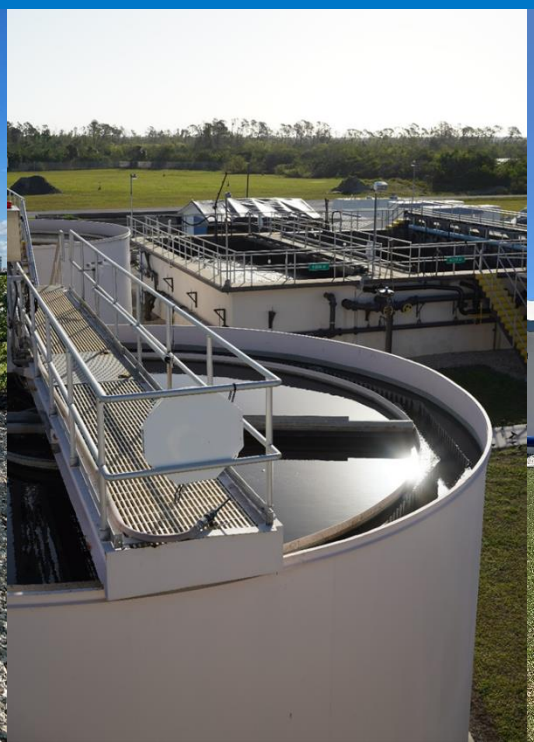
Charlotte County Utilities Department

2022 Annual Report
March 2023

Prepared by

JonesEdmunds



2022 ANNUAL REPORT

Prepared for:

Charlotte County Utilities Department

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Jones Edmunds Project No.: 03405-029-06

March 2023

SIGN-OFF SHEET

This document, titled 2022 Annual Report, was prepared by Jones Edmunds & Associates, Inc. with the Charlotte County Utilities Department's assistance. Some information included was collected during Jones Edmunds' field observations of facilities. Other information, including financial and statistical information, was provided by Charlotte County Utilities Department staff. The report reflects Jones Edmunds' best judgment in light of the information available at the time of preparation. Any use that a third party makes of this report or any reliance on or decisions made based on it are the responsibilities of such third parties. Jones Edmunds accepts no responsibility for damages, if any, suffered by any third party resulting from decisions made or actions based on this report.

This 2022 report captures some but not all observed deficiencies and provides recommendations for facilities and assets as a result of Hurricane-Ian-related damage. However, this report's purpose is not to capture hurricane-related damage but to annually document the condition of facilities and infrastructure assets. As such, carry-over is expected from the Federal Emergency Management Agency (FEMA) assessments conducted in November 2022 by Jones Edmunds, Kimley-Horn, and HDR. Ultimately, the information in the 2022 FEMA assessments supersedes this report as it relates to recommendations for repair, rehabilitation, or replacement of CCU facilities and assets damaged by Hurricane Ian.

Prepared by:

Christopher R Makransky

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Christopher R. Makransky, PE
Florida PE No.: 95778

CHRISTOPHER R. MAKRANSKY, STATE OF FLORIDA PROFESSIONAL ENGINEER LICENSE NO. 95778

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY CHRISTOPHER R. MAKRANSKY, PE, ON THE DATE INDICATED HERE.

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ABBREVIATIONS AND ACRONYMS

Abbreviation	Definition
AADF	Annual Average Daily Flow
ACFM	Actual Cubic Feet Per Minute
AMI	Advanced Metering Infrastructure
AMP	Asset Management Plan
ARV	Air-Release Valve
ASR	Aquifer Storage and Recovery
ATS	Automatic Transfer Switch
AWIA	America's Water Infrastructure Act of 2018
AWT	Advanced Water Treatment
AWWA	American Water Works Association
BCC	Board of County Commissioners
BFP	Belt Filter Press
BOD	Carbonaceous Biochemical Oxygen Demand (5 day)
CAR	Capacity Analysis Report
CCC	Chlorine Contact Chamber
CCR	Consumer Confidence Report
CCTV	Closed-Circuit Television
CCU	Charlotte County Utilities Department
CDL	Commercial Driver's License
CDOC	Continuing Demonstrations of Capability
CHWA	Charlotte Harbor Water Association
CIP	Capital Improvement Program
CMOM	Capacity, Management, Operation, and Maintenance
CMP	Capital Maintenance Plan
CR	County Road
CRA	Community Redevelopment Area
°F	Degrees Fahrenheit
DMR	Discharge Monitoring Report
DO	Dissolved Oxygen
EAMS	Enterprise Asset Management System
EPA	US Environmental Protection Agency
EPLAB	East Port Laboratory
EQ	Equalization
ERP	Emergency Response Plan
ERU	Equivalent Residential Unit
EWD	Englewood Water District
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FDOH	Florida Department of Health
FEMA	Federal Emergency Management Agency

Abbreviation	Definition
FOG	Fat, Oil, and Grease
FSAWWA	Florida Section of AWWA
FY	Fiscal Year
GDC	General Development Corporation
GDU	General Development Utilities
GIS	Geographical Information System
GIWA	Gasparilla Island Water Association
GMLS	Grand Master Lift Station
gpd	Gallons Per Day
gpm	Gallons Per Minute
GPS	Global Positioning System
GST	Ground Storage Tank
HDPE	High-Density Polyethylene
HMI	Human Machine Interface
HOA	Homeowners Association
HP	Horsepower
HSP	High-Service Pump
HSPS	High-Service Pump Station
I&C	Instrumentation and Controls
I/I	Inflow/Infiltration
IDOC	Initial Demonstrations of Capability
IR	Internal Recycle
IW	Injection Well
kVA	Kilovolt-Ampere
kW	Kilowatt
lb/day	Pounds per Day
LES	Liquid Environmental Solutions
LIMS	Laboratory Information Management System
LPS	Low-Pressure Sewer
LS	Lift Station
LTF	Leachate Treatment Facility
µS/cm	Micro Siemens Per Centimeter
MADF	Maximum Average Daily Flow
MBR	Membrane Bioreactor
MCC	Motor Control Center
MDF	Maximum Daily Flow
MG	Million Gallon
mg/L	Milligrams Per Liter
MGD	Million Gallons Per Day
MIT	Mechanical Integrity Test
mL	Milliliters
MLE	Modified Ludzack-Ettinger
MLSS	Mixed Liquor Suspended Solids

Abbreviation	Definition
MLVSS	Mixed Liquor Volatile Suspended Solids
mm	Millimeter
MSBU	Municipal Service Benefit Unit
NEC	National Electrical Code
NELAC	National Environmental Laboratory Accreditation Conference
NELAP	National Environmental Laboratory Accreditation Program
NFPA	National Fire Protection Association
O&M	Operations and Maintenance
ORP	Oxygen Reduction Potential
OSHA	Occupational Safety and Health Administration
PAC	Powdered-Activated Carbon
PACT	Powdered-Activated Carbon Treatment
PLC	Programmable Logic Controller
ppm	Parts Per Million
PRMRWSA	Peace River Manasota Regional Water Supply Authority
PRMRWSF	Peach River Manasota Regional Water Supply Facility
psi	Pounds Per Square Inch
PVC	Polyvinyl Chloride
PWS	Potable Water System
QAS	Quality Assurance Specialist
R&R	Renewal and Replacement
RAS	Return-Activated Sludge
RO	Reverse Osmosis
RRA	Risk and Resilience Assessment
RTS	Regional Transmission System
RTU	Radio Telemetry Units
RWBS	Reclaimed Water Booster Stations
SCADA	Supervisory Control and Data Acquisition
scfm	Standard Cubic Foot per Minute
SDS	Safety Data Sheet
SF	Square Feet
SFWMD	South Florida Water Management District
SM	Standard Method
SO	Service Order
SOP	Standard Operating Procedure
SR	State Road
SRF	State Revolving Fund
SRS	Septage Receiving Station
SWFWMD	Southwest Florida Water Management District
TCU	Telemetry Control Unit
TDH	Total Dynamic Head
TDS	Total Dissolved Solids
TMADF	3-Month Average Daily Flow

Abbreviation	Definition
TNI	The National Environmental Laboratory Accreditation
TSS	Total Suspended Solids
UCMR4	Unregulated Contaminant Monitoring Rule
UF/IFAS	University of Florida/Institute for Food and Agricultural
UIC	Underground Injection Control
UV	Ultraviolet
VFD	Variable-Frequency Drive
WAS	Waste-Activated Sludge
WBS	Water Booster Stations
WRF	Water Reclamation Facility
WTP	Water Treatment Plant
WUP	Water Use Permit

GLOSSARY

Term	Description
Activated sludge	A process for treating wastewater using air and a biological floc to reduce the organic content of the wastewater.
Annual average daily flow (AADF)	The total volume of wastewater flowing into a wastewater facility or water flowing from a water facility during any consecutive 365 days divided by 365.
Backflow prevention	A physical means to keep water from flowing back into a water system once it is discharged from the system. Examples are air gaps, double-check valve assemblies, and reduced-pressure zone devices.
Consumer Confidence Report (CCR)	An annual water-quality report that is required by the US Environmental Protection Agency and Florida Department of Environmental Protection and distributed to the customers of a water utility.
Cross-connection	Any physical arrangement whereby a public water supply is connected, directly or indirectly, with any other water supply system, sewer, drain, conduit, pool, storage reservoir, plumbing fixture, or other device that contains or may contain contaminated water, sewage, or other waste or liquid of unknown or unsafe quality that may be capable of imparting contamination to the public water supply resulting from backflow.
Deep injection well	A well drilled into a confined, non-potable aquifer for disposal of treated wastewater.
Force main	A pressure pipe joining the pump discharge at a wastewater pumping station with a point-of-gravity flow.
Gravity sewer	Piping installed at a gradual incline (slope) that allows wastewater to flow exclusively by the energy of gravity.

Term	Description
Headworks	The *front end* of a wastewater treatment plant that removes items from wastewater that cannot be removed by the treatment process.
Lift station (pumping station)	A structure equipped with pumps to impart energy to convey wastewater through a force main.
Low pressure sewer	An alternative to gravity sewers that requires a small pump at each property. Piping is small and shallow and can be constructed to follow the contours of the land as opposed to deeper and larger pipes necessary to accommodate the slopes required for gravity sewers.
Peak day flow	The largest volume of wastewater flowing into a wastewater facility or water flowing from a water facility during any consecutive 24-hour period.
Peak hour flow	The largest volume of wastewater flowing into a wastewater facility or water flowing from a water facility during any consecutive 1-hour period.
Public-access reclaimed water	Treated wastewater meeting the requirements of Chapter 62-610, Part III, of the Florida Administrative Code for application on areas accessible to the public.
Restricted-access reclaimed water	Treated wastewater meeting the requirements of Chapter 62-610, Part II, of the Florida Administrative Code, for application on areas where access by the public is controlled and infrequent.
Reverse osmosis	A water treatment method that uses pressure and a semi-permeable membrane to purify water.
Three-month average daily flow	The total volume of wastewater flowing into a wastewater facility or water flowing from a water facility during 3 consecutive months divided by the number of days in this 3-month period.
Vacuum sewer	A mechanized system of wastewater transport that relies on differential air pressure to move wastewater. Vacuum pumps maintain a negative pressure on the collection system. The differential pressure between atmosphere and vacuum is the driving force that conveys wastewater through the system.

EXECUTIVE SUMMARY

INTRODUCTION

The Charlotte County Utilities (CCU) 2022 Annual Report updates the public and bond holders on the utility system's status and provides CCU staff with a tool for planning capital projects and improving operations. The report provides a high-level review and update of CCU's administration organization, financial information, major events, and capital improvement program (CIP) projects and the conditions and recommendations for the water treatment plants, water distribution systems, wastewater collection systems, wastewater treatment facilities, and reclaimed water distribution systems.

ADMINISTRATION

The Board of County Commissioners (BCC) periodically reviews and determines the appropriate rate structure for providing services to current customers. There were no rate increases in Fiscal Year 2022. A Rate Study will be completed in FY 2023.

The total Operations and Maintenance (O&M) revenue for Fiscal Year (FY) 2022 was:

- $ 87,192,954 (water and wastewater services).
- $ 6,782,024 (connection charges).
- $ 19,262,790 (connection fees).

In FY 2022, CCU continued to see growth, with the number of active water customers increasing by 3.5 percent (from 64,413 to 66,734) and the number of active wastewater customers increasing by 3.9 percent (from 42,230 to 43,932).

WATER TREATMENT PLANTS

Chapter 3 presents an overview of the Peace River Manasota Regional Water Supply Facility (PRMRWSF) and a detailed assessment of the County-owned Reverse Osmosis (RO) Water Treatment Plant (WTP). CCU has two water supply sources for its two independent public water systems (PWSs). CCU is a member government of and purchases treated water from the Peace River Manasota Regional Water Supply Authority (PRMRWSA) for the consecutive PWS that serves Mid/West County. The PRMRWSA owns, operates, and maintains the PRMRWSF, which has its own water use permit and provides treated surface water to neighboring counties. Charlotte County's allocation of the PRMRWSA-produced water is 16.1 million gallons per day (MGD) annual average daily flow (AADF), 19.32 MGD for the peak month, and 22.54 MGD for the maximum day. In FY 2022, CCU used 11.8 MGD AADF or approximately 73 percent of the water allocated by the PRMRWSA under AADF conditions.

CCU also owns and operates the Burnt Store RO WTP, which produces water to serve the South County distribution system. The Burnt Store RO WTP operates under Water Use Permit No. 3522, which expires in 2033. As currently configured, the Burnt Store RO WTP capacity is 3.61 MGD with 1.5 million gallons (MG) of storage. In FY 2022, the Burnt Store RO WTP operated at an average annual capacity of 0.52 MGD or approximately 15 percent of its design capacity. Raw water is supplied by six water production wells. Concentrate from the treatment process is disposed of into two on-site deep injection wells with a combined capacity of

3.44 MGD. The primary recommendations for the Burnt Store RO WTP include completing a membrane evaluation and beginning to install new groundwater withdrawals wells under the existing permit.

WATER DISTRIBUTION

Chapter 4 reviews and discusses CCU's distribution system infrastructure for its two independent PWSs. At the end of FY 2022, the Mid/West County system had 63,632 water service connections and the population based on units served was estimated to be approximately 158,070. The Mid/West County distribution system consists of approximately 1,464 miles of water main, six active water-booster pumping stations (WBS) with ground storage tanks (GSTs), eight supply interconnects with PRMRWSA, and seven emergency interconnects with neighboring water utilities. The current total GST capacity for this system is 10 MG. The PRMRWSA also has an additional 12 MG of storage capacity available to PRMRWSA members for emergency fire flow or for general distribution during temporary loss of treatment at the PRMRWSF. For FY 2022, the total unaccounted-for water loss for the Mid/West County distribution system was 7.3 percent. The Mid/West County distribution system recommendations include continuing the load studies at the WBSs, applying arc-flash labeling on appropriate equipment, increasing the resiliency at the Gulf Cove WBS by replacing the Myakka River water main, and implementing the recommendations from CCU's Risk and Resilience Assessment (RRA) report (CCU, March 2020).

At the end of FY 2022, the South County distribution system had 3,102 service connections and the population based on units served was estimated to be approximately 8,914. The South County distribution system consists of 53 miles of water main and has no interconnects with neighboring water utilities. For FY 2022, the total unaccounted-for water loss for the South County system was 15.3 percent, triggering a water audit, which includes a plan to mitigate the high loss. CCU completed a water loss investigation to identify sources of water loss in FY 2021. Recommendations for the South County system include continuing to replace the old "class" polyvinyl chloride (PVC) pipes with new C-900 PVC pipes to mitigate leaks in the system, continuing to develop a computerized hydraulic model for the distribution system, and investigating the potential to install interconnects with neighboring utilities to increase system resiliency.

Annually, CCU performs maintenance on pipe, valves, meters, and hydrants throughout both distribution systems. In FY 2022, CCU replaced one hydrant, repaired 106 hydrants, and serviced 616 hydrants; repaired 47 line breaks on pipes 3 inches in diameter or larger; and installed two new valves, replaced 12 valves, and serviced 1,783 valves throughout the Mid/West County and South County distribution systems. The 2022 Consumer Confidence Reports confirm that the water delivered by both CCU water distribution systems meets or exceeds regulatory quality requirements.

WASTEWATER COLLECTION

Chapter 5 presents the CCU wastewater collection system, which currently serves 43,932 customer accounts in four distinct collection areas. Based on existing geographical information system (GIS) information at the time of preparation of this report, the total collection system consists of 512 miles of gravity sewer, 409 miles of low-pressure sewers (LPSs), 35 miles of vacuum sewer, three vacuum stations, 202 miles of force main, 319

maintained lift stations (305 owned by CCU), and approximately 8,099 manholes. Wastewater from each customer is transported to one of four water reclamation facilities (WRFs), depending on the customer's location. The Wastewater Collection workgroup has a maintenance program that includes condition assessment inspections by closed-circuit television (CCTV) and cleaning of collection lines to restore/maintain hydraulic capacity. CCU also owns tanker trucks that are available to haul wastewater from lift stations and vacuum stations to the treatment plants during emergencies. CCU used their wastewater collection system hydraulic model to identify deficiencies and improvements throughout the system.

During FY 2022, a site review of representative facilities selected by CCU showed them to be maintained in working order. General recommendations for the CCU wastewater collection system mainly include continuing to rehabilitate lift stations, continuing to use the hydraulic modeling to assess the need for upgrades, continuing to televise and repair gravity sewers and manholes, and installing odor-control systems at lift stations that are significantly impacted by sewer gases.

WASTEWATER TREATMENT FACILITIES

Chapter 6 includes an overview and discussion of CCU's four WRFs and the Zemel Road leachate treatment facility (LTF). Table ES-1 summarizes permit information and current percent permit capacity associated with each WRF. The WRFs are complex plants that require continual repair and maintenance. In FY 2022, the WRFs were generally operating within their permit limits for flow and were operating within limits for effluent quality. The primary recommendations include completing the advanced water treatment (AWT) plant expansion upgrades at the East Port WRF and the Burnt Store WRF, evaluating improvements for biosolids-handling facilities at all four WRFs, and completing the West Port WRF expansion project, which will include evaluating the future use of the Rotonda WRF.

