Operating Trends Report for Fiscal Year 2025

JANUARY 2026

Orange Water and Sewer Authority

Carrboro, North Carolina

Orange Water and Sewer Authority
Our community's trusted partner for clean water and environmental protection.

Table of Contents

Table of Contents ii
Purpose and Summary iii
Acronyms iv
Background 5
Source Water Protection 6
Raw Water Supply 11
Water Treatment Plant: Peak Day Drinking Water Demands 13
Drinking Water Distribution System Integrity 15
Water System Audit 16
Wastewater Collection System Integrity 17
Mason Farm Wastewater Treatment Plant Maximum Month Flows 19
Mason Farm Wastewater Treatment Plant Nutrient Capacity 20
Reclaimed Water 22
Biosolids 24
Regulations 26
Energy Management 30

Purpose and Summary

This report summarizes observed trends for several indicators – such as water supply and drinking water treatment, wastewater treatment, use of reclaimed water, and environmental regulations – which are important factors that influence the need, timing, and scope of our facilities planning and investment decisions. Through the process of regularly reviewing and updating this report, we strive to anticipate and proactively prepare for change so that we are better positioned to provide high quality and reliable water, wastewater, and reclaimed water services for the long-term. Some of the key messages are:

- Since FY 2002, the year with the highest peak day demand under normal operations, peak day drinking water demand has declined by 26 percent despite a 14 percent increase in customer accounts over that same period. Similarly, demands on our raw water supply have decreased substantially. These reduced, long-term demands result from:
  - Increased water use efficiency and conservation by our customers;
  - Conservation pricing and conservation ordinances including year-round water restrictions; and
  - Implementation of the reclaimed water system in partnership with the University of North Carolina at Chapel Hill (UNC) in 2009, which now meets about 10 percent of the community's water needs based on water sales.
- These reductions in drinking water demand – and the associated reductions in wastewater flows – help defer the need for costly expansion of the capacities of our raw water supplies, water treatment plant, and wastewater treatment plant. More efficient use of water also helps reduce costs for energy and chemicals for water supply, drinking water treatment and water distribution, and wastewater collection and treatment.
- Based on current demands, we believe we have sufficient raw water supply for the next few decades under most conditions. However as noted in analyses completed for the July 2022 update of our Long-Range Water Supply Plan (LRWSP), we are vulnerable during droughts. The LRWSP recommends that we work with the City of Durham and TriRiver Water (a regional water utility serving the City of Sanford, Town of Pittsboro, Siler City, and Chatham County), known as the Western Intake Partnership or WIP, on a new intake and transmission infrastructure on the western side of Jordan Lake. This partnership will secure access to our allocation of water from Jordan Lake to use during extended droughts or operational emergencies and meet our long-term needs. Given our current water demand weighed against our available supply, OWASA has decided to delay our full financial participation and partnership in the WIP to invest in more urgently needed projects. OWASA will fully join the WIP closer to the time when water from Jordan Lake will be needed on a regular basis.
- Based on current demands and projections, we do not anticipate the need to expand the hydraulic capacity of the water or wastewater plants for several decades.
- There are recent regulations that will require significant investments of capital and/or staff to ensure we meet all regulatory requirements. These include the upcoming drinking water compliance standards for per- and poly-fluoroalkyl substances (PFAS) and the requirement to identify and replace certain galvanized service lines in our community as part of the Lead and Copper Rule Revisions (LCRR) and Lead and Copper Rule Improvements (LCRI).

Acronyms

AWWA	American Water Works Association
CIP	Capital Improvements Program
CY	calendar year
DEQ	NC Department of Environmental Quality
EPA	US Environmental Protection Agency
FY	fiscal year (July – June)
GAC	granular activated carbon
ILI	Infrastructure leak index
lb/yr	pounds per year
LCRI	lead and copper rule improvements
LCRR	lead and copper rule revisions
LRWSP	Long-Range Water Supply Plan
mgd	million gallons per day
NPDES	National Pollutant Discharge Elimination System
OWASA	Orange Water and Sewer Authority
PAC	powdered activated carbon
PFAS	per and poly-fluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
ppt	parts per trillion
RCW	reclaimed water
SSO	sanitary sewer overflow
TN	total nitrogen
TP	total phosphorus
µg/l	micrograms per liter
UCMR	Unregulated Contaminant Monitoring Rule
UCMR5	Unregulated Contaminant Monitoring Rule 5
UNC	University of North Carolina at Chapel Hill
WTP	water treatment plant
WWTP	wastewater treatment plant

Background

Orange Water and Sewer Authority (OWASA) publishes this annual report to evaluate how well we are meeting our mission of providing our customers with valuable water and sewer services that are essential to our community's health, environment, and economy through the stewardship of infrastructure and natural resources.

This report summarizes observed trends for several indicators – such as water supply and drinking water treatment, wastewater treatment, use of reclaimed water, and environmental regulations – which are important factors that influence the need for, timing, and scope of our facilities planning and investment decisions. Thus, the information in this document shapes our Capital Improvements Program (CIP). Through the process of regularly reviewing, updating, and publishing this report, we strive to anticipate and proactively prepare for change so that we are better positioned to engage the community as we consider and decide how best to sustainably meet service requirements for the foreseeable future.

This Operating Trends report includes a description of OWASA's main management areas beginning with source water protection that includes our forest management program; raw water supply and treatment; distribution of drinking water to our customers; wastewater collection, treatment, and recycling or reuse. The report also provides a summary of upcoming regulations that will impact our operations and for which we are proactively planning and includes a section on energy management.

Source Water Protection

Description

OWASA has three locally managed water supply sources: Cane Creek Reservoir, University Lake, and the Quarry Reservoir as illustrated in Figure 1. Our community has a long history of taking progressive actions to ensure the health and safety of these drinking water supplies. Since it began operations in 1977, OWASA has understood that to protect the water source, you must protect the watershed. We have worked with the other local governments in Orange County on a variety of watershed protection efforts, such as:

- Limits on the extension of water/sewer service into the Cane Creek Reservoir and University Lake watersheds;
- Support for comprehensive protection through zoning and land use controls;
- Restrictions on in-lake recreational activities;
- Lake water quality monitoring;
- Special technical studies and educational activities;
- Land acquisition through the strategic purchase of property or conservation easements in areas determined to be critical for water quality protection; and
- Management of healthy forests.

OWASA set land management protection goals based on water quality modeling of University Lake and Cane Creek Reservoir. In the 1990s and early 2000s, OWASA had an active program to purchase land and protect easements around streams to meet those land protection goals. OWASA has met those goals and now focuses on managing the land it owns; we also continue to acquire cost-effective easements on land near our water supplies. Figure 1 illustrates the location of protected lands in OWASA's watersheds. The remainder of this section focuses on some of OWASA's land management activities; protecting water quality is OWASA's highest objective in each of these activities.

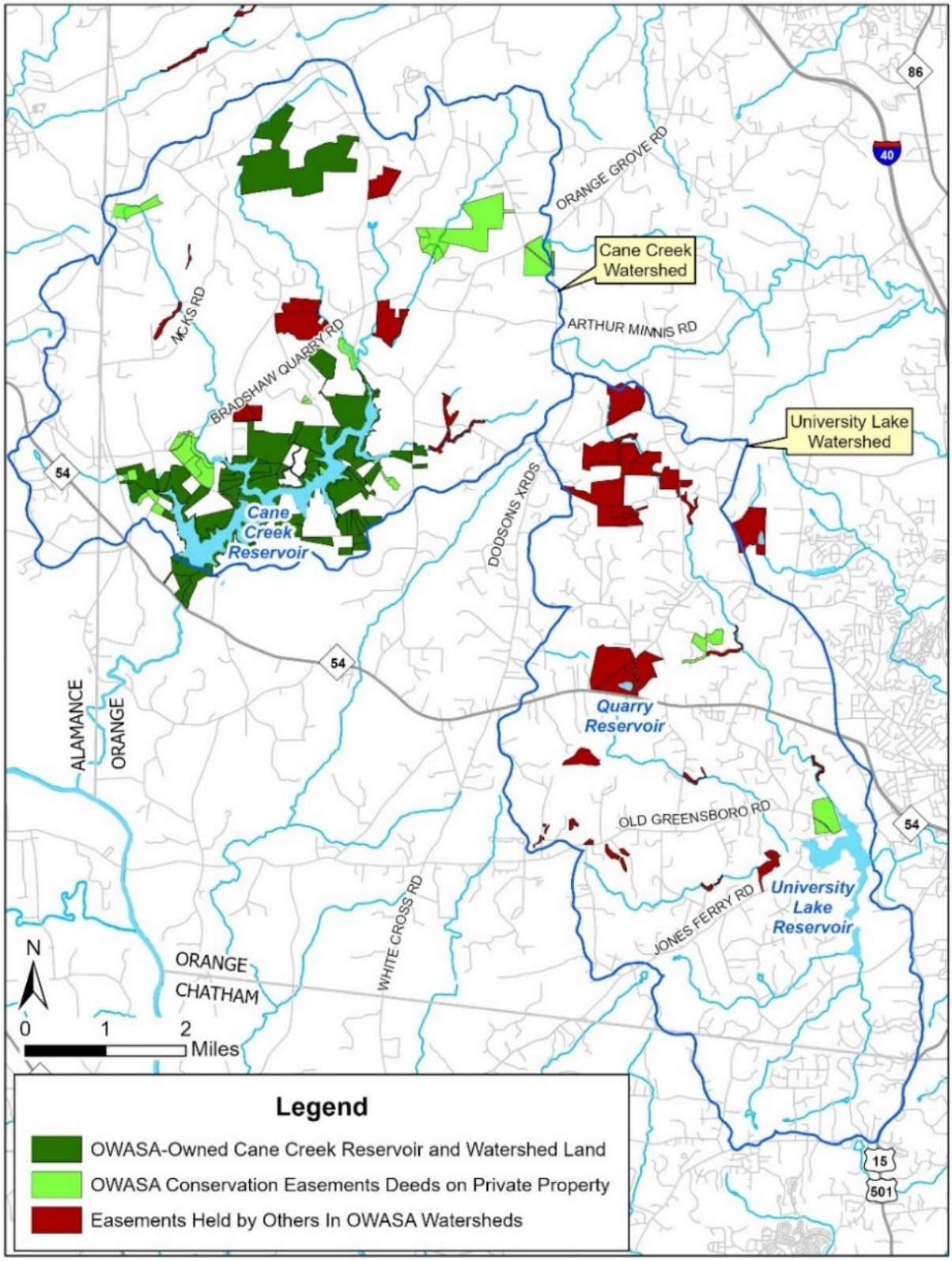


Figure 1. Protected Land in OWASA's Watersheds – Approximately 10 percent of our watershed lands are located outside Orange County, where less stringent controls apply.

