

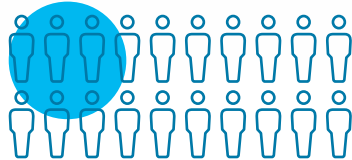
PROJECT QUENCH

CLAY COUNTY UTILITY AUTHORITY

PROGRAM OVERVIEW

Clay County Utility Authority (CCUA) provides water, sewer, and reclaimed water services to over 55,000 customers in the unincorporated areas of the county. Northeast Florida continues to grow rapidly, and CCUA expects the served population to approximately **double in the next 20 to 25 years**. As the population grows, CCUA is taking proactive measures to ensure Clay County has a reliable and sustainable water supply for generations to come.

SERVED POPULATION



EXPECTED TO

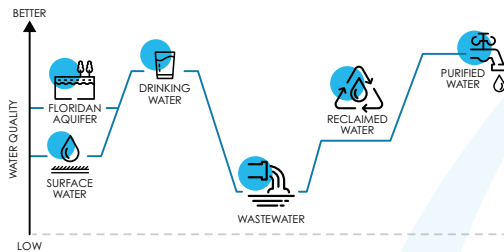
DOUBLE

in the next 20 to 25 years

CCUA customers use, on average, **80 gallons of water per day** — less than the national average. Residents and CCUA together have preserved the water supply through water conservation efforts such as efficient home fixtures and appliances, leak detection and prevention, efficient lawn watering and other measures. However, conservation alone will not be enough to serve future growth in this area.



80 GALLONS of water per day used by CCUA customers — less than the national average



Currently, water for CCUA customers is sourced from the **Floridan Aquifer**, a vast resource which services **10 million people in parts of the southeastern U.S.** The groundwater from the aquifer is the region's best source of **high-quality, low-cost water**. Following continuous withdrawal to meet increasing demands, the aquifer is approaching its sustainable limit, and additional sources need to be identified to serve future supply needs. Other potential sources are stormwater, river water (also called surface water), and reclaimed water. Reclaimed water is the cleanest and easiest to treat to drinking water standards of these three sources.



CCUA operates an extensive public access reclaimed water program which treats wastewater for irrigation purposes. This reclaimed water is used on golf courses and many residential lawns for irrigation. Reclaimed water can be used as a source water and treated further so the final product is suitable for drinking water. The method relies on multiple tried-and-true water treatment processes, which CCUA is testing through a new pilot program, Project Quench, to generate drinking water from reclaimed sources.



Project Quench is a collaboration between CCUA, the St. Johns River Water Management District, and Carollo Engineers to design, construct and operate a demonstration facility. The project will showcase the water treatment process using advanced technology, and serve as a training center for staff. It will also offer a touring platform for the public to learn about the treatment technologies and view the process firsthand. **The facility is expected to open in the Summer of 2024.**

PROJECT QUENCH

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Reclaimed water is available year-round and is much lower in dissolved solids than surface waters, making it a more reliable and cost-effective source of water than stormwater or surface waters. To be turned into clean, safe drinking water, reclaimed water undergoes an extensive and highly effective purification process. It's a multi-barrier approach where several filtering processes add extra measures for safety and destroy contaminants, creating water that exceeds drinking water standards.

And to be certain the resulting water is clean and safe to drink, the entire purification process includes real time monitoring and safeguards.

Step 1 of the purification process is called Ozonation. During ozonation, oxygen molecules are subjected to high electrical voltage to create ozone, which is added to the water. This process is a powerful way to degrade organic matter and kill germs and bacteria. The ozone then breaks down into dissolved oxygen.

Step 2 is Biofiltration. During biofiltration, water is passed through a special carbon filter where beneficial microorganisms break down and remove impurities from the water, such as organic matter and chemicals.

Step 3 is called Ultrafiltration. During this step, water is passed through a membrane filter with tiny pores – 100X smaller than the width of a human hair! These pores trap tiny particles and contaminants in the water, such as bacteria, viruses, and other pathogens, while the clean water passes through to the other side.

In **Step 4**, Granular Activated Carbon, water flows through activated carbon granules, like the filter which adsorbs remaining trace elements. The large surface area of the activated carbon adsorbs additional bulk organics and chemicals found in trace amounts.

Step 5 is UV Disinfection. This step generates high energy ultraviolet light which is a proven technology that is highly effective at disinfecting pathogenic microorganisms.

Step 6, Chlorination, is the oldest and most widely utilized form of water treatment. The water is dosed with chlorine as a final barrier for any pathogens remaining and to provide a lasting disinfectant so the water remains safe to drink on its way to our homes and businesses.



1 WHERE DOES OUR WATER COME FROM?

Drinking water supplies in North Florida and much of the state rely on groundwater from the Floridan Aquifer. The aquifer system in Florida consists of the shallow Surficial Aquifer, the Intermediate Aquifer, and the deeper Floridan Aquifer. Clay County Utility Authority's (CCUA) water treatment plants withdraw groundwater from Floridan Aquifer wells 800 to 1,200 feet below the surface. This source of water is of excellent quality. CCUA removes sulfur from the water and chlorinates it to make it safe for human consumption.

2 HOW MUCH WATER DO WE CONSUME IN CLAY COUNTY?

CCUA customers are generally very efficient water users. The average person uses about 80 gallons of water per day, slightly lower than the national average. As our population grows, however, we will need more water to serve that population.