Table ES-1 CCU WRFs Flow and Capacity Statistics

Facility	Permitted Capacity (MGD AADF)	AADF[1] (MGD)	Maximum TMADF[2] (MGD)	Permitted Operating Capacity[1] (%)	Maximum TMADF Operating Capacity[2] (%)
East Port	6.00[a]	4.81	5.58	80	93
West Port	1.20[b]	0.78	0.82	65	68
Rotonda	2.00[b]	1.16	1.36	58	68
Burnt Store	0.50[c]	0.32	0.42	64	84

Notes:

[a] Construction of upgrades for expansion from 6 MGD to 9 MGD including AWT modifications expected to begin by Summer 2023.

[b] Design of West Port WRF expansion including AWT modifications and evaluation of future use of Rotonda WRF will begin Summer 2023.

[c] Construction of upgrades for expansion from 0.5 MGD to 2.5 MGD including AWT modifications expected to begin Winter 2023.

[1] Based on the AADF/permitted capacity.

[2] Based on the highest 3-month average daily flow (TMADF)/permitted capacity, which is used to help determine when a facility should begin planning for expansion.

The Zemel Road LTF uses powder-activated carbon (PAC) to treat the leachate originating from the Zemel Road Class 1 landfill. The LTF has a capacity of 0.25 MGD and conveys treated effluent to a deep injection well. The plant is operating within its permitted treatment capacity, but several improvements are recommended to maintain operations. The primary recommendations include rehabbing the influent holding tank and evaluating effluent pumping operations.

RECLAIMED WATER DISTRIBUTION SYSTEM

Chapter 7 discusses CCU's reclaimed water distribution systems including the Master Reuse System serving Mid/West County and the South County reclaimed water distribution system. The Master Reuse System is fed by the East Port, West Port, and Rotonda WRFs. The Master Reuse System contains approximately 90 miles of transmission mains, three reclaimed water booster stations (RWBSs), three GSTs with a total volume of 4.0 MG, and three storage ponds with a total volume of approximately 113 MG. The Master Reuse System infrastructure is in good condition; however, it requires more pipe hydraulic capacity to allow more reclaimed water to be transferred to major users in West County. The South County reclaimed water distribution system consists of one 8.5-mile-long transmission main that is currently serving five customers. The system infrastructure is in good condition, although some improvements are required at the Burnt Store WRF. These improvements are being investigated as part of the Burnt Store WRF expansion project.

CCU's current goal is to encourage the beneficial use of reclaimed water and continue expanding the system to serve additional customers, with a focus on large users. The primary recommendations for the reclaimed water distribution system are to implement recommendations from the Countywide Reclaimed Water Master Plan; develop a comprehensive operating protocol for the Master Reuse System; install throttling control valves at all current major reclaimed water users with pond discharges in the Mid and West County areas; install certified staff gauges for pond water surface elevations for all pond discharges; develop an operational protocol for using the West Port RWBSs; and develop and conduct a community survey to better determine potential customer interest in reclaimed water reuse (to be used to evaluate economic feasibility of distribution system expansion opportunities).

ENGINEERING

As Charlotte County's population continues to grow, CCU's ability to develop plans that address the projected growth is vital. The Engineering Division develops CIP projects for CCU's water, wastewater, and reclaimed water infrastructure systems. Table ES-2 summarizes the FY 2022 CIP budget dollars and expenditures for the three infrastructure sectors. The budget includes multi-year CIP projects; therefore, expenditures occur over multiple years. Chapter 8 provides details of the CIP budget and expenditures.

Table ES-2 FY 2022 CIP Budget and Expenditures

Infrastructure Sector	Budget	Expenditure
Water	$250,000	$307,000
Wastewater	$68,726,000	$16,396,000
Reclaimed Water	$150,000	$3,000

UTILITY SUPPORT SERVICES

Chapter 9 discusses support services for CCU services including state-certified laboratory testing, asset management (Cityworks), and Operation and Information Technology (Supervisory Control and Data Acquisition [SCADA] and Cybersecurity).

The East Port Laboratory (EPLAB) conducts most water quality testing for the County's facilities. The EPLAB is certified to conduct analyses by the Florida Department of Health (FDOH) according to The NELAC Institute (TNI) Standards. During FY 2022, the EPLAB participated in and passed two TNI/FDOH-mandated Proficiency Testing studies. In FY 2022, the laboratory processed 8,066 samples including performing 30,694 analyses and additional field sampling and sample courier service responsibilities. Due to upcoming AWT plant expansions at East Port WRF and Burnt Store WRF, staffing requirements may need to be evaluated so that laboratory analysis services are not negatively impacted by new monitoring requirements. The EPLAB uses Laboratory Information Management System (LIMS) – a data management software that generates paper documentation forms and sample identification numbers to record and track test results.

Jones Edmunds is working with CCU to implement the Cityworks Enterprise Asset Management System (EAMS) to track work and status of assets across the County. This work is in conjunction with Cityworks implementation in other departments within the County to standardize the work and asset tracking in a robust system with capabilities to schedule routine maintenance and tasks, identify and track hot spots and issues with infrastructure, and report on key performance indicators.

Operation and Information Technology refers to CCU's SCADA and Cybersecurity infrastructure. CCU uses SCADA to monitor and control facility operations. Several facilities represent multiple projects involving different engineers, bid contractors, and SCADA system integrators. This has resulted in a SCADA system of mixed hardware, software, and architectures that include diverse and separate operations. A SCADA Master Plan was completed in FY 2020. The primary goal of the SCADA Master Plan was to define and document a road map for implementing the technology, practices, and organizations required to meet CCU's short-term and long-term goals for SCADA. Chapter 9 includes recommendations from the SCADA Master Plan.

CONSOLIDATED RECOMMENDATIONS

Chapter 10 consolidates all recommendations discussed throughout this Annual Report for each CCU water, wastewater, and reclaimed water facility visited during this assessment.

1 INTRODUCTION

1.1 PURPOSE AND SCOPE

The Charlotte County Utilities Department (CCU) prepares an Annual Report to provide the public with a utilities status update and to fulfill Revenue Bonds requirements. The bonds issued to Charlotte County require that the County retain the services of a licensed professional engineer to verify the quality of CCU's operations. The bond covenant states:

> *The Issuer shall at all times employ Consulting Engineers, whose duties shall be to make any certificates and perform any other acts required or permitted of the Consulting Engineer under this Resolution, and also to review the construction and operation of the System at least once a year, and, not more than 120 days prior to the end of each Fiscal Year, to submit to the Issuer a report with recommendations as to the proper maintenance, repair and operation of the System during the ensuing Fiscal Year, including recommendations for expansion and additions to the System to meet anticipated service demands, and an estimate of the amount of money necessary for such purposes. Copies of such reports, recommendations and estimates made as here in above provided shall be filed with the issuer for the inspection by bondholders, if such inspection is required.*

Table 1-1 summarizes the principal balances for CCU bonds as of FY 2022.

Table 1-1 Principal Balances on CCU Bonds by FY 2022

Bond Issues	Original Issuance	Current Debt	Comments
2008 Bond	Wastewater Expansion – 1998	$20,040,000	Wastewater Expansion Program
2011 Bond	Refinance – 2011	$0	Refinanced Debt
2013 Bond	Refinance – 2003A	$0	Refinanced Debt
2016 Bond	Refinance – 2006 and part of 2011	$8,105,000	Refinanced Debt
2021 Bond	Refinance – 2011	$15,790,000	Refinanced Debt
	Total Current Bond Debt	$43,935,000	
	State Revolving Fund (SRF) Debt	$66,493,251	
	Tax-Exempt Commercial Paper	$0	
	Total Long-Term Debt	**$110,428,251**	

The Report is divided into the following chapters:

1. **Introduction:** General information concerning the report's preparation.
2. **Administration**: Charlotte County government structure and CCU's organization, administration programs, and financial information.
3. **Water Treatment Plants**: Descriptions and records concerning the purchase and production of potable water and the general condition of the components.

4. **Water Distribution System**: Description of the water distribution system and the general condition of components.
5. **Wastewater Collection:** Description and records concerning the collection of wastewater and the general condition of components.
6. **Wastewater Treatment Facilities**: Descriptions and records concerning the facilities used to treat wastewater and leachate and the general condition of the components.
7. **Reclaimed Water Distribution System**: Description of the reclaimed water distribution system and the general condition of the components.
8. **Engineering**: The status of the water, wastewater, and reclaimed water Capital Improvement Program (CIP) projects and a summary of the major engineering reports completed for the County.
9. **Utility Support Services**: Descriptions and records concerning the laboratory facilities, asset management, and information technologies.
10. **Consolidated Recommendations**: Summary of planning recommendations, capital improvements, and operation and maintenance (O&M) items for the water, wastewater, and reclaimed water systems.

1.2 AUTHORITY

Jones Edmunds' preparation of the Fiscal Year (FY) 2022 Annual Report is authorized by Charlotte County Purchase Order No. 2023001055, Work Order No. 20.

1.3 DEMOGRAPHICS

Charlotte County is on the southwest coast of Florida approximately 96 miles south of Tampa. It covers 694 square miles and contains approximately 126 miles of waterways. With an elevation ranging from 5 to 25 feet above sea level, Charlotte County enjoys a sub-tropical climate where the extreme temperatures of summer and winter are subdued by the prevailing gulf breezes. Numerous upland and aquatic preservation areas are in the area. Charlotte Harbor includes one of the world's largest protected marine estuaries encompassing 270 square miles with 219 miles of natural shoreline.

The Office of Economic and Demographic Research estimated the Charlotte County population in 2022 at 196,742. In 2009, Port Charlotte was named "Best Place to Retire" by *Money* magazine, and the community has received similar recognition from other sources during the past decade.

A large portion of this coastal community's urban development is in the west third of the County, including the barrier islands abutting the Gulf of Mexico. The Port Charlotte planned residential development occupies most of Central County with some residential lots having canal access to Charlotte Harbor. A large development known as Rotonda is in the west area of the County. Every lot within Rotonda is within half mile of a golf course.

A growing area in the extreme south area of the County, near the Lee County border, is known as the Burnt Store Corridor because of its location on and near Burnt Store Road. This area encompasses 8 square miles and is currently only 15-percent built out.

Commercial growth along many of the main corridors constitutes over 1,500 acres. Most of the commercial epicenters are along US Highway 41 and in the Murdock area of Port Charlotte. Commercial zones have also developed along Kings Highway, Rampart Boulevard, and State

Road (SR) 776. Less than 0.1 percent of the County area consists of industrial development. The industrial development is primarily within the Community Redevelopment Area (CRA) in Charlotte Harbor.

1.4 DEVELOPMENT OF CCU

In the mid-1950s, the Mackle brothers of Miami, Florida, began to purchase large tracts of land in the Mid and West County areas. The Mackle brothers, later known as General Development Corporation (GDC), platted the area for residential development communities, generally 0.25-acre residential lots with some commercial areas along main corridors such as US Highway 41. Most GDC developments in the area were supplied water from the GDC-owned and -operated Peace River water treatment facility, which was constructed in the 1970s and managed by GDC's subsidiary General Development Utilities (GDU).

In 1991, Charlotte County purchased the GDU assets, forming the initial core of the CCU system in Mid County and in the Gulf Cove and South Gulf Cove areas of West County. The purchase included water infrastructure including three water booster stations (WBSs), three ground storage tanks (GSTs), and approximately 610 miles of water mains serving approximately 28,500 water connections. The purchased wastewater infrastructure included three treatment plants (South Port and East Port in Mid County and West Port in West County) along with associated transmission lines and collection systems consisting of 140 miles of gravity and low-pressure mains, 56 lift stations, and 61 miles of force mains serving approximately 11,000 sewer connections. CCU eventually grew to operate wastewater, potable water, and leachate treatment plants.

Over the years CCU has continued to acquire, upgrade, and construct facilities such as water treatment plants (WTPs), WBSs, and wastewater treatment facilities, now known as water reclamation facilities (WRFs), and expand its collection and distribution system infrastructure as necessary to serve residents, meet demands, treat flows, and maintain permit requirements. The major expansions to the CCU system are listed below, and more detailed improvements can also be found in previous Annual Reports:

- In 1991, CCU purchased the GDU assets establishing the CCU water and wastewater systems.
- The Leachate Treatment Facility (LTF) was first permitted in 1991. The plant is owned by Charlotte County Solid Waste and operated by CCU.
- In 1992, CCU established interconnects with North Port at Flamingo Boulevard and Biscayne Boulevard and at Harbor Boulevard.
- CCU constructed Walenda WBS consisting of a 2-million-gallon (MG) GST in 1994.
- CCU started its reuse program on August 16, 1994, in Mid County.
- CCU acquired Rampart Utilities in Mid County in 1999, consisting of gravity collection and transmission lines serving 1,400 connections.
- CCU acquired the Five Lands WTP in 1998 and decommissioned it in April 2007.
- CCU acquired Aqua-Source Utilities in West County in Fall 2000, consisting of the Rotonda WRF and gravity and low-pressure collection systems totaling 3,400 connections.
- The 24-inch transmission main and interconnect from the PRMRWSF along Kings Highway to the DeSoto County line was completed in 2001.
- CCU acquired Florida Water Services in Mid County in 2003, consisting of a collection system that serves 3,400 sewer connections in the Deep Creek area, in 2003.

- CCU acquired Florida Water Services in South County in 2003, consisting of the Burnt Store WRF and WTP and gravity sewer collection systems and pump stations in the Burnt Store area, in 2003.
- The Rotonda WTP #3 was converted to a WBS in 2005.
- The Rotonda, Gulf Cove, and Golf Course WBSs were upgraded in 2007 with new chemical feed systems.
- A potable water system interconnect was established with the Englewood Water District (EWD) in 2007.
- The Gertrude WBS and GST were decommissioned in 2008.
- The reclaimed water Phase 1 expansion was completed in 2009 and included two strategically placed 0.5-MG storage tanks and pumping stations along with approximately 10 miles of 16-inch-diameter reclaimed water transmission main and 4 miles of 12-inch-diameter reclaimed water transmission main.
- The reclaimed water Phase 2 expansion was completed in 2014, which included approximately 2 miles of 16-inch transmission pipe, additional storage at the West Port WRF in West County, and construction of the West County reclaimed WBS along the interconnect between the reclaimed water systems for the Rotonda and West Port WRFs.
- The reclaimed water Phase 3 expansion began in 2017 and was completed in FY 2020. It included Stage 5 Improvements at East Port WRF for a 95-MG reclaimed water storage pond and a 9-million-gallon-per-day (MGD) High-Service Pump Station (HSPS) and installation of three reclaimed water transmission mains (approximately 5.5 miles of 16-inch-diameter main along Placida Road, approximately 1.5 miles of 16-inch-diameter main along Cape Haze Drive, and approximately 1 mile of 12-inch-diameter main along Rotonda Boulevard West).

1.5 Major Events

CCU is an active Charlotte County department with projects and administrative activities underway. The following sections list significant events occurring within FY 2022.

1.5.1 General Operations

- Charlotte County continues to work with Jones Edmunds to provide the services required to implement the selected enterprise Cityworks EAMS. Services include but are not limited to software/database configuration, workflow definition/configuration, integration, and training.
- CCU staff worked with Kimley-Horn to develop a written capacity, management, operation, and maintenance (CMOM) program and roadmap to address a consent order from the Florida Department of Environmental Protection (FDEP). CCU is working with various consultants to fully implement the program in accordance with FDEP and US Environmental Protection Agency (EPA) requirements.
- Hurricane Ian greatly impacted CCU operations, causing extensive damage to the Administration Building and utility facilities and assets. CCU responded appropriately by conducting a Countywide Federal Emergency Management Agency (FEMA) assessment with HDR, Kimley-Horn, and Jones Edmunds. CCU is evaluating the feasibility of rehabilitating the damaged Administration Building.
- On March 22, 2022, the Board of County Commissioners (BCC) approved the interlocal agreement between Charlotte County and the Peace River Manasota Regional Water Supply Authority (PRMRWSA) for the Regional Integrated Loop System 2B Interconnection

Project. The project will be capable of supplying northwest Port Charlotte and West County with additional potable water.

- Blue Cypress Consulting, LLC, was selected on April 12, 2022, to complete a Charlotte County Utilities Business Process and Manpower Audit.
- CCU continues to have some consent orders with FDEP, but the consent orders continue to diminish due to the extensive capital improvements over the last few years.
- CCU modified numerous lift stations in the Mid County area to reflect 48-inch gravity interceptor installation and grand master lift station at the East Port WRF for better operational performance.
- CCU completed the West Port headworks rehabilitation/replacement project and replaced the screens, electrical, piping and concrete repairs.
- CCU continued with the Capacity Assessment and Assurance Program (CAAP) Framework Development and Flow Monitoring Program being conducted by Veith Engineering and Hazen-Sawyer. A final report is expected by end of 2023.
- CCU added portable and stationary generators to the sanitary sewer collection system that were procured through a FEMA grant.
- CCU received legislative appropriations for $1,000,000 and $2,000,000 for the Ackerman Septic to Sewer Project.
- In July 2022, Charlotte County West Port WRF received the Florida Water and Pollution Control Operators Association Safety Award in the Wastewater "B" category.

1.5.2 ENGINEERING

- CCU secured additional grant and low-interest funding monies for various projects through a FDEP Section 319(h) Nonpoint Source Pollution Grant and FDEP SRF construction loans.

- CCU is nearly complete with the design phase of two major wastewater plant expansion projects, which include advanced water treatment (AWT) modifications to the East Port WRF (9.0 MGD) and Burnt Store WRF (2.5 MGD); construction is expected to begin in 2023/2024.

- Major construction activities in FY 2022:

    - Ackerman Septic-to-Sewer Conversion Project – To address water-quality issues by replacing aged septic systems with centralized sewer collection systems. This project is partially funded by the State of Florida based on individual property assessments. A vacuum station and Zones 1 and 2 are currently under construction with the project scheduled to complete in early FY 2024.
    - The El Jobean Vacuum Station – Completed in November 2021 and is currently in service.
    - El Jobean Septic-to-Sewer Project – To address water-quality issues via replacement of aged septic systems with centralized sewer and vacuum collection systems. This project is partially funded by the State of Florida based on individual property assessments. Construction of Phase 3 began in February 2022. All on-lot sewer service connections were completed September 30, 2022.
    - Loveland Grand Master Lift Station (GMLS) and 48-inch Gravity Interceptor Project – Utility crews completed construction of a master lift station and a major 48-inch wastewater gravity interceptor to transfer wastewater to the East Port WRF. This Lift Mid County Lift Station Modifications project improved the operation and efficiency of

a substantial number of lift stations in the Mid County area. This project was completed in Spring 2022.