Forest Management

OWASA owns approximately 2,400 acres of forested land, the majority of which is in the Cane Creek Reservoir watershed. Sustainable forest management facilitates the protection of our water supply and provides other environmental benefits such as reducing the risk of wildfire and providing wildlife habitat. OWASA has seven guiding principles for its forest management program:

- Protect water quality, OWASA's highest priority;
- Improve ecological health of forested land;
- Reduce the risk of wildfire;
- Improve wildlife habitat and species diversity;
- Sustainably manage OWASA's resources;
- Engage the community and partner agencies; and
- Minimize adverse impacts on neighbors and the surrounding community.

In FY 2025, OWASA accomplished the following:

- Logging operations were re-initiated on Meadowcrest South, nearly completing Phase 1.
- Firebreaks for Meadowcrest South were refreshed by the North Carolina Forest Service, but the full prescribed burn was not completed.
- Started implementing the approved forest management plan for 98 acres at Teer West in August 2025.
- Hosted four tours/visits by North Carolina State University and Duke University Forestry students to provide training and academic tours related to oak management at the Cane Creek Mitigation tract.
- Entered negotiations with a horse-drawn logger for hardwood overstory removal at Cane Creek Mitigation tract to enhance oak regeneration.
- Began development of the Forest Stewardship Plan for Peninsula South.

In FY 2026, OWASA plans to accomplish the following:

- Complete Phase 1 timber harvest at Meadowcrest South and start Phase 2.
- Treat for removal and prevention of invasive species at Meadowcrest North and Teer West.
- Conduct a prescribed burn at Meadowcrest North and South (95 acres).
- Apply to the North Carolina Forest Service for cost-share assistance through the Forest Development Program for reforestation at Meadowcrest South and Teer West.
- Complete logging 98 acres at Teer West.
- Begin horse logging at the Cane Creek Mitigation tract.
- Conduct a 26-acre prescribed burn at the Cane Creek Mitigation tract.
- Engage with partners and neighbors and finalize the Forest Stewardship Plan for Peninsula South.

Figure 2 illustrates the location of OWASA's land near Cane Creek Reservoir and the status of forest management activities.

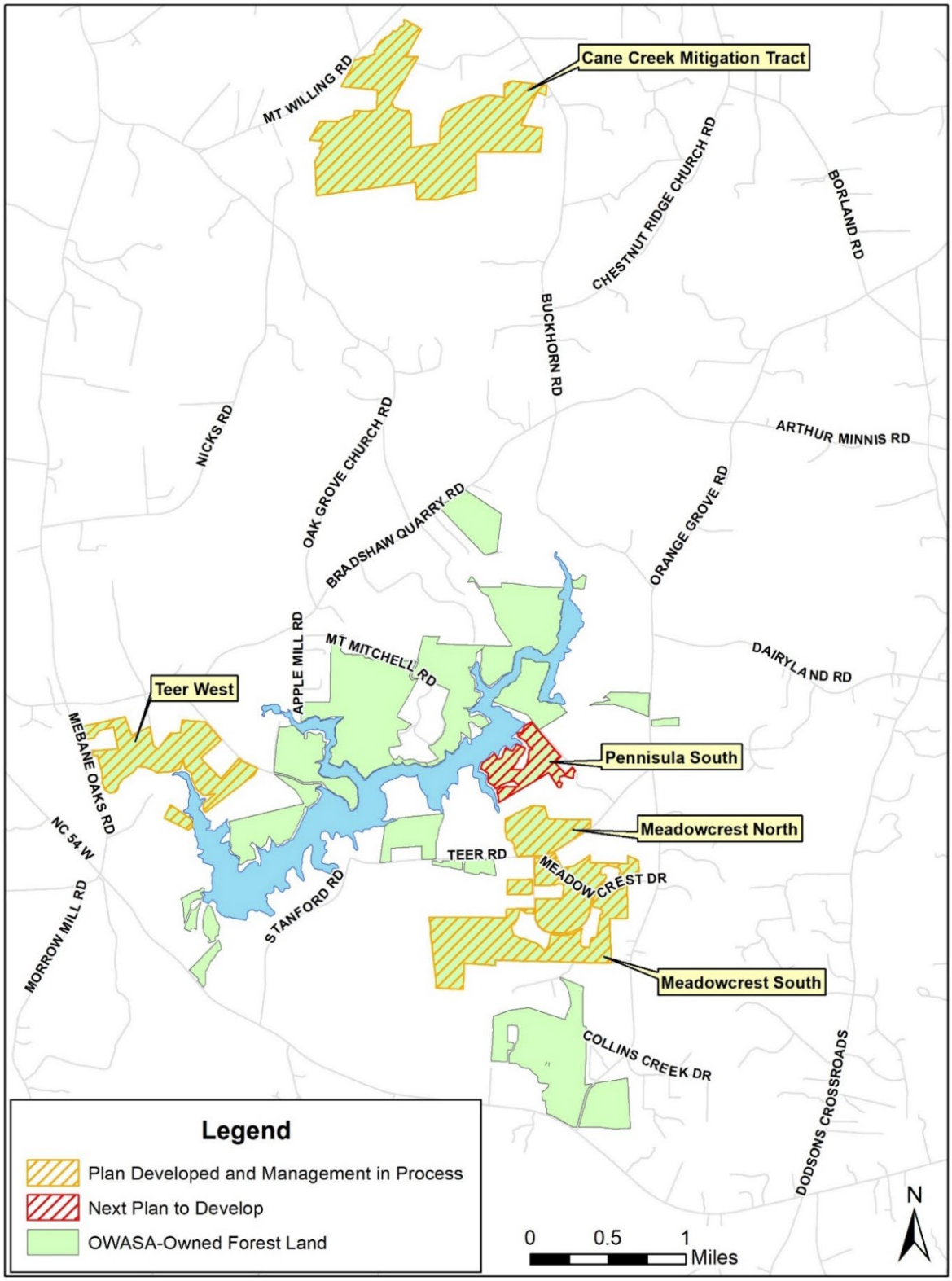


Figure 2. Status of OWASA Forest Management Plan Development and Implementation

Managing Lands with Orange County Local Governments

OWASA believes it should work with the local government agencies within Orange County to provide the best level of services for county residents when it does not increase the cost of OWASA's services or add risk to our mission of delivering valuable water and sewer services that are essential to our community's health, environment, and economy. Our highest priority when working with other local governments is protecting the water quality of our water supply watersheds.

One of the main areas where we are working with Orange County is in the creation of the Mountains-to-Sea Trail (MST). OWASA developed a list of conditions for the use of OWASA property for the MST that were designed to protect Cane Creek Reservoir, reduce risks from hiking, and minimize the impacts on neighbors. Development of this trail on OWASA property is likely several years away, but OWASA staff and Orange County staff communicate regularly about the project and other land management activities that may impact one another.

Raw Water Supply

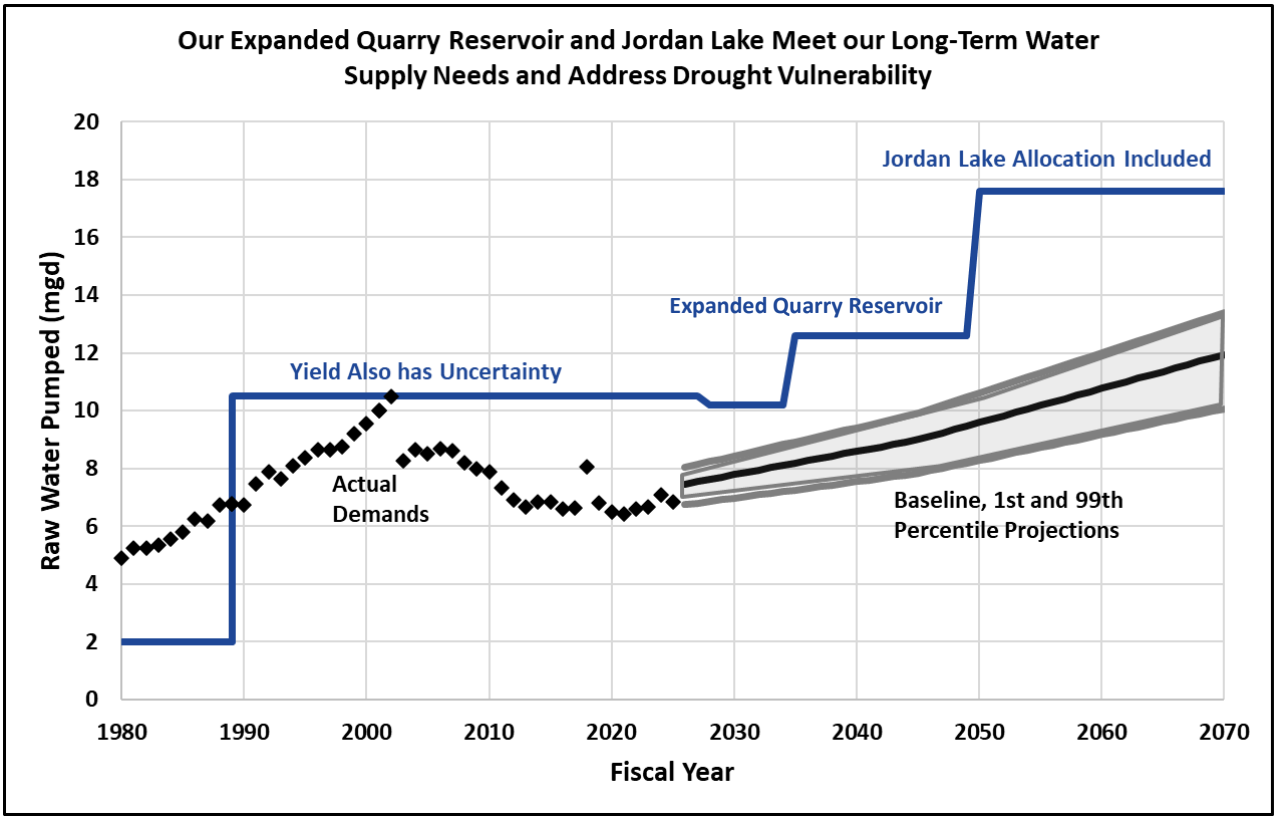


Figure 3. OWASA's Water Supply Yield and Demands – The estimated yield that includes our allocation of water from Jordan Lake is oversimplified as our access through the Western Intake Partners has not yet been modeled with our three local supplies. The projections shown in the figure are from 2019. In addition, there is uncertainty in the yield which is more difficult to quantify than the demand projections.

