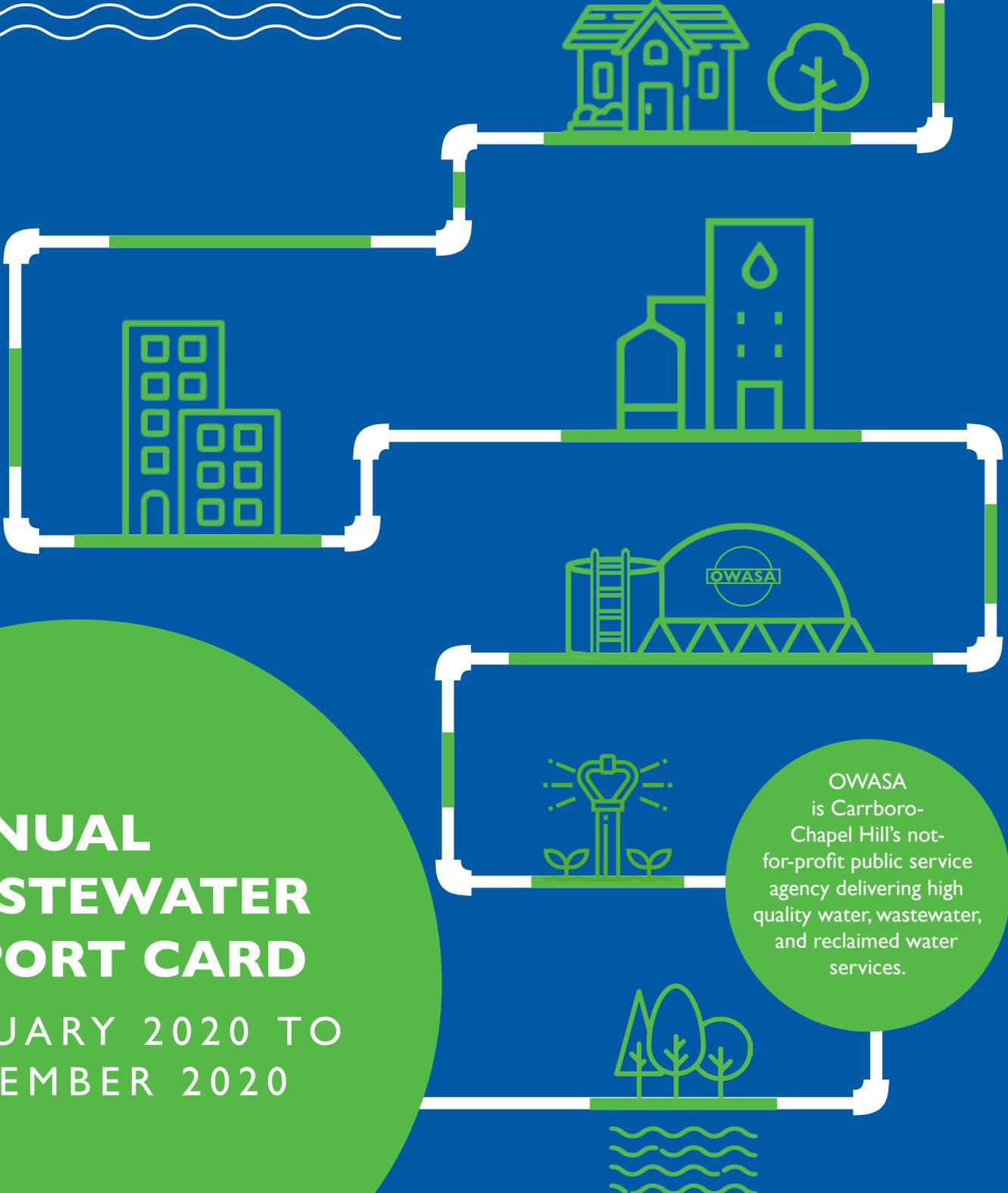




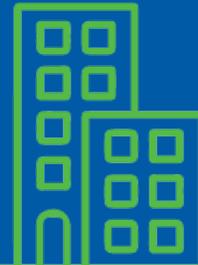
ORANGE WATER AND SEWER AUTHORITY  
400 Jones Ferry Road, Carrboro, NC 27510



# ANNUAL WASTEWATER REPORT CARD

JANUARY 2020 TO  
DECEMBER 2020

OWASA is Carrboro-Chapel Hill's not-for-profit public service agency delivering high quality water, wastewater, and reclaimed water services.



