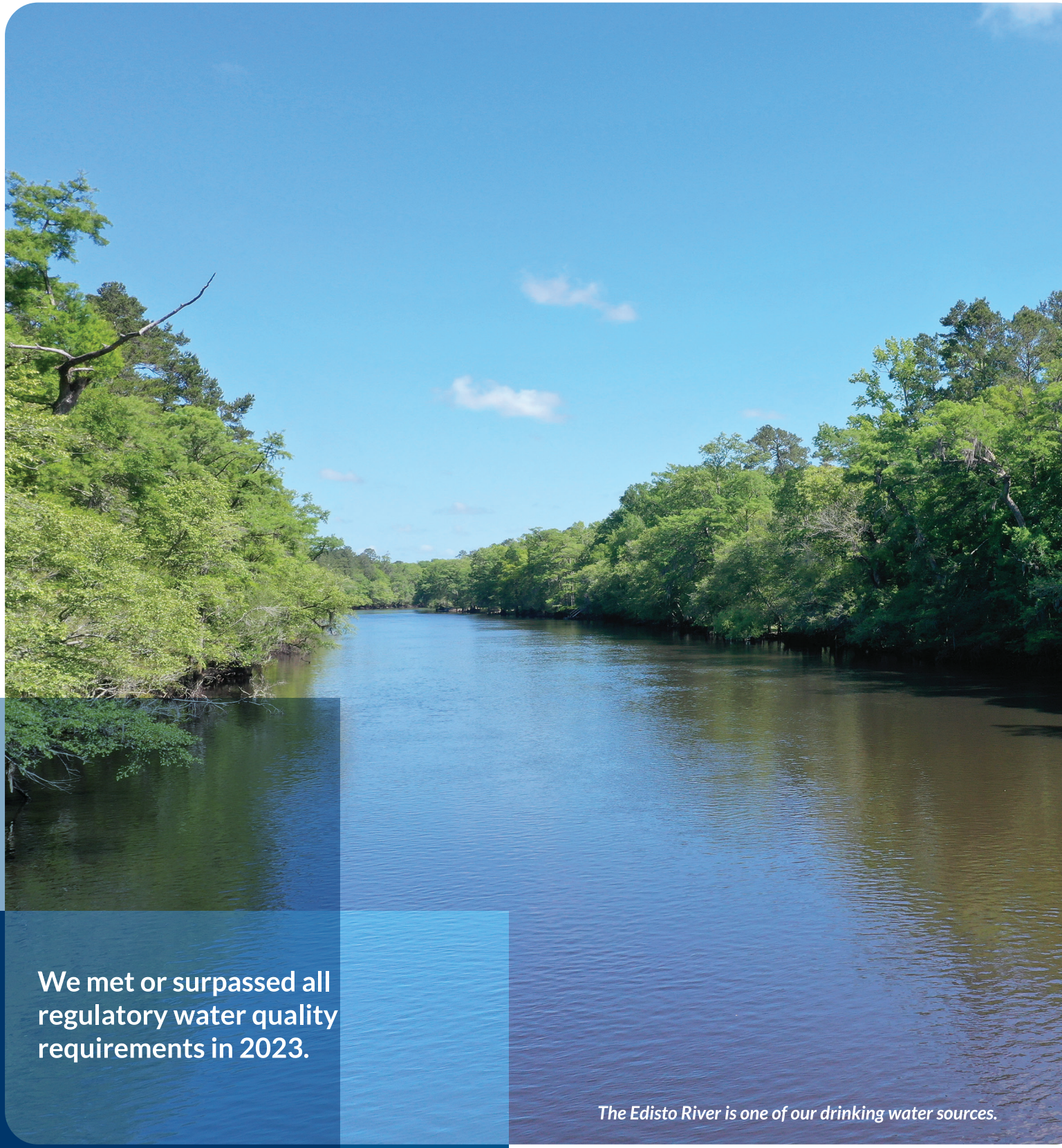
Water Quality Report 2023

Charleston Water System



We met or surpassed all regulatory water quality requirements in 2023.

The Edisto River is one of our drinking water sources.

Welcome to

Charleston Water System

Our Mission

Support public health and protect the environment.

Our Vision

Achieve excellence and exceed customer expectations.

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On the Cover: Edisto River

Produced by Communications Manager Matthew Kenwright

Questions / Extra Copies
Communications team: (843) 727-7146
Call our staff for direct assistance in translating this publication at (843) 727-6800.

En Español
Este informe contiene información muy importante sobre su agua beber. Tradúzcalo ó hable con alguien que lo entienda. Llame a nuestro personal para obtener asistencia directa para traducir esta publicación al (843) 727-6800.

Get Involved
Our Board of Commissioners meets monthly and meetings are open to the public. Citizen participation is welcomed. Meetings are typically held the fourth Wednesday of every month at 9 a.m. at 103 St. Philip Street. More information: www.charlestonwater.com.

Public Water System ID#: 1010001

Drinking Water Sources

Bushy Park Reservoir is Our Primary Water Source

Source Water Protection

To raise awareness about preventing water pollution, SC DHEC identifies potential sources of contamination for each drinking water source in the state: www.scdhec.gov/environment/your-water-coast/source-water-protection.

You Can Help Protect the Water

- **Pick up the poop!** Pet waste adds bacteria and excess nutrients, which contribute to algae growth that chokes out plants and wildlife.
- **Don't over-fertilize your lawn.** It washes into storm drains, streams, rivers, and oceans.
- **No dumping in storm drains.** They empty directly into a waterway.
- **Proper disposal** of oils, paints, and chemicals.

The Bushy Park Reservoir is our primary drinking water source.

Bushy Park Reservoir Watershed

Drinking Water Sources, continued

Edisto River is Our Secondary Water Source

The Edisto River

- Our intake is located in Givhans Ferry State Park.
- Connected to Hanahan Water Treatment Plant by the historic 23-mile Edisto Tunnel.
- We recently spent $4.1 million to improve our intake structure. These improvements give us better operational control of the raw water supply.

The Edisto River is our secondary drinking water source.

Source Water Management:

Investing in Source Water Management Brings Rewards

(L-R) Source Water Assistant Manager Baker Stevens and Source Water Manager Jason Thompson monitor conditions on our Bushy Park Reservoir.

Dedicated source water management staff among public utilities is a very exclusive club in South Carolina — we're the only members.

