

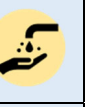
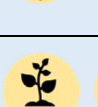
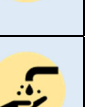
--Drinking Water and Wastewater Management--

ONE WATER VISION: Maintain efficient, resilient, and fiscally sound water supply and treatment services to Charlotte County while protecting our aquatic resources.

PATHWAYS TO THE VISION

 	Using guidance provided through Utilities Department's planning processes, develop, support, and align Department monitoring initiatives with existing county monitoring and assessment projects and initiatives to track water quality/quantity impacts from Department activities.
 	Expand surface water monitoring program to target water quality trends for surface waters served by non-county wastewater management systems.
 	Identify and prioritize opportunities for reducing new septic installations within areas with potential surface and ground water quality impacts.
 	Identify and prioritize opportunities for addressing areas at higher risk of saltwater intrusion.
 	Prioritize implementation of infrastructure resiliency enhancements, especially in areas with highest risk of flooding and tidal surge impacts, and higher failure rates during storm events.

CURRENT VISION TASKS*

Categories	Task	Anticipated Regional Benefits
	Conduct a needs and cost analysis of expanding sewer and potable water service to portions of west Port Charlotte.	 
	Increase groundwater elevation and salinity monitoring network to track saltwater intrusion trends in the region, especially in areas with higher densities of groundwater withdrawal wells.	 
	In cooperation with other relevant departments (such as Community Development), organize and implement enhanced education and enforcement process to reduce construction-related breaks in water supply and wastewater transmission pipes.	 
	Initiate reclaimed water user irrigation education campaign, providing guidance on water content and application to reduce fertilizer use and inappropriate irrigation application.	 

* **NOTE:*** The Utilities Department has developed multiple plans with recommendations related to addressing water supply and treatment processes while addressing water quality and quantity considerations. The measures in those plans

should be considered components of the county's One Water Program, with the recommendations in this document intended to be complimentary to those efforts.

Associated Plans, Ordinances, and Mandates

- Charlotte County Sewer Master Plan
- Charlotte County Potable Water Master Plan
- Charlotte County Capacity, Management, Operations, and Maintenance (CMOM) Program
- Charlotte County Capacity Assessment and Assurance Program Framework
- [Southwest Florida Water Management District Minimum Flows and Levels for Peace River](#)
- Peace River Manasota Regional Water Supply Authority Operations Guidance

Background

Prior to the 1990s, water supply and wastewater treatment services in unincorporated Charlotte County were provided by a suite of commercial and community-funded utilities systems, the largest of which was serviced by General Development Corporation (GDC) until their decline toward bankruptcy in the late 1980s. Charlotte County Utilities (CCU) was formed upon the county's purchase of GDC's wastewater conveyance and treatment system in 1991. Since then, the county has acquired other local wastewater treatment networks as they reach the end of life or operation costs of those systems exceed the financial capability of the community it serves.

To address the loss of potable water services due to GDC's collapse, in the early 1990s SWFWMD partnered with multiple counties in the region to create the Peace River Manasota Regional Water Supply Authority (PRMRWSA), which is tasked with providing potable water for member counties. The PRMRWSA provides withdrawal, initial treatment, and transmission of water to county facilities; the county, in turn, conducts an additional level of treatment before distribution to end users in their service area. The principal source of potable water is the Peace River; the PRMRWSA maintains intakes in Desoto County, just south of the river's confluence with Horse Creek near Fort Ogden. Withdrawal rates are regulated via permitting through SWFWMD, which determines minimum flow and level requirements of the Peace River to protect aquatic life. In addition, the PRMRWSA must conduct extensive monitoring in the lower Peace River to demonstrate withdrawals are not negatively impacting aquatic systems downstream.

CCU operates two independent public water systems: the Port Charlotte Water System and the Burnt Store Water System. The Port Charlotte Water System serves Mid and West County and is supplied by the PRMRWSA. The Burnt Store Water System serves South County and is supplied by the Burnt Store Reverse Osmosis (RO) Water Treatment Plant (WTP). The County's water facilities include groundwater supply wells, water booster stations (WBSs), water storage tanks, and emergency interconnects with neighboring utilities.

CCU is one of several providers of potable water and wastewater treatment in the county; the City of Punta Gorda provides utilities services to its residents, and multiple smaller community-scale systems still exist in various pockets of the county. **Figures 23-24** shows the current distribution of utilities in the county. As with any growing county, Charlotte County has private utilities that were the right solution at the time they were built. As the growth in the County has continued and regulations have increased on utilities, consolidating poor-performing systems into the County systems is the best solution for both parties. The County has been continually consolidating private systems where it is mutually beneficial to both parties. The ongoing Sewer Master Plan Update is further evaluating consolidation. With the elevated

level of AWT and reuse that will be provided by the County's systems, this consolidation will further reduce pollutant loading to the County's receiving waterbodies.