## WHEN YOU FLUSH THE TOILET OR SEND WATER DOWN THE DRAIN, WHERE DOES IT ALL GO?



OWASA's wastewater system treats on average 7.5 million gallons per day; that's about 3 billion gallons per year. We work 24/7 to collect, treat and clean the community's wastewater, and recycle (or reclaim) it where we can. What we can't reclaim, we return to Morgan Creek. The water that we return to the Creek, which eventually flows into Jordan Lake, has gone through a comprehensive treatment process so it is safe for the environment and for communities to access downstream.

# 350 MILES OF WASTEWATER PIPES UNDER CARRBORO- CHAPEL HILL: INVISIBLE YET ESSENTIAL

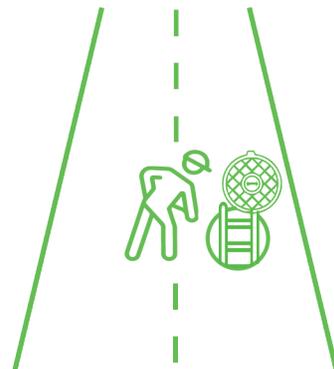


Back in the old days, when people collected their water with pails and tossed their waste out the door, life was messy! With the advent of modern plumbing, chores and sanitation became more convenient and public health improved significantly.

Today, OWASA maintains about 350 miles of underground wastewater pipes, connecting to every home, school and business across Carrboro and Chapel Hill. If you look down when you walk along the street, what do you see? Not a wastewater pipe, but probably a manhole. For maintenance or emergency, OWASA can access this critical piping network anywhere in the community through its nearly 11,000 manholes.

The wastewater system is also designed to harness the power of gravity. Most pipes originate at elevated locations and descend as they make their way to OWASA's Wastewater Treatment Plant in Chapel Hill.

When you send water down the sink at home, or flush the toilet at work, the waste travels through these pipes powered by the natural force of gravity. At locations where gravity has run its course, 21 pump stations help keep the wastewater flowing as it makes its way to the treatment plant.



# BIOLOGY PLUS TECHNOLOGY: THE WASTEWATER TREATMENT PROCESS

Wastewater treatment is the biological process of removing pollutants from the water so it can be returned safely to the environment. OWASA's treatment system mimics nature's processes and uses technology to accelerate it. The system starts with the collection of wastewater through pipes, pumps to help move it, settling tanks to take out solids, and treatment tanks where naturally occurring bacteria and other microorganisms consume pollutants.

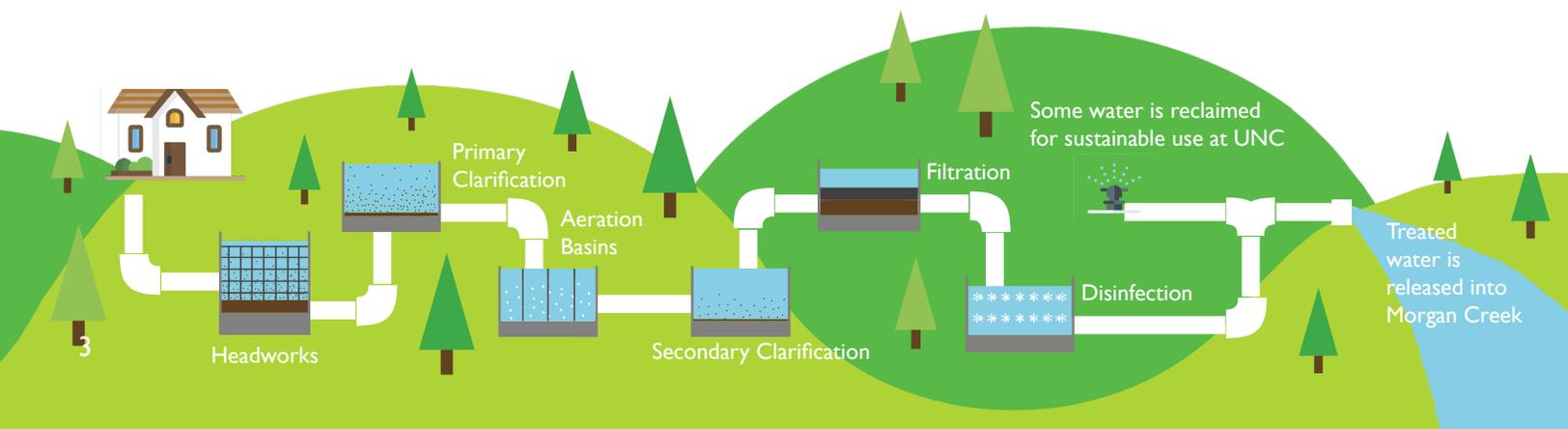
Our Mason Farm Wastewater Treatment Plant is located in the southern part of Chapel Hill. We do our best to be a good neighbor and maintain a comprehensive odor elimination program throughout our treatment process. This includes ensuring our storage basins are covered tight at all times, and treating air being exhausted from our tanks with carbon filters.