Description: This trend evaluates the supply (estimated yield) of our locally-owned upland water sources – Cane Creek Reservoir, University Lake, and the Quarry Reservoir as well as access to our Jordan Lake allocation (cumulatively represented by the blue line) along with actual historic raw water demands (represented by black diamonds) and estimated future raw water demands (represented by the black curve with a range of uncertainty).

Key Observations and Related Information:

- The annual average-day amount of water we pumped from reservoirs has declined substantially since peaking in FY 2002.
- Our customers have reduced peak day drinking water demands by 26 percent since Fiscal Year (FY) 2002 despite a 14 percent increase in customer accounts over that same period.
- Figure 3 shows how our baseline demand projections compare to the reliable yield of our water supplies and actual water demands. Reliable yield was defined by the Long-Range Water Supply Plan as the maximum rate we could continuously withdraw from our reservoir system under a scenario

as severe as the 2001-2002 drought of record while maintaining an emergency reserve of 20% of total reservoir storage.

- As recommended in our Long-Range Water Supply Plan, OWASA is working with the City of Durham and TriRiver Water (collectively known as the Western Intake Partnership, or WIP) on new water supply intake on the western side of Jordan Lake. OWASA does not anticipate needing access to its Jordan Lake allocation on a regular basis for at least two decades. While OWASA invested in preliminary engineering studies and design for the WIP facilities, in 2024 OWASA declined to invest further as a full financial partner during this phase of the project, instead deferring to a future capacity upgrade of the proposed water treatment plant and transmission pipelines. The City of Durham has a more immediate need for their water supply allocation from Jordan Lake. Therefore, Durham is moving forward with plans for the WIP infrastructure, which is planned to be operational around 2031. OWASA will utilize a revised mutual aid agreement with the City of Durham to access our Jordan Lake allocation once the new WIP facilities are operational. These facilities will provide OWASA with access to its 5 mgd allocation once additional yield is needed.
- Our current estimated yield is 10.5 mgd, while daily demand averaged 6.8 mgd during FY 2025. OWASA will lower the water level in the Quarry Reservoir in the next few years to prepare for the Quarry Reservoir expansion and our estimated yield will decline to approximately 10.2 mgd. When the Quarry Reservoir expansion is completed, our local supplies will provide approximately 12.6 mgd in the mid-2030s. Once we have access to our Jordan Lake allocation, our estimated yield will be 17.6 mgd. Though the current phase of WIP infrastructure is estimated to be online in approximately 2031, it will be further in the future before infrastructure is expanded and OWASA will rely on it as part of our regular water supply.

Water Treatment Plant: Peak Day Drinking Water Demands

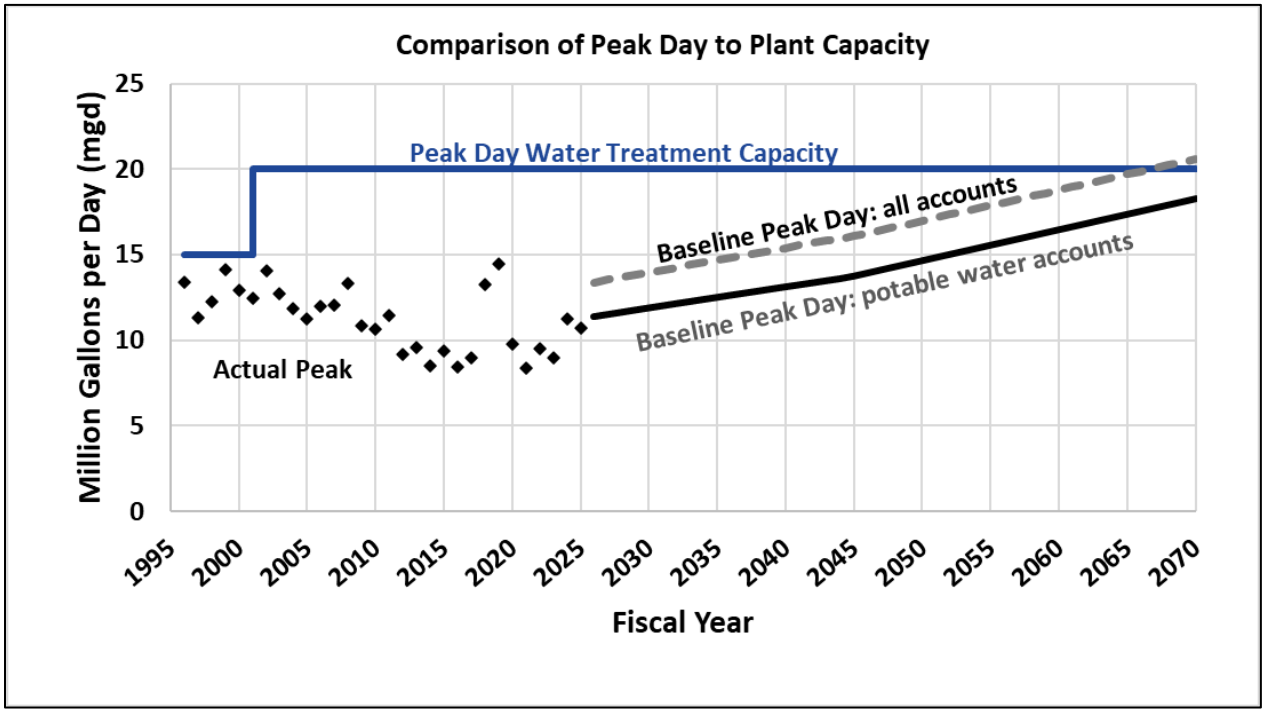


Figure 4. WTP Capacity and Peak Day Drinking Water Demands. The projections were based on an analysis completed in 2019.

Description: This trend evaluates peak day drinking water demands and compares those demands to the 20 mgd rated capacity of the Jones Ferry Road Water Treatment Plant (WTP).

Key Observations and Related Information:

- Since FY 2002, the year with the highest peak day demand under normal operations, peak day drinking water demand has declined by 26 percent despite a 14 percent increase in customer accounts over that same period. See comments below regarding peak demands in FY 2018, FY 2019, and FY 2024.
- There was a significant increase in peak day drinking water demand in FY 2018 when OWASA provided drinking water to Durham while they had one WTP offline and were making improvements at their second WTP. In FY 2019, a large water main break occurred near OWASA's WTP on November 5, 2018. If the main break had not occurred, OWASA's peak day demand would have been 8.6 mgd (rather than 14.4 mgd), which is comparable to earlier years. In FY 2024, OWASA provided drinking water to Durham to support local drought conditions, which accounted for the peak day transfer of 11.2 mgd.
- Figure 4 shows that we have adequate capacity in our WTP through at least 2070 to meet the peak day demands for all non-reclaimed water accounts. Factoring in the peak day reclaimed water demand, which is projected to increase from 1.97 MD to 2.3 MGD by 2040 when it levels off, we

expect to have adequate capacity in our WTP for the next 40 years through approximately 2065. OWASA has interconnections with the City of Durham, Town of Hillsborough and Chatham County. We rely on these interconnections during some CIP projects and maintenance activities, and operational emergencies. Existing interconnections provide the capacity to receive approximately 7 MGD of treated drinking water from the City of Durham and 3 MGD from the Town of Hillsborough, but due to capacity constraints at Hillsborough's WTP, the transfer ability may be limited to 1 or 1.5 MGD. The interconnection with Chatham County allows OWASA to receive approximately 1 MGD. The combined capacity of our interconnections is about 9.5 MGD, which is about 134 percent of our current average-day drinking water demands, though utilizing the full capacity of our interconnections has not been tested in practice.

- For the twelfth consecutive year, OWASA received the Excellence in Water Treatment award from the Partnership for Safe Water program. The Partnership for Safe Water is a voluntary effort sponsored by the American Water Works Association (AWWA) for water utilities to optimize their treatment and distribution system processes, above and beyond regulatory requirements, to help ensure the production and delivery of safe water to all users.
- In 2025, OWASA received the distinguished 20-year Directors Award for Water Treatment from AWWA. The award honors a utility's achievements and showcases its exceptional performance and contributions to the field. Receiving the award demonstrates that a utility has met rigorous standards and exemplifies the highest level of service in the water community.
- The WTP is still optimizing its current strategies to meet new drinking water standards for per and poly-fluoroalkyl substances (PFAS – see the Regulations section of this report). Another significant project at our WTP is designing and constructing a new and larger clearwell and the associated electrical work to increase our system's resiliency and provide necessary treatment capacity.