- Olean Boulevard and Gertrude Avenue utility improvements – Continued in 2022.
- Burnt Store Road Widening Phase 2 and Notre Dame – Continued in 2022. The project consists of all three major utility mains and is expected to be completed in March 2023. This project extended all three utilities approximately 3 miles south into Lee County along Burnt Store Road to serve new developments.
- Deep Creek Sewer Force Main Replacement Phase 1 – Complete. Phase 2 continued in 2022. The project is expected to be complete in March 2023.
- Easy Street Force Main Replacement – Completed in November 2021 to replace approximately 1,980 feet of 6-inch wastewater force main. The final project close-out was completed January 2022.
- Rehabilitation of Lift Station No. 2 – Completed in December 2021 including the replacement of 6-inch force main and 8-inch water main along Conway Boulevard.
- The Quesada Force Main Replacement Project – Design was completed in February 2021 for replacing approximately 780 linear feet of 12-inch wastewater force main and 1,841 linear feet of 20-inch wastewater force main that runs along Quesada Boulevard from the Master Lift Station to the Lion Heart waterway. Construction began in July 2021 and completed in July 2022.
- The Cochran Boulevard Reclaimed Water Main Extension Project – Began construction in late 2022 for installing 3,010 linear feet of 6-inch and 2,850 linear feet of 8-inch reclaimed water distribution main along the right-of-way of Cochran Boulevard from Quesada Avenue to Peachland Boulevard. The project is expected to be completed in Spring 2023.

- Major design activities in FY 2022:

  - CCU is nearly complete with the design to expand the East Port WRF from 6.0- to 9.0-MGD, including upgrades to achieve AWT effluent water quality, with various processes designed to accommodate expansion to 12.0 MGD. Construction is expected to begin Summer 2023 and complete in Winter 2025.
  - CCU is nearly complete with design to expand the Burnt Store WRF from 0.5- to 2.5-MGD, including upgrades to achieve AWT effluent water quality. Additionally, the design includes future phased upgrades to 5.0- and 7.5-MGD as future planning dictates. Construction is expected to begin Winter 2023 and complete in Summer 2026.
  - The design of Midway Boulevard (Ellicott to Lakeview) 24-inch force main and 16-inch water main is included with the Lake View Midway Water Quality Improvement Project (S2S).
  - The Flamingo-Edgewater Roadway and Utility Improvement Project design was initiated in FY2022. Johnson Engineering was awarded the Engineering Design contract. CCU is also engaged in modeling services with Jones Edmunds to aide in sizing of the infrastructure.
  - CCU completed design for the SR 776 Force Main Replacement project from Biscayne Drive to Charlotte Sports Park. This in-kind project for the FDEP Consent Order is expected to be complete by Summer 2023.
  - Work began on the Lake View/Midway Septic-to Sewer project to provide approximately 1,500 properties with centralized sewer service, new water service lines, and a new vacuum station. Project completion is estimated for late FY 2023.

- Work began for the planning stages for the Cape Haze Wastewater Expansion in late FY 2022 to connect approximately 500 properties with sewer service, new water service lines, and a new station.
- A consultant has been selected for the US 41 Northbound Utility Improvements in conjunction with the FDOT utility sidewalk and drainage improvements. The area is from Conway Boulevard to Paulson Drive.
- CCU contracted for survey work for numerous improvements throughout the county.
- CCU selected an engineering consultant for the Sewer Master Plan Update. The scope and fee will be finalized in FY23.
- CCU selected an engineering consultant for the West Port WRF expansion. The scope and fee will be finalized in FY23.
- CCU performed ongoing extensive modeling of the potable water system, sanitary sewer system, and reclaimed water system to reflect changes and growth occurring in the county. Results will be forthcoming in final reports.

1.5.3 Water System Operations

- CCU provided approximately 4.50 billion gallons of water to 66,734 connections in FY 2022.

1.5.4 Wastewater System Operations

- CCU treated 2.54 billion gallons of wastewater from 43,932 customers in FY 2022.
- CCU continued the successful program of sewer rehabilitation to reduce groundwater infiltration into the collection system. Work included internal closed-circuit television (CCTV) inspection of gravity sewer, smoke testing, manhole repairs, and service lateral repairs.

1.5.5 Reclaimed Water System Operations

- CCU provided irrigation water to golf courses, parks, roadway landscaping, and numerous residential and commercial customers in 2022. CCU continues to identify new users and improve operations with a focus on large users.

1.5.6 Instrumentation and Control Group

- CCU provided programmable logic controller (PLC) programming.
- CCU cross-trained between divisions.
- CCU installed and calibrated controls.

1.5.7 Operations Data Management

- CCU Operations staff completed initial VTSCADA implementation at all plant facilities. Full integration including migration from Data Flow Systems (DFS) to VTSCADA is pending work by the County Information Technology Department. The transition is expected to be complete by late 2023.

1.5.8 Reports and Studies

- CCU completed a Potable Water Master Plan with Jones Edmunds in January 2023 to prioritize CIP projects for the water treatment and distribution systems and document CCU's water conservation efforts. The document is expected to be finalized by April 2023 in accordance with direction from CCU and the BCC.

- CCU is amending the South County portion of the Sewer Master Plan with various consultants as part of the Burnt Store WRF AWT Expansion project.
- CCU and Jones Edmunds are completing a Reclaimed Water Master Plan to prioritize CIP projects for the reclaimed water distribution systems. The report is expected to be finalized by April 2023.
- CCU continues to work with various consultants to prepare quarterly reports for each WRF and prepare operating permit renewals for the WRFs and deep injection wells.
- CCU is developing a CMOM program in compliance with the requirements of the FDEP Consent Order. This work includes the Capacity Assessment and Assurance Program (CAAP) Framework Development and Flow Monitoring Program and is being conducted by Veith Engineering and Hazen-Sawyer. A final report is expected by end of 2023.
- Operations staff began working with Hazen-Sawyer to update its Pre-Treatment and Fat, Oil, and Grease (FOG) programs and ordinances. The updated ordinances are scheduled to be presented to the BCC in 2023.
- CCU has developed O&M manuals for all plants, water distribution, wastewater collection, and reclaimed systems in compliance with EPA guidelines. However, maintaining and updating the O&M manuals remains a progressive requirement whenever new features are introduced or when notable changes to operation occurs.

1.6 ACKNOWLEDGEMENTS

Jones Edmunds would like to acknowledge the following Charlotte County staff for providing guidance, information, field assistance, and review in the preparation of this report:

- Dan Atkisson Jr.
- Tod Avers
- Tim Bracke
- Bruce Bullert
- Dean Campbell
- Chris Carpenter
- Denise Caruthers
- Delmis Castillo
- David Chamberlain
- Johnny Chamberlain
- Thomas Cimino
- Thomas Dunn
- Chris Durso
- Scott Ericson
- Jeremy Frost
- Tom A. Hill
- Robert Jones
- Sandra Lavoie
- James (Ross) Lynch
- Michael McCrumb
- Gerry Mills
- Tina Nusbaum
- Norma Rogers
- John Sanguinet
- Bruce Schellinger
- Ken Stecher
- Ruta Vardys
- Caroline Wannall
- Dave Watson

2 ADMINISTRATION

2.1 COUNTY GOVERNMENT

Charlotte County government operates under an elected BCC and an appointed County Administrator. The BCC is responsible for the legislative duties of the County government. Five County Commissioners representing separate Districts serve on the BCC over staggered 4-year terms.

The County Administrator is the County's chief administrative officer and is responsible for all administrative matters and operations under the BCC's authority. The County Administrator's responsibilities include appointing County Department Directors with final approval by the BCC.

2.2 UTILITIES DEPARTMENT

CCU, a Charlotte County government department, provides potable water production and distribution, wastewater collection and treatment, and reclaimed water distribution for irrigation within the certified service area. CCU serves nearly 70,000 homes and businesses in the Greater Port Charlotte area, El Jobean, Gulf Cove, Englewood East, Rotonda, and Burnt Store, as well as bulk customers including El Jobean Water Association, Riverwood Development, Inc., Encore Super Park, and Little Gasparilla Island.

CCU maintains interconnects for emergency bulk water sales with the Charlotte Harbor Water Association, Gasparilla Island Water Association, City of North Port Utilities, and EWD. An interconnect with the City of Punta Gorda allows CCU to provide or receive water depending on each system's demands.

CCU's mission, vision, and values are as follows:

Mission: To provide safe, reliable drinking water, reclaimed water and wastewater service for the enrichment of the community.

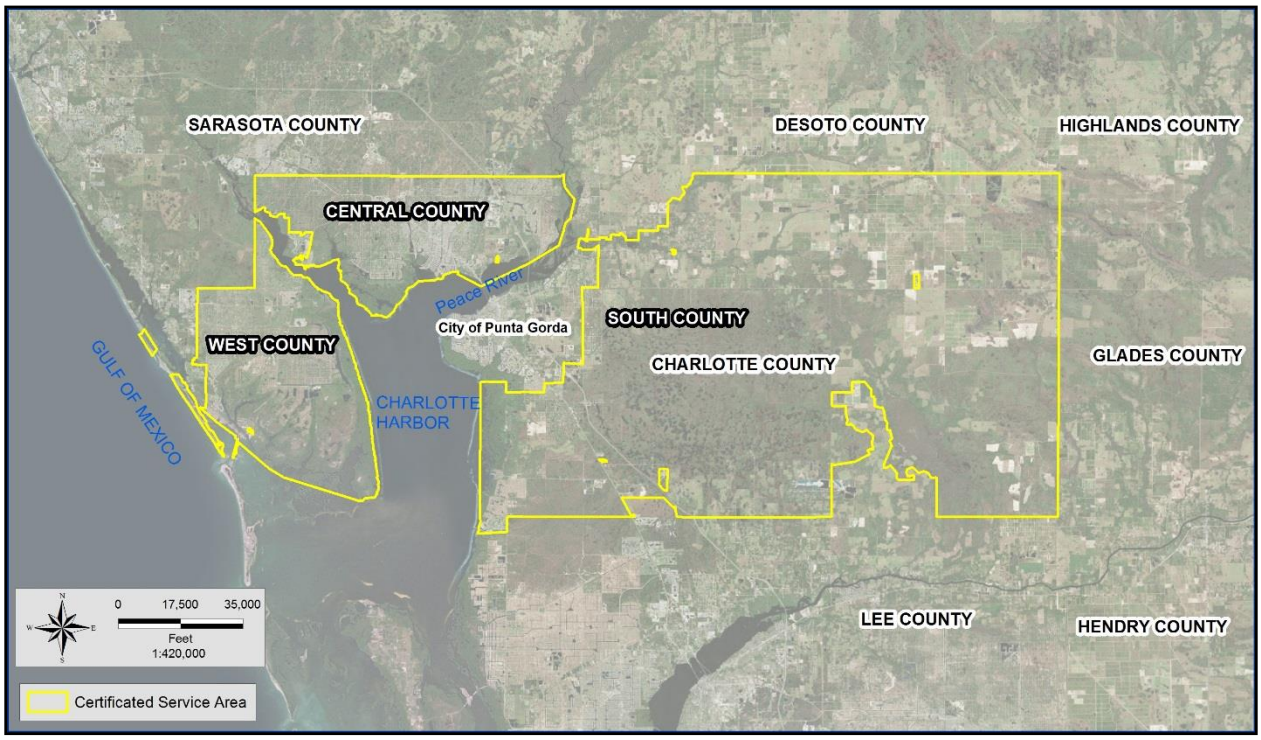
Vision: To enrich our community's quality of life by providing reliable utility services that fulfill future demands.

Values:

- **Committed** – to public and environmental safety as good stewards of what we have been given.
- **Accountable** – to the public through transparency and honesty.
- **Resourceful** – efficiencies through collaboration, teamwork, technology, and defined processes.
- **Energetic** – by providing exemplary service that exceeds our community's expectations.
- **Supportive** – by striving to meet the needs of the public and our environment.

Figure 2-1 shows the CCU certificated service area outlined in yellow.

Figure 2-1 CCU Certificated Service Area



CCU is led by a Utilities Director, who works under the direction of the County Administrator and Deputy County Administrator. CCU consists of four divisions: Administration, Business Services, Engineering Services, and Operations.

The Administration Division includes the Utilities Director and support staff. The Administration Division manages the overall utility and supervises all other utility divisions. Specific duties of the Administrative Division include Utilities Department budget oversight, Grants Management, Asset Management, and warehouse and Administrative Support Services.

The Director's responsibilities include:

- Planning for water and wastewater needs.
- Developing potable water treatment/distribution systems.
- Developing wastewater treatment/collection systems.
- Developing reclaimed water distribution systems.
- Operating the County's water, wastewater, and reclaimed water systems.
- Instituting water conservation practices and educational programs.
- Communicating – internally and externally with customers.

The Business Services Division is managed by the Business Services Manager and includes:

- Customer Service.
- Billing and Collections.
- Meter Services.

The Engineering Services Division provides engineering and construction observation services to residential and commercial utility customers. The Division is managed by the Engineering Services Manager and includes:

- Preliminary Engineering Group.
- Design Group.
- Construction Services Group.

The Operations Division, overseen by the Utility Operations Manager, is responsible for the O&M of all County-owned and -operated water, wastewater, and reclaimed water facilities including:

- Water and wastewater treatment facilities.
- Water distribution systems including booster pumping stations, storage tanks, fire hydrants, valves, and the entire water distribution piping.
- Wastewater collections including lift stations and vacuum stations, low-pressure sewer, gravity sewer, vacuum sewer, and force main piping systems.
- Reclaimed water distribution systems including cross-connection control and water-quality monitoring.
- An Instrumentation and Controls (I&C) Group, under a supervisor, formed from existing I&C technicians in each division.

Financial Services are supplied by the Fiscal Services Division of the Charlotte County Budget & Administrative Services Department. CCU pays for five personnel, led by a Financial Manager, through an inter-fund transfer.

CCU also funds two positions in the County Information Technology Department to assist with upgrading and maintaining hardware and software systems.

At the start of 2023, the total number of positions budgeted for CCU was 260, with 232 positions filled by full-time employees.

Figure 2-2 and Figure 2-3 show the CCU organizational structure at end of FY 2022 (October 2022).

2.3 ADMINISTRATION FACILITIES

The Charlotte County Environmental Campus is on an outparcel of the East Port WRF. The campus includes the CCU Administration Building, Operations Service Center/Warehouse, Charlotte County Public Works Solid Waste Division, Community Services, University of Florida Institute of Food and Agricultural Services (UF/IFAS) Extension Services Division, the Charlotte County/Punta Gorda Municipal Planning Organization, and Public Works Mosquito and Aquatic Weed Control.