UNDERSTANDING SOURCE WATER PROTECTS CUSTOMERS

Our source water story is remarkable. We're incredibly fortunate to have two full-time employees completely dedicated to keeping an eye on our drinking water long before it reaches our Hanahan Water Treatment Plant (HWTP). Source Water Manager Jason Thompson, who has a chemistry degree and Class A water treatment operator certification (see pages 8-9 to learn more about operators), worked as a CWS chemist for 13 years before taking on his current role in 2018. He oversees our **three** water sources, which are significant because most cities only have one source. In 2024, we bolstered our source water management by adding Source Water Assistant Manager Baker Stevens, who has a degree in geological science and experience in water quality. Our primary source is Bushy Park Reservoir, which typically provides about 80% of our water and is 15 miles north of downtown Charleston. Our secondary source is the Edisto River, which typically provides about 20% of our water and is 31 miles from downtown Charleston. Our backup supply is the Goose Creek Reservoir, which is next to the HWTP.

Our team works with key staff at the HWTP to monitor and maintain two water tunnels, two dams, two reservoirs, three water intakes, and up to 13 raw water pumps and lift pumps. This critical infrastructure gives us the power to blend water from the three sources at a moment's notice.

MANAGING SOURCE WATER REDUCES OR ELIMINATES PROBLEMS

"A lot of what we do allows our utility to be proactive and eliminate problems before they happen," Jason said. "Otherwise, by the time you're noticing a water quality issue, whether it be taste, odor, or color, you're detecting it while it gets sent out to customers."

The team's water monitoring procedures at Bushy Park Reservoir reflect their methodical approach. They visit eight strategic locations to evaluate our water from the surface to the bottom, often more than 20 feet down. Their robust process helps prevent a range of problems such as over-vegetation that can cause taste, odor, or color issues.

They also stay in constant communication with municipalities and industry upstream of our waters so they can adjust our water intake if any type of contamination is headed our way. This elevated control enables us to better serve the people, businesses, environmental groups, government agencies, and elected officials who all play a vital role in our operations.

Source Water Assistant Manager Baker Stevens monitors water quality.

"Our utility's investment in source water protection ensures the entire Lowcountry will have access to this critical resource for centuries to come."

LEADING THE WAY

Investing in source water management also gives us a seat at the table. We bring invaluable data and insight to crucial conversations on the local, state, and national levels.

"You have a lot of stakeholders all vying over a very, very important resource that needs to be managed very carefully in order to protect our ability to have high-quality source waters long into the future, frankly, forever," Jason said.

PROTECTING OUR FUTURE

Water has always been a key factor in Charleston's success, growth, and prosperity.

"Our utility's investment in source water protection ensures the entire Lowcountry will have access to this critical resource for centuries to come," Jason said.

Water Treatment Plant:

Producing Safe, Clean, Abundant, and Award-Winning Water

Director of Water Treatment Dr. Jane Byrne inspects plate settlers, which help to remove clumps of particles near the beginning of our water treatment process.

The serene campus at the Hanahan Water Treatment Plant (HWTP) is a testament to the fine-tuned machine run by our incredible staff.

COLLABORATING TO ENSURE WATER QUALITY

There's an art to the science of providing 64 million gallons of safe, clean water each day to 500,000 people across the Lowcountry. Passion, precision, dedication, and collaboration are all critical to ensuring our water continues to outperform regulatory standards and customer expectations. Our water is consistently at least 66% better than it has to be, recently earning us the 20-Year Directors Award for Water Treatment from the Partnership for Safe Water.

Director of Water Treatment Dr. Jane Byrne, who has worked for CWS for 20 years and has degrees in chemistry, physical chemistry, and biochemistry, manages the plant's processes. Our operators execute her vision while providing critical input, all united behind one goal — providing safe, pleasing drinking water at the right flow rate and pressure.

Relationships across HWTP run deeper than our water tunnels. Operating 24/7/365 means troubleshooting water issues caused by extreme heat or cold, hurricanes, severe storms, ice, and countless other outside forces.

"You don't do it in a vacuum," Jane said. "In my Venn diagram of management, we all intersect so that we can shadow each other's jobs if someone is unavailable."

PLANT OPERATION DICTATES WATER QUALITY

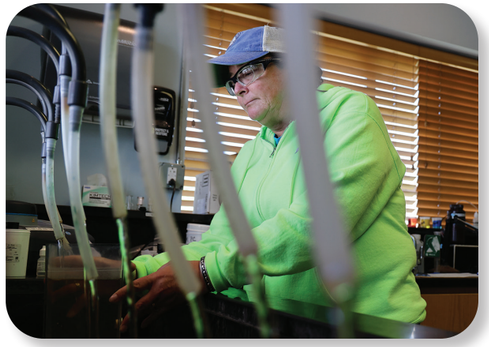
The operators are the nerve center of the plant, working in our process control room and across the plant site, monitoring the facility around the clock to ensure customers' water service is uninterrupted. Their 12-hour shifts include tracking water quality data, checking the water flow rate through our filters, making sure each of the 24 filters is washed on time on different schedules, responding to issues on the fly, and checking equipment.

"My job is to make sure they have everything they need," Jane said. "They're at the bleeding edge of the water treatment process. If they have a problem, it's my problem, and we're all very good at solving problems."

Essentially, the treatment process (see pages 30-31) targets water turbidity, which is the cloudiness of water, and the elimination of

"Water is why we're alive. It's public health and economic growth. It's the environment. How we do our business affects everybody."

bacteria and pathogens. Keys to this process are alum, which clumps larger particles together for easy removal; filtration, which removes microscopic particles; chlorine dioxide, which disinfects water; and powder activated carbon, which reduces or eliminates unappealing aesthetic issues such as any foul taste or earthy/musty odors.



Journeyman Operator Kristen Tipton and her fellow operators collect and analyze water samples throughout the day .

The annual cost to produce our award-winning water is about $10 million dollars. We spend $6 million for chemicals, $3 million on electricity, and the remainder for incidentals. Despite the steep cost, customer return on investment is priceless!

SAVING LIVES THROUGH WATER QUALITY

A spirited hour-long walk with Jane around the sprawling HWTP campus and conversing about her critical work covers a century of progress in water treatment. Improving drinking water quality is an eternal endeavor to ensure the Lowcountry's quality of life and support public health. The treatment process has evolved considerably since the early 1900s, when disinfecting water helped prevent waterborne diseases such as typhoid, cholera, hepatitis, and giardiasis in Charleston, and that progress continues today and forever.

"Water is why we're alive," said Jane. "It's public health and economic growth. It's the environment. How we do our business affects everybody."

Operator Apprentice Kenny Soos and the other operators monitor numerous aspects of water treatment from our process control room.

Laboratory Services:

Protecting Customers with 20,000 Lab Tests Each Year

Laboratory Services Director Becky Thames and four chemists use their expertise and state-of-the-art equipment to check water quality.