While wastewater management is a public service that is somewhat invisible, OWASA's team members that make it happen are so essential! Our wastewater team ranges from operators who manage the treatment processes to our maintenance crews who work every day across the community, maintaining the pumping systems and pipes 24/7. They keep the 350 miles of wastewater pipes coursing underground clear of blockages and test for cracks in pipes to mitigate potential sewer overflows.

Meanwhile, scientists in OWASA's wastewater lab test our effluent – the treated wastewater that we recycle into clean water for return to Morgan Creek. One of the purposes of these tests is to ensure that the leftover nutrients from the wastewater, such as phosphorus and nitrogen levels that re-enter the creek, are below regulatory limits. This is important because nutrient levels that are too high can cause an increase in algal blooms, which have the potential to affect water quality.

“The water that people use for personal hygiene, cleaning, in commercial buildings and restaurants, it all originates from local water sources and is returned to OWASA as wastewater,” said Monica Dodson, OWASA's Wastewater Treatment and Biosolids Recycling Manager. “At our plant, the wastewater undergoes thorough clarification, filtration and disinfection processes. Along the way, we reclaim some of it for sustainable use for non-drinking purposes. This reduces our use of water, energy and material resources, a triple win for the planet.”

## OWASA'S WASTEWATER TREATMENT PROCESS





## OWASA IS A PARTNER IN COVID-19 SURVEILLANCE RESEARCH

OWASA is a partner to ongoing scientific research, including providing wastewater samples to help track the spread of COVID-19.

OWASA began providing weekly wastewater samples to researchers with the North Carolina Policy Collaboratory in mid-July 2020. The goal of this phase of the project, which ended in December, was to perfect the analytical methods and to contribute valuable information to the State of North Carolina on the presence and persistence of COVID-19.

Meanwhile, North Carolina is one of eight states participating in the National Wastewater Surveillance System being initiated by Centers for Disease Control and Prevention and the United States Department of Health and Human Services. OWASA was contacted by the North Carolina Department of Health and Human Services in December to participate in this national surveillance monitoring.

We are always proud to contribute to scientific research benefitting our community and beyond.

## ROD DAIL CONTINUING TO SERVE HOME TOWN AT WASTEWATER TREATMENT PLANT

Providing wastewater services for our customers is a job that requires work every hour and every day of the year. Keeping equipment running – or fixing an issue – is part of the responsibility for OWASA’s maintenance team, including Senior Maintenance Mechanic Rod Dail.

“You really never know what’s coming,” Rod says, “but when a facility runs 24 hours a day, seven days a week, there’s always going to be an opportunity for something to break.”

Rod grew up in Carrboro and then enlisted in the United States Marine Corps. Rod took over this role at OWASA in 2010, and he says it means a lot to work for the community he grew up in.

“I understand that our mission — OWASA in general — is essential to the economic wellbeing of Carrboro and Chapel Hill,” Rod says. “It gives us a great sense of purpose, and it’s integrated into a better class of living alongside our customer base.”

Outside of work, Rod enjoys walking, “eternal tug-of-war” with his two boxers, as well as golfing and spending time with his kids.



# RECYCLING NUTRIENTS WITH BIOSOLIDS



Another by-product of the anaerobic digestion process is an organic material containing nutrients called biosolids. During the anaerobic process, the extreme heat applied in the digester to aid the breakdown of the organics also destroys bacteria and eliminates odors. The nutrients in these biosolids are recycled and reused as fertilizer or amendments to improve soil conditions.

We land apply biosolids to lands that we own or through partnerships with farmers in Orange, Chatham and Alamance Counties, in accordance with State permits and regulations. The maximum amount of biosolids that can be applied to a field is determined by the biosolids' nitrogen content, and is limited to the nitrogen requirements of each particular crop. Our biosolids are designated as Class A – Exceptional Quality by the Environmental Protection Agency (EPA).