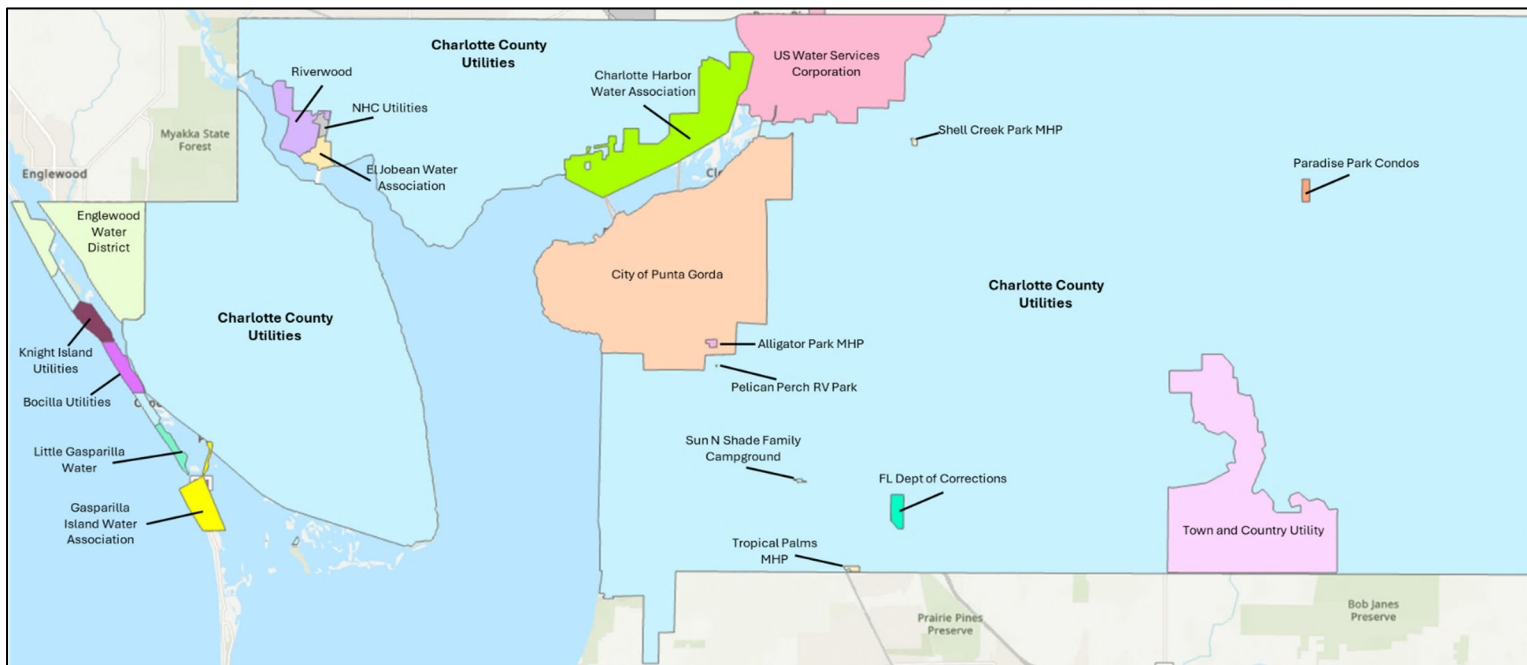


Figure 23. Certificated Water Service areas in Charlotte County. Shaded regions do not represent water service availability, only the authority to provide such services.