Figure 2-2 January 2023 CCU Organizational Chart – Overall

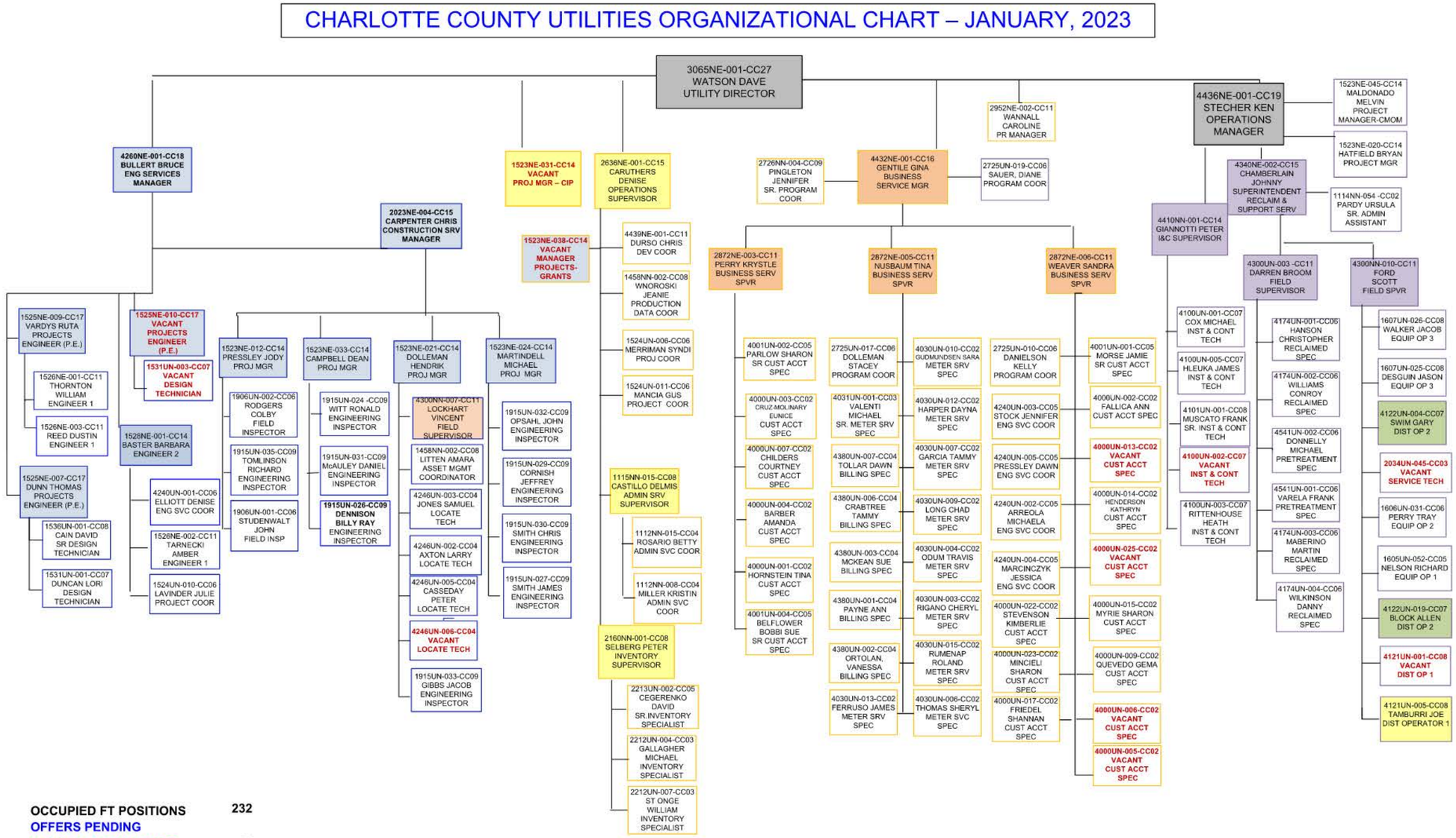
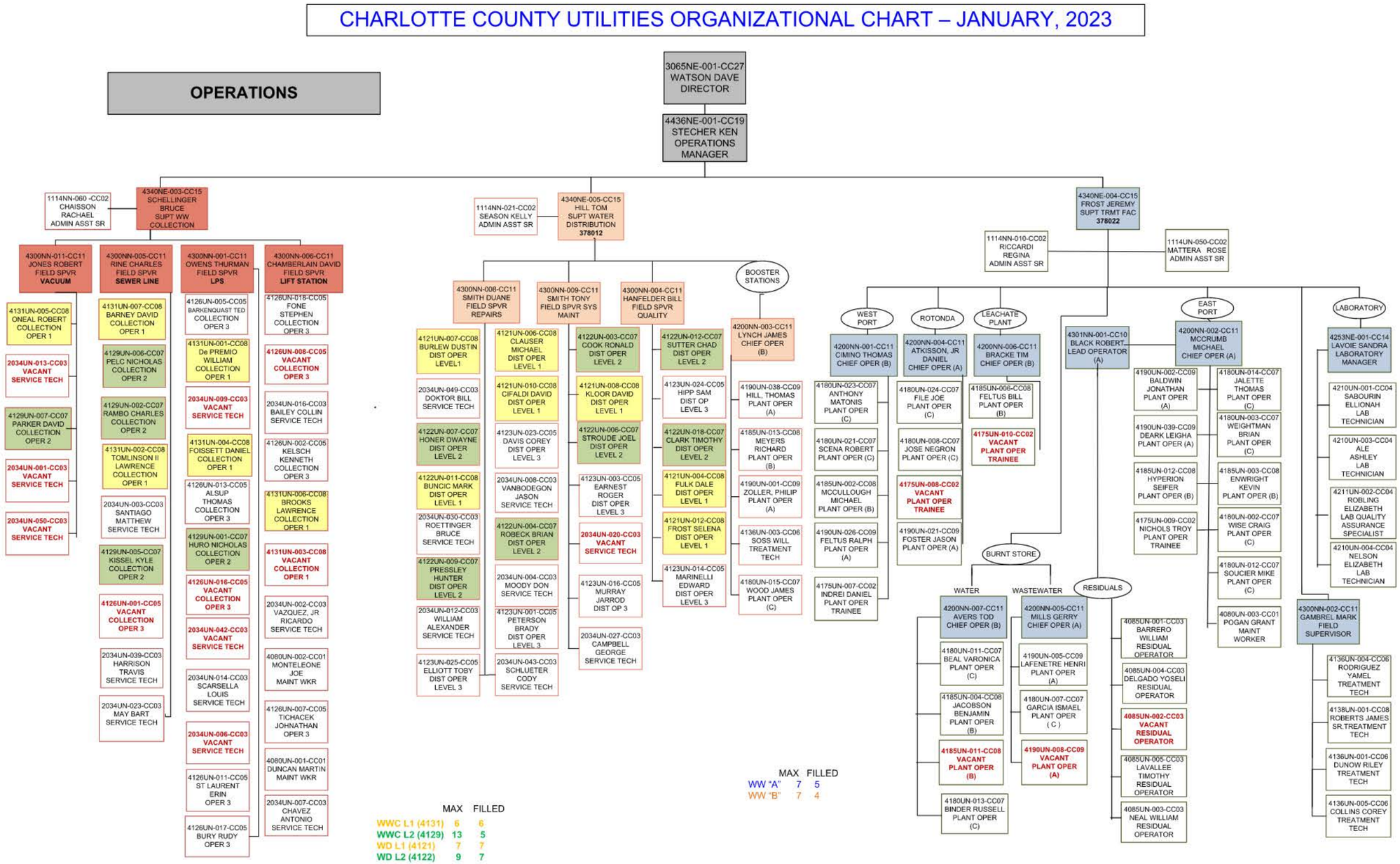


Figure 2-3 January 2023 CCU Organizational Chart – Operations



2.4 CCU WATER CONSERVATION EFFORTS

In FY 2022, CCU continued with its outreach efforts, including oversight of the Water Conservation Programs and community education efforts discussed in the following sections.

2.4.1 WATERING RESTRICTIONS

For the portion of Charlotte County where CCU provides service, Charlotte County follows current Southwest Florida Water Management District (SWFWMD) Conservation Measures as posted on their website *https//www.SWFWMD.state.fl.us/.* For portions of Lee County where CCU provides service, Charlotte County follows the South Florida Water Management District (SFWMD) Conservation Measures as posted on their website *https://www.sfwmd.gov/community-residents/landscape-irrigation*.

2.4.2 IN-HOUSE ENFORCEMENT OF WATERING RESTRICTIONS

The BCC approved enforcement of watering restrictions in early 2008. The enforcement allows CCU staff to progressively enforce water restrictions for CCU customers, including written warnings with educational materials and escalating unauthorized water usage charges for repeat offenses. These charges appear on the customer's water bills. The Sheriff's Office continues to provide enforcement services for non-CCU customers.

2.4.3 WATER RESTRICTIONS ORDINANCE

On November 24, 2020, the BCC adopted Ordinance #2020-045 modifying the existing ordinance to comply with year-round SWFWMD water conservations and to add water shortage plan provisions distinguishing between water management districts in Charlotte County. The details of the watering restrictions are contained at *https://www.charlottecountyfl.gov/departments/utilities/about-utilities/conservation/water-restriction.stml.*

2.4.4 CONSERVATION-BASED RATE TIERS

CCU uses a five-tier rate structure where the water user pays different prices per unit of water delivered depending on the amount used, with a higher price charged for larger quantities.

2.4.5 RECLAIMED WATER USE AND EXPANSION

Another method for conserving water supplies is to encourage the use of reclaimed water. Using reclaimed water for irrigation and other non-potable water needs reduces the demand for potable water, surface water, and groundwater. CCU started its reuse program on August 16, 1994, when the first customer was signed to the East Port Water WRF. The County's other treatment facilities were eventually upgraded to provide reclaimed water to meet customer demands in other parts of the County. In 2005, CCU began designing a customer-based reclaimed water transmission system rather than a WRF service-area-based system. Preliminary design began with preparing a computerized hydraulic model.

The goal of the modeling effort was to identify the infrastructure needed to connect the three WRFs in Mid and West County into one reclaimed water transmission system and to serve as many customers as economically possible. Today, CCU has two reclaimed water systems – one serves the areas of Mid and West County, and one serves the South County area. CCU's Mid/West County system operates under a Master Reuse Permit approved by FDEP that allows

CCU to move reclaimed water from East Port WRF, West Port WRF, and Rotonda WRF to customers. Abundant reclaimed water at the East Port WRF and customer demands for irrigation water throughout the central and west parts of the County were the driving forces behind CCU's desire to expand its reclaimed water distribution system. Today, the Master Reuse System is kept fully pressurized to allow customers to withdraw reclaimed water when needed.

Over the years, the hydraulic model continued to be improved and used as a tool to expand the reuse system throughout the County. In January 2020, a Technical Memorandum completed by Jones Edmunds documented the updates to the CCU reclaimed water hydraulic model, model verification, current operations, and analyses and recommendations for reclaimed water system improvements to maximize conveyance of reclaimed water to existing and future customers. CCU and Jones Edmunds have continued this effort and have developed the CCU Reclaimed Water Master Plan to prioritize CIP projects for the reclaimed water systems; the report is expected to be finalized by April 2023.

2.4.6 Community Outreach

CCU regularly participates in water conservation-related outreach including bill inserts, news articles, and speaking engagements within the community. CCU funded a portion of the salary for a Florida Yards and Neighborhoods Charlotte County UF/IFAS Extension Program Assistant for the past several years. CCU and UF/IFAS Extension Services work jointly to promote Florida-Friendly Landscaping. A donated demonstration garden is on CCU's Environmental Campus property. The garden is accessible to all Charlotte County residents and is maintained by Master Gardeners who are given free space at the Campus to better educate the residents.

CCU conducts citizen educational tours at the Burnt Store Reverse Osmosis (RO) WTP and CCU's four WRFs. The purpose of the tours is to promote alternative water sources, water conservation, and good stewardship of water resources.

The water/wastewater plant tours included:

- Water/Wastewater Treatment Processes.
- Regulatory Requirements.
- State-of-the-Art Membrane Bioreactor (MBR) and RO Technology.
- Process for Producing Reclaimed Water.
- Treatment and Disposal of Effluent.
- Biosolids and Their Disposal.
- Environmental Impacts of Water Reclamation.
- Alternative Water Sources.

CCU promotes an understanding of its operations through outreach programs such as:

- Water Conservation Booth at the Charlotte Harbor Nature Festival.
- Presentation of the Utility for County Ambassador Program.
- Handouts and Conservation Display at the Environmental Campus and Administration Building.
- Speaking Engagements at Homeowner Association (HOA) meetings.
- Engineering Availability and Business Services Presentations to Charlotte County Realtors.
- Participation at Safety and Emergency Planning Fair at Heritage Oak Park Association.

- Presentations and Speaking Engagements at local schools.
- Participation at Government Academy Day.
- Project Information Meetings for Residents and Business Owners.
- H_2O and Your Health Program – for proper hydration by drinking CCU tap water.

2.4.7 Water Conservation Month

CCU's annual Water Conservation Month program includes a BCC proclamation with community outreach/educational displays at the Murdock County Administration office and at the CCU office year-round.

2.4.8 CCU Website/Social Media

Customers can receive the latest water restrictions, conservation tips, and general CCU current events at the Charlotte County website, *www.charlottecountyfl.gov,* and at the Administration office. The public can also receive updated information on projects, services, conservation tips, hydration information, and general current events with pictures on Facebook. Facebook also provides an avenue to announce public outreach events and educational tours and to make reservations online to attend events and tours.

2.5 Financial

CCU is a government-owned enterprise fully funded by customer rates, not by tax dollars. Savings opportunities (or profits) are passed through to the benefit of the utility customers. CCU's policies, rates, and security deposits are established by the BCC. The County Clerk of Circuit Court serves as the accountant and auditor for the BCC and is responsible for the collection and disbursement of County funds.

2.5.1 Revenues

No rate increases occurred in Fiscal Year 2022. A rate study will be completed in FY 2023.

The HeartShip Program is available to help customers who are faced with a period of personal or family crisis and do not have sufficient money to pay their utility bill. This program is funded by contributions from caring members of the community. The County's Human Services Department, in cooperation with CCU's Business Services Division, administers the HeartShip funds.

The total O&M revenue for FY 2022 water and wastewater services was $87,192,954. The total O&M connection charge revenue was $6,782,024, and the total connection fee revenue was $19,262,790.

2.5.2 CCU Customer Base

During FY 2022, the number of active water services increased from 64,569 to 66,734, and the number of active sewer services increased from 42,088 to 43,932. For planning purposes, the level of water and wastewater service established by CCU is 225 gallons per day (gpd) of water consumption per equivalent residential unit (ERU) and 190 gpd of wastewater flow per ERU. These levels, as established by the Charlotte County 2050 Comprehensive Plan, represent peak day usage, including fire flow.

2.5.3 INSURANCE

CCU is self-insured. The self-insurance is provided by the County and is administered by the Gehring Group, with Kurt Gehring acting as the Agent of Record. CCU is also covered by general property and liability insurance, excess property insurance, boiler and machinery insurance, and pollution liability insurance. Utility buildings and contents are covered for up to 100 percent of the replacement cost without depreciation. In Mr. Gehring's opinion, the insurance coverage is adequate for CCU and its facilities. Therefore, the County complies with the bond covenant property insurance requirements as set forth below:

> *Insurance – The Issuer will carry such insurance as is ordinarily carried by private or public corporations owning and operating utilities similar to the System with a reputable insurance carrier or carriers, including public and product liability insurance in such amounts as the Issuer shall determine to be sufficient and such other insurance against loss or damage by fire, explosion (including underground explosion), hurricane, tornado or other hazards and risks, and said property loss or damage insurance shall at all times be in an amount or amounts equal to the fair appraisal value of the buildings, properties, furniture, fixtures and equipment of the System, or such other amount or amounts as the Consulting Engineers shall approve as sufficient.*
>
> *The Issuer may establish certain minimum levels of insurance for which the Issuer may self-insure. Such minimum levels of insurance shall be in amounts as recommended in writing by an insurance consultant who has a favorable reputation and experience and is qualified to survey risks and to recommend insurance coverage for persons engaged in operations similar to the System.*
>
> *The Issuer shall, immediately upon receipt, deposit the proceeds from property loss and casualty insurance to the credit of the Revenue Fund. The proceeds from property loss and casualty insurance shall be applied as follows: (A) if such proceeds, together with other available funds of the Issuer, are sufficient to repair or replace the damaged portion of the System, such proceeds and other available funds shall be deposited to the credit of the Renewal and Replacement Funds and, together with any other available funds of the Issuer, applied to such repair or replacement; or (B) if such proceeds, together with other available funds of the Issuer, are not sufficient to repair or replace the damaged portion of the System or if the Issuer makes a determination in accordance with Section 5.07 hereof that such portion of the System is no longer necessary or useful in the operation of the System, such proceeds shall (1) if such proceeds equal or exceed $50,000, (a) be applied to the redemption or purchase of Bonds or (b) be deposited in irrevocable trust for the payment of Bonds in the manner set forth in Section 9.01, provided the Issuer has received an opinion of Bond Counsel to the effect that such deposit shall not adversely affect the exclusion, if any, from gross income of interest on the Bonds for purposes of federal income taxation, or (2) if such proceeds are less than $50,000, be deposited in the Revenue Fund.*

2.6 RATE COMPARISON

The County investigated the rates and rate structure for various neighboring utility systems that provide residential services. The results of this comparison as of March 2022 assumes that water service consists of delivering 4,000 gallons of water per month through a standard (3/4-inch) meter and that sewer service flows correspond with 4,000 gallons of water per month. Table 2-1 presents the rate comparison results.

Table 2-1 Rate Comparison

Utility Systems	Water Charge ($)	Wastewater Charge ($)	Combined Charges ($)
CCU:			
Rates as of April 2022	50.58	67.22	117.80
Other Neighboring Utilities:			
City of Arcadia (outside City)	57.64	65.38	123.02
City of Marco Island (outside City)	48.52	77.38	125.90
Desoto County	59.23	55.04	114.27
City of Fort Myers (outside City)	36.14	71.49	107.63
City of North Port (outside City)	44.96	66.02	110.98
FGUA – North Fort Myers	49.68	59.58	109.26
City of Venice	51.33	57.29	108.62
City of Marco Island (inside City)	53.92	52.48	106.40
FGUA – Lake Fairways and Pine Lakes	49.68	58.79	108.47
City of North Port (inside City)	39.11	67.22	106.33
City of Fort Myers (inside City)	28.94	71.49	100.43
FGUA – Lehigh Acres	38.96	63.09	102.35
St. Lucie County Utilities	41.06	61.29	99.59
Collier County	38.15	58.30	96.45
City of Arcadia (inside City)	38.44	43.57	82.01
Okeechobee Utility Authority	43.75	57.04	100.79
City of Cape Coral	32.92	57.23	90.15
City of Punta Gorda (outside City)	43.24	44.51	75.45
City of Sarasota (inside City)	33.54	55.23	88.77
City of Sarasota (outside City)	41.50	67.53	109.03
City of Naples (outside City)	18.59	48.84	67.43
Sarasota County	28.27	54.64	81.91
City of Clearwater	35.21	46.00	81.21
Bonita Springs Utility	26.81	47.34	74.15
Lee County	25.67	43.85	69.52
Englewood Water District	28.30	42.74	71.04
Hillsborough County	30.82	30.82	61.64
Pinellas County	27.32	35.17	62.49

Utility Systems	Water Charge ($)	Wastewater Charge ($)	Combined Charges ($)
Manatee County	22.62	54.22	76.84
City of Bradenton	27.53	34.76	62.29
City of Punta Gorda (inside City)	24.75	35.61	60.36
City of Naples (inside City)	14.87	39.07	53.94

Note: The reflected residential rates were in effect April 2022, are exclusive of taxes or franchise fees if any, and reflect rates charged for inside the service, unless otherwise noted.

2.7 Large Water Users

Table 2-2 and Table 2-3 lists the 10 largest water consumers in FY 2022 for the Mid/West and South County distribution systems, respectively.

Table 2-2 CCU Mid/West County Large Water Users

Water Customer	Total Water Purchased (thousands of gallons)
Riverwood Community Development District	60,790
El Jobean Water Association	27,000
HCA Florida Fawcett Hospital	22,104
Little Gasparilla Water Utility	16,805
Shorepoint Health – Port Charlotte	13,628
Riverwood Development Inc.	12,449
Homeowners of Port Charlotte Village	12,009
Encore Super Park	11,050
Shorepoint Health – Port Charlotte	8,980
Charlotte County School Board	8,346
Total	**193,161**

Table 2-3 CCU South County Large Water Users

Water Customer	Total Water Purchased (thousands of gallons)
Florida Design Communities	2,626
Keel Club Condo Assn Inc.	2,508
SHM Burnt Store, LLC	2,507
Grande Isle Towers I & II Condo Association Inc.	2,503
WCI Communities, Inc.	2,329
SHM Burnt Store, LLC	1,761
Vista Del Sol Restaurant at Burnt Store Marina	1,153
Acapulco Gardens, LLC	1,023
Turtle Crossing Plaza, LLC	950
Marina South Shore Condos	813
Total 10 Largest Users	**18,173**

2.8 PLANNING RECOMMENDATIONS

Table 2-4 through Table 2-7 summarize the planning recommendations for CCU's continued operations of the utilities systems.

Table 2-4 Administration Planning Recommendations

Recommendation:	Continue CCU's vision to ensure safe, reliable utility services at fair and reasonable rates.
Recommendation:	Continue developing and updating standards for water and sewer construction to ensure the most effective use of CIP funds.
Recommendation:	Continue developing options for water, sewer, and reclaimed water service in the County to meet the growing demand for municipal utility services.
Recommendation:	Continue developing the Utilities' Information System functions to update/replace software and computer equipment to increase operating efficiencies and cost savings.
Recommendation:	Continue to explore regional solutions to water and wastewater service needs for the mutual benefit of Charlotte County and the adjoining counties and cities.
Recommendation:	Complete a rate study evaluation to determine fair adjustments to current water, sewer, and reclaimed water rates as it relates to ongoing and future projects (current rates were established in 2021).
Recommendation:	Continue to document planned and proposed developments to assist with future planning.
Recommendation:	Continue to pursue FEMA funding for rehabilitation of utility assets damaged by Hurricane Ian.
Recommendation:	Continue to evaluate the feasibility of rehabilitating the damaged Administration Building.