OWASA closely monitors its biosolids application rates which are well below regulatory levels. In accordance with Federal regulations, we test our biosolids quality throughout the year. We also measure the trace metals, solids, and nutrients in our biosolids every 60 days.

Last year, we recycled about 50% of our biosolids through land application. As reported in the table below, the level of substances in our biosolids met or surpassed all State and Federal regulations. What we don't land apply we compost into a soil additive in partnership with a regional composter.

Biosolids Quality Annual Data Summary (Permit #s WQ0021828/WQ0001169)		
Substance	EPA Limit for Exceptional Quality Biosolids	OWASA Calendar Year Results
Fecal Coliform Bacteria	1,000 cfu	126 cfu (maximum)
Mercury	17 ppm	0.48 ppm
Cadmium	39 ppm	0.84 ppm
Arsenic	41 ppm	1.26 ppm
Lead	300 ppm	2.92 ppm
Copper	1,500 ppm	272 ppm
Zinc	2,800 ppm	661 ppm
Nickel	420 ppm	11.69 ppm
Molybdenum	n/a	4.45 ppm
Selenium	36 ppm	2.38 ppm

ppm = part per million. One part per million is equal to one penny in \$10,000.

CFU = colony forming units

# BACK TO MORGAN CREEK AND BEYOND



Water that is not reclaimed throughout this comprehensive treatment process is returned to Morgan Creek, safe for the environment and communities, including wildlife along the waterway's path and water treatment plants and the people they serve downstream. The water eventually makes its way to the Atlantic Ocean, traversing Jordan Lake and Cape Fear River along the journey. It's all part of the world's water system, interconnected, interdependent and shared by everyone, making it all the more important for us to transform our community's wastewater into clean water, before we return it back to the environment.

Last year, as in previous years, OWASA met or surpassed all Federal and State standards for the quality of our treated wastewater. We ensure that leftover nutrients from wastewater, such as nitrogen levels, are below regulatory limits so as not to impact water quality. In our effluent (the treated water we return to Morgan Creek) phosphorus and nitrogen levels test consistently below the regulatory limit.

Wastewater Effluent Quality Annual Data Summary (Permit # NC0025241)			
Water Quality Measure	Regulatory Limit	OWASA Calendar Year Results	Notes
Phosphorus	Maximum of 10,188 lbs for the year	890 lbs	Full compliance; 91% below the limit
Nitrogen	Maximum of 409,448 lbs for the year	96,245 lbs	Full compliance; 76% below the limit



OWASA's Youth Water Academy visits the Wastewater Treatment Plant in 2019 to learn about the wastewater process.



## COMMITTED TO SUSTAINABILITY

OWASA plays a critical role in the sustainability of our community. OWASA has an active and strategic energy management program designed to reduce our use of electricity and natural gas.

We have made significant strides in reducing our use electricity and natural gas for wastewater treatment and collection! **In 2020, we used 35% less electricity and 17% less natural gas to collect and clean wastewater than in 2010.** This is the result of investment in cost-effective energy efficiency projects and the reuse of biogas generated by biosolid digestion. Collectively, our energy management efforts have resulted in 35% decrease in greenhouse gas emissions.