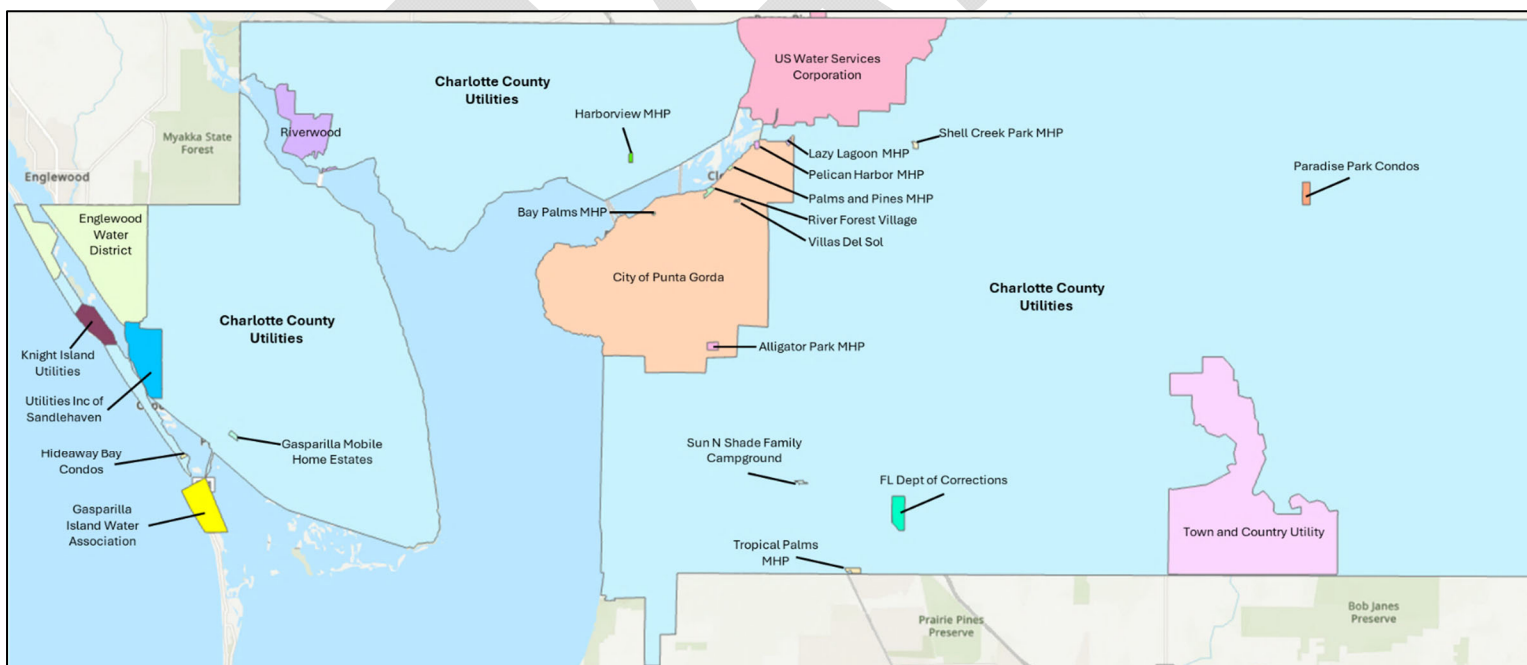


Figure 24. Certificated Sewer Areas in Charlotte County. Shaded regions do not represent sewer availability, only the authority to provide sewer services.

Potable Water Supply

Charlotte County's potable water supply is best summarized by the Charlotte County Potable Water Master Plan (CCPWMP) completed in 2023. The CCPWMP's purpose is to ensure a sustainable and reliable potable water supply for Charlotte County through 2045. The CCPWMP outlines the county's water system development, current water supply, treatment, distribution, and future water demand projections while also addressing water conservation, regional supply options, and capital improvement projects.

The CCPWMP's primary goal is to meet the current and future water needs of Charlotte County residents while protecting the natural environment. Key objectives include:

- Summarize historical water demands and present the water system components.
- Model and estimate system growth and water demands.
- Identify methods to reduce potable water demands through conservation and reclaimed water use.
- Update the County's Water Conservation Plan (WCP).
- Review water treatment capacities and identify water supply options.
- Update water distribution system models and conduct simulations to determine future system requirements.
- Develop a water quality improvement plan and a hydrant installation planning map.
- Develop capital improvement projects (CIPs) and identify funding options.

Guiding Principles

The CCPWMP was developed with the guiding principles of affordability, sustainability, efficiency, reliability, resiliency, and modernization. These principles ensure that the CCPWMP focuses on affordable solutions, incorporates water conservation initiatives, implements efficient construction methods, updates water treatment and conveyance infrastructure, increases system resilience, and expands the use of advanced tools for utility operations.

Hydraulic models were used to analyze the current and future performance of the water distribution systems. The models helped determine system requirements, size new transmission mains, identify expansion areas, reduce energy consumption, and increase system resilience. The CCPWMP includes recommendations for improving the hydraulic performance and fire protection capabilities of the water systems.

As Charlotte County's population grows, expanding the water systems will be necessary to meet future demands. The CCPWMP uses GIS data to track and manage water service assets and projects future water demands through 2045. The CCPWMP considers infill growth, new developments, and potential utility acquisitions. Water demand projections indicate that the Port Charlotte Water System will exceed its allocated capacity by 2027, and the Burnt Store Water System will exceed its permitted capacity by 2034.