The highly skilled scientists on our Laboratory Services team make sure water is safe and exceeds customer expectations.

ASSESSING WATER QUALITY

Laboratory Services Director Becky Thames, who has worked in our lab for 23 years and has degrees in biology, earth and environmental resource management, and business administration, leads the four chemists we rely on to thoroughly analyze our water. With more than 100 years of combined experience, their expertise helps us make data-driven decisions about water treatment and water distribution. Each year, they run about 20,000 tests to confirm that our water treatment efforts have eliminated the bacteria that arrive in our raw water, balanced pH, and more.

Their work in part also relies on strong community relationships; each month 180 customers in homes, schools, and businesses in strategic locations give us permission to take water samples for continuous water quality monitoring.

In addition, our lab staff work directly with customers on lead and copper testing. This year we'll visit 150 homes served by lead service lines to ensure that special actions taken within our water treatment process continue to prevent lead and copper leaching from customers' pipes into their water. Becky communicates with these customers through a letter and follow-up phone calls to guide our customers through the process.

PREPARING FOR THE FUTURE

Our lab collects data to help us to prepare for future regulations, investing in enhanced monitoring, promoting transparency, and pursuing efficiency. We continually anticipate and adapt to new rules regarding topics such as Per- and Polyfluorinated Substances (PFAS), also known as "forever chemicals," and lead and copper.

"As soon as we know some new compound may present a water quality issue, we're already collecting data," Becky said. "In some instances, we've been grandfathered into new EPA rules because we've already collected up to 12 years' worth of data that shows that we don't have a problem with a compound of emerging concern."

LEADING IN WATER QUALITY

Our lab expertise in biology and chemistry plays a significant role in our success on state and national levels. Our team provides support to smaller labs across the state, helping troubleshoot their problems, improve operations, and make informed decisions about water treatment processes.

Beyond meeting all regulatory requirements, our drinking water is recognized nationwide for exceptional water quality. We have consistently received honors from the American Water Works Association, including the Partnership for Safe Water Award and Sustainable Water Utility Management Award.

We were the first utility in the state to be certified to test for haloacetic acids, which can cause cancer over time. We have state-of-the-art gas chromatography/mass spectrometry equipment, which is uncommon among public utilities. This advantage makes us more cost efficient, allowing us to run tests and get results faster instead of waiting on commercial labs.

Beyond publishing water quality data each year as required by the EPA, we have voluntarily published other data such as our PFAS levels and other unregulated contaminants since 2017. The reports are available at **https://charlestonwater.com/Water-Quality.**

APPROACHING WATER QUALITY AS CUSTOMER SERVICE

Although the stereotype of a scientist is an introvert solely focused on data, Becky breaks the mold by taking on the additional responsibility of leading our Customer Focus Strategic Team where she embraces customer engagement, acting on their feedback, and improving their experience. Safe, clean drinking water can still have taste and odor issues caused by the life cycle of blue-green algae and influenced by the temperature of source water, and some customers detect the concern before lab equipment that costs more than a hundred thousand dollars.

Becky translates complicated science for non-lab employees and customers.

"I like to say, 'The nose knows.' Some people are more sensitive," Becky said.

Becky's lifelong love of math and science led to her role. That passion empowers her to translate the lab's complicated science into common terminology so our non-lab employees and customers can understand and make good use of it.

"I love the customer. If the customer is not happy, nobody's happy," Becky said. "It's my goal to give the customers a 'wow' moment instead of a 'whoa' moment."

Becky has a simple reassurance for anyone curious about our drinking water quality.

"I drink from the tap," Becky said.

Chemist Joe Rafalowski and his colleagues on our Laboratory Services team run 20,000 lab tests each year to check water quality.

Water Distribution: Bringing High-Quality Water to Customer Taps

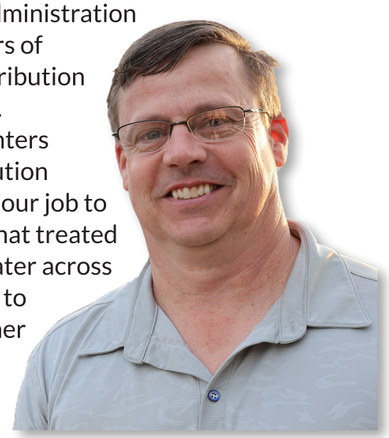
Our Water Distribution team members shepherd water on its journey from the Hanahan Water Treatment Plant (HWTP) to the customer's tap.

MAINTAINING WATER QUALITY

Responsible for maintaining a network of pipes large enough to stretch from Charleston, South Carolina, to Phoenix, Arizona, our Water Distribution department conducts preventive maintenance and repairs on more than 1,800 miles of water mains. They're flushing fire hydrants, taking water samples for testing, looking for leaks, responding to breaks, and conducting water quality tests for customers.

The sheer size of the Water Distribution system requires significant planning, and we aim to visit each neighborhood every three to five years to make sure it's working properly.

"When the HWTP sends the water out, it's beautiful," said Senior Distribution System Manager Kevin Sterling, who has a degree in business administration and 19 years of Water Distribution experience. "When it enters our distribution system, it's our job to transport that treated drinking water across many miles to the consumer in the same condition as when it left the plant."



Senior Distribution System Manager Kevin Sterling

Hydrant Maintenance Operator Will Wade and his Water Distribution team members flush fire hydrants to support water quality and to help prevent discolored water.

SAMPLING TO ASSURE PERFECTION

Kevin's team samples 180 sites each month to make sure our water is safe and stays safe, which also helps us determine where to perform maintenance. If sample test results raise concern, Water Distribution conducts more tests to determine whether things like pollen or rain tainted the original sample. If further testing confirms a concern, they spring into action!

FLUSHING PROBLEMS OUT

When we identify a water quality concern, or if a customer calls to report a taste or odor issue or cloudy or discolored water, Water Distribution responds. We flush a large volume of water out of the system by opening a fire hydrant in the area for an appropriate time period and then testing the water to confirm that we've resolved the problem, which it typically does. Unidirectional flushing (UDF) is the most important thing Water Distribution does to maintain water quality. UDF involves getting the water in a targeted group of water mains all moving in one direction at a very high velocity to scour the inside of the mains before releasing the water from a fire hydrant, which is now carrying a small amount of sediment. There's no localized water quality problem that UDF can't fix!

Hydrant Maintenance Operator John Bennett and his crew team members have to open fire hydrants to flush them.

SUPPORTING FIREFIGHTERS

Installing and maintaining fire hydrants is another critical responsibility proudly performed by Kevin's talented team. Water Distribution provides support for fighting fires, including making sure there is enough water pressure for fire hydrants, repairing them, and ensuring their consistency.