Table 2-5 Water System Planning Recommendations

Recommendation:	Continue to update the water system computer models and use them as planning tools for future water system improvements.
Recommendation:	Begin investigating alternatives and improvements to the fixed base water meter system.
Recommendation:	Continue to integrate acquired utilities into the overall CCU water system to maximize reliability and reduce costs to CCU customers.
Recommendation:	Explore ways to augment the Peace River water supply through economically feasible means including new water sources.
Recommendation:	Continue to make improvements at the water storage tank/booster pumping station facilities to increase reliability and control of the pumps to improve water distribution to customers.
Recommendation:	Plan for future water demands in the South County Service Area by analyzing the water distribution system using the computer water model completed in 2004 and most recently updated in 2021.
Recommendation:	Create a water system O&M Manual with operating protocols based on EPA and American Water Works Association (AWWA) best practices.
Recommendation:	Determine the Babcock Ranch Wellfield potential withdrawal capacity and pursue renewal of the existing 372-MG annual allocation secondary source permit as a primary water source permit.

Table 2-6 Wastewater System Planning Recommendations

Recommendation:	Use the wastewater lift station and force main computer model to assess the need for upgrades to the system based on expected demand for services.
Recommendation:	Continue to televise and smoke test gravity sewers to locate source(s) of inflow/infiltration (I/I). Repair gravity sewers and manholes as required to mitigate I/I and regain sewer and WRF capacity.
Recommendation:	Continue construction and plan for the next phases of sewer expansion in the Port Charlotte area in accordance with the 2017 Sewer Master Plan.
Recommendation:	Continue working toward an operational CMOM program.
Recommendation:	Create O&M Manuals for all wastewater plants in compliance with EPA guidelines.

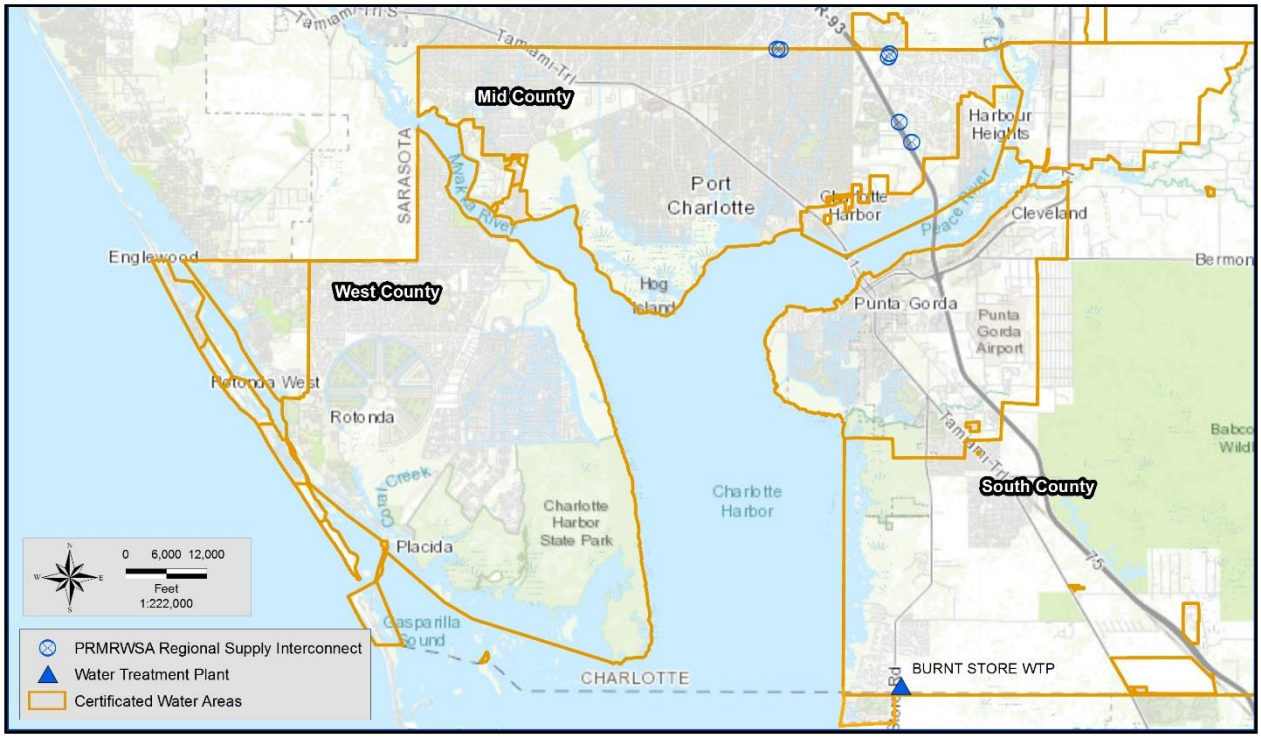
Table 2-7 Reclaimed Water System Planning Recommendations

Recommendation:	Seek ways to increase the use of reclaimed water currently produced by CCU WRFs including improving reliability and access for customers.
Recommendation:	Continue to update the reclaimed water system computer models and use them as planning tools for future system improvements.
Recommendation:	Create a reclaimed water system O&M Manual with operating protocols.
Recommendation:	Continue to work with new developers to determine economic feasibility of teaming opportunities to expand the reclaimed water distribution system, especially for potential large users.

3 WATER TREATMENT PLANTS

CCU has two water supply sources for its two independent public water systems (PWSs). The mid and west parts of Charlotte County are provided with treated surface water from the PRMRWSF. The water is purchased from the PRMRWSA under a multi-county water supply agreement and conveyed to the County via transmission mains. The south area of Charlotte County (South County) is supplied treated groundwater from the CCU-owned Burnt Store RO WTP. Figure 3-1 shows the Burnt Store RO WTP, PRMRWSA supply interconnect, and water service areas. This Chapter presents an overview of the PRMRWSF and a detailed assessment of the County-owned Burnt Store RO WTP.

Figure 3-1 Charlotte County Water Service Areas



3.1 PEACE RIVER MANASOTA REGIONAL WATER SUPPLY FACILITY

Charlotte County is a member of the PRMRWSA, which was created by agreement on February 26, 1982, by Charlotte, DeSoto, Manatee, Hardee, and Sarasota Counties. Hardee County ceased to be a member the following year. The initial term of the agreement was 35 years, renewable for an equal consecutive term; a new Master Water Supply Contract was executed in 2005 with amendments in 2008 and 2015 by the four members and one customer – the City of North Port.

The PRMRWSA owns and operates the PRMRWSF, which is on the Peace River in DeSoto County approximately 4 miles northeast of Charlotte County. The source water, the Peace River, is treated via conventional surface-water treatment consisting of coagulation, flocculation, sedimentation, filtration, and disinfection. The five-step process is used to remove organics, color, and turbidity while inactivating bacteria that may be present in the

source water. The water produced by the PRMRWSA meets current EPA and FDEP drinking water requirements.

Treated water is distributed to member customers using high-pressure pumps and transmission mains. The PRMRWSA completed a Regional Expansion Program in 2009, which included constructing a 6-billion-gallon reservoir. The reservoir is designed to store water during periods of high Peace River flow for use when the Peace River flow is low and the withdrawal from the river is reduced or not permitted. The allocated cost to Charlotte County for the expansion was approximately $27.7 million.

Charlotte County's allocation of the PRMRWSA-produced water is currently 16.1 MGD annual average daily flow (AADF), 19.320 MGD for the peak monthly average day, and 22.54 MGD for the maximum day. In FY 2022, the PRMRWSA supplied Charlotte County with a total of approximately 4,305 MG or 11.8 MGD. However, each PRMRWSA member has an equal right to reasonably increase its allocation of water if the member can demonstrate the need for the increase because of future water demands or to meet current demands that cannot be met by the current supply. In this instance, the PRMRWSA is responsible for obtaining all environmental permits for the expansion to meet demands.

3.2 Burnt Store RO WTP

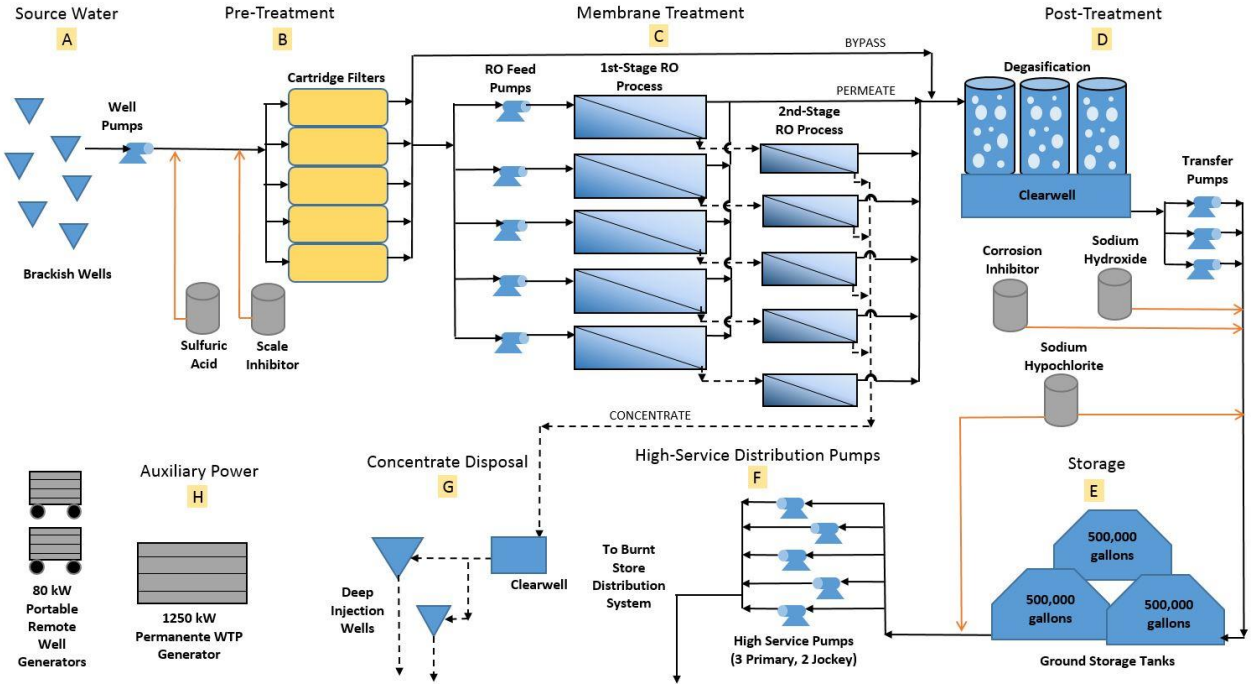
The Burnt Store RO WTP (PWS ID6080318) is owned and operated by CCU. The South County service area is served by the Burnt Store RO WTP at 17430 Burnt Store Road in Punta Gorda. The Burnt Store RO WTP was expanded in 2009 and has a permitted treatment capacity of 3.61 MGD.

The Burnt Store RO WTP draws groundwater from six production wells. As raw source water is pumped from the production wells to the RO process room, sulfuric acid and a scale inhibitor are injected into the raw water stream to prevent membrane scaling during the RO treatment process. Downstream of the chemical injection, the pH-adjusted raw water passes through cartridge filters to remove sand and small particles present in the raw water sources. After the cartridge filters, the RO feed water passes through high-pressure RO feed pumps before entering the RO treatment trains.

The RO process separates dissolved solids from the water by forcing the water through a semi-permeable membrane. The process requires significant pressure and results in two streams. The water that permeates through the membrane is referred to as permeate, and the water that remains on the feed side of the membrane is referred to as the concentrate. Two-stage processes can be used to increase the water recovery of the system by processing the concentrate of the first stage through a second stage of membranes. The remaining concentrate is disposed of via on-site deep well injection. In FY 2022, approximately 9 percent of the cartridge-filtered water bypasses the membrane process for permeate stabilization before post-treatment.

During post-treatment, the permeate is conveyed through packed tower degasifiers for hydrogen sulfide removal. After degasification, sodium hydroxide is added for pH adjustment, followed by a corrosion inhibitor and sodium hypochlorite for disinfection. The finished water is stored in GSTs before passing through the high-service pumps (HSPs) to the distribution system. Figure 3-2 shows the Burnt Store RO WTP process flow diagram.

Figure 3-2 Burnt Store RO WTP Process Flow Diagram



The Burnt Store RO WTP process consists of the following components:

- A) Source Water
  - Six Groundwater Wells (Well No. 15 is out of service and is not currently permitted for withdrawals.)
  - Six Submersible Pumps
  - Twelve Monitoring Wells
- B) Pre-Treatment Process
  - Sulfuric Acid Chemical Feed System
  - Scale Inhibitor Chemical Feed System
  - Five Cartridge Filter Vessels
- C) Membrane Treatment Process
  - Five RO High-Pressure Feed Pumps
  - Two 2-Stage RO Trains (500,000-gpd capacity each)
  - Three 2-Stage RO Trains (750,000-gpd capacity each)
- D) Post-Treatment Process
  - Sodium Hypochlorite Chemical Feed System
  - Sodium Hydroxide Chemical Feed System
  - Corrosion Inhibitor Chemical Feed System
  - Control Valve for Blended Raw Water
  - Three Packed Tower Degasification Units
  - Three Transfer Pumps

- E) Storage
  - 1.5 MG – Three 500,000-gallon Finished-Water GSTs
- F) Distribution HSPs
  - Two Distribution HSPs (medium flows)
  - One Distribution HSP (high flows)
  - Two Distribution Jockey Pumps (low flows)
- G) Concentrate Disposal
  - Two Deep Injection Wells with a Total Capacity of 3.44 MGD
  - One Dual-Level Deep Monitoring Well
- H) Auxiliary Power
  - One 1,250-kW Generator (serving the original RO Process Building, RO Process Building, Operations Building, and three on-site groundwater wells)
  - Two 80-kW Portable Generators (serving four remote groundwater wells)

3.2.1 Regulatory Considerations

The Burnt Store RO WTP is a Category II, Plant Class B, community PWS. The permit schedule includes:

- FDEP – Deep Injection Well IW-1 (Underground Injection Control [UIC] Permit No.: 0271367-007-UO/1I) was issued on May 14, 2019, and expires on May 14, 2024. According to Chapter 62-4.090, Florida Administrative Code (FAC), a permit renewal application should be submitted at least 60 days before the expiration date.
- FDEP – Deep Injection Well IW-2 (UIC Permit No.: 0271367-008-UO/1X) was issued on August 18, 2022, and expires August 18, 2027.
- SWFWMD Water Use Permit (WUP) was issued on September 25, 2013, and expires on September 25, 2033.

3.2.1.1 Water-Quality Monitoring

As required by federal and state regulations for all utilities, CCU routinely and continuously monitors the quality of the raw water and finished water produced at the Burnt Store RO WTP. Monitoring wells are sampled quarterly, and the samples are sent to the CCU laboratory at the East Port WRF. Water-quality data from the production and monitoring wells are reported to SWFWMD and stored on the CCU the Cityworks Enterprise Asset Management System (EAMS). In addition to meeting regulations, water-quality parameters are used to assess the performance of the WTP and to determine maintenance events.

Table 3-1 shows the Burnt Store RO WTP finished water quality for FY 2022. Additional water quality data are found in the Consumer Confidence Reports discussed in Chapter 4.

Table 3-1 Burnt Store RO WTP Finished Water Quality for FY 2022

Month	pH (Std Units)*	TDS (mg/L)*	Cond. (µS/cm)*	Free Chlorine (mg/L)*	Alkalinity (mg/L)*	Total Hardness (mg/L)*	Remote Sample pH (Std Units)	Remote Sample Free Chlorine (mg/L)
Oct-21	7.82	291	623	1.48	27	100	7.78	1.37
Nov-21	7.77	288	617	1.50	29	101	7.75	1.40
Dec-21	7.75	288	618	1.54	31	101	7.74	1.42
Jan-22	7.76	284	611	1.53	24	76	7.78	1.43
Feb-22	7.76	283	609	1.58	24	99	7.79	1.48
Mar-22	7.78	286	614	1.60	31	100	7.79	1.50
Apr-22	7.78	286	614	1.67	25	107	7.78	1.53
May-22	7.83	286	615	1.52	40	120	7.79	1.42
Jun-22	7.82	292	604	1.49	26	140	7.61	1.37
Jul-22	7.81	295	627	1.48	18	78	7.83	1.35
Aug-22	7.81	292	623	1.52	32	117	7.86	1.43
Sep-22	7.85	292	619	1.47	22	96	7.83	1.36
Annual Avg.	7.79	289	616	1.53	27	103	7.78	1.42

Notes: * GST Sample Location; mg/L = milligrams per liter; TDS = Total Dissolved Solids; µS/cm = micro-Siemens per centimeter.

3.2.1.2 Production Wells and Treatment Capacity

The SWFWMD WUP (No. 3522.012) specifies the Burnt Store RO WTP's permitted well capacities. Table 3-2 lists the well specifications and permitted withdrawal capacity of the current and future wells based on average day and peak month conditions.

Table 3-2 Burnt Store RO WTP Current and Future Production Wells

Well ID No.	Diameter (inches)	Depth Total/Cased (feet-bls)	Permit Limit, Average (gpd)	Permit Limit, Peak Month (gpd)
RO-7	8	596/300	200,000	272,000
RO-8	8	600/304	200,000	272,000
RO-9	8	602/550	200,000	272,000
RO-11	12	650/526	367,500	471,700
RO-12	12	470/412	367,400	471,700
RO-14*	12	650/450	367,400	471,700
RO-15[1]	12	1,050/800	—	—
RO-16	12	611/320	367,400	471,800
RO-17*	12	650/450	367,500	471,700
RO-18*	12	650/450	367,400	471,700
RO-19*	12	650/450	367,400	471,700
		TOTAL	**3,172,000**	**4,117,900**

Notes: * Future wells; [1] Well No. 15 is out-of-service. Rehabilitation of this well was discussed in the 2017 Brackish Groundwater Wellfield Study; bls = below land surface; — = Not Applicable.