3 IS THERE A SHORTAGE OF GROUNDWATER IN OUR AREA?

Most of the state of Florida is beginning to experience a shortage of fresh drinking water supplies as a result of population growth.

Ground water from the Floridan Aquifer is used for drinking, for irrigation and industrial purposes, and for agriculture. As Florida's communities grow, we will need to limit what is pulled from groundwater wells to preserve the aquifer as our first and best source of drinking water. Groundwater supplies have a limit, which is called the sustainable limit. We will need other sources of water in the future besides groundwater to serve our growing needs. These are called "Alternative Water Supplies" because they are more expensive than groundwater supplies, and not used until groundwater is limited.

4 WHAT ARE OTHER POSSIBLE SOURCES?

We are surrounded by water in Florida, from the ocean to lakes and rivers, as well as stormwater ponds. However, not all of this water can be readily used for drinking without additional and often expensive treatment. These water sources are also subject to unreliable availability. For example, stormwater is extremely unreliable unless large and expensive reservoirs are constructed to catch it when it is raining and store it for when it is needed in dry seasons.

One water source which comes with a predictable level of availability and reliability is reclaimed water, which is currently used for lawn irrigation.

From lowest quality to highest quality, from a water treatment standpoint, sources include ocean, river, stormwater and reclaimed water.

5 HOW CAN RECLAIMED WATER BE A BETTER SOURCE THAN THE OCEAN, RIVER, OR STORMWATER?

Ocean water is salty, and that salt is extremely expensive to remove. Since the ocean is a long way from CCUA's service area, costly transmission piping would also be needed to transport the water to our region.

River water in our region is tidal, so it is both salty and tannic. It requires expensive processes to remove those compounds and to make it suitable for drinking.

Stormwater is abundant when it's raining but not available during dry conditions, so large storage systems are needed to make it a significant part of the water supply.

Reclaimed water has already been treated to meet all environmental standards and is a reliable local source. It is more cost-effective and reliable to treat to drinking water standards compared to other sources at a large scale.



6 WHAT CAN WE DO TO CONSERVE FRESH WATER SUPPLIES?

CCUA has an extensive public access reuse program, where wastewater from your home is treated to a high standard, sent back to sub-divisions, and used for lawn irrigation. CCUA and the St. Johns River Water Management District work cooperatively to educate homeowners on the efficient use of reclaimed water for outdoor irrigation. This irrigation water “offsets” or replaces water that otherwise would be drawn from the aquifer for irrigation – so it is a conservation technique. But there are still savings to be gained by reducing the amount of outdoor water irrigation needed. This can be done by reducing the amount of water intensive turf grass, using landscape beds and planting trees to provide shade on landscaped areas to reduce watering needs.

The housing stock in CCUA’s service territory is generally very efficient. This is called passive efficiency: new toilets, shower fixtures, and appliances are all much more efficient than they were 20 years ago. On average, CCUA residential customers use about 80 gallons per person per day, a little below the national average. So, on average, our residents are doing great. But conservation alone will not be sufficient to serve the growth in our region in the future. So CCUA is also engaged in evaluating alternative supplies such as stormwater harvesting and potable reuse.

7 WHAT IS POTABLE REUSE?

Potable reuse is the process of effectively treating reclaimed water to the highest drinking water standard by utilizing multiple treatment barriers. It is the next step in CCUA’s proactive approach to evaluating alternative supplies to serve our communities growth needs while protecting our first and best water source, the Floridan Aquifer.

8 IS POTABLE REUSE SAFE?

Potable reuse combines tried and tested treatment technologies with the latest water quality monitoring and testing advancements. Treatment techniques like filtration, adsorption, advanced oxidation, and advanced disinfection are employed to purify the water.

Upon complete treatment, the resulting water exceeds regulatory requirements set forth by the U.S. Environmental Protection Agency and the Florida Department of Environmental Protection.

9 WHAT IS THE TIMELINE FOR IMPLEMENTING AN ALTERNATIVE SUPPLY DEMONSTRATION PROJECT?

CCUA is in the early planning stage for future supplies considerations. Part of this planning involves forecasting population growth and increased water needs. Past planning efforts have secured CCUA’s water through the mid 2030’s, however, alternative water supply projects require long-term planning, which is why CCUA is identifying alternatives now – long before they are needed.

10 WHY SHOULD WE LOOK AT ALTERNATIVE WATER SUPPLIES IF WE DON’T HAVE AN IMMEDIATE NEED?

Developing a safe, sustainable cost-effective water supply program takes careful planning and time to study. CCUA is investigating potable reuse today to verify if it is a viable future water supply solution.

11 WHAT’S THE NEXT STEP FOR THE POTABLE REUSE PROJECT?

CCUA collaborated with the St. Johns River Water Management District and Carollo Engineers to design, construct and operate a demonstration facility. The facility will offer an incredible opportunity for technology demonstration, which will show the process of treating the water, offer training grounds for staff and operators, and serve as a platform for educational tours for the public.

The treatment processes and advanced treated water went on display for interaction by the public in 2024.

12 WHERE CAN I FIND MORE INFORMATION ON CCUA’S DEMO?

You can find additional information at ccuaprojectquench.org.

13 WHERE CAN I FIND MORE INFORMATION ON POTABLE REUSE?

A variety of reputable resources have extensively studied potable reuse. You can find additional information at [One Water Florida](#), [WaterReuse National](#), and [EPA Reuse Action Plan](#).

