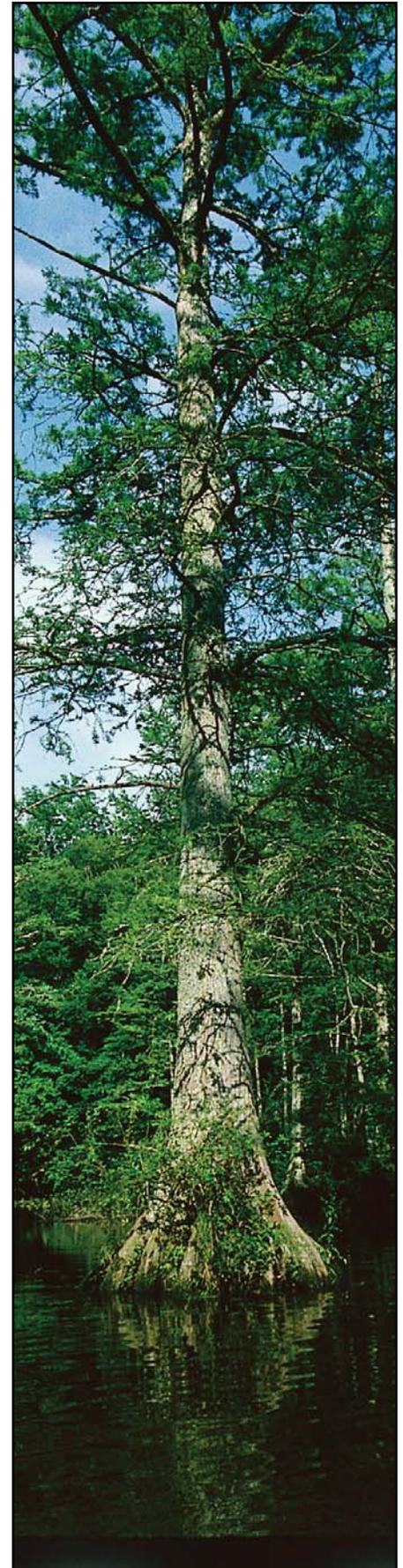
NET POSITION AT JUNE 30, 2017	321,406,541
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FINANCIAL HIGHLIGHTS

STATEMENT OF CASH FLOWS PROPRIETARY FUNDS FY 2017

Cash Flows from operating activities:	
Receipts from customers	90,495,995
Payments to suppliers	(15,807,215)
Payments to employees	(24,911,112)
Other payments	(2,333,868)
Net cash provided by (used in) operating activities	47,443,800
Cash flows from capital and related financing activities:	
Acquisition of capital assets	(29,914,499)
Contributed Capital	2,263,856
Proceeds from sale of capital assets	102,154
Premium on bonds issued	3,074,374
Repayment and retirement of long-term debt, net	(14,635,004)
Bond issuance costs	(340,792)
Proceeds from bond issue	27,930,000
Interest paid	(3,949,478)
Net cash used in capital and related financing activities	(15,469,389)
Cash flows from noncapital financing activities:	
Transfer to other funds	(9,500,000)
Net cash used in capital and related financing activities	(9,500,000)
Cash flows provided by investing activities:	
Interest received	454,799
Net cash provided by investing activities	454,799
Increase (decrease) in cash and restricted cash	22,929,210
Cash, cash equivalents, and restricted cash at beginning of year	64,721,152
Cash, cash equivalents, and restricted cash at end of year	87,650,362
Reported as:	
Cash and cash equivalents	56,320,607
Restricted cash	31,329,755
Total cash, cash equivalents and restricted cash	87,650,362
Cash flows from operating activities:	
Operating income (loss)	29,991,716
Adjustments to reconcile operating income to cash provided by operating activities:	
Depreciation Expense	14,217,465
Change in:	
Accounts receivable	(554,516)
Inventories	132,287
Accounts payable, accrued liabilities, and leases payable	3,584,893
Unearned revenues	(939,634)
Deposits	838,480
Net pension asset	22,455
Net pension liability	2,749,222
Deferred outflow of resources	(2,188,952)
Deferred inflow of resources	(409,616)
Total adjustments	17,452,084
Net cash provided by operating activities	47,443,800



NEWPORT NEWS CITY COUNCIL & CITY MANAGER



Mayor McKinley L. Price, DDS



Vice Mayor Tina Vick
South District



Herbert H. Bateman, Jr.
Central District



Sandra Nelson Cherry, D. Min
South District



Marcellus L. Harris III
North District



Sharon P. Scott
North District



Dr. Patricia P. Woodbury
Central District



Cindy D. Rohlif
City Manager