Drinking Water Distribution System Integrity

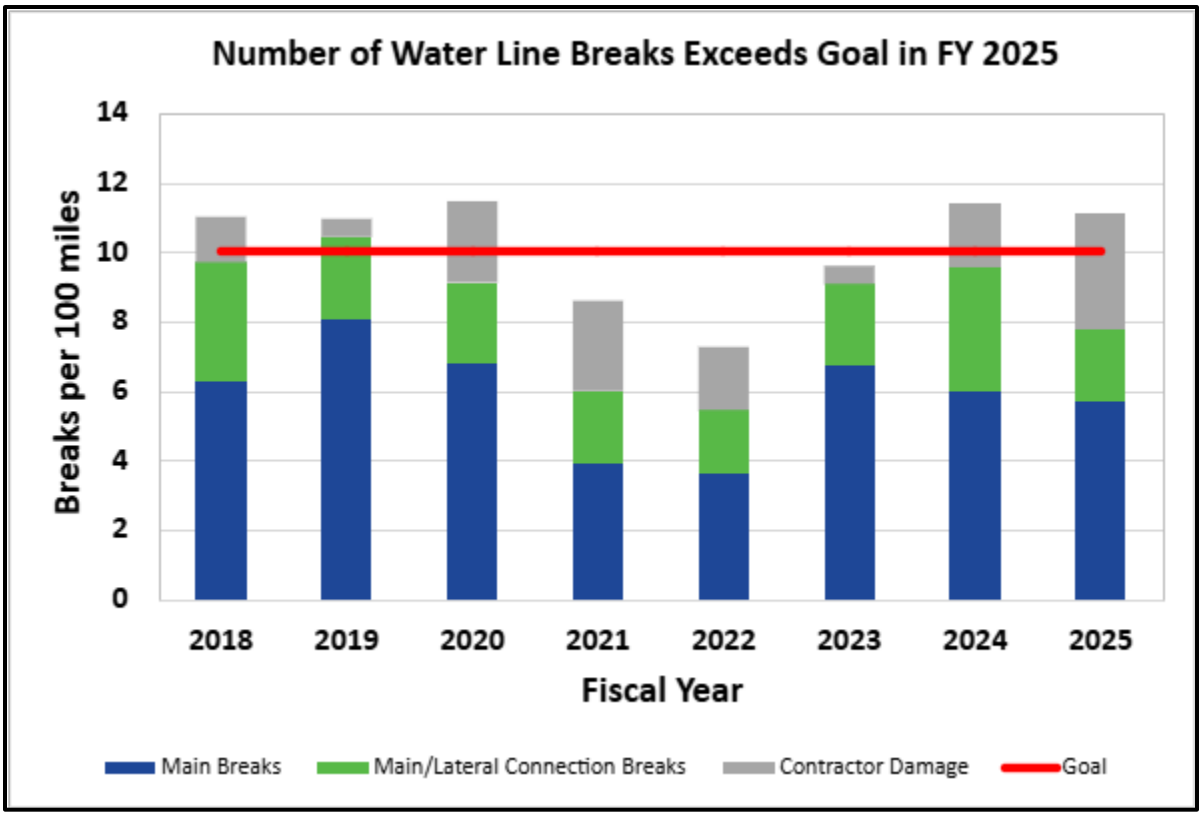


Figure 5. Historic Water Line Breaks

Description: This trend evaluates the number of water main breaks per 100 miles of water main lines. These are important indicators of the integrity of our drinking water distribution system. It also includes information on lines damaged by contractors; while that metric is not indicative of an issue with the integrity of our water distribution system, it represents an impact on our customers and thus we include contractor damage in this trend.

Key Observations and Related Information:

- We exceeded our goal of 10 main breaks or less per 100 miles of pipeline in FY 2025, the goal set by the Board of Directors at its December 10, 2020 meeting. That goal is based on OWASA's historic breaks, break rates from other local utilities, and a large study which evaluated break rates in the United States and Canada. For context, OWASA has about 387 miles of water lines.
- In FY 2025, the upward trend of main breaks did not continue from the past few years. OWASA will continue to monitor this metric and determine whether changes are needed to our maintenance program and planned capital projects for water distribution.

Water System Audit

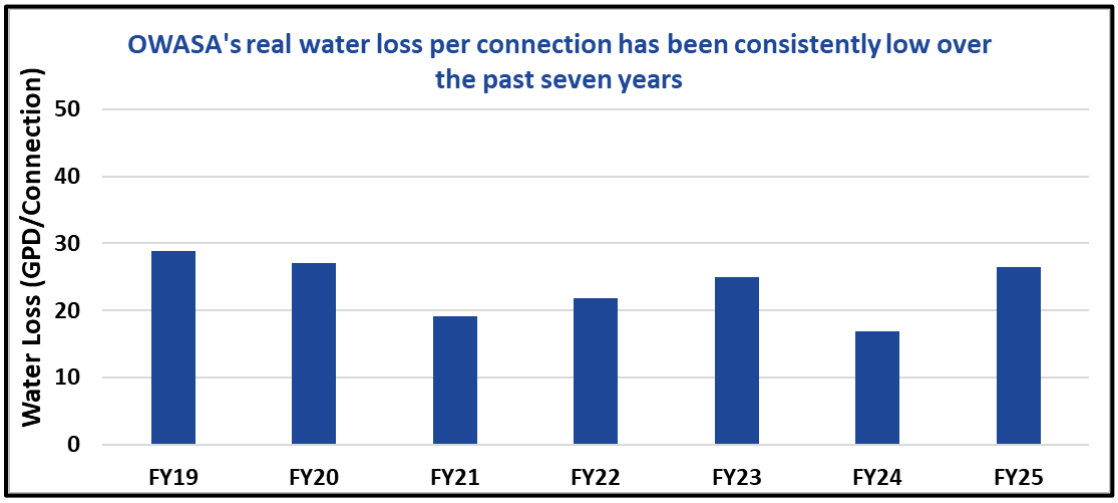


Figure 6. Historic Real Water Loss

Description: Every year, we conduct a system water audit using the American Water Works Association (AWWA) Water Audit Method and Water Audit Software. This analysis compares treated water pumped to the system to all billed water consumed by customers, as well as water used in system flushing, CIP projects, unbilled water from illicit connections, and water that leaks out of OWASA's nearly 400 miles of drinking water distribution pipes. The trend reflected above summarizes the annual volume of water lost through leaks in the distribution system. Real loss is the difference between water supplied and authorized consumption; utilities also subtract out apparent losses associated with inaccuracies in metering, data errors, and estimated water theft.

Key Observations and Related Information:

- OWASA's water loss remains less than the industry average. The median water loss for water utilities in Georgia (a state where all water providers that serve a population of 3,300 or more conduct annual, validated water system audits) averaged over 70 gallons per connection per day in 2021 with a median water loss of 49 gallons per connection per day. The median water loss reported in the 2024 AWWA Benchmarking survey was 40.6 gallons per connection. OWASA's real water loss in 2025 was 26.5 gallons per connection per day.
- Part of the water audit process is for utilities to account for all water uses. Prior to September 2023, OWASA did not account for water used in the water treatment process at our WTP. Once we started metering and accounting for that water use, real water loss has decreased. The Water Audit Software calculates an "infrastructure leak index" (ILI) as the ratio of real water losses (physical losses from the distribution system) to the unavoidable real water losses (an industry-calculated technical low limit of leakage for well-managed systems in good condition with aggressive active leak control). OWASA maintains a historical ILI at or around 1.0 (1.1 for 2025), which means that the water leaking from our distribution system is equal to the lowest limit technically (and economically) feasible to maintain.