Several regional water supply options to meet future demands were evaluated in the CCPWMP, including:

- Use the Babcock Ranch water supply.
- Increase the PRMRWSA allocation.
- Install new groundwater wells.
- Implement potable reuse.
- Use neighboring interconnects.

Each option was evaluated based on regulatory and legal considerations, advantages, and disadvantages. The CCPWMP recommended a combination of these options to ensure a reliable and sustainable water supply.

Given current and projected potable water needs in the county, water conservation is a critical component of the CCPWMP. The CCPWMP includes public education programs, incentive-based water-rate structures, indoor and outdoor water-use reduction programs, and a water-loss-reduction program. The CCPWMP also promotes the use of reclaimed water for irrigation and other non-potable uses. The effectiveness of the water conservation program is assessed through trends in potable water use, reclaimed water use, and non-revenue water use.

Ensuring drinking water meets or exceeds regulatory requirements for safe consumption is essential for public health and regulatory compliance. The CCPWMP includes strategies for monitoring and improving water quality, such as chemical monitoring, disinfectant residuals, bacteriological monitoring, and lead and copper monitoring. The CCPWMP also addresses water age and quality modeling scenarios to identify areas for improvement.

The CCPWMP outlines capital maintenance and improvement projects to ensure the long-term sustainability and reliability of the water systems. These projects include installing new water mains, upgrading booster stations, and constructing new water storage tanks. The CCPWMP also identifies funding options such as grant funding, legislative appropriations, loan funding, revenue bonds, and taxes and rate increases. The CCPWMP emphasizes the importance of securing adequate funding to support the long-term sustainability of the water systems.

Wastewater Treatment

Charlotte County disposes of treated wastewater through their reuse water distribution network and deep well injection. Treated waters meeting certain regulatory quality requirements are provided to permitted entities for irrigation needs. Each permittee is allowed a limited allocation of reuse water, subject to:

- Availability of reuse water - Generally speaking, reuse water is stored in reservoirs at the East Port, West Port, Rotonda, and Burnt Store WRFs. Water is then pumped into the network based on usage requests and available capacity in the reservoirs. This availability is contingent on:
 1. Wastewater inflow rates reaching WRFs (which can decrease when many seasonal residents have left Charlotte County).
 2. Reuse demand (which tends to increase during the dry season).
 3. The proportion of treated wastewater meeting minimum water quality requirements for reuse. Water not meeting those requirements are discharged via deep well injection.
- Capacity of the end user to accept reuse water - With few exceptions, reuse water is distributed into holding ponds on permittees' properties, and permittees irrigate their lands with water from these ponds. These ponds often also serve as stormwater runoff and retention areas for the surrounding land and can thus discharge once water in the pond reaches a certain elevation. Automatic triggers are in place to prevent reuse water from entering ponds that are discharging or are full enough that discharges are imminent.

When discharges occur from permittees' ponds due to rain events, some volume of those discharges likely contain reuse water. This necessitated the need to implement AWT at the County's four WRFs. AWT will further reduce the nutrient concentrations in the WRF effluent. Construction at the East Port WRF began early in 2024. As of this writing, the current schedule for implementation of AWT at the other CCU WRFs are:

- Burnt Store: Construction expected to start date of August 2024
- West Port: In design now; construction starting summer 2027;
- Rotonda: In design now; construction starting winter 2027 or spring 2028.

Per state statutory requirements, AWT must be implemented at all CCU facilities by 2031.