The permitted maximum day operating capacity of the WTP is 3.61 MGD. Table 3-3 and Table 3-4 show the total and average monthly water flows, respectively. The tables summarize the amount of water that was bypassed around the RO process, produced from the WTP, discharged to the deep injection wells (concentrate), and conveyed to the distribution system. As of FY 2022, the Burnt Store RO WTP is operating on average at 15 percent of its design capacity.

Table 3-3 Burnt Store RO WTP – Total Water Balance FY 2022

Month	Raw Water from Wells (MG)	Raw Water Bypass (MG)	Total Water Produced (MG)	Total Concentrate (MG)	Finished Water to Distribution (MG)
Oct-21	18.53	1.78	15.16	3.64	14.72
Nov-21	18.87	1.78	15.36	3.70	14.97
Dec-21	20.04	1.90	16.63	3.96	16.03
Jan-22	22.46	2.07	18.32	4.41	17.86
Feb-22	22.22	2.11	18.60	4.46	17.46
Mar-22	25.70	2.35	20.75	4.81	20.22
Apr-22	24.00	2.18	19.33	4.66	18.72
May-22	19.38	1.83	15.70	3.77	15.17
Jun-22	16.72	1.59	13.54	3.25	13.05
Jul-22	17.08	1.64	14.04	3.37	13.40
Aug-22	20.25	1.92	16.46	3.87	15.94
Sep-22	19.42	1.76	15.67	3.76	14.92
Total	**244.65**	**22.92**	**199.56**	**47.66**	**192.45**

Table 3-4 Burnt Store RO WTP – Average Flows FY 2022

Month	Raw Water from Wells (MGD)	Raw Water Bypass (MGD)	Total Water Produced (MGD)	Total Concentrate (MGD)	Finished Water to Distribution (MGD)
Oct-21	0.598	0.057	0.489	0.118	0.475
Nov-21	0.629	0.059	0.512	0.123	0.499
Dec-21	0.646	0.061	0.536	0.128	0.517
Jan-22	0.724	0.067	0.591	0.142	0.576
Feb-22	0.794	0.075	0.664	0.159	0.624
Mar-22	0.829	0.076	0.669	0.155	0.652
Apr-22	0.800	0.073	0.644	0.155	0.624
May-22	0.625	0.059	0.506	0.122	0.489
Jun-22	0.557	0.053	0.451	0.108	0.435
Jul-22	0.551	0.053	0.453	0.109	0.432
Aug-22	0.653	0.062	0.531	0.125	0.514
Sep-22	0.647	0.059	0.522	0.125	0.497
Annual Avg.	**0.671**	**0.063**	**0.548**	**0.131**	**0.528**

3.2.2 Treatment Components and Condition Assessments

Jones Edmunds personnel performed an on-site review of the WTP on February 9, 2023. A tour of the facility was conducted with the Chief Operator to review plant conditions, operations, and records. The WTP is secured by a perimeter fence that surrounds the Burnt Store RO WTP and WRF. Site access is through a single security gate. At the time of the site visit, the security gate was observed damaged as a result of Hurricane Ian; however, CCU staff confirmed that the gate was being repaired. This repair should be completed at the County's earliest availability to meet regulatory requirements for PWS facilities under Chapter 62-555, FAC. The site perimeter requires some maintenance including clearing debris. The site has a significant amount of brush and woods east of the WTP that should be maintained to prevent on-site wildfires. The Process Building, Storage Room, Motor Control Center (MCC) Building, and Operations/Administration Building (shared with the Burnt Store WRF) were observed to be in good condition. The exterior of the MCC Building should be painted, the Process and Operation Building should be cleaned, and the gutters of the Process Building should be cleared of debris as needed. Chemical storage and delivery of non-bulk chemicals (sulfuric acid, scale inhibitor, and corrosion inhibitor) are currently by single-wall 55-gallon chemical drums; secondary containment should be provided to meet EPA standards. Three SCADA computer stations use on-site computer graphic monitoring screens. The site contains a small operations testing laboratory for monitoring water-quality parameters such as conductivity, pH, and temperature.

Overall, the WTP site is well maintained. Staff does an excellent job of keeping the interior of the buildings neat and clean as is customary for potable WTPs. Valves throughout the WTP are exercised once per year. Process piping is painted and clearly marked indicating the raw, feed, permeate, concentrate, and finished water streams. The stainless-steel pipe and equipment are cleaned frequently. Compliance meters are calibrated every 6 months, and calibration tags are up to date. Bulk-storage chemical tanks and secondary containment are in a covered area that is attached to the east end of the WTP process building. The chemical tanks and piping are painted and well-marked. Eyewash and shower stations are at the bulk storage area and the chemical feed area and are in good condition.

The chemical feed pumps and piping are inside the building along the wall that is common to the bulk storage area. The chemical feed pump area requires routine maintenance as would be expected for any chemical feed system. The area is inspected daily for leaks and pump functionality. The chemical feed pumps are operating and in good condition; however, CCU has begun replacement as they are nearing end of useful life. The scale inhibitor, sodium hydroxide, and sodium hypochlorite chemical feed pipes occasionally leak due to the nature of the chemicals. The manufacturer of the chemical feed units indicated that the connections need to be checked regularly and tightened as needed. The chemical feed units are discussed in more detail in the following sections.

The required documents maintained on site include:

- Monthly Operating Reports
- Operating Permits
- Operators' Licenses
- Facility Logbook
- Facility Operating Plans
- Well Laboratory Reports
- Sampling Plans
- Laboratory Results
- Flow Meter Calibrations
- Chlorine and pH Meter Calibrations

- Chain-of-Custody Forms
- Facility O&M Manuals
- Maintenance Records
- Facility Record Drawings
- Daily Temperature Logs
- Spill Protocol and Record of Spills

3.1.1.1 Source Water

The WTP currently uses six production wells with a total permitted AADF of 1,702,300 gpd. The wells have flow meters on their discharge pipes, and withdrawal rates meet the WUP requirements. Two of the production wells are outside the WTP site. In November 2009, nine groundwater monitoring wells were constructed and placed into operation. Three of the monitoring wells are on site. Two of the four production wells on the Burnt Store RO WTP site were placed into operation in August 2010. Three additional shallow groundwater monitoring wells were installed on site in February 2014.

All production wells are confined in fenced areas and include submersible well pumps. Flow and pressure for each of the wells are monitored through SCADA. Well pads are elevated from the surrounding ground and are not prone to flooding that would result from normal rain events. In FY 2022, new air-release valves were installed at each well. The well observations from the condition assessment are as follows:

- Well No. 7 is an 8-inch-diameter well on site adjacent to the WTP's back-up generator. This is the oldest well in operation at the WTP, but it remains in good condition. Minor rust was observed on the stainless-steel wellhead and knife gate valve operator. The operator reported that valves are typically exercised.
- Well No. 8 is an 8-inch-diameter well on site near the WTP entrance. The well pump was replaced in February 2015 and is currently out for repair. Minor rust was observed on the pressure transducer saddle.
- Well No. 9 is an 8-inch-diameter well on site near the GSTs. A new well pump and motor were installed in 2016. Minor rust was observed on the wellhead and butterfly valve operator, but overall, the well is in good condition.
- Well No. 11 is a 12-inch-diameter well off site on Burnt Store Road. The well meter flow tube and check valve were replaced in February 2016 and are in excellent condition. Minor rust was observed on the wellhead stainless-steel pipe.
- Well No. 12 is a 12-inch-diameter well off site on Burnt Store Road. A small burrow was found under the concrete, which should be filled to prevent concrete cracking. Minor rust was observed on the stainless-steel wellhead pipe, but the pump and motor are in excellent condition. The check valve was repaired in FY 2022.
- Well No. 15 is at the rear of the site. The well pump and piping are in excellent condition. However, Well No. 15 is currently not in service due to suspected intrusion of lower-quality water from this well's terminal strata. The 2013-issued WUP required this well be abandoned and capped. A study was completed in 2017 to evaluate an alternative way to bring this well back into service.
- Well No. 16 is a 12-inch-diameter well on the east side of the site. The well pump is in excellent condition.

3.2.2.1 Pre-Treatment Components

Sulfuric Acid Addition

Sulfuric acid is used to decrease the pH of the raw water and prevent calcium carbonate precipitation. The 1,000-gallon bulk sulfuric acid storage tank is outside in the covered bulk storage area. The 100-gallon sulfuric acid storage tank is indoors near the chemical feed skid. The sulfuric acid skid contains two metering pumps. The metering pumps are at the end of their useful life and are scheduled to be replaced in 2023. The concrete secondary containment structure in the bulk chemical storage area was painted in 2021, and the 100-gallon tank inside the process room was replaced.

Scale Inhibitor Addition

Scale inhibitor is used to prevent precipitation and scaling of carbonate, sulfate, silica, and iron onto the membrane surface. The scale inhibitor is stored in a 75-gallon tank near the scale inhibitor feed skid in the process room. The scale inhibitor skid contains two metering pumps for redundancy. The scale inhibitor system is in good condition.

Cartridge Filtration

The facility contains five stainless-steel cartridge filter-housing vessels. Each vessel holds 40 1-micron cartridge filters. The pressure differential of each cartridge filter vessel is monitored to determine when filters need to be replaced, which is typically completed two times per year. Four of the vessels are in good condition, and the staff changes the filters within the recommended differential pressure. Filter #4 was undergoing routine maintenance. No irregularities were reported, and the equipment appeared to be in excellent working order at the time of the site visit. Water-monitoring gauges and instrumentation for pretreatment components are centrally mounted on a wall that is adjacent to the chemical feed pumps and the filter vessels. The gauges are functioning properly and are in good condition.

3.2.2.2 Membrane Treatment Components

RO Feed Pumps

The Burnt Store RO WTP has five two-stage RO process trains, A through E. Trains A and B were installed in 2007, and Trains C, D, and E were installed in 2009. Trains A and B are served by two horizontal split-case pumps, and Trains C, D, and E are fed by vertical turbine pumps. Each RO feed pump is painted and in good condition.

Membranes

Trains A and B are arranged in an 8:4 array – eight pressure vessels in the first stage and four pressure vessels in the second stage. Trains C, D, and E are arranged in a 14:6 array. Each pressure vessel contains seven RO membrane elements resulting in a total of 84 for Trains A and B and 120 for Trains C, D, and E. The total number of membrane elements at the Burnt Store RO WTP is 528. The membrane elements in Trains A and B are approximately 14 years old and have shown signs of minor membrane fouling. The membrane elements in Trains C, D, and E are 12 years old. New isolation valves were installed at all stations in FY 2022 as part of a CCU project to provide an autopsy of the membranes to better determine requirements for maintenance and/or replacement.

Sampling and Instrumentation

Membrane performance is assessed by monitoring the pressure, recovery, and water quality of the system. Staff can monitor water quality and pressure throughout the membrane process. Sampling sinks and instrumentation are operating properly and in good condition.

Membrane Cleaning System

Over time, membranes may experience fouling due to scaling, plugging, break-through, or several additional factors. Reversible fouling can be mitigated by in situ cleaning of the membranes, whereas some fouling may require membrane replacement. The WTP's membrane cleaning system has not been used in over 5 years. Operators restored the system in 2018; a membrane autopsy will be completed in FY 2023 to determine and implement the most effective strategy for improving or maintaining membrane performance.

The older trains (A and B) are still producing good quality permeate but operate at a higher pressure, indicating minor fouling is occurring. Cleaning was last conducted on Train A in 2012 to reverse the effects of fouling and reduce the operating pressure. Minor improvements were achieved indicating that fouling is irreversible and will eventually require membrane replacement. Trains A and B may be replaced by larger membranes to match Trains C, D, and E in the future. Treatment Trains C, D, and E are in good working condition except for some leaks on the concentrate port seals on Trains C and D. The port seals should be replaced.

3.2.2.3 Post-Treatment Components

Degasification and Clearwell

Hydrogen sulfide is removed from the RO permeate via packed-tower degasification. Three packed-tower degasification units are on top of the concrete clearwell and can be operated automatically or manually. One of the degasifier blowers was repaired in February 2017. The degasifier media was inspected in FY 2022 and will be replaced in FY 2023. In 2014, the clearwell was temporarily taken out of service for inspection. The clearwell inspection report noted for staff to paint the clearwell and exercise the isolation valve between the two tanks.

The clearwell valve was exercised by staff and found to be operational in 2019. The outside of the clearwell should be painted.

Degasified water is transferred from the clearwells to the GSTs by three horizontal centrifugal pumps. In 2013, two in-line static mixers were installed in the transfer pipe leading to the GSTs to mix sodium hydroxide, corrosion inhibitor, and sodium hypochlorite. These injection points should be labeled. In 2015, two additional air-release valves (ARVs) were installed downstream of the pumps. We recommend that the pumps and piping be covered to prevent sun damage and to prolong the equipment life.

Sodium Hydroxide

Sodium hydroxide is used to adjust the pH of the finished water before pumping it into the distribution system. The sodium hydroxide system consists of a 1,100-gallon bulk storage tank, a chemical feed skid with two metering pumps, and a 90-gallon chemical feed tank. The skid and smaller storage tank are in the RO process room and are in good condition. One pump is scheduled to be replaced in FY 2023. The bulk storage tank is outside near the other bulk chemical storage tanks, which poses operational issues during cold weather. When temperatures are less than 45 degrees Fahrenheit (°F), operators install heat lamps to prevent the sodium hydroxide viscosity from increasing. The glass sight gauge on the bottom of the 1,100-gallon bulk storage tank and the ball valve on the transfer line from the bulk tank were replaced in 2018 and are functioning properly.

Corrosion Inhibitor

A zinc-orthophosphate-based corrosion inhibitor is used to reduce the dissolving of copper, lead, and zinc in the distribution system. A 30-gallon tank and chemical feed pump are indoor near the HSPs. The dosing pump was being replaced at the time of the site visit.

Sodium Hypochlorite

The sodium hypochlorite system consists of two bulk storage tanks, one 200-gallon storage tank, two chemical metering pumps, and two injection points. The two bulk storage tanks are outside the process room and hold 1,400 and 1,100 gallons, respectively. The chemical containment area for the bulk storage tanks requires periodic painting. The smaller storage tank and chemical feed skid are in a segment of the RO process room. Sodium hypochlorite is primarily injected before water enters the storage tanks (pre-disinfection), although operators also have the capability of injecting after the GSTs (post-disinfection) if needed to boost chlorine residual. The sodium hypochlorite system is in good operating condition.

Redundant analyzers that monitor post-treatment conditions of the water are on the wall of the clearwell. The instruments are well organized with SCADA connections to the Wonderware program, which can be monitored from the Operations Building. Instruments and chemical feed rates can be adjusted to obtain the proper water quality. Instrumentation is calibrated and up to date. Operations staff reported that the conductivity meter requires periodic replacement. We recommend the cover of the analyzer panel be extended to prevent water from contacting the equipment during rain events.

Ammonium Sulfate

Since the distribution system currently operates with free chlorine, the ammonia system used to produce combined chlorine residual (chloramine) is not being used. CCU is planning to convert the existing sodium hypochlorite disinfection system to a chloramine disinfection system for future use and interconnect compatibility; the project is currently underway. A new ammonia sulfate containment and chemical pumping station has been installed for future use.

3.2.2.4 Storage and Distribution HSPs

The Burnt Store RO WTP contains three 0.5-MG concrete GSTs housing a total of 1.5 MG of finished water. GSTs A and B were cleaned, inspected, and received new interior coating in FY 2022; GST C was inspected in FY 2019. No sedimentation or defects were found in any tank. The outside of GST B was painted in 2019. The outside of GST A was cleaned and painted in 2020.

The RO WTP has one high-flow HSP (Pump A), two medium-flow pumps (Pumps B and C), and two jockey pumps (Jockey Pumps A and B) providing flow to the distribution system. The two medium-flow pumps were installed in early 2012 to match the system flow needs more accurately. One of the jockey pumps was installed in August 2017. Normally, the jockey pump and either of the two medium-flow service pumps are all that are needed to supply water and pressure to customers. The high-flow service pumps are necessary for fire-flow demands and are exercised when system flushing is performed.

The variable-frequency (motor speed) drives (VFDs) on the pumps provide a constant pressure of 55 pounds per square inch (psi) at the beginning of the distribution system at the WTP regardless of the water use. At the time of the site visit, the HSPs were operational and in good condition.

3.2.2.5 Concentrate Disposal/Deep Injection Wells

Concentrate from the RO process is disposed of by means of the on-site Deep Injection Wells IW-1 and IW-2. Both wells are permitted to accept concentrate and treated wastewater effluent. Concentrate is transferred to the deep well pumping station clearwell by latent pressure in the RO trains where it is combined with wastewater effluent and injected into the deep wells. The maximum capacity of IW-1 is 0.564 MGD at a maximum rate of 392 gallons per minute (gpm). The maximum capacity of IW-2 is 2.88 MGD at a maximum rate of 2,000 gpm.

Both injection wells have flow meters and pressure gauges that can be monitored in the control room. Both wells undergo mechanical integrity testing every 5 years. A mechanical integrity test (MIT) was successfully performed on IW-2 in 2013. A vibration analysis was also conducted for the vertical turbine injection well pumps in 2017. Due to the test results, the pumps were reprogrammed to minimize wear and appear to be functioning properly at the time of the site visit. The pumps at the station were painted in 2018.

3.2.2.6 Electrical Components, Standby Power, and Circuitry

The main electrical components of this facility include the electrical components of the RO process buildings, one 1,250-kW standby generator, and two 80-kW portable generators. The distribution transformer, which provides power to the site, was in good condition with no obvious signs of significant concern. CCU's most recent Risk and Resilience Assessment (RRA) recommended bollards be installed around the influent transformer box.

RO Process Building and MCC Building

The incoming switchgear is in good condition with minor issues. The switchgear contains warning labels identifying parts and components behind blank cabinets as being energized. The floor near the electrical equipment is marked with hazard tape, but none of the equipment includes the appropriate arc flash labeling as required by National Fire Protection Association (NFPA) 70E. In FY 2021, the building exterior was pressure washed.

Auxiliary Power

Auxiliary power is adequately sized to run the WTP. The WTP generator and automatic transfer switch (ATS) were part of the 2009 upgrade of the WTP. The standby generator is operated for 4 hours under load twice per month. An outside contractor performs the maintenance. The generator was cleaned and serviced in FY 2020. Two generators that were historically attached to Wells No. 15 and 16 were converted to portable trailers. These generators can

now be used to power the pumps at Wells No. 11, 12, 15, and 16 through permanently mounted generator connections at each well.