Wastewater Collection System Integrity

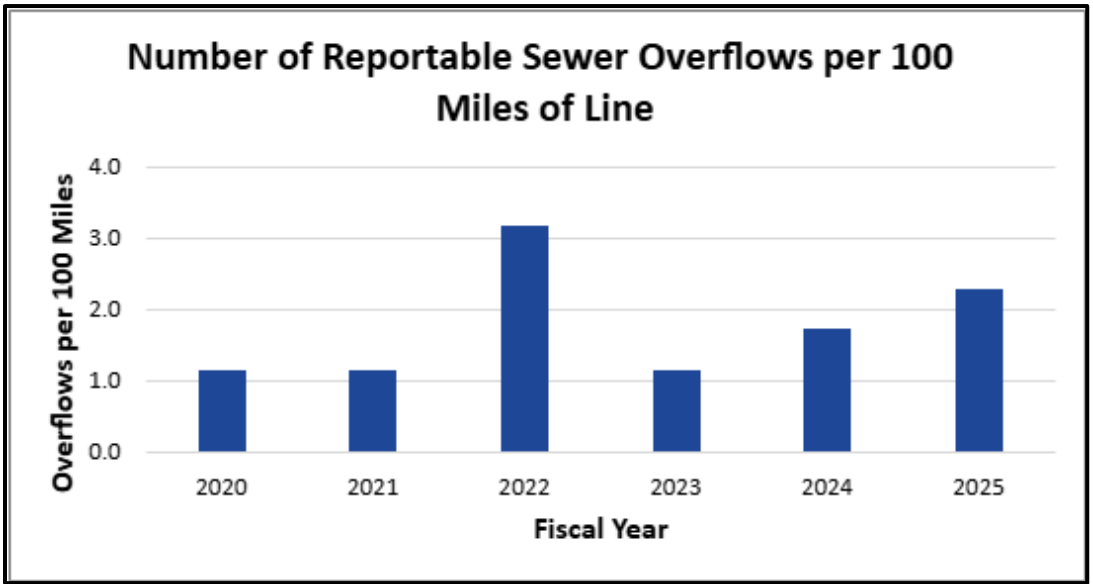


Figure 7. Historic Reportable Sanitary Sewer Overflows

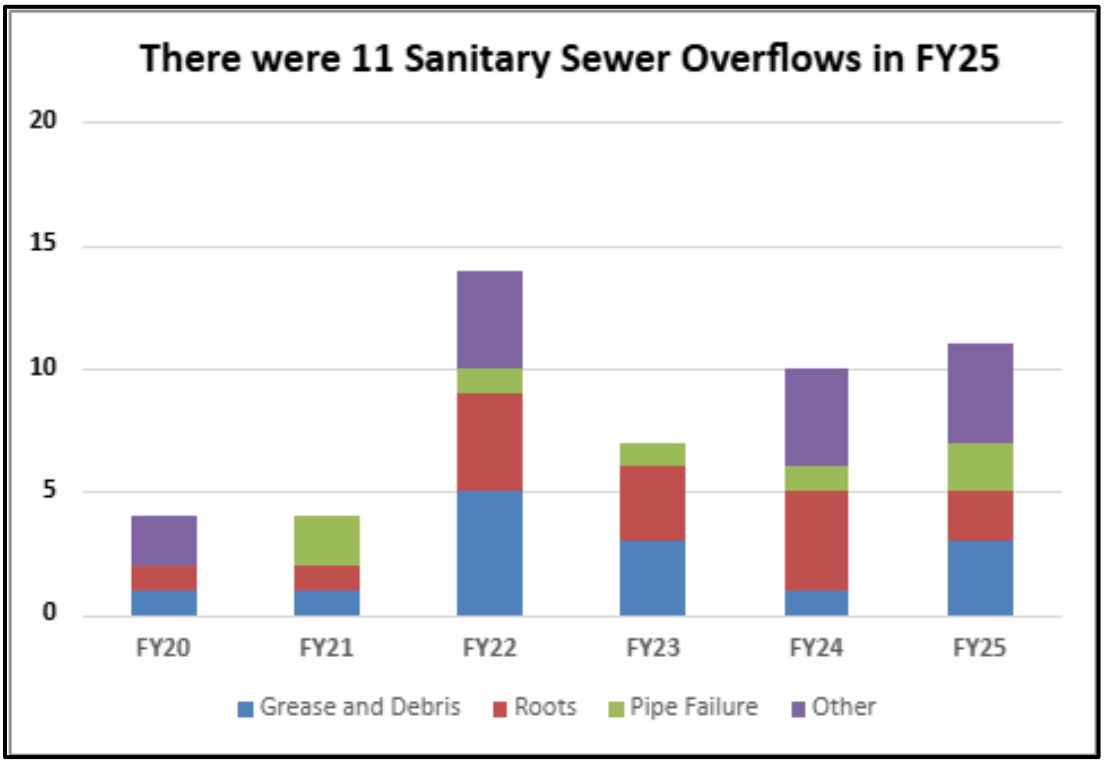


Figure 8. Historic Causes of All Sanitary Sewer Overflows

Description: This trend evaluates the number of reportable sewer overflows (Figure 7), which is an important indicator of the integrity of our wastewater collection system. It also evaluates the causes of all sanitary sewer overflows (SSO) in Figure 8. The North Carolina Department of Environmental Quality (DEQ) defines a reportable overflow as being over 1,000 gallons or any amount reaching surface water.

Key Observations and Related Information:

- The number of reportable overflows in FY 2025 was 2.3 per 100 miles of pipeline, which is less than the national median of 3.0 overflows per 100 miles of pipeline, according to the American Water Works Association 2021 Benchmarking report. For context, OWASA has about 350 miles of sewer lines. Per DEQ guidance, OWASA strives to have no overflows.
- In FY 2025, there were 11 total overflows (reportable and non-reportable) attributed to grease, debris, roots, pipe failure, severe weather or other natural causes, and damage during construction activities. Grease, debris, and roots are common causes of overflows. Customers can help minimize overflows from grease and debris by scraping fats and oils from pans and dishes prior to washing them. Our wastewater collection system is designed to collect water that has been used for flushing, bathing, washing clothes and dishes, and other normal residential, business and institutional purposes; other items should not be disposed of down drains. Customers are reminded to only flush the three Ps: pee, poop, and toilet paper. Customers can also help minimize potential root intrusion by not planting deep rooted plants near our sewer lines. OWASA's website includes a list of shallow-rooted species that are more appropriate choices in and near our sewer easements.

Mason Farm Wastewater Treatment Plant
Maximum Month Flows

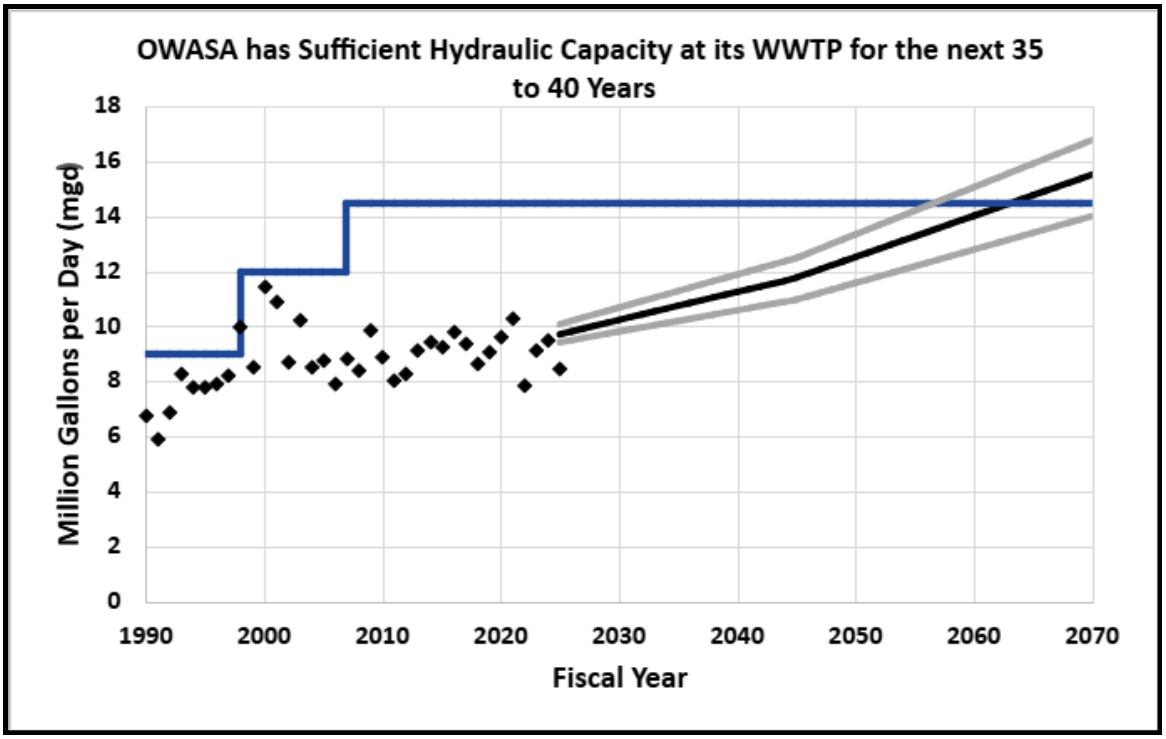


Figure 9. Mason Farm WWTP Capacity and Demands. Projected flows are from 2019.

Description: The Mason Farm Wastewater Treatment Plant (WWTP) has a permitted capacity of 14.5 mgd, which is the maximum average daily flow which can be treated in any given month. This trend tracks historic annual maximum month of flow and compares those against the permitted capacity of the WWTP.

Key Observations and Related Information:

- OWASA's maximum month wastewater flows have declined from a peak of 11.5 mgd in FY 2000. This corresponds to reduced drinking water demands by our customers, as well as our continuing investments in the rehabilitation and replacement of sewer lines and manholes, to reduce inflow and infiltration.
- In FY 2025, the maximum month flow was 8.5 mgd, which is about 59 percent of the WWTP's permitted flow capacity.
- The projected maximum month flow indicates that we have adequate hydraulic capacity in our treatment plant for the next 35 to 40 years assuming inflow and infiltration rates do not increase. However, if the frequency of high intensity storms increases with climate change, we may need to address our hydraulic capacity earlier than anticipated.

Mason Farm Wastewater Treatment Plant Nutrient Capacity

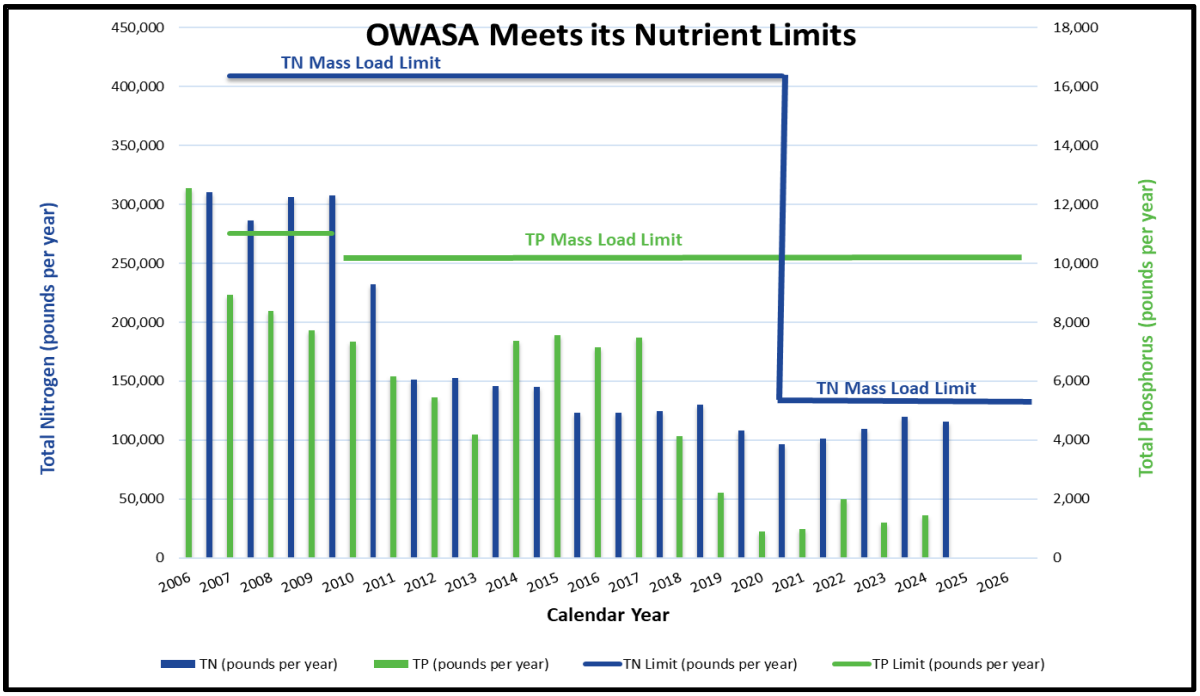


Figure 10. Mason Farm WWTP Annual Nutrient Loading

Description: The state's Jordan Lake nutrient management rules require point sources to reduce their discharge of Total Phosphorus (TP) and Total Nitrogen (TN). OWASA's updated TN limit took effect in calendar year 2021. We report nutrient loading on a calendar year basis rather than a fiscal year basis since our permit limits for TN and TP are based on a calendar year.