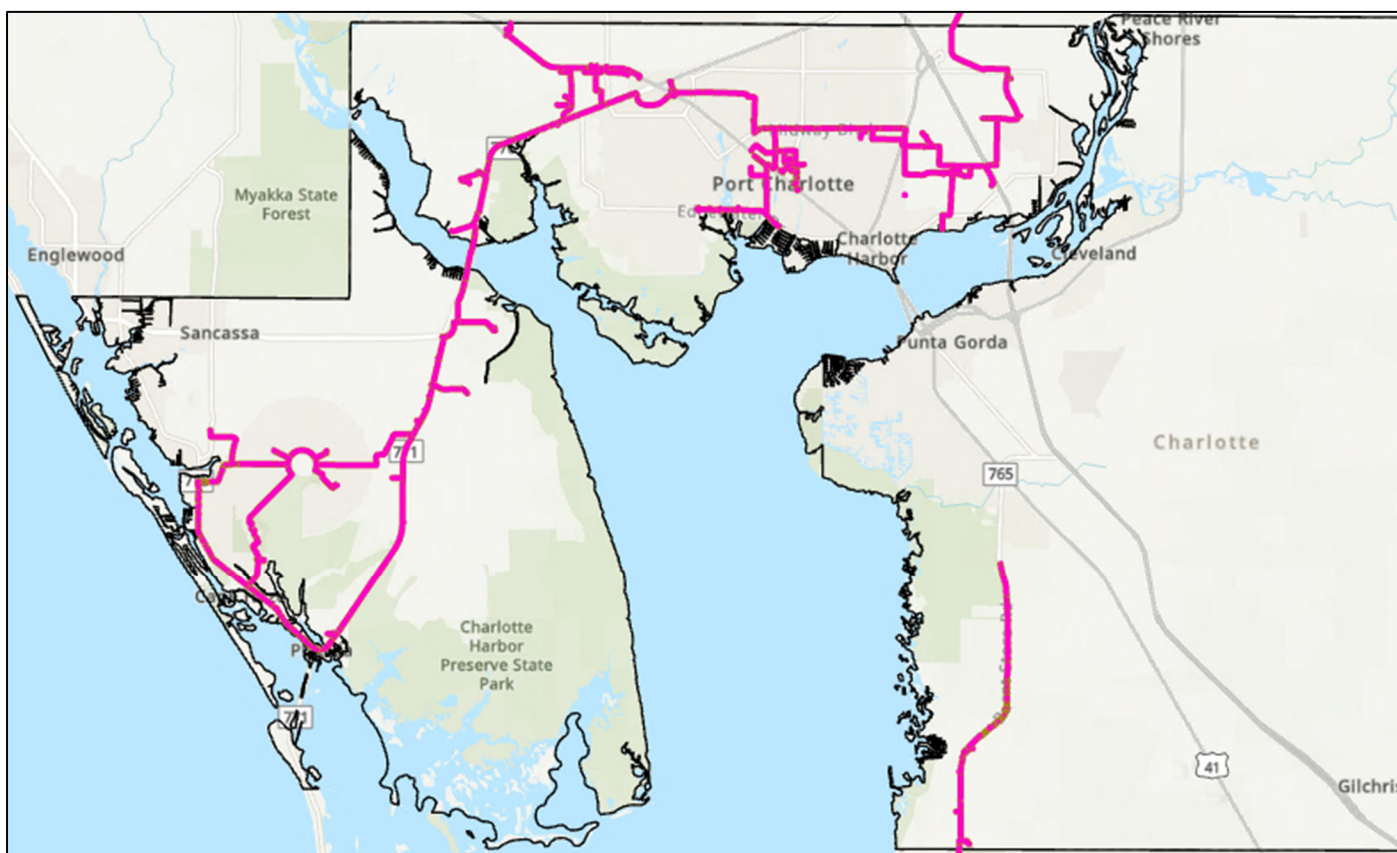


Figure 25. Reclaim water distribution network in Charlotte County.

The biosolids from the County's four WRFs are sent to the East Port WRF where it is dewatered and processed. The processed biosolids are sent to the County's Zemel Road Landfill where it is made into Class AA compost at the on-site Synagro Compost Facility (a public-private partnership) or sent to the County's landfill for disposal. These methods of disposal minimize the impact of biosolids on the County's receiving waterbodies. The County is also evaluating other options for biosolids disposal that are similarly favorable to receiving waterbodies.

Wastewater Management Planning

CCU continually engages in the Sewer Master Planning process on a 5-year recurring basis in part to ensure and sustain the quality of natural water resources to protect and provide a safe water supply, a recreational haven, and an environmental resource. The previous Sewer Master Plan was completed in 2017, and the 2023 Sewer Master Plan update is in progress. The Sewer Master Plan serves as high-level planning document to assess the county's sewer system and provide short- and long-term recommendations for improvements. Implementing these elements is discussed further below. The Sewer Master Plan provides background on the county's sewer collection, transmission, treatment, reuse, and disposal systems; consolidation of private utilities; sewer improvements to address current needs and future growth (capital improvement planning); septic-to-sewer prioritization; overview of collection system Capacity, Management, Operations and Maintenance Program (CMOM), biosolids management; and funding. From a water quality perspective, this planning helps to minimize pollutant loading to the county's receiving waterbodies.

CCU has an ongoing Septic-to-Sewer Program and has been eliminating septic systems by extending the collection and transmission systems throughout the County. The prioritization since 2017 has largely been based on the prioritization

developed in the 2017 Sewer Master Plan. The prioritization is being updated in the ongoing Sewer Master Plan Update. The County is committed to continuing the Septic-to-Sewer Program, which is a total turnkey construction program that includes the on-lot sewer connections to each home/business and proper abandonment of the septic tank.