Private citizens sometimes make the mistake of painting over yellow fire hydrants, which are color-coded for firefighting, or they hide them behind shrubs. These changes can disrupt the firefighters' process, which may delay response time and bring catastrophic consequences, so Kevin's team routinely inspects hydrants and immediately remedies any problems.

RESPONDING TO WATER MAIN BREAKS

"I always hope my day is boring. I prefer coming into the office, going through work tickets, assigning work, doing preventive maintenance, spotting issues before they happen, and getting ahead," Kevin said. "But nine times out of 10, we'll respond to at least one main break each day, and we're glad to because we enjoy being part of the solution."

Covering a tri-county radius that stretches from Hollywood to Lincolnville to Goose Creek to Cainhoy to Johns Island, our Water Distribution staff travels far and wide. Navigating heavy traffic in a dump truck towing a backhoe at rush hour can turn a 30-minute drive to a site into an hour and a half. Meanwhile, the water flowing from the break does not stop. A large break can release 100,000 to millions of gallons of water under high pressure, which can tear up roads and flood the surrounding area until the water is cut off. Thankfully, we have numerous field crews, and someone is close enough to a main break that we get it turned off and repaired quickly.

LEGACY AND FUTURE OF WATER DISTRIBUTION

Our team's ability to do great work in the field is a continual reminder of their predecessors' incredible skill, professionalism, and commitment to clean water, as we find valves and mains from the 1880s still working well today. Kevin's team is proud to contribute to the continuation of that legacy.

"The improvements we're making now can last centuries if they're done right," Kevin said.

Quick Facts

1
Largest water treatment plant by permitted capacity in S.C.

10,746
Fire hydrants

39,118
Water valves

1,887
Miles of water mains

33
Miles of raw water tunnels

$70,000
Spent since 2017 on voluntary unregulated compound testing

500,000
People served in the tri-county area

126,000
Retail customer accounts

9
Wholesale customers

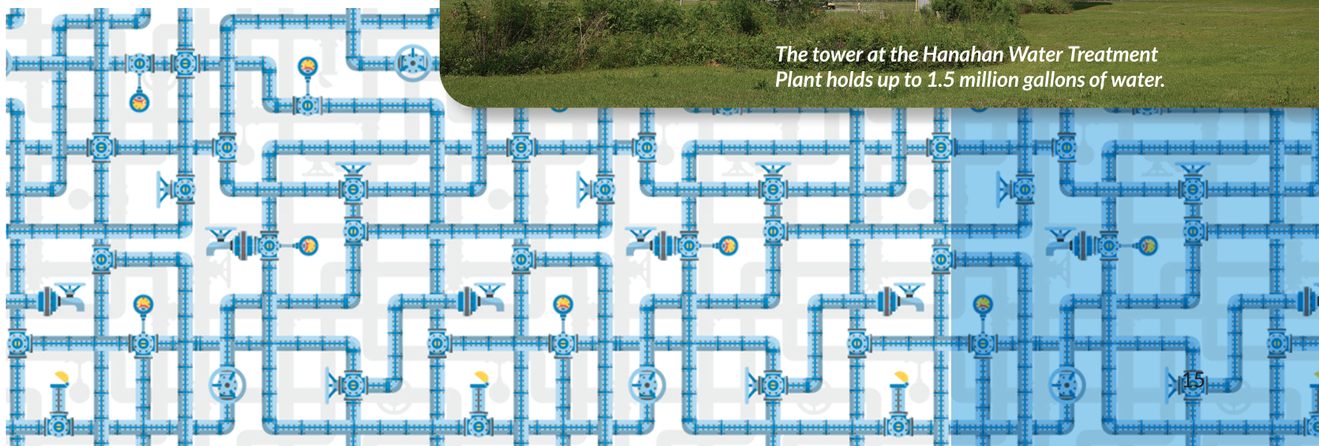
20,000
Total annual water quality tests

64 Million
Gallons per day, average daily volume treated

105.5 Million
Gallons per day, largest recorded volume treated in one day

115.4 Million
Gallons per day, DHEC permitted capacity

The tower at the Hanahan Water Treatment Plant holds up to 1.5 million gallons of water.



Information from the EPA

Contaminants

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791).

Cryptosporidium

Cryptosporidium is a microbial parasite found in surface water throughout the United States. Although *Cryptosporidium* can be removed by filtration, the most commonly used filtration cannot guarantee 100% removal. Our monitoring of source/finished water indicates the presence of these organisms. Current test methods do not enable us to determine if these organisms are dead or alive. Symptoms of infection include nausea, diarrhea and abdominal cramps. Most healthy persons are able to overcome the disease within a few weeks. However, immunocompromised people (such as those with AIDS, undergoing chemotherapy or recent organ transplant recipients) are at a greater risk of developing a severe, life-threatening illness. Immunocompromised persons should contact their doctor to learn about appropriate precautions to prevent infection. *Cryptosporidium* must be ingested to cause disease and it may be passed by other means than drinking water

How to Interpret Our Data

EPA Definitions

Maximum Contaminant Level Goal (MCLG) The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Maximum Contaminant Level (MCL) The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

Action Level (AL) The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements that a water system must follow.

Treatment Technique (TT) A required process intended to reduce the level of a contaminant in drinking water.

Maximum Residual Disinfectant Level Goal (MRDLG) The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contamination.

Maximum Residual Disinfectant Level (MRDL) The highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Regulatory Testing Abbreviations

ppm	**Parts per million (mg/L)**	**LRAA**	**Locational Running Annual Average**
ppb	**Parts per billion (ug/L)**	**RAA**	**Running Annual Average**
ppt	**Parts per trillion (ng/L)**	**NTU**	**Nephelometric Turbidity Units**

CWS water intake structure on the Bushy Park Reservoir collects water to send to the Hanahan Water Treatment Plant.

Regulatory Testing

These are the compounds we are required to test for, and all were below the regulatory limit.