Key Observations and Related Information:

- OWASA has met its TP limit since the annual mass load limit was first incorporated into our permit in 2007. We expect to continue to meet the limit within the 20-year planning horizon without the need for additional major capital improvements for TP removal.
- OWASA optimized its biological phosphorus removal process which is reflected in the decrease in TP starting in 2018.
- OWASA has consistently met its current TN limit. Staff continue to focus efforts on plant optimization to improve the denitrification process, but we may need to operate our filters in denitrification mode to meet the more stringent limits that started in 2021. Staff have inspected and tested the denitrification filters to ensure they are operationally ready should they be needed. TN could be reduced significantly by using the denitrification filters, but OWASA would see a significant increase in energy and chemical costs as a result.

- The Wastewater Treatment Plant Master Plan was finalized in January 2024 and provides an adaptable roadmap with triggering events for the timing of needed capital investments and operational changes to ensure we continue to meet our nutrient limits.
- The North Carolina Department of Environmental Quality is currently reviewing the Jordan Lake Nutrient Rules for updates or revisions. OWASA has participated in the stakeholder engagement process which began in early 2024; revised rules are expected to be adopted by the Environmental Management Commission and approved by the Rules Review Commission in 2027.
- In 2025, OWASA's WWTP received the National Association of Clean Water Agencies (NACWA) Platinum Peak Performance award for 100% compliance with the National Pollutant Discharge Elimination System (NPDES) permit for the 15th consecutive year.

Reclaimed Water

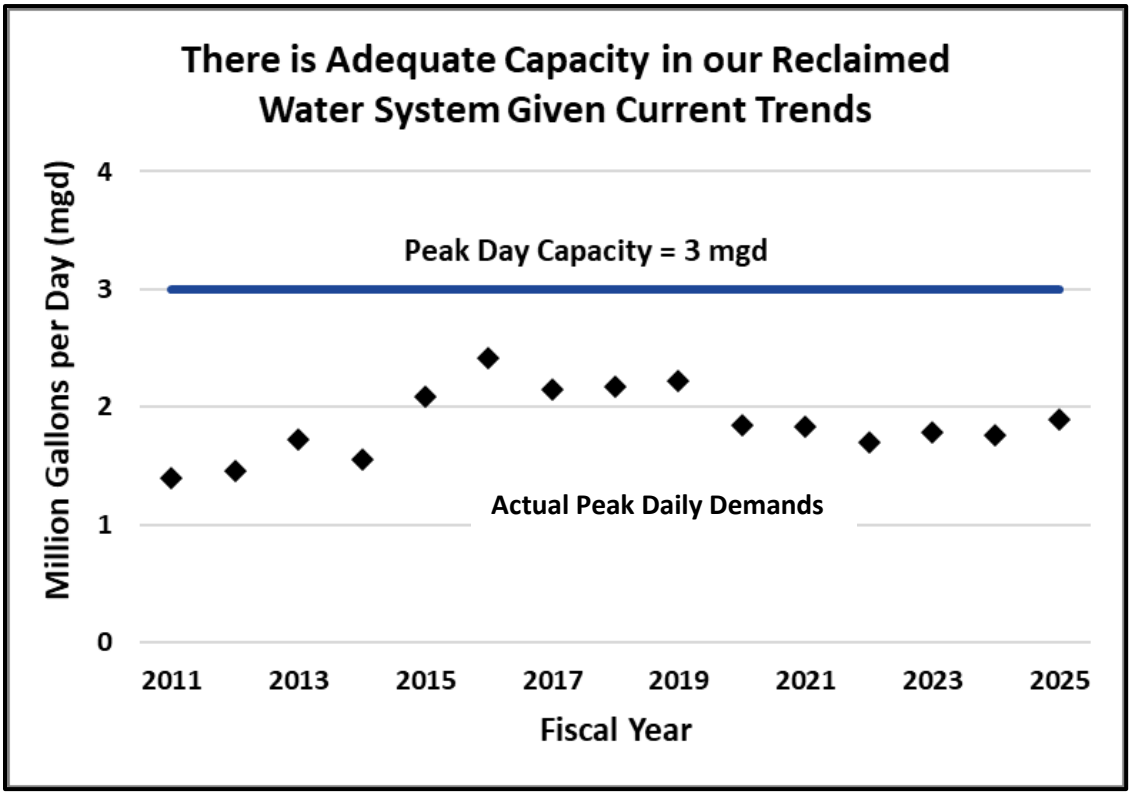


Figure 11. Reclaimed Water System Capacity and Demands

Description: This trend tracks historical annual peak day reclaimed water (RCW) demands and compares those against the peak day capacity of the Mason Farm WWTP's RCW system.

Key Observations and Related Information:

- The RCW system is currently configured to meet a total peak day demand of 3 mgd; however, the system was designed and constructed to allow cost-effective expansion to 5.2 mgd by adding only an additional transfer pump and additional chemical feed system capacity (if that feed system is deemed necessary).
- The majority of RCW is used by UNC for chilled water and irrigation of landscaping and athletic fields. These demands peak during warm months (April-October) and help reduce peaking on our Jones Ferry Road WTP during high demand periods. Demands are typically lower during cold months (November-March).
- A study was conducted to evaluate the water quality of our reclaimed water to ensure that it will continue to meet quality requirements for UNC's chilled water plants. As a result of the study, OWASA identified some potential opportunities to optimize the water quality.

- The RCW system was designed without storage within its distribution system. There was a CIP study completed in FY 2024 to evaluate the addition of an elevated storage tank for the RCW system. The study found that the current demand for reclaimed water and estimated price did not justify the construction of a storage tank at this time.

Biosolids

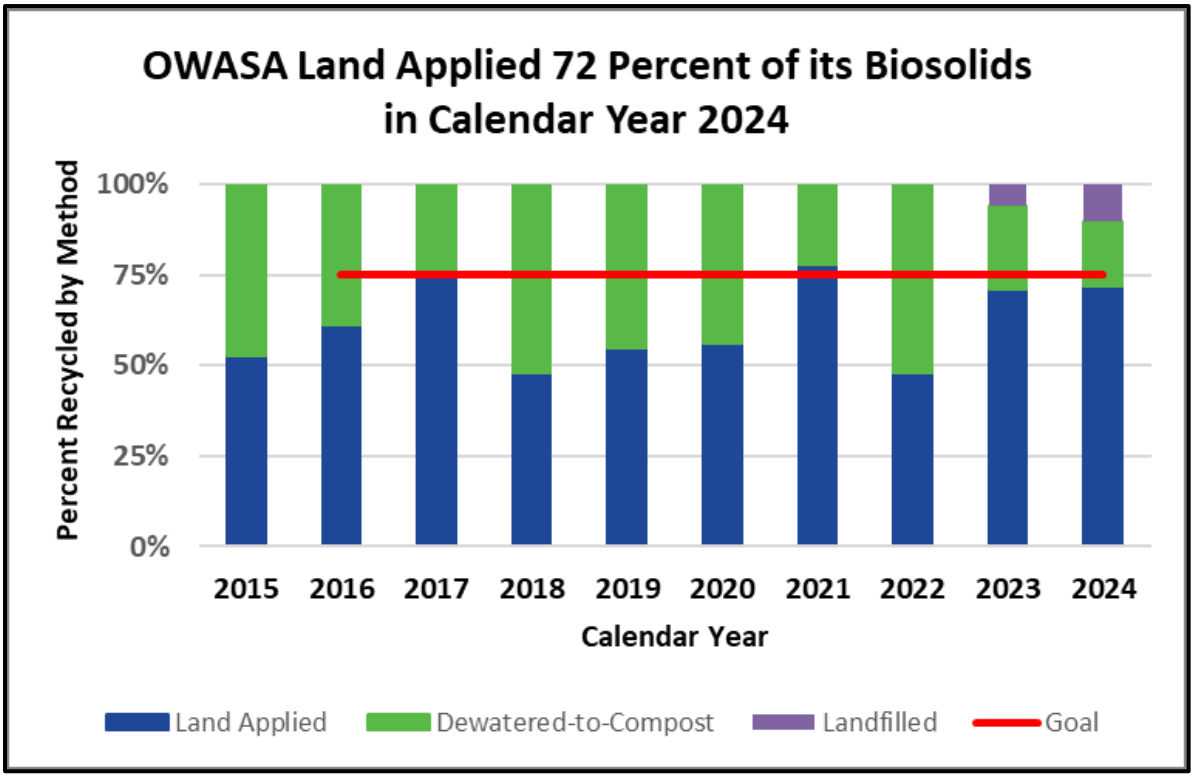


Figure 12. Historic Biosolids Application

Description: This trend evaluates the amount of biosolids which OWASA applies to land and the amount it dewaters for composting or landfilling. The Mason Farm WWTP produces 3-4 dry tons of biosolids each day. Some of this is applied in liquid form to agricultural land and a portion is dewatered to the texture and consistency of moist soil and transported to a private composting facility in Chatham County or a landfill in Randolph County. For the liquid form, OWASA has 1,666 acres of farmland in Orange, Chatham, and Alamance counties available for its land application program (see Figure 13). Ninety percent (1,513 acres) is privately owned. The remaining 153 acres are owned by OWASA as part of a 700-acre tract west of Orange Grove Road in Orange County. At its October 8, 2015, work session, the Board of Directors agreed that OWASA's goal is to apply 75 percent of our biosolids in liquid form and to dewater 25 percent of our biosolids. The Board of Directors understands that there are factors including weather conditions and staffing which may keep staff from meeting the goal.

Key Observations and Related Information:

- In CY 2024, OWASA land applied 72 percent of its biosolids, falling a little short of the goal. Frequent rains, wet field conditions, and staffing limited the amount of biosolids we could land apply.