Senate Bill 64, enacted in 2021, outlined key requirements for eliminating surface water discharges from WRFs. CCU is largely in compliance with Senate Bill 64 already since they dispose of their reclaimed water by distributing it to large-user public access reuse systems and by disposing of excess reclaimed water through deep injection wells. CCU has no direct outfalls to the Charlotte Harbor estuary or its tributaries. With the commitment to implement to AWT at all WRFs, pollutant loading to surface waterbodies via groundwater infiltration from reuse areas will be further reduced.

Infrastructure Performance and Resiliency

CCU developed their CMOM program in 2021 to improve the wastewater collection and transmission system. The CMOM Program aims to better manage, operate, and maintain the collection system, investigate capacity constraints, reduce sanitary sewer overflows (SSOs), and provide high-quality service. The CMOM outlines CCU's organizational structure, collection system management practices, capacity assessment and assurance program, and operation and maintenance (O&M) programs.

Overall, the CMOM Program establishes a structured approach for CCU to manage its wastewater infrastructure, comply with regulations, and provide reliable service to customers. The document serves as a guide for ongoing implementation and continuous improvement of CCU's wastewater management practices.

A component of the CMOM Program is the Capacity Assessment and Assurance Program (CAAP) and flow monitoring program. The county has recently developed the framework for the CAAP and a pilot program for flow monitoring. Future efforts will continue in both programs. Both programs will improve the understanding of how the collection and transmission systems are functioning.

CCU regularly inspects and maintains its collection and transmission systems, including ongoing activities such as closed-circuit television inspections, cleaning, and fat/grease removal. These activities ensure that the collection and treatment systems are operating at full capacity and are structurally sound. CCU uses a portion of its annual budget on repair and replacement (R&R) of the collection and treatment system. R&R activities are based on inspection findings or ad hoc needs. Relatively recent rulemaking for collections systems covered under Chapter 62-600, FAC, requires utilities to submit "a pipe assessment, repair, and replacement action plan with at least a 5-year planning horizon for all collection/transmission systems under the utility's control to mitigate sanitary sewer overflows and underground pipe leaks to the extent technically and economically feasible." To assist with implementing measures of the aforementioned plans, CCU has recently developed an asset management system using Cityworks to track and schedule inspections, O&M, and R&R. In addition to streamlining operations, CCU will be able to better analyze data on system performance.

Occasional breaks, malfunctions, and inadvertent spills of untreated wastewater are an inevitability in a system the size of Charlotte County's. **Figure 26** below provides a breakdown of sewage spills between 2017-2024. There are multiple culprits for these spills, ranging from breakdowns due to aging infrastructure, environmental damage (such as debris strikes and flooding), and accidental line strikes by construction-related activities. Processes such as the aforementioned CMOM program should result in fewer spills due to aging infrastructure. Utilities has also collaborated with the county's code enforcement office to implement more measures assuring contractors are locating water and sewage transmission lines prior to construction, and appropriate enforcement actions are taken if strikes occur due to their negligence.

Since 2022, multiple hurricanes have brought historic rain, flood, and wind damage to the Charlotte County region, damaging numerous lift stations and transmission lines. These storms thus highlight sites with vulnerable stations and lines that will need armoring and/or elevating to better withstand future storms and impacts from sea level rise and changing weather patterns. Ongoing county asset vulnerability assessment and remediation planning are identifying current and future at-risk utilities structures, with the goal to conduct future planning and prioritization for asset upgrades and armoring. In addition, vulnerability modeling outputs will be shared with community utility providers so they may be better informed of current and future risks to their own systems. Federal storm recovery funds are being utilized to restore damaged stations and increase their resistance to failures in future storm events.

Figure 26. Charlotte County Utilities effluent spill statistics from 2017-2024.

	2017	2018	2019	2020	2021	2022	2023	2024
Total Spilled	389,750	111,743	210,325	629,720	1,279,618	547,017	169,554	621,745
Total Into Waterways	89,430	29,622	168,950	182,270	20,850	88,882	26,500	166,462
Total Reported Spills	60	35	40	46	63	151	65	120
Average Spill Amount	6,496	3,193	5,258	13,690	20,311	3,623	2,609	5,181
	Hurricane Irma			Quesada FM Break Year	Tropical Storm Elsa	Hurricane Ian	Hurricane Idalia	Hurricane Helene and Hurricane Milton

Future Operational Considerations

As illustrated in this section, the Utilities Department have invested substantial resources in creating roadmaps for service expansion, maintenance, and improvement. That said, there are external factors that can influence aspects of timing and prioritization in implementing the Department’s operational strategies:

- Since 2020, infrastructure construction and maintenance costs have increased dramatically, such that the cost of these activities is exceeding current and predicted revenue from rate payers. For example, when initial planning commenced for the expansion of the Burnt Store plant, the original engineering report estimated a project cost of \$30 million. When that project was revisited in 2023, the estimate increased to \$90-\$100 million, and the final bid estimate in 2024 was \$181 million;
- Saltwater intrusion continues to be a specter for coastal communities in Florida relying on groundwater for their drinking water supply. In Charlotte County, substantial portions of the western and central portions of the county contain groundwater with measured chloride concentrations in excess of 1,000 mg/L (**Figure 25**). As of this writing, certain regions of Charlotte County with no potable water service, such as that area in western Port Charlotte, could be at risk for enhanced saltwater intrusion impacts as the volume of single family residential homes requiring well water increase.
- The county is currently developing community and asset flood/tidal surge risk assessment models, in order to identify and prioritize resiliency enhancement measures needed for the most vulnerable portions of the county. These efforts are anticipated to be completed in 2025.

Summary of Opportunities and Obstacles



Recent utilities management processes have mitigated the potential for accidental spill events to occur, such that the principal cause of spills is unintentional infrastructure breaches during construction activities. Additional outreach and enforcement are necessary to reduce the frequency of incidents.



Due in part to aging infrastructure, population growth, and recent inflation trends, maintenance and expansion needs are rapidly increasing, bringing unprecedented funding needs that far exceed current revenue.



Expansion plans for the WRFs include implementing AWT, which should dramatically decrease the volume of nutrients being introduced into reclaimed water distribution systems, thus reducing risk of nutrient pollution incidents.



CCU has allocated staff resources toward identifying and applying for external funding opportunities to offset costs to ratepayers. CCU is at a competitive disadvantage with many of these opportunities (especially those offered by the state), because agencies often prioritize areas with restoration plans developed to address water quality impairment issues. Several impaired watersheds in the region and surrounding area lack such plans. In addition, multiple watersheds lack sufficient data sets to determine water quality status, a knowledge gap the water quality monitoring program is looking to fill.

Vision Task Details

Task A and B: *Conduct a needs and cost analysis of expanding sewer and potable water service to currently undeveloped regions of west Port Charlotte. Increase groundwater elevation and salinity monitoring network to track saltwater intrusion trends in the region, especially in areas with higher densities of groundwater withdrawal wells.*

Estimated Development Cost: LOW (<\$100,000)

Details and Justification: Because of the lot sales boom of the 1950's-1980's, the region of Charlotte County just east of the Myakka River is divided into thousands of individual single family home plats. Construction of homes in this area has historically been sporadic, but over the last few years has been increasing in frequency. At this point, potable water supply or central sewer services are unavailable for much of this area, as there is currently an insufficient volume of prospective rate payers present in the region to support extension of those services. That said, this portion of the county is under threat from encroaching saltwater intrusion, which can be exacerbated if a substantive increase in water withdrawal wells are permitted in the area. In addition, lack of centralized sewer availability will necessitate the installation of septic systems throughout, which may pose future water quality issues to the Myakka River.



Figure 27. Distribution of platted lands in West Port Charlotte.



Figure 28. Chloride isohaline line as described by SWFWMD Regional Water Supply Plan (2020). Note 250 mg/L is the water quality standard for chlorides in drinking water.

In order to mitigate these potential issues, a feasibility study and menu of options should be developed to determine the most cost-effective options for expanding Utilities service to the region. Included in this effort should be an analysis of construction cost trends in recent years, cost and funding availability for existing low-population areas with Utilities services (such as the Rotonda Meadows region), and feasibility of, at minimum, a tiered system of service expansion into west Port Charlotte.

Task C: *In cooperation with other relevant departments (such as Community Development), organize and implement enhanced education and enforcement process to reduce construction-related breaks in water supply and wastewater transmission pipes.*

Estimated Development Cost: LOW (<\$100,000) Note this estimate may increase based on number of additional FTEs needed for sufficient enforcement measures.

Details and Justification: In recent years, the Utilities Department has been making strides to reduce the frequency of unpermitted discharges due to failing infrastructure. New asset management protocols are prioritizing replacement and maintenance of equipment and materials as they near “end of life”, rather than waiting for mechanical failure to occur prior to replacement or repair. As such, a significant proportion reported spills over the last several years are due to construction-related accidents, during which transmission lines were accidentally breached. Given the accelerated rate of construction activity occurring in this county, a communications, education, and enforcement strategy needs to be developed to identify the most common root causes of these accidental spills and determine the most effective combination of activities to reduce future spill incidents.