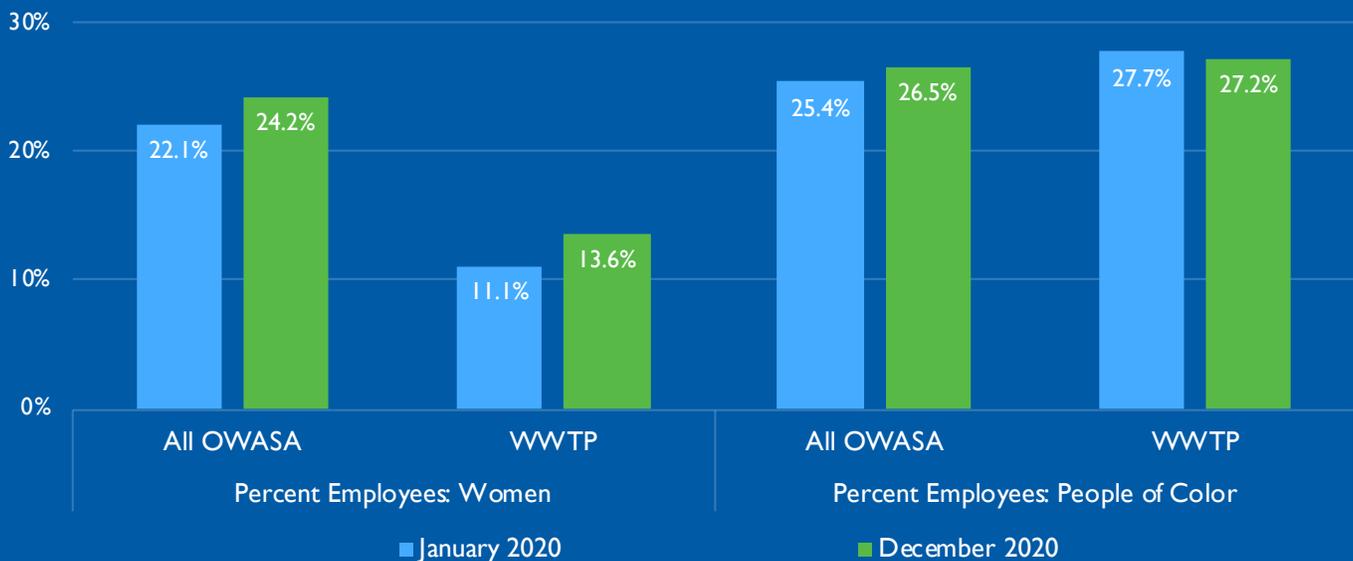
With significant strides in energy conservation and energy efficiency underway, we have begun to develop cost-effective renewable energy projects. In December 2020, we started generating clean renewable energy from solar PV panels installed on a small portion of property that we use for biosolids management. Through a public-private partnership, this project did not cost OWASA rate payers any additional funds to construct and will lead to increased cost savings throughout the 25-year life of the system.



## OWASA VALUES DIVERSITY AND INCLUSION

OWASA initiated a formal Employee Diversity and Inclusion (D&I) program in 2017 to ensure our workforce reflects the communities we serve and to provide an inclusive working environment for each team member.

The graph below compares statistics on how OWASA and the Wastewater Treatment Plant (WWTP) began and ended the year, in terms of gender and racial distribution. We are encouraged, not only by the trends, but in the commitment of our team and Board to learn, grow, and contribute to help make OWASA a more diverse and inclusive place. As with everything we do, we are committed to continuous improvement of Diversity and Inclusion efforts.





# WASTEWATER (SEWER) OVERFLOWS



What flows through a community’s wastewater system is what gets flushed or sent down the drain by residents and visitors. Sometimes, what isn’t supposed to be flushed can create overflows. For example, when grease gets sent down sinks and builds-up in the system. Or when a large volume of dental floss clogs up a pump. Nature can also play a role; for example, when a tree root causes a crack in an underground pipe, or when a flash flood inundates the system with too much water.

We continuously monitor the community’s wastewater system to mitigate for potential overflows. This is important because wastewater can be contaminated, so we work to prevent overflows or isolate them quickly when they occur. Electronic alarms at pump stations throughout our system notify us of a potential issue, which we investigate quickly to keep the wastewater moving. We count on the community to alert us too. If you see an overflow at a manhole, please stay clear of the area (people and pets) and notify OWASA immediately at 919-968-4421.

Last year, the total volume of recorded overflows in OWASA’s wastewater system was 1,585 gallons. As noted in the table below, two overflow events occurred due to tree roots interfering with the line and one act of vandalism.

Sewer Overflows Annual Data (Permit #WQCS00031)			
Date	Location	Quantity (Gallons)	Cause
1/6/20	208 Clark Lake Road	945 gallons	Roots
1/8/20	Morehead Labs	640 gallons	Vandalism

# YES TO THE THREE Ps!



One impact from the COVID-19 pandemic has been an increase in sanitary wipes being flushed down the toilet. Flushing the wrong stuff can harm the wastewater system by causing costly and messy clogs and even impact water quality in our streams and lakes. This is a friendly reminder that the three Ps are the only things that should be flushed down the toilet: pee, poo, and toilet paper!

## PROTECT YOUR COMMUNITY'S WASTEWATER SYSTEM

Together, we can protect our community's water system, wastewater system and the environment. Please help keep these items out of our sewers:



### FEMININE PRODUCTS

These products expand and absorb moisture, making it difficult for them to travel through pipes. Nor do they break down into smaller pieces.



### DISPOSABLE DIAPERS

Like feminine products, diapers expand and absorb moisture, and are very bulky. Diapers are just not meant to be flushed!