	Required Regulatory Report	Maximum Contaminant Level (MCL) set by EPA	Maximum Contaminant Level Goal (MCLG)	Actual Level in CWS Water for 2023	Year Sampled	Possible Sources in Water
	Turbidity[1] A measure of the amount of suspended particles in the water (cloudiness); an indicator of overall water quality and filtration effectiveness.	Requires a specific treatment technique; 95% of monthly samples must be less than 0.3 NTU	None	0.13 NTU highest level detected 100% of monthly samples met the limit Range: 0.07 – 0.13 NTU	2023	Soil runoff.
	***Cryptosporidium* (in source water)** A parasite spread through human and animal waste that causes gastrointestinal illness.	No MCL exists	None	0.2 per liter Range: 0 to 0.2 per liter	2023	Human and animal sources.
	***Giardia* (in source water)** A parasite spread through human and animal waste that causes gastrointestinal illness.	No MCL exists	Zero Giardia oocysts per 1 liter of water	0.1 per liter Range: 0 to 0.1 per liter	2023	Human and animal sources.
Inorganic Compounds	**Copper** A metal widely used in household plumbing that may corrode into water.	90th percentile of all samples collected must be less than the 1.3 ppm action level	1.3 ppm	90th percentile = 0.09 ppm No samples exceeded the action level. Range: 0 to 0.14 ppm	2021[2]	Corrosion of household plumbing materials.
	Lead A metal no longer used in water pipes, but may be present in plumbing fixtures or old pipes; may corrode into water.	90th percentile of all samples collected must be less than the 15 ppb action level	0 ppb	90th percentile = 2.1 ppb One sample exceeded the action level. Range: 0 to 19 ppb	2021[2]	Corrosion of household plumbing materials.
	Nitrate/Nitrite (as N) Nitrates and nitrites are nitrogen-oxygen compounds that can become a source of pollution in the form of unwanted nutrients.	Nitrate 10 ppm Nitrite 1 ppm	Nitrate 10 ppm Nitrite 1 ppm	0.11 ppm Range: 0.11 to 0.11 ppm	2023	Runoff from fertilizers.
	Fluoride A substance that is naturally occurring in some water sources, particularly groundwater. It is also added to drinking water to help prevent tooth decay.	4 ppm	4 ppm	0.16 ppm in source water 0.55 ppm in finished water Range: 0.23 to 0.55 ppm	2023	Naturally occurring in source water and adjusted during treatment to prevent tooth decay.
Disinfectants	**Chlorine Dioxide** A disinfection agent added in small amounts to protect against microbes.	0.8 ppm	0.8 ppm	0.32 ppm Range: 0 to 0.32 ppm	2023	Added for disinfection.
	Chloramine Residual A compound of chlorine and ammonia added in small amounts to treated water to protect against microbes.	4 ppm MRDL	4 ppm MRDLG	3.0 ppm Running Annual Average (RAA) Range: 3.0 – 3.0 ppm	2023	Added for disinfection.

[1]Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.

[2] Lead and copper regulatory sampling frequency is every three years, based on our compliance history.

(Data continued on next page.)

Regulatory Testing, continued

	Required Regulatory Report	Maximum Contaminant Level (MCL) set by EPA	Maximum Contaminant Level Goal (MCLG)	Actual Level in CWS Water for 2023	Year Sampled	Possible Sources in Water
Disinfection Byproducts	**Total Trihalomethanes (Stage 2)** Stage 2 of the Disinfectants and Disinfection Byproducts Rule requires the locational running annual average (LRAA) for each sampling location to be below the MCL. CWS has eight sampling locations.	Locational Running Annual Average must be below 80 ppb.	NA	LRAA: 7 ppb Range: 3.6 to 11.1 ppb	2023	Byproduct of disinfection
	Total Haloacetic Acids (Stage 2) Stage 2 of the Disinfectants and Disinfection Byproducts Rule requires the locational running annual average (LRAA) for each sampling location to be below the MCL. CWS has eight sampling locations.	Locational Running Annual Average must be below 60 ppb.	NA	LRAA: 14 ppb Range: 9.7 to 31.60 ppb	2023	Byproduct of disinfection
	Chlorite A byproduct formed when chlorine dioxide is used to disinfect water.	1 ppm	0.8 ppm	Highest level detected: 0.81 ppm Range: 0.43 to 0.81 ppm	2023	Byproduct of disinfection
Organics & Bacteria	**Total Organic Carbon (TOC)** The measure of organic substances in a body of water, mostly from naturally occurring sources such as plant material. TOC provides a measurement for the potential formation of disinfection byproducts.	No MCL; EPA requires a specific treatment technique.	Required % removal depends on source water, 35% - 50%	Removal range: 46% to 62% 54% removed	2023	Naturally present on the environment
	Total Coliform Bacteria A group of bacteria whose presence in water indicates possible contamination with soil or waste from warm-blooded animals.	No more than 5% samples total coliform-positive.	0%	2.3% highest level detected in any monthly sample. All repeat samples were satisfactory. Range: 0% to 2.3%	2023	Naturally present in the environment
Radionuclides	**Gross Alpha excluding Radon and Uranium**	15 pCi/L	0 pCi/L	Highest level detected: 0.376 pCi/L Range: 0.376 to 0.376 pCi/L	2022[3]	Runoff from herbicide used on row crops

[3] Radionuclides regulatory sampling frequency is every six years.

Voluntary Testing of Unregulated Compounds

These compounds have EPA Health Advisories.

Unregulated Compound Position Statement and testing schedule: www.charlestonwater.com/positionstatement

Compounds with Health Advisories	Units	Aug 2018	Dec 2018	Feb 2019	May 2019	Oct 2020	Nov 2021	Feb 2022	Oct 2023	EPA Health Advisory	Secondary Drinking Water Standards
2,4-D (2,4-dichlorophenoxyacetic acid)	ppt	NA	NA	NA	8.7	NA	NA	NA	NA	200,000*	NA
Aluminum	ppb	74	58	38	35	70	78	73	NA	NA	50 to 200
Atrazine	ppt	22	19	7.2	16	24	NA	NA	NA	700,000*	NA
Barium	ppb	14	12	16	17	14	12	13	19	7,000*	NA
Bromodichloromethane	ppb	5.6	3.7	3.3	2.9	5.2	1.6	0.96	2.2	100*	NA
Bromoform	ppb	NA	NA	NA	NA	NA	0.5	NA	NA	1,000	NA
Chloroform	ppb	7.2	2.7	2.6	3.2	7.1	0.77	NA	1.9	350*	NA
Dibromochloromethane	ppb	2.6	2.0	1.6	1.5	1.9	1.6	1.0	1.5	700*	NA
Diuron	ppt	NA	NA	NA	NA	82	NA	NA	NA	100,000*	NA
Formaldehyde	ppb	NA	NA	NA	7.1	7.3	6.3	NA	NA	7000*	NA
Manganese	ppb	13	6.4	3.3	9.6	8.5	4.3	3.9	8.5	1,600*	NA
Perchlorate	ppb	NA	NA	0.13	0.12	NA	0.09	0.44	0.14	25*	NA
PFOA**	ppt	5.0	4.1	4.4	5.3	4.3	4.7	4.5	4.2	0.004	NA
PFOS**	ppt	9.7	6.1	6.3	7.0	7.5	6.0	5.4	5.2	0.02	NA
PFBS	ppt	3.8	4.0	3.2	3.5	2.9	3.5	3.8	2.8	2,000	NA
Simazine	ppt	NA	6.9	14	16	NA	NA	NA	NA	700,000*	NA
Strontium	ppb	53	41	43	53	46	39	44	50	20,000*	NA
Zinc	ppb	NA	NA	6.3	NA	NA	5.2	NA	NA	10,000*	NA

*EPA Drinking Water Equivalent Level (DWEL)

** This report shares data from 2023, and the EPA did not set MCLs for PFOA and PFOS until 2024. Before 2024, the EPA issued Health Advisories, which are non-regulatory. Starting in 2024, public water systems have until 2029 to implement solutions that reduce these PFAS if monitoring shows that drinking water levels exceed the MCLs.