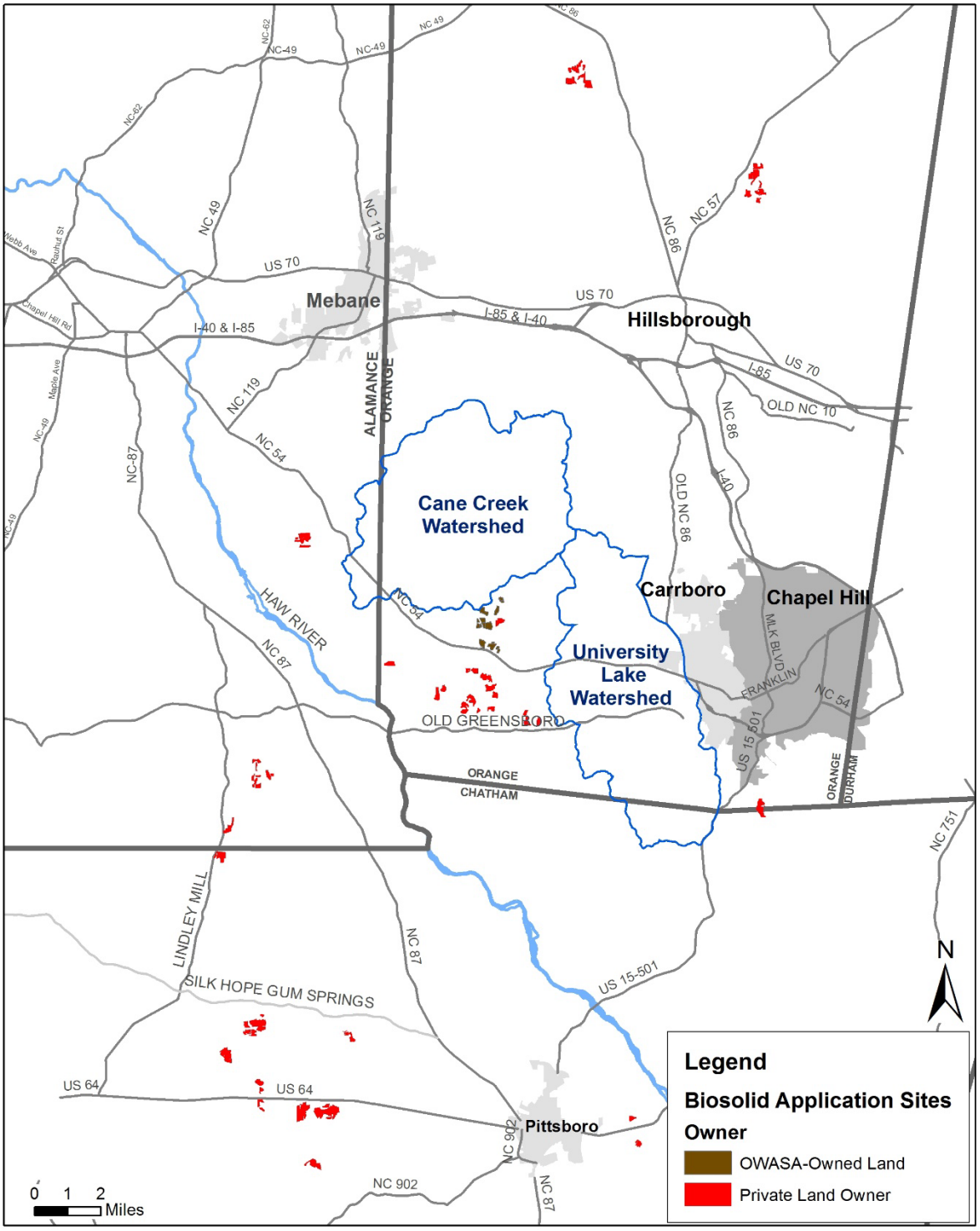


Figure 13. OWASA Biosolids Application Sites

Regulations

This section summarizes upcoming regulations for which OWASA is preparing. Upcoming regulations included in this section are:

- Fifth Unregulated Contaminant Monitoring Rule (UCMR5),
- Per- and polyfluoroalkyl substances (PFAS), and
- Lead and Copper Rule Revisions (LCRR) and Lead and Copper Rule Improvements (LCRI).

Fifth Unregulated Contaminant Monitoring Rule (UCMR5)

The Safe Drinking Water Act Amendments of 1996 included a program for water utilities to monitor unregulated contaminants in drinking water every five years, known as the Unregulated Contaminant Monitoring Rule (UCMR). The US Environmental Protection Agency (EPA) identifies the contaminants in each round based on the potential to occur in drinking water, whether there is an established laboratory method, the potential health impacts of the substance, public interest, and other factors. EPA has identified 29 PFAS substances and lithium to monitor in drinking water in the fifth round of monitoring for unregulated contaminants (UCMR5). UCMR5 monitoring occurs between 2023-2025, and OWASA is monitoring for these compounds in 2025. Gathering data under the UCMR is one of the first steps EPA takes to establish drinking water regulations.

Per- and poly-fluoroalkyl substances (PFAS)

Per- and poly-fluoroalkyl substances (PFAS) are compounds of emerging concern. PFAS have been used in a variety of substances since the 1940s to increase resistance to water, grease, fire, or stains. PFAS are highly persistent once released into air, water, and soil, and there is the potential for them to bioaccumulate. Our treatment processes are not sources of PFAS, but rather they convey PFAS compounds through treated drinking water, wastewater, and biosolids. Exposure to PFAS over a prolonged period may lead to health effects including an increased risk of certain cancers, high blood pressure, elevated cholesterol, hormone disruptors, and immune system impacts.

Because of the concerns about health impacts, EPA released its PFAS Strategic Roadmap in October 2021 which outlined a strategy to address PFAS which includes developing drinking water standards, investing in scientific research, and holding responsible parties accountable. As part of its PFAS Strategic Roadmap, EPA issued enforceable drinking water standards for six PFAS compounds in drinking water on April 10, 2024:

- Perfluorooctanesulfonate (PFOS) and perfluorooctanoic acid (PFOA) – these are two of the most widely studied PFAS compounds; while they are no longer manufactured, they persist in the environment. EPA issued a maximum contaminant level (MCL) of 4.0 parts per trillion (ppt) for each of these compounds.
- In September 2025, the EPA issued a statement that the agency is reconsidering all the pending regulations in the bullets below. The agency is still considering the proposed regulations for

PFOA and PFOS mentioned in the first bullet above, the MCLs for which are set to go into effect in 2029 with the possibility that compliance deadlines may shift to 2031.

- PFHxS, PFNA, and HFPO-DA (commonly known as GenX chemicals) – EPA issued an MCL of 10 ppt for each of these compounds.
- PFNA, PFHxS, PFBS, and HFPO-DA (GenX) – EPA issued a proposed Hazard Index of 1 (unitless) for mixtures containing two or more of these four compounds. The Hazard Index is a tool to evaluate the health risks of simultaneous exposure to mixtures of these compounds. The Hazard Index considers the combined toxicities of the four compounds by comparing the level of each compound measured in a water sample to the level determined not to have risk of health effects.
- The EPA also released final health-based, non-enforceable maximum contaminant level goals for these six PFAS compounds in April 2024. The goal for PFOS and PFOA is 0 ppt each, meaning the EPA does not consider there to be any safe concentration for these compounds. The goal for PFHxS, PFNA, and HFPO-DA (GenX) is 10 ppt each. Public water systems have until 2027 to complete initial monitoring, followed by compliance monitoring.
- In July 2024, the EPA designated PFOA and PFOS as hazardous substances under CERCLA (Comprehensive Environmental Remediation, Compensation, and Liability Act), also known as Superfund. The rule requires entities to immediately report releases of PFOA and PFOS that meet or exceed the reportable quantity and enables cost recovery and enforcement authorities to address PFOA and PFOS releases, which will help ensure that the polluters pay for investigations and cleanup.

- At the state level, in September 2025 the North Carolina Environmental Management Commission established groundwater standards for three PFAS (PFOA, PFOS, and GenX). The respective groundwater quality standards are 0.001 ng/L (equal to parts per trillion or ppt) for PFOA, 0.7 ng/L for PFOS, and 10 ng/L for GenX. While OWASA does not utilize groundwater as a source for our drinking water supply, these groundwater quality standards could have a bearing on OWASA's land application program for our biosolids.

In 2018, OWASA began proactive quarterly testing of our source waters in Cane Creek Reservoir and our treated drinking water to monitor these PFAS compounds and publishing the data on OWASA's website. Though our source waters in Cane Creek Reservoir do contain PFAS, OWASA's existing treatment technology that utilizes powdered activated carbon is able to reduce PFAS levels in the treated drinking water to concentrations that would meet the future regulations.

OWASA has taken several steps to ensure compliance with the proposed drinking water regulations and to better understand the sources and extent of PFAS throughout the utility system:

- Engaged consultants to provide recommendations for the mitigation, treatment, and removal of PFAS in drinking water, and evaluated and updated our monitoring plan for wastewater, and biosolids;
- Expanded our PFAS monitoring program to include feeder creeks to Cane Creek Reservoir, our collection system, and biosolids; monitoring of the feeder creeks strongly suggests a

connection between prior biosolids application by another wastewater utility on sites north of the reservoir and higher levels of PFAS in those feeder creeks;

- Optimized our existing Powdered Activated Carbon (PAC) treatment process to provide near-term PFAS reductions in drinking water, while maintaining the ability to meet other water quality goals.
- Launched pilot testing of Granular Activated Carbon (GAC) and Ion Exchange technologies, currently two of the best available technologies (as defined by the EPA) for drinking water treatment, in May 2024. Based on the results of the pilot testing, OWASA identified GAC as the preferred long-term technology for removing PFAS from our water based on effectiveness considering seasonal variations, environmental considerations and the construction and maintenance costs;
- Began preliminary design for a proposed site layout of a new PFAS treatment process at our Jones Ferry Road WTP;
- Work with the OWASA Board to develop goals towards compliance with the EPA's new PFAS drinking water standards;
- Continued support for several PFAS research projects with universities and looked for additional collaborative opportunities;
- Completed a formal bid for and purchase for an advanced laboratory tool, a liquid chromatography mass spectrometer, which will analyze water samples for PFAS and provide results with a much shorter turnaround time;
- Issued a recommendation not to consume fish caught in Cane Creek Reservoir after testing in summer 2025 showed high levels of PFOS and other PFAS compounds in all but one of the gamefish tested;
- Started testing fish for PFAS at University Lake.

In late May 2025, OWASA was contacted by the North Carolina Department of Environmental Quality (NC DEQ) to notify us of four private drinking water wells, three in Orange County and one in Alamance County, that contain PFAS exceeding the maximum contaminant levels (MCLs) for public drinking water near two of our biosolids land application sites. OWASA is working collaboratively with NC DEQ and the health department directors in the counties where OWASA land applies biosolids (Alamance, Chatham, and Orange) to better understand the situation and plan next steps. OWASA is also looking at testing additional private wells and is evaluating other means of disposing of our biosolids.