Task D: *Initiate reclaimed water user irrigation education campaign, providing guidance on water content and application to reduce fertilizer use and inappropriate irrigation application.*

Estimated Development Cost: LOW (<\$100,000)

Details and Justification: Currently, Charlotte County manages treated wastewater by distributing it through a system-wide reclaim use distribution network (water that does not meet minimum requirements for reclaim use are disposed of via deep well injection). Currently, the concentration of nutrients in reclaim irrigation systems far exceed ambient nutrient concentrations, which can discharge into natural systems during large storm events.

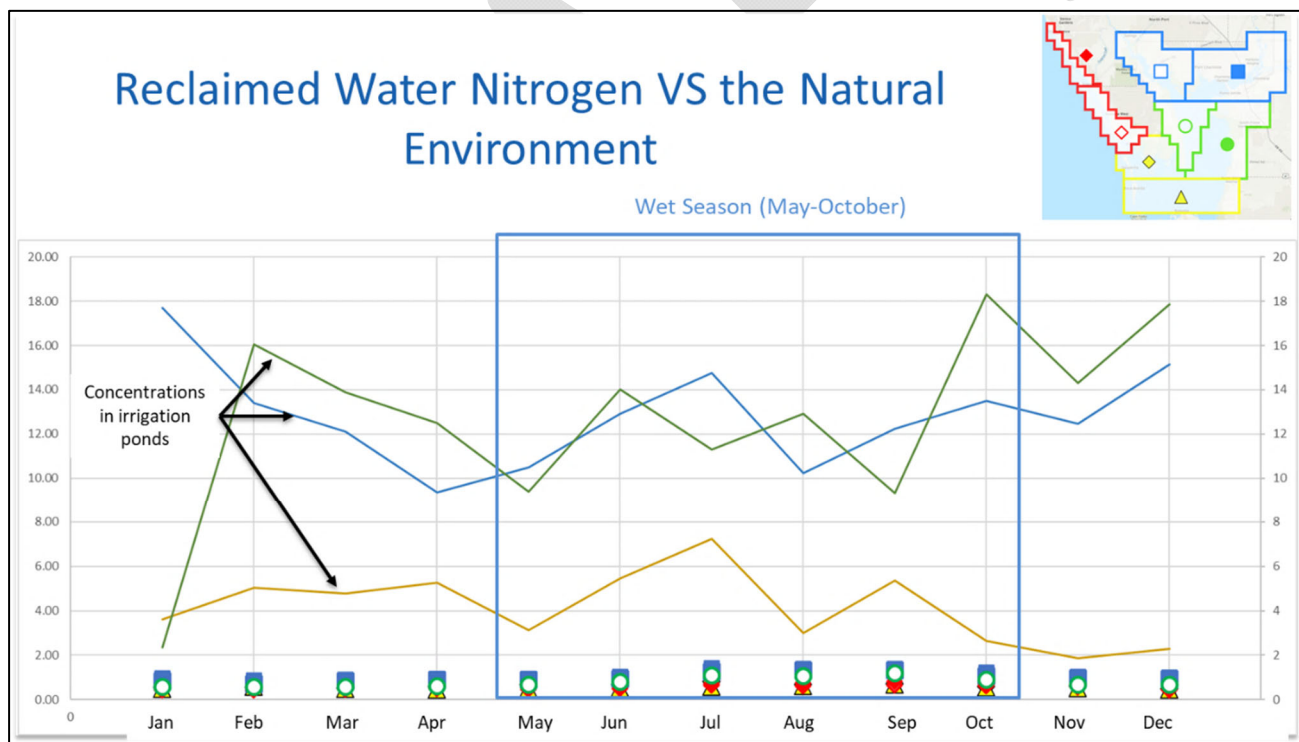


Figure 29. Average monthly measured Nitrogen concentrations in reclaim-augmented irrigation ponds (lines) and Charlotte Harbor/Lemon Bay (colored icons) from 2021-2023.

Planned implementation of Advanced Wastewater Treatment processes to the county’s water reclamation facilities will serve to reduce these concentrations substantially, requiring effluent to be treated to a Total Nitrogen concentration at or below 3 mg/l and Total Phosphorus at 1 mg/l. That said, these lowered targets are still above ambient nutrient

concentrations. As such, this task seeks to create a responsible reclaim campaign targeting end-users of the county's reclaim distribution network. The campaign will focus on two facets of reclaim use:

1. Develop nutrient calculators, allowing end-users to view the volume of nutrients applied to their lands through reclaim irrigation, so that they can adjust the rate/frequency of fertilizer application to account for these nutrients.
2. Create mechanisms to guide educating users on proper application of reclaim water, and the consequences to the environment of failing to do so (such as limiting overspray onto impervious surfaces, avoiding irrigation in areas with direct/focused runoff into receiving waters, etc.).

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