(Data continued on the next page.)

Voluntary Testing of Unregulated Compounds, continued

Additional unregulated compounds detected during unregulated compound testing.	Units	Aug 2018	Nov 2018	Feb 2019	May 2019	Oct 2020	Nov 2021	Feb 2022	Oct 2023	EPA Health Advisory	Secondary Drinking Water Standards
1,4 Dioxane	ppb	0.11	0.14	0.32	0.33	0.11	0.31	0.56	0.45	NA	NA
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ppt	NA	4.0	NA	NA	NA	NA	NA	NA	NA	NA
Acesulfame-K	ppt	NA	32	160	88	46	NA	NA	28	NA	NA
Atenolol	ppt	NA	NA	NA	5.8	NA	NA	NA	NA	NA	NA
Boron	ppb	37	32	26	22	28	31	28	26	NA	NA
Chromium, hexavalent	ppb	0.06	0.06	0.06	0.06	0.33	0.20	0.17	0.20	NA	NA
DEA (Diethanolamine)	ppt	NA	NA	NA	NA	6.2	NA	NA	NA	NA	NA
DEET	ppt	NA	12	NA	NA	21	NA	NA	NA	NA	NA
Erucylamide	ppt	NA	NA	NA	NA	NA	5.8	5.3	9.5	NA	NA
Iohexal	ppt	NA	19	19	51	21	NA	NA	NA	NA	NA
Lincomycin	ppt	NA	24	NA	NA	NA	NA	NA	NA	NA	NA
NDMA	ppt	7.5	3.4	5.6	5.1	7.7	NA	NA	2.3	NA	NA
NMEA	ppt	NA	2.5	NA	NA	NA	NA	NA	NA	NA	NA
PFBA	ppt	7.0	NA	NA	NA	8	4.8	5.6	NA	NA	NA
PFHpA	ppt	3.2	2.9	2.3	2.8	2.6	3.0	3.0	2.1	NA	NA
PFHxA	ppt	5.6	5.7	4.3	5.6	4.9	6.3	7.7	4.2	NA	NA
PFHxS	ppt	3.3	2.8	2.1	2.2	2.7	2.2	2.2	NA	NA	NA
PFPeA	ppt	7.5	7.5	4.7	5.8	5.5	7.2	8.8	NA	NA	NA
Quinoline	ppt	NA	19	NA	NA	NA	NA	NA	NA	NA	NA
Sucralose	ppt	NA	950	640	580	430	NA	NA	130	NA	NA
Tetrahydrofuran	ppb	NA	NA	NA	6.1	20	NA	NA	NA	NA	NA
Theobromine	ppt	NA	NA	16	NA	NA	NA	NA	NA	NA	NA

Water Characteristics

Parameter	Units	2023 Average	Highest Level Recommended by EPA
Chloride	ppm	14	250
Color	PCU	3	15
Iron	ppm	<0.10	0.3
Manganese	ppm	<0.05	0.05
Total Dissolved Solids (TDS)	ppm	94	500
Sodium	ppm	9	No Standard
Alkalinity	ppm	30	
Conductivity	µmhos/cm	181	
Hardness	ppm	59 (3.45 gpg)	
Ortho-phosphate	ppm	1.2	
Silica	ppm	7.3	
Temperature	F	69.8° (21°C)	

Water Characteristics Abbreviations

These parameters affect aesthetics, such as taste, odor, hardness, etc. The EPA has secondary standards for some of these parameters, which are recommended guidelines.

ppm Parts per million

PCU Platinum Cobalt Units

gpg Grains per gallon

µmhos/cm Micromohs/cm

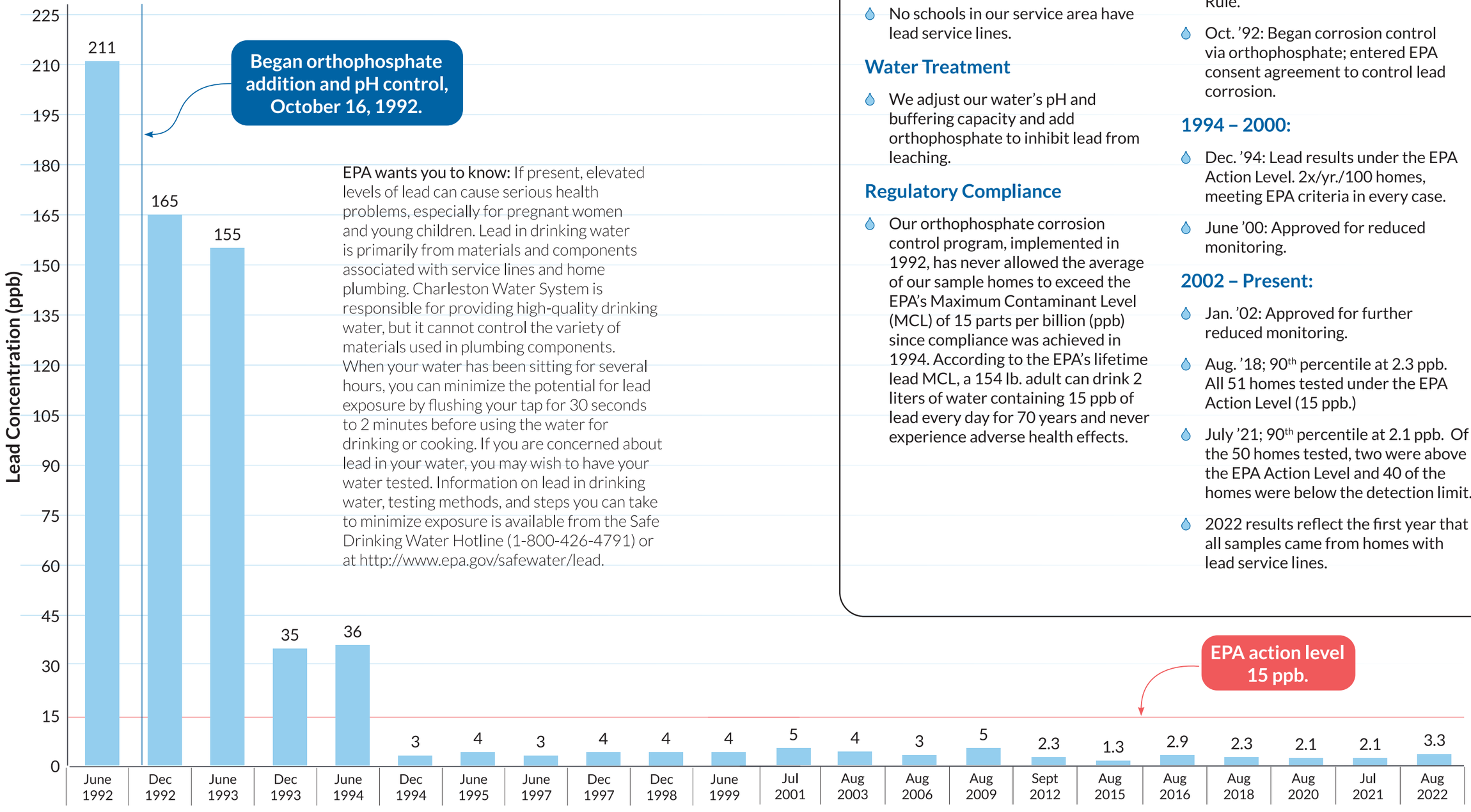
EPA's 2020 Unregulated Contaminant Monitoring Rule (UCMR4)