At the time of the site visit, the ATS was noted as broken, with temporary generator and cordage being provided as secondary power; the switch should be repaired or replaced, and default operations with the permanent on-site generator should be restored.

3.2.3 OPERATIONS

The facility is staffed 16 hours per day, 7 days a week. The Burnt Store RO WTP operators remotely monitor the pressures in the Burnt Store distribution system 24 hours per day. Alarms can be evaluated, and operators or maintenance personnel can be deployed to take corrective action, if necessary. Since the water demand of the system does not require 24-hour production, the RO trains are regularly alternated to reduce membrane fouling. The operator indicated that typical membrane operation alternates daily between (1) Trains A and B plus one additional train (C, D, or E) in service and (2) Trains C, D, and E in service.

The Chief Operator also indicated that the security camera displays for the site are currently in the on-site laboratory, as opposed to the Operations Office Building, where staff typically monitors the plant. The laboratory is also shared with Burnt Store WRF staff. In FY 2021, Jones Edmunds recommended relocation of the security camera displays to the Operations Office Building. In FY 2022, the security camera feed has been relocated to the Operations Office Building; however, the feed was installed in a small electrical room. Provisions should be made to relocate the security camera feed where it may be best used, such as a monitor display in the operator office(s).

3.2.4 MAINTENANCE

Routine maintenance is performed on a scheduled basis. Groundwater wells are visually inspected daily and well valves are exercised yearly. Generators are serviced and tested monthly. Rehabilitation of major pieces of equipment is completed according to the CIP that is revised yearly. Maintenance required to keep the WTP in compliance with regulations is performed immediately using in-house maintenance personnel or outside contractors. The treatment process requires constant maintenance of the chemical systems. The Chief Operator has established a chemical system inspection routine where operators inspect the chemical systems daily. Inspection results are recorded in a log. Leaks or other malfunctions are addressed immediately or referred to the Chief Operator for maintenance.

As part of the daily inspection, the Operations staff examines the membrane process piping and tightens pipe fitting bolts when necessary. Operators visually check the union connections and other potential sources of leaks for each chemical storage and feed system daily and tighten as needed. The staff change the cartridge filters every 6 months or when the differential pressure across the vessel exceeds 50 psi. Membranes are cleaned or replaced as needed determined by continuous water-quality and hydraulic monitoring. GSTs A and B at the Burnt Store RO WTP were cleaned and inspected in FY 2022 and did not reveal any deficiencies. GST C was cleaned and inspected in FY 2019 and did not show any deficiencies. GSTs are scheduled for cleaning and inspection every 5 years in accordance with FDEP Rule 62.555.350(2), FAC. As a result of the maintenance practices and the HSPs that were placed into operation in FY 2013, no service interruptions due to pump malfunction occurred in FY 2022.

3.2.5 Review of Previous Report Recommendations

Table 3-5 summarizes the recommendations and status from the 2021 Annual Report for the Burnt Store RO WTP.

Table 3-5 Burnt Store RO WTP 2021 Recommendations and Status

Recommendation:	Determine the ultimate use and/or replacement of Well No. 15.
Progress:	Ongoing.
Recommendation:	Perform yard maintenance around the perimeter fencing and well pads.[1]
Progress:	Ongoing.
Recommendation:	Continue to inspect and tighten the connections for the scale inhibitor, sodium hydroxide, sodium hypochlorite, and sulfuric acid pipes daily to prevent leakage.
Progress:	Ongoing.
Recommendation:	Paint the concentrate disposal wetwell.
Progress:	Staff noted standard maintenance procedure to spray wash wetwell as needed. Wetwell was noted in good condition upon site visit.
Recommendation:	Replace multiple end caps that are leaking on Trains C and D.
Progress:	Ongoing – leaking end caps are periodically found and repaired. Also, membrane evaluation is ongoing.
Recommendation:	Install a cover over the transfer pumps and piping near the degasifier towers to prevent sun damage and prolong equipment life.
Progress:	Not completed.
Recommendation:	Extend the cover of the analyzer panel attached to the wetwell to prevent water from contacting the equipment during rain events.
Progress:	Completed.
Recommendation:	Repair and paint the northwest inside wall of the MCC Building.
Progress:	Completed.
Recommendation:	Install bollards around the influent transformer box.[1]
Progress:	Not completed.
Recommendation:	Install fire hose connections on the well piping.[1]
Progress:	Not completed.
Recommendation:	Identify a backup chemical and fuel supplier in the event of a chemical or fuel shortage.[1]
Progress:	Ongoing.
Recommendation:	Upgrade the ammonia feed system and prepare for monochloramine conversion of the Burnt Store system.
Progress:	Ammonia chemical feed system installed onsite. Conversion to monochloramine disinfection is in progress.

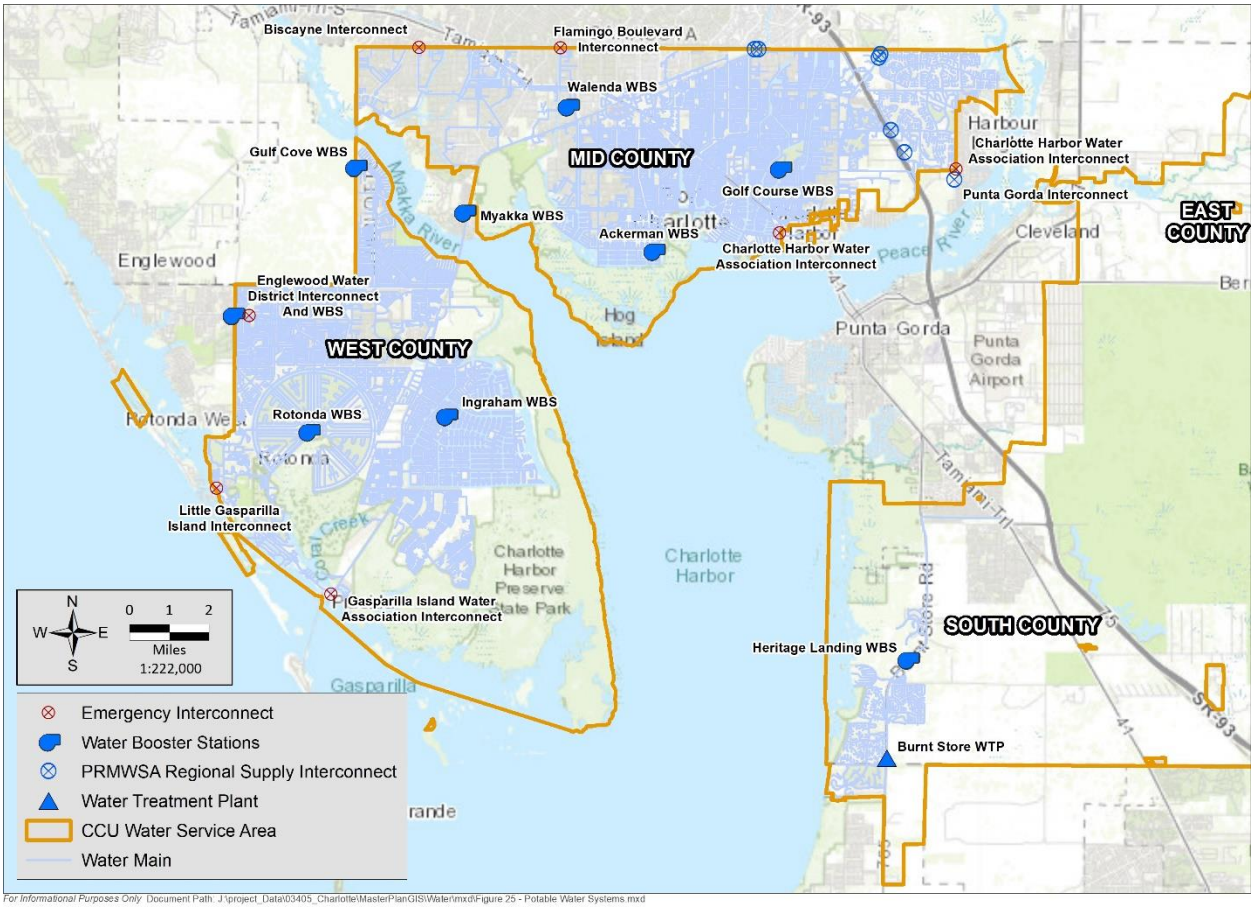
Recommendation:	Evaluate the feasibility of relocating the security camera displays from the lab to the operations office building.
Progress:	Camera feed connected to operations office building via fiberoptic cable. CCU should evaluate installing monitor feed in operators' offices for improved security surveillance.
Recommendation:	Continue maintenance of controlled burns on the property to maintain shrub growth and fire buffer around wells.[1]
Progress:	Ongoing.
Recommendation:	Develop a procedure to obtain the equipment for transporting key chemicals (fuel and chlorine) from one site to another if required in an emergency.[1]
Progress:	Not completed.
Recommendation:	Apply appropriate arc flash labeling on all switchgear in compliance with NFPA 70E to properly notify O&M personnel of the potential hazard. This may require creating a complete and thorough arc flash model using the existing switchgear to determine the energy levels present. This information would appear on the appropriate arc flash labeling as required.
Progress:	Ongoing.
Recommendation:	Perform a load study to identify any issues related to power quality, quantity, and capacity of the system. The load study will help identify deficiencies in the system, reserve capacities, and potential anomalies that may affect long-term maintenance and serviceability of the equipment.
Progress:	Load study completed.
Recommendation:	Develop a wildfire Emergency Response Plan (ERP), identify fire hydrant locations, and coordinate with Fire Department for training for critical assets.[1]
Progress:	Not completed.
Recommendation:	Develop an incident action checklist for operating without the support of SCADA.[1]
Progress:	Not completed.
Recommendation:	Link contamination detection to SCADA to immediately shut down or lockout any pump in operation.[1]
Progress:	Not completed.
Recommendation:	Develop an ERP for valve failure in the clearwell and begin exercising the valve.[1]
Progress:	Not completed.

[1] Recommendation from the *Charlotte County RRA Report* (March 2020).

4 WATER DISTRIBUTION SYSTEM

This Chapter reviews the potable water distribution system infrastructure of CCU's two independent PWSs. Jones Edmunds personnel evaluated the water distribution system components on February 9, 2023; however, due to recent FEMA assessments, Mid County facilities were not included as part of this years' site visits. The larger system that serves the central and west portions of Charlotte County (referred to as Mid/West County or Peace River distribution system) is supplied with water from the PRMRWSA and uses chloramine as the disinfectant. The smaller system that serves the south area of Charlotte County (South County or Burnt Store distribution system) is supplied by water from the CCU-owned Burnt Store RO WTP, which uses free chlorine as the disinfectant. Figure 4-1 shows the certificated water service area and water distribution system infrastructure.

Figure 4-1 CCU Water Distribution Systems



At the end of FY 2022, CCU had 63,632 customer accounts in the Mid/West County distribution system and 3,102 customer accounts in the South County distribution system. CCU is updating geographical information system (GIS) information as part of its Cityworks Implementation project. Based on existing GIS information at the time of this report, the two systems contained approximately 1,570 miles of water mains ranging in size from 2 to 10 inches in diameter for the distribution mains and from 12 to 36 inches in diameter for the transmission mains as well as 5,749 fire hydrants.

The CCU water distribution system consists of the following major components:

- Regional transmission mains to transport water from the PRMRWSF to the CCU Mid/West County distribution system with flow meters at connections to the Charlotte County system.
- CCU transmission mains that supply water to the distribution mains from the regional transmission mains.
- Transmission mains in South County that transport water from the Burnt Store RO WTP to distribution mains in South County and north Lee County.
- Distribution mains that supply water from the transmission mains to customers.
- Fire protection assemblies and fire hydrants that may also be used to flush the distribution system for maintenance purposes.
- Isolation valves that allow the operators to shut off the flow in pipe sections for maintenance purposes.
- GSTs that provide storage for peak customer demand, firefighting, and periods when treatment plants are not producing water.
- Disinfection facilities to maintain appropriate disinfection levels in the distribution system for delivery to the consumer.
- WBSs adjacent to GSTs and associated disinfection chemical feed facilities.
- A 24-inch check valve on the main supply line from the PRMRWSF to maintain system pressures and reserve water supply if the PRMRWSF is unable to supply water and pressure during emergencies.
- Interconnects with neighboring utilities for system redundancy and system flexibility.

4.1 Mid and West County Distribution System

The Mid/West County distribution system water is supplied to CCU through four PRMRWSA-owned regional transmission mains. The original pipeline is a 36-inch-diameter line supplemented by a 12-inch line. In September 2007, a 24-inch main became operational. In August 2012, a 42-inch main became operational. Based on existing GIS data at the time of this report, the Mid/West County distribution system consists of four aboveground, pre-stressed concrete GSTs with an active combined capacity of 10 MG, six WBSs, one chemical booster station, eight supply interconnects, seven emergency interconnects, approximately 1,496 miles of water pipes between 2 and 36 inches in diameter, and 5,277 fire hydrants. The following sections describe the system interconnects and WBSs in Mid and West Charlotte County.

4.1.1 Supply Interconnects

The Mid/West County distribution system contains supply interconnects used exclusively to receive PRMRWSA water supplies; several have been installed over the years, providing CCU with redundancy and system flexibility. Allowable through the PRMRWSA contract, CCU may re-sell PRMRWSA water supplies to adjacent utilities using available emergency interconnects described in Section 4.1.2. Table 4-1 lists the Charlotte County metered supply interconnects with neighboring entities.

Table 4-1 Charlotte County Metered Supply Interconnects

Entity	Name	Approximate Location	Size
PRMRWSA	Discovery Drive Meter Station	Discovery Drive	24-inch
PRMRWSA	Kings Highway Meter Station	10 Kings Highway	24-inch
PRMRWSA	Kings Highway Meter Station	10 Kings Highway	12-inch
PRMRWSA	Harbor Boulevard Interconnect	21453 Bachmann Boulevard	24-inch

4.1.1.1 Discovery Drive Meter Station

The Phase 1A Punta Gorda pipeline interconnect (Kings Highway/Shell Creek Loop) consists of over 12 miles of pipeline with a minimum design capacity of 6.0 MGD, aboveground storage, high-service pumping, disinfection facilities, and tie-in points with CCU. The geographical end points of the interconnect are the PRMRWSA's 24-inch Regional Transmission System (RTS) on Kings Highway at the Charlotte/DeSoto County line and the City of Punta Gorda's Shell Creek WTP on South Washington Loop Road in Charlotte County. The interconnect is on Discovery Drive and is owned and operated by the PRMRWSA, which was historically used to supply water to the City of Punta Gorda during the dry season and receive water from the Punta Gorda system during the wet season. As of FY 2021, this seasonal operation has ceased, and the interconnect is only used to supply CCU water from PRMRWSA.

Condition Assessment

Overall, the interconnect is in good condition, and no deficiencies were reported.

4.1.1.2 PRMRWSA Supply Connections

The PRMRWSA supply connections are on the north and east edges of the Mid County distribution system and supply water to Mid and West County. The Kings Highway and Harbor Boulevard connections contain interconnect vaults and telemetry that are owned by PRMRWSA but can be accessed by Charlotte County. The connections along I-75 (Rampart, Luther, and Sandhill) are buried and do not have flow monitoring at each location; instead, the flow is calculated from the flow meters on Kings Highway and the Punta Gorda Interconnect flow meter.

Additionally, CCU will be funding PRMRWSA's new 42-inch-diameter transmission main from approximately the Harbor Boulevard connection to Gulf Cove WBS, along Hillsborough Boulevard, Chancellor Boulevard, and Campbell Street; the new transmission main will provide additional flow and pressure to Mid and West County and will include several new supply connections. The project is in design at the time of this report; construction is expected to be completed by 2025.

Condition Assessment

The interconnects were reported to be in good condition.

4.1.2 Emergency Interconnects

As a further safeguard for uninterrupted water supplies to Charlotte County citizens, CCU has additional emergency interconnects with adjacent water distribution systems. These interconnects are manually operated, equipped with bi-directional flow meters, and connected

to the County's advanced metering infrastructure (AMI) system. The County has two 6-inch interconnects with Charlotte Harbor Water Association (CHWA), one 16-inch and one 12-inch interconnect with the City of North Port PWS, two interconnects with the Gasparilla Island Water Association (GIWA), and one interconnect with EWD. Table 4-2 lists the County's emergency interconnects.

Table 4-2 Charlotte County Emergency Interconnects

Entity	Name	Approximate Location	Size
CHWA	CHWA Interconnect	2606 Mauritania Road	6-inch
CHWA	CHWA Interconnect	22234 Edgewater Drive	6-inch
City of North Port	Flamingo Boulevard Interconnect	W Hillsborough Blvd	12-inch
City of North Port	Biscayne Drive Interconnect	17 Biscayne Drive	16-inch
GIWA	GIWA Interconnect	12595 Gasparilla Road	10-inch
GIWA	GIWA WTP Interconnect	5050 Linwood Road	6-inch
EWD	Englewood Interconnect	6369 Richledge Street	12-inch

The emergency interconnects with CHWA, North Port, and GIWA require little maintenance other than exercising valves, but a flow meter at the Biscayne interconnect with the City of North Port was replaced in FY 2017. In FY 2018, the design for a new interconnect was completed at the North Port interconnection with Flamingo Boulevard. The County relocated the Flamingo Boulevard interconnect to the City of North Port's nearby new pump station on Hillsborough Boulevard. The project was completed in FY 2019.

Condition Assessment

The emergency interconnects were reported to be in good condition.

4.1.2 Water Booster Stations

Booster stations are strategically located in the distribution system and typically adjacent to GSTs. The equipment at the booster stations is secured by chain-link fences with barbed-wire tops. The booster stations are used to increase the flow, pressure, and disinfectant concentrations throughout the system. As previously discussed, CCU has repurposed or discontinued the Gertrude (WBS #1) and Fivelands (WBS #5) booster stations. The following sections describe the active booster station operations and their respective conditions.

As a general comment for WBSs, during site visits under this report several WBS operators and CCU staff expressed concerns about delays with pump repairs and maintenance, noting the variety of different pump and motor types throughout the existing WBS configurations.