OWASA supports local and national monitoring and research on PFAS. OWASA is a founding member of the Triangle Water Supply Monitoring Partnership, in which utilities in the Triangle fund the U.S. Geological Survey (USGS) to monitor our water supply reservoirs. In April 2024, the USGS started monitoring for PFAS analytes in select Triangle reservoirs, including both Cane Creek Reservoir and University Lake. Cane Creek Reservoir is also targeted for stormwater runoff sampling. The reservoirs were sampled for PFAS every other month through March 2025. Data collected during PFAS monitoring is undergoing review by the USGS before being published and shared. OWASA participated in the PFAS Testing Network's landfill leachate sampling study and drinking water studies. We also help fund research through the North Carolina Urban Water Consortium and the Water Research Foundation.

Lead and Copper Rule Revisions (LCRR) and Lead and Copper Rule Improvements (LCRI)

There is no safe level of lead exposure. The EPA first began regulating lead through the Lead and Copper Rule in 1991. As part of these requirements, OWASA has historically tested for lead in drinking water in 30 homes that have lead solder because we have no known lead service lines. OWASA also provides testing of our drinking water for lead at no charge when requested by a customer.

The primary source of lead in drinking water is pipes. Thus, the EPA published the Lead and Copper Rule Revisions on January 15, 2021. One of the initial requirements of the LCRR was to identify lead service lines on both the utility and customer sides of the meter, which had to be completed by October 16, 2024. OWASA has worked to identify lead service lines through the following steps:

- Using data to identify properties that may have lead service lines based on the structure's age and other information;
- Identifying unknowns by working with residents to identify the type of pipe in their crawl space/basement or by exposing a small part of the pipe in the landscape (potholing);
- Identifying unknown service lines on the OWASA side of the meter;
- Using this information to input into a model that helped us identify the highest probability areas to check lines next, new data from these priority areas was then fed into the model to continually improve the analysis through machine learning.

Following the inventory of service lines in our service area, OWASA found no lead service lines. In the October 2024 inventory, there were 108 galvanized service lines that, according to the LCRR, could cause lead exposure under certain circumstances. OWASA is developing a service line replacement program for customers with galvanized service lines requiring replacement (GRR). As of October 2025, when annual letters to any customers with a GRR were sent out, OWASA only had 92 service lines remaining. The number of GRR was reduced between October 2024 and October 2025 through replacement of service lines and additional inspections of lines that had been identified as GRR. OWASA plans to fund and start the construction of the replacement of these remaining 92 lines throughout FY26 and FY27. OWASA has hired a consultant to assist with the requirements of the LCRR and published an online map on October 16, 2024 to help inform the community of our efforts. The EPA further evaluated the rule and concluded that there are opportunities to improve it to better protect communities from lead exposure. On October 8, 2024, EPA published the final Lead and Copper Rule Improvements (LCRI). This rule requires drinking water systems to replace lead service lines within 10 years and lowered the action level to 10 ug/L along with other public education and public health requirements.

Energy Management

In 2015, the OWASA Board of Directors set energy management goals to reduce our overall use of electricity by 35% and of natural gas by 5% from 2010 levels. Our progress toward those goals is shown in Figures 14 and 15.

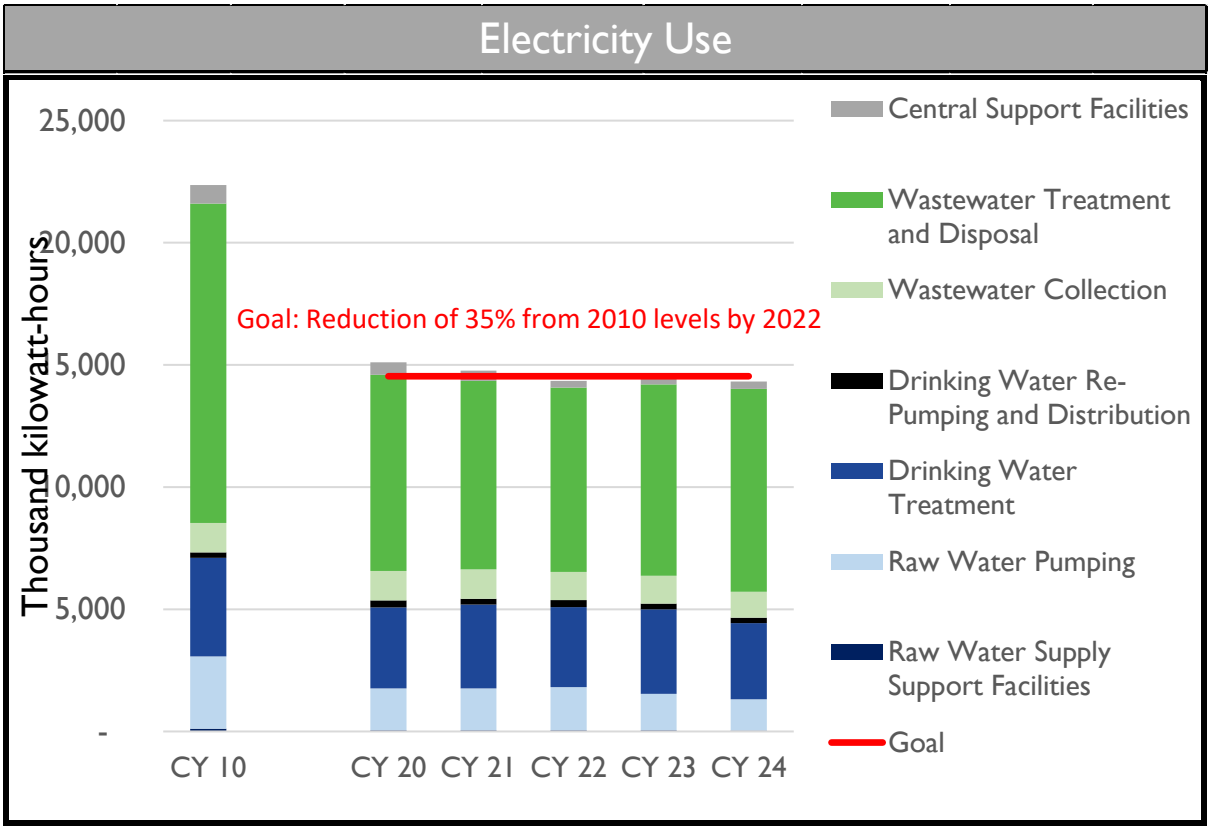


Figure 14. OWASA's Use of Purchased Electricity

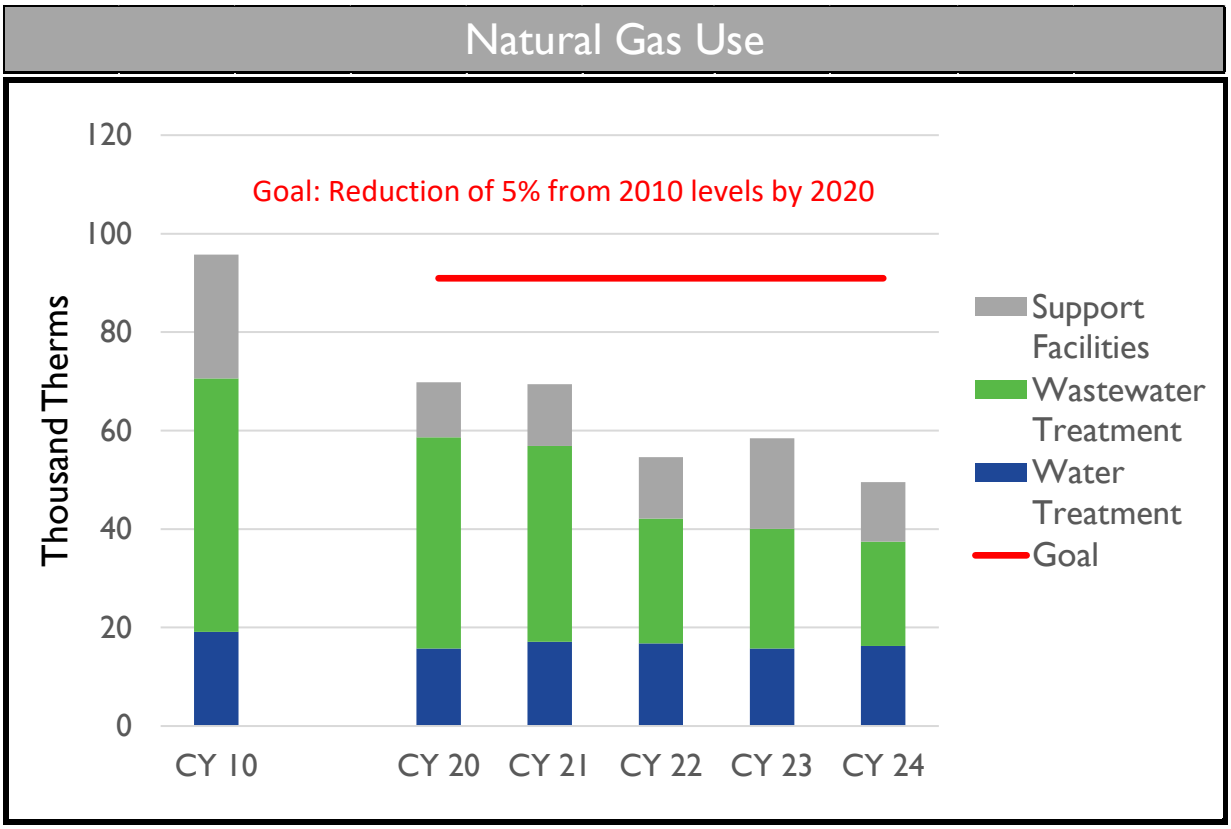


Figure 15. OWASA's Use of Natural Gas

Key Observations and Related Information:

- At the end of Calendar Year 2024, we met our goal for reducing our use of purchased electricity by 35% for the third year in a row.
- As of the end of Calendar Year 2024, we have surpassed our goal for reducing our use of natural gas by 5% for the sixth year in a row, with a reduction of 48% compared to 2010 levels.
- These gains have been achieved through a series of cost-effective investments in energy efficiency and renewable energy technology, as well as an organization-wide commitment to conservation and the wise use of energy.