UCMR participation requires most recent data to be published in the Water Quality Report (this document) until the next round of UCMR testing (2025).

Compound	Units	Raw Water		Finished Water		Distribution Water	
		Average	Range	Average	Range	Average	Range
HAA5	ppb					12.19	8.14 – 18.44
HAA6Br	ppb					5.89	4.34 – 8.42
HAA9	ppb					17.28	12.25 – 25.86
Bromide	ppb	0.04	0.03 – 0.04				
Manganese	ppb			9.38	6.15 – 14.4		
Total Organic Carbon (TOC)	ppm	7.45	6.46 – 7.98				

Lead

Tier I Lead Values (90th percentile)



EPA wants you to know: If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Charleston Water System is responsible for providing high-quality drinking water, but it cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using the water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (1-800-426-4791) or at http://www.epa.gov/safewater/lead.

Our Water

- There is no lead in our treated water leaving the plant.
- No schools in our service area have lead service lines.

Water Treatment

- We adjust our water's pH and buffering capacity and add orthophosphate to inhibit lead from leaching.

Regulatory Compliance

- Our orthophosphate corrosion control program, implemented in 1992, has never allowed the average of our sample homes to exceed the EPA's Maximum Contaminant Level (MCL) of 15 parts per billion (ppb) since compliance was achieved in 1994. According to the EPA's lifetime lead MCL, a 154 lb. adult can drink 2 liters of water containing 15 ppb of lead every day for 70 years and never experience adverse health effects.

1992 – 1994:

- June '92: Reported highest lead levels in US under the new Lead and Copper Rule.
- Oct. '92: Began corrosion control via orthophosphate; entered EPA consent agreement to control lead corrosion.

1994 – 2000:

- Dec. '94: Lead results under the EPA Action Level. 2x/yr./100 homes, meeting EPA criteria in every case.
- June '00: Approved for reduced monitoring.

2002 – Present:

- Jan. '02: Approved for further reduced monitoring.
- Aug. '18; 90th percentile at 2.3 ppb. All 51 homes tested under the EPA Action Level (15 ppb.)
- July '21; 90th percentile at 2.1 ppb. Of the 50 homes tested, two were above the EPA Action Level and 40 of the homes were below the detection limit.
- 2022 results reflect the first year that all samples came from homes with lead service lines.

Water Treatment Process

How It Works

Alum (aluminum sulfate) — Helps the impurities stick together to form bigger particles called floc. Gentle mixing allows the floc particles to grow bigger and heavier.

Chloramine — Long-lasting disinfectant.

Chlorine Dioxide — Disinfectant.

Filtration — A physical process that removes very tiny particles.

Fluoride — Added for dental health. View our fluoride position statement at: www.charlestonwater.com/positionstatement

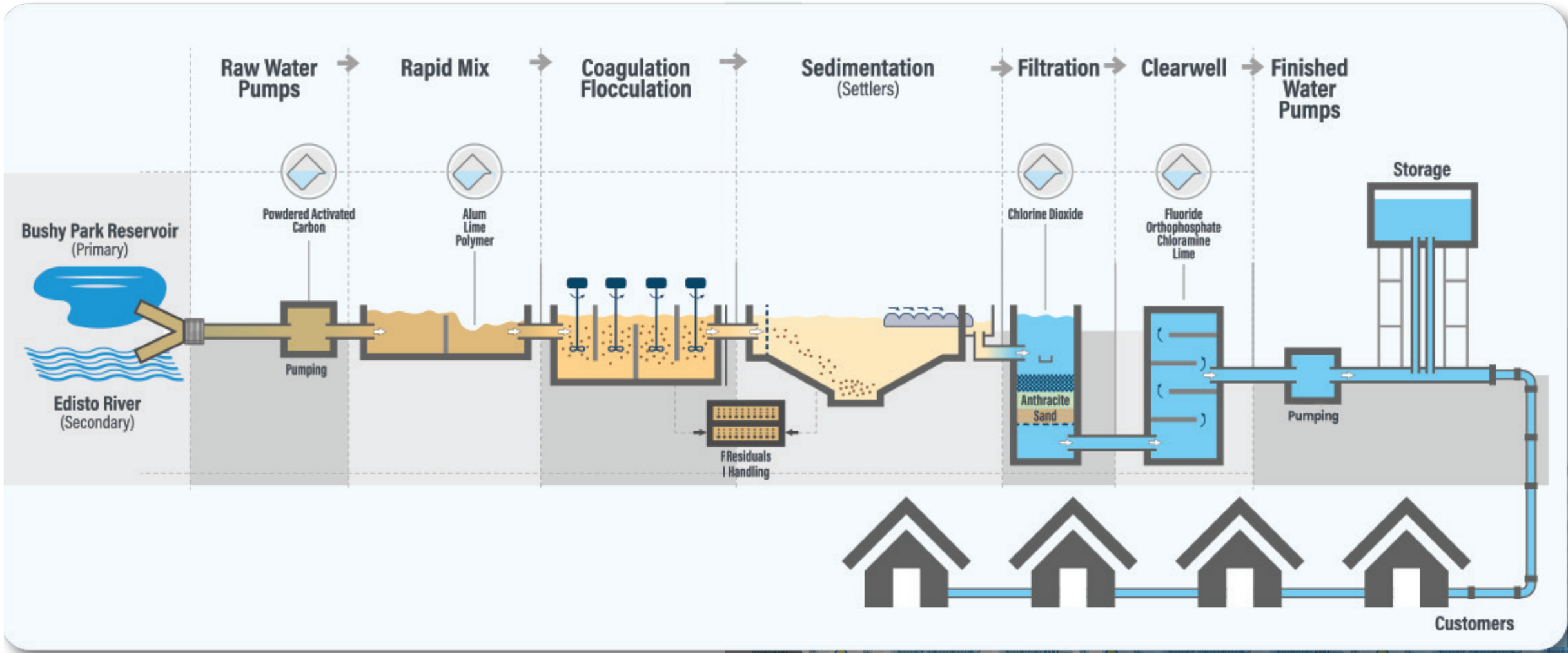
Lime — pH Adjustment for chemical stability.