### DENTAL FLOSS

This stringy substance loves to wrap itself around anything and everything that travels down the same path in the sewers.



### "FLUSHABLE" WIPES

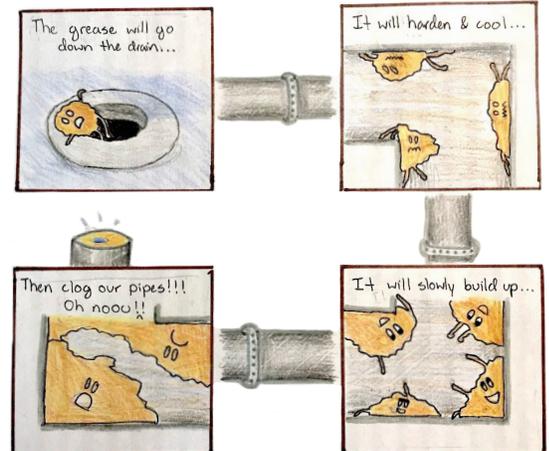
These clog wastewater pipes and get caught in the equipment at the treatment plant. Please dispose of wipes in the trash, even if the package says they're flushable!



### OILS AND GREASE

Inside a sewer or plumbing drain, fat, oil and grease harden into a plaster-like substance that can block flow. Please scrape or wipe fat, oil and grease off pots, pans, plates and bowls before washing them.

### WHAT HAPPENS WHEN I FLUSH FATS & GREASE? BY CRYSTAL SOONG



### OTHER PRODUCTS

Other products that should not be flushed include sand, hair, kitty litter, condoms and cotton balls.



## PRESCRIPTION MEDICATIONS!

Please don't flush prescription medications. Wastewater treatment plants were not designed to remove the chemicals in many pharmaceuticals. If they are flushed and enter the wastewater system, they may enter into a creek, river or lake that acts as a water supply for a community downstream, or harm aquatic life. The Police Departments of Chapel Hill and Carrboro have "no questions asked" drop boxes where you can discard of your leftover medicines.

Safe Disposal Locations	Drop Box Day	Hours	Address	More Information
Chapel Hill Police Headquarters	Monday - Friday	9:00 am – 5:00 pm	828 Martin Luther King Jr. Blvd.	919-968-2760
Carrboro Police Department	Monday - Friday	8:30 am – 5:00 pm	100 N. Greensboro St. (Century Center)	919-918-7397

2020  
**QUICK  
FACTS**

Our team mowed and cleared 72 miles of easements in the community to help keep tree and shrub roots from growing into the wastewater system.

We tested for cracks by putting non-toxic smoke into the wastewater pipes to see where the smoke came out. Cracks are caused mostly by intrusive tree roots, and also age. Where we found a crack, we fixed it: to keep rainwater and groundwater from seeping in, and wastewater from leaking out.

Last year, OWASA cleaned about 118 miles of wastewater pipes, 35% of the community's wastewater system. Fats, oil and grease, dental floss and wipes were the main culprits clogging up the system.

Throughout the year, we spent \$4.6 million replacing or renewing 4.8 miles of wastewater pipes to prevent overflows and maintain system resiliency.

**FOR MORE  
INFORMATION  
ABOUT  
WASTEWATER AND  
RECLAIMED WATER**

If you have any questions about the wastewater treatment process, please contact our team! Connect with Monica Dodson, OWASA's Wastewater Treatment and Biosolids Recycling Manager, at 919-537-4205.





## LEARN MORE



### PLAN A FUTURE TOUR OF THE WASTEWATER TREATMENT PLANT!

The science of wastewater treatment is fascinating incorporating biology, ecology, chemistry, and more! Unfortunately, tours of the treatment plants are temporarily suspended due to COVID-19. Please stay tuned to [owasa.org](http://owasa.org) for more information on when tours will resume and other fun ways to engage.

### CHECK OUT OUR VIDEO

You can keep your kids (and kids at heart) engaged by watching a video on how wastewater is treated in our community. View our video now!

<https://bit.ly/2ZJJtUK>



## CONTACT OWASA ANYTIME

OWASA is Carrboro- Chapel Hill's not-for-profit public service agency delivering high quality water, wastewater, and reclaimed water services. Under the streets, in the field, at the lab and in the office, our diverse team manages the community's wastewater system. Contact us anytime. We welcome your questions and feedback!

### ORANGE WATER AND SEWER AUTHORITY

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919-968-4421

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[owasa.org](http://owasa.org)

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