Orthophosphate — Lead and copper control.

Polymer — Aids with flocculation.

Powdered Activated Carbon — Added for taste and odor control.

Sedimentation (settling) — Allows the large, heavy floc particles to settle to the bottom, leaving the clean water on top.



Infrastructure Highlights

Adding and maintaining critical infrastructure is an important part of maintaining water quality all the way to customer taps!

Learn more about our capital improvements program: www.charlestonwater.com/CIP

Palmetto Commerce Parkway Interchange Water Main Relocation Project

(Under Construction)

This project relocates water utilities to support Charleston County's planned Palmetto Commerce Parkway interchange at Interstate 26. The Utilities Relocation Act offsets our cost.

Hanahan Water Treatment Plant Clearwell 3 Curtain Wall Improvements

(In Design)

We use clearwells (pictured) to make sure water has enough time to be disinfected. These large, enclosed storage systems use curtain walls to ensure flow distribution and mixing. We are replacing the curtain walls in Clearwell 3.

Clements Ferry Road Widening Phase 2 Water Utilities Relocation

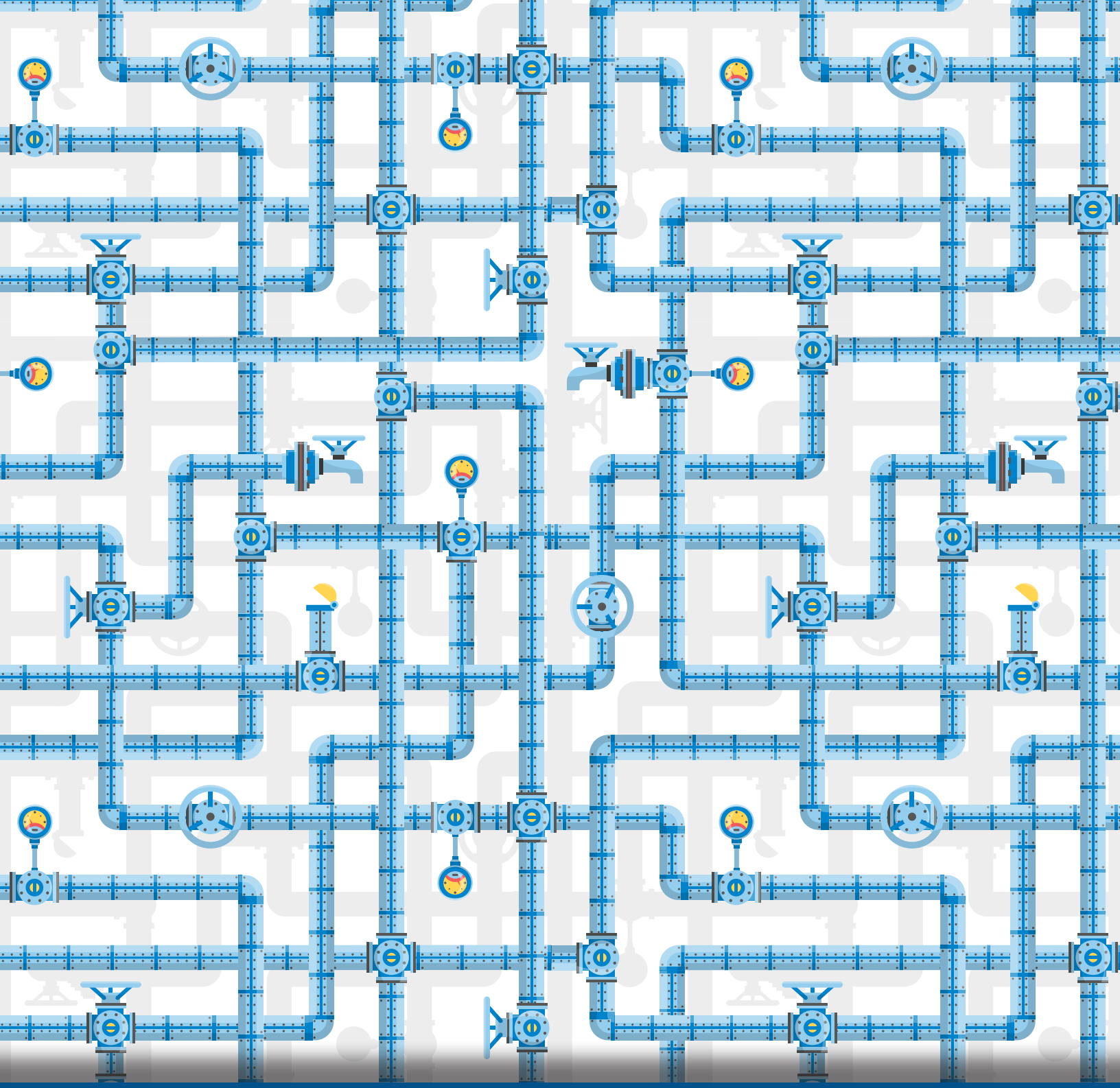
(Under Construction)

This project relocates water utilities to support Berkeley County's road improvements, widening Clements Ferry Road from Jack Primus Road to South Carolina Highway 41. The Utilities Relocation Act offsets our cost.

Bainbridge Avenue Water Main Replacement

(Under Construction)

This project replaces approximately 2,000 linear feet of undersized water main along Bainbridge Avenue with a new 12-inch water main.



Charleston Water System

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This report is published annually in May.

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