4.1.2.1 Port Charlotte Golf Course – WBS #2

The Port Charlotte Golf Course Booster Station is at 22339 Gleneagle Terrace, Port Charlotte, Florida 33952. The station provides local storage, pressure, and disinfectant boosting capability for the Mid County service area east of Tamiami Trail. The station was built in 1966 and rehabilitated in 2011. The station contains a climate-controlled laboratory and electrical room, a ventilated pump and chemical feed room, and a 1-MG GST. The station is fenced and has one automatic access gate. The station contains two chemical-injection systems for sodium hypochlorite and ammonium sulfate addition. Each system contains three metering pumps and two chemical storage tanks. The two 300-gallon ammonium sulfate storage tanks and two 900-gallon sodium hypochlorite tanks are under a covered shed adjacent to the pump room. The County operates the station to maintain a 4.0-milligrams per list (mg/L) disinfectant residual. The station has a detached diesel generator for backup power supply.

The following O&M upgrades were made over the last 3 years:

- 2020 – The on-site ice machine used for sample preservation was replaced.
- 2020 – Arc-flash labeling has been added to the electrical switch gear.
- 2021 – Chemical injection piping wall connection was sealed.
- 2022 – Security upgrade.

Condition Assessment

Jones Edmunds last completed an on-site review of the plant on November 15, 2022, as part of CCU's Hurricane Ian Damage Assessments; the information gathered at that time was used to update this section, in accordance with the project scope. CCU staff is aware of the following damages, as recorded during the hurricane assessment, and have been working diligently to address them accordingly. The station is in good condition with updated equipment. The roof cap has some damage to it and is being repaired. The graveled areas around the station infrastructure are weeded, and the landscaping is well maintained. The outside perimeter of the site requires some maintenance including filling holes under the fence caused by burrowing animals and clearing any fallen trees. Some portions of the fence and barb wire are broken or leaning inward from hurricane winds. Due to roof damage, water has leaked inside the building and damaged a computer that should be replaced. All tools and equipment are organized and stored properly inside the building. The HSPs are well maintained and functioning properly. The lower portion of the ladder cage on the side of the aboveground storage tank is torn off and needs to be repaired or replaced.

The incoming switchgear and distribution transformer appear in good condition with no obvious signs of significant concern. The generator and enclosure are mounted outside on an elevated sub-base fuel tank. They are in good condition. Overall, the electrical equipment is in good functioning condition based on information from the Operations staff.

Additionally, an electrical equipment site visit assessment was conducted by a Jones Edmunds electrical engineer in 2022. The electrical engineer and CCU Operations staff reported no issues.

The review of the plant showed systems in good condition and well maintained.

The following deficiencies were noted:

- The roof cap is damaged from hurricane winds and is currently being repaired.
- Some portions of the site fence are broken and leaning with loose barb wire.
- Fallen trees are around the fence perimeter at the site.
- The computer inside the building is damaged from a water leak through the roof of the building.
- The lower portion of the ladder cage on the side of the aboveground storage tank is torn off and laying on the ground.

4.1.2.2 Gulf Cove – WBS #3

The Gulf Cove Booster Station was built in 1980 and is at 12050 Van Lenten, Port Charlotte, Florida 33981. The station receives flow through an aging 12-inch ductile-iron pipe that spans under the Myakka River and feeds the 2-MG GST. The station has four HSPs, rated at 50, 60, 75, and 100 horsepower (HP). The pumps and electrical components of the station are in a ventilated building. The station is fenced and contains two entrances with automatic gates.

The station contains two chemical injection systems for ammonium sulfate and sodium hypochlorite addition. Each skid has two chemical feed pumps for redundancy. The booster station has two 600-gallon sodium hypochlorite storage tanks and two 300-gallon ammonium sulfate storage tanks. Chemical skids and associated analyzers are in ventilated buildings, and the chemical storage tanks are outside under covered sheds. The sodium hypochlorite storage tanks are double walled, and the ammonium sulfate storage tanks contain secondary containment basins for safety.

Disinfectant residual is continuously monitored using an ammonia/monochloramine analyzer. The County operates the station to maintain a 4.0-mg/L disinfectant residual. The booster station contains a diesel generator as a backup power supply.

The following O&M improvements were completed over the past 3 years:

- 2020 – Repaired perimeter fencing from hog damage.
- 2020 – Pump No. 4 was replaced.
- 2020 – The generator radiator was replaced.

- 2020 – Through coordination with CROM, the leaking GST was assessed and repaired.
- 2020 – Cleaned generator fuel tank.
- 2020 – Repaired tank leak.
- 2021 – Cut and reinstalled drain line screen to remove debris and adjusted discharge area to accept flows.
- 2021 – Tank repaired in 2020 went into service.
- 2021 – Motor No. 4 was replaced.
- 2022 – New fencing installed around the perimeter.
- 2022 – The GST was inspected and received minor wall leakage repairs.
- 2022 – New 15-gallon-per-hour Jesco DX50 sodium hypochlorite pumps were installed.
- 2022 – New LED lighting was installed in the pump and chemical storage tank rooms.
- 2022 – Replaced Pump No. 4 VFD and subsequently corrected VFD issues by installing higher voltage fuses.
- 2022 – Replaced an existing chlorine chemical storage tank with a new tank.

According to Operations staff, a generator replacement project is budgeted for FY 2023, including a new generator and fuel tank sized to support five 150-HP pumps. A security upgrade began in FY 2022 and is pending completion of camera upgrades in FY 2023. Additionally, the corroded exhaust fans in the ammonia chemical room will be replaced in FY 2023.

Condition Assessment

The station is generally in good condition. Roads and landscaping are well maintained. Graveled areas around the facility infrastructure are weeded and the grass is cut. The fence surrounding the perimeter is being replaced in response to damage done by Hurricane Ian. The indoor buildings are kept clean, and tools and equipment are organized and stored properly. Three of the four HSPs are well maintained and functioning properly with Pump #2 out of service and is scheduled to be repaired in FY 2023. In 2016, the County began planning to install a new water feed pipe across the Myakka River. The project is ongoing and in the permitting phase. The GST tank was down for maintenance due to a leak in the floorstop.

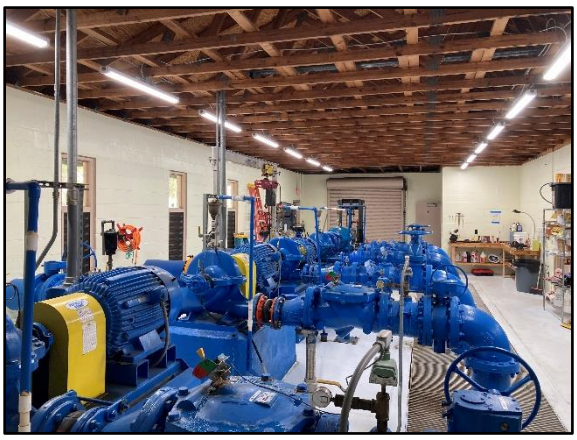
The incoming switchgear and distribution transformer appear in good condition with no obvious signs of significant concern. The incoming power company transformer shows signs of surficial rust. The standby generator reportedly functions properly and has no issues. The fuel system on the generator is a separate fuel tank, not a sub-base fuel tank as in many other installations throughout the County. The fuel tank is undersized and is insufficient to provide the County's minimum required 72 hours of operation during a storm event; it should be increased to hold additional fuel. The fuel piping and transfer system appears in good condition with no apparent signs of leakage. Overall, the electrical equipment is in good functioning condition based on information from the Operations staff.

In FY 2021, the Operations staff reported that several VFDs have failed due to power-quality issues. These issues were resolved in FY 2022 by replacing the fuses and drives with ones of higher voltage.

The following deficiencies were noted:

- The pipe connecting the GST to the pump station is constructed of formed concrete, which is not industry standard.
- The Pump Building requires repainting.
- HSP No. 2 is out of service and undergoing replacement.
- The ammonia chemical feed room exhaust fan is severely corroded and will not function.
- The pressure transducer at the back of the GST is not properly anchored or supported and is being supported by the conduits.
- The conduit wires from the newly installed cameras are not enclosed.
- The copper chemical injection quill connections are rusted and should be replaced with Schedule 80 quill connections.

4.1.2.3 Walenda – WBS #4



The Walenda Booster Station is at 17177 Walenda Avenue, Port Charlotte, Florida 33953. The property contains potable water and reclaimed water infrastructure including reclaimed and potable water GSTs. The potable water GST has a capacity of 2 MG. The potable water station was built in 1994 and has two 100-HP and three 75-HP pumps. The larger pumps were replaced in 2010, and the smaller pumps are being investigated as part of the Potable Water Master Plan. The pumps and electrical components are in a ventilated room. The laboratory and office are in a climate-controlled room. The station is fenced and has two entrances with automatic gates. The station contains two liquid-handling systems for sodium hypochlorite and ammonium sulfate injection. The sodium hypochlorite system contains two 1,000-gallon bulk storage tanks and a chemical injection skid. The ammonium sulfate system consists of two 300-gallon bulk storage tanks and a chemical skid. The chemical skids for sodium hypochlorite and ammonium sulfate each contain two metering pumps and are in ventilated rooms. The bulk storage tanks are outside under covered sheds within secondary containment structures. The County operates the station to maintain a 4.0-mg/L disinfectant residual using an ammonia/monochloramine analyzer and a total chlorine analyzer. A diesel generator is in the pump room to provide backup power to the station.

The following O&M improvements were completed over the past 3 years:

- 2020 – Upgrade GST level control to a radar-based system.
- 2020 – Added arc-flash labeling to the electrical switchgear.
- 2020 – Realigned the motor and replaced the seals and bearings for Pump No. 5.
- 2020 – Installed new 24-inch influent line with flow meter and in-line mixer.
- 2020 – Installed conduit and wires for the chemical feed to the new influent line.
- 2020 – Replaced the No. 1 sodium hypochlorite storage tank due to a leak.
- 2020 – Repaired a faulty uninterruptible power supply causing low pressure.
- 2021 – Installed a new HACH 5500 SC analyzer to replace the HACH 6000 unit.
- 2021 – Programmed the influent chemical control for pre-chlorination.

- 2021 – Replaced seals, bearings, and O-rings in pump No. 3.
- 2021 – Modified the distribution piping to the south along Walenda Avenue. A 16-inch check valve was removed and replaced with straight piping. This modification was performed to accommodate large development (future) to the immediate south of the Walenda WBS.
- 2022 – Installed new 1-inch mesh security fence around perimeter of station.

Condition Assessment

Jones Edmunds last completed an on-site review of the plant on November 15, 2022, as part of CCU's Hurricane Ian Damage Assessments; the information gathered at that time was used to update this section, in accordance with the project scope. CCU staff is aware of the following damages, as recorded during the hurricane assessment, and have been working diligently to address them accordingly. The general condition of the station is good. The access roads outside the facility are aging and need to be repaved but are in fair condition inside the property. Graveled areas around the station infrastructure are weeded, and landscaping is well maintained. The site perimeter requires some maintenance including filling holes under the fence caused by burrowing animals and clearing debris off the fence. Fallen trees around the site will require complete removal. The portion of the site fence near the entrance is damaged, causing the gate to be inoperable. The indoor buildings are kept clean, and tools and equipment are organized and stored properly. The soffit and shingles on the external of the main building are damaged or missing due to hurricane winds and need to be replaced. The HSPs are well maintained and functioning properly.

The incoming switchgear and distribution transformer appear in good condition with no obvious signs of significant concern. CCU staff reported that the existing on-site standby generating system is slightly undersized for a full load of the facility. The generator is inside the building that also contains the electrical switchgear. The security camera needs to be reinstalled, and the internet antenna needs to be repaired. Overall, the electrical equipment is in good functioning condition based on information from the Operations staff.

The following deficiencies were noted:

- The tank inspection found an issue in the tank bonding that will require multi-layer stripping before the tank can be repainted.
- CCU Operations staff confirmed that the generator is unable to accommodate the existing loads of the facility, which is a significant concern and relates to the operational security of the facility. Additionally, since the generator is inside the building that also contains the electrical switchgear, it raises concerns regarding maintenance personnel being properly notified of hazardous conditions that may exist during maintenance operations including fuels present, elevated noise level, and potentially excessive heat. This heat may also prove detrimental to the VFDs in the building since these devices are typically temperature sensitive. Staff has also indicated that the fuel system for the generator is sufficiently sized and functioning properly to handle the current loading.
- The chemical injection skid containment areas appeared to feature open-floor sumps filled with rocks. Staff indicated that the floor sumps were abandoned water meter boxes. To comply with regulations, the floor sumps should be properly surfaced and/or sealed.
- The access roads outside the facility are washed out and need to be repaved.
- The external soffit on the external of the main building are damaged or missing.

- The security camera needs to be reinstalled.
- The internet antenna is broken and needs to be repaired.

According to Operations staff, tank re-coating is budgeted for FY 2022; a generator upgrade is budgeted for FY 2023, including a new generator and fuel tank; MCC/pump upgrades are budgeted for FY 2022/2023.

4.1.2.4 Rotonda – WBS #6

The Rotonda Booster Station is at 46 Parade Circle, Rotonda, Florida 33947. Built in 1973, the station has two 100-HP pumps, two 60-HP pumps, and a 5-MG GST. The pumps and electrical components of the station are in a ventilated building. The station also contains a separate climate-controlled building with an office and laboratory. The station is fenced and contains one gated entrance.

The station has two chemical feed systems for injecting ammonium sulfate and sodium hypochlorite. The ammonium sulfate skids are in a ventilated shed, and each skid contains two metering pumps for injection before and after the GST. The sodium hypochlorite skids are in a chemical room attached to the main pumping room, and each skid contains two metering pumps for injection before and after the GST. Ammonium sulfate is stored in two 300-gallon bulk storage tanks, and sodium hypochlorite is in two 1,000-gallon bulk storage tanks. The chemical storage tanks are housed within a covered structure with secondary containment chambers for safety.

Disinfectant residuals are continuously monitored an ammonia/monochloramine analyzer. The County operates the station to maintain a 4.0-mg/L disinfectant residual. A diesel generator is available on site to provide backup power supply to the station.

The following O&M improvements were completed over the past 3 years:

- 2020 – Installed retaining walls for a new GST manway access port.
- 2020 – Replaced couplings on Pumps No. 1 and No. 4.
- 2021 – Bypassed the storage tank for liner replacement.
- 2021 – Repaired the generator.
- 2021 – Installed a mixer in the GST.
- 2022 – Repainted aboveground piping.
- 2022 – Installed new lighting.
- 2022 – Installed new fencing around the perimeter.
- 2022 – Installed new rotating assembly into Pump No. 1.
- 2022 – Power-washed the GST.
- 2022 – Repainted the influent GST piping.

Condition Assessment

The station is in fair condition. Roads and landscaping are in good condition. Graveled areas around the facility infrastructure are weeded. The indoor buildings are kept clean, and tools and equipment are organized and stored properly. Hurricane Ian damaged the plumbing, waterlogged the roof of the building, and blew away the awning over the chemical storage tanks.

Interviews with operators indicates that the valves in and out of the GST are exercised regularly, but that standard gate valve #5 is difficult to close. A new rotating assembly will be installed into Pump No. 2 in FY 2023.

The incoming switchgear and distribution transformer appear in fair to poor condition. Components were identified as possibly being at the end of their service life because of their age. The standby generator and incoming power appear in fair condition as well. Interviews with County staff reported an unresolved issue in FY 2021 that continued into FY 2022. During the last maintenance cycle, the incoming main breaker for the facility would not re-close. After several attempts, maintenance personnel were able to get the breaker to close and maintain position. However, this indicates that the breaker has an issue and may likely fail soon. A electrical engineer's review of the site found an unresolved issue from the last annual report. Several drives have been updated to Yaskawa VFDs and were retrofitted into the existing MCC cabinets. However, the spaces provided did not match the drives, and foam is now filling the gap between the drive and the enclosure, which may be problematic. Although no live parts appear to be exposed, this does raise a maintenance concern and the possibility of exposed parts. Staff has indicated that the CIP includes a project to replace all main switchgear in this facility this fiscal year or next. Additionally, MCC/pump upgrades are budgeted for FY 2022/2023.

The following deficiencies were noted:

- Much of the switchgear appears to be in fair-poor condition and is possibly reaching the end of its service life. Many components may no longer be manufactured, making long-term maintenance an issue.
- An exterior-mounted ATS appears to be in fair condition and degraded due to exposure to weather.
- The switchgear contains no warning labels identifying parts and components as being energized.
- Foam spacers are between the updated VFD drives and the enclosure.
- Several large paint chips in the GST influent pipe.
- A VFD exhaust fan was blown away, leaving potential for the room equipment to overheat.
- The chemical storage tanks are not clearly labeled.
- The check valve at Pump No. 4 was leaky.
- The building roof is damaged and waterlogged.

4.1.2.5 Ingraham – WBS #7

The Mid/West County distribution system contains one disinfection booster station at 14276 Ingraham Boulevard, Port Charlotte, Florida 33981. The Ingraham Boulevard sodium hypochlorite/ammonium sulfate injection station monitors chlorine residual and injects additional disinfection chemicals to maintain the FDEP-required levels. The injection station is enclosed in a 6-foot chain-link fence with barbed wire on top. The station contains two ventilated buildings; one serves as an office and the other houses the chemical skids. Each skid contains one metering pump, and a spare is kept on site. The system does not have a permanent backup generator and relies on the sewer system pump station power adjacent to the booster station. A total chlorine residual of 4.0 mg/L is maintained by injecting sodium hypochlorite and ammonia at a rate that is paced by the flow passing the station. The chlorine level and local water pressure are monitored continuously.

The following upgrades were made over the last 3 years:

- 2020 – Installed a new transmitter on the flow meter at the station.
- 2021 – Installed a new flow meter to replace a failed one.
- 2021 – Repaired the doorstep to the water-quality testing and storage shed.
- 2022 – Installed a new insertion flow meter at bridge crossing; solar-powered radio signal transmits flows back to the station.

Condition Assessment

The general condition of the station is fair. The buildings are weathered but in operational condition. The landscaping is maintained. The electrical components at the Ingraham Disinfection Station are in good condition. A new flow meter will be installed in FY 2023.

The station is powered from the nearby lift station and does not have access to backup power in the event of power loss.

4.1.2.6 Englewood – WBS #8

The EWD interconnect not only provides redundancy for EWD and CCU during an emergency, but also acts as a water-pressure booster and/or chemical dosing station. The EWD WBS includes two 40-HP booster pumps with a diesel generator for backup power supply. Monitoring at the interconnect facility includes total chlorine residual, free ammonia residual, pressure, and flow. By opening or closing valves, the EWD interconnect pumping station can pump water in either direction, i.e., to or from EWD. However, EWD and CCU must both get permission from and will be billed by the PRMRWSA to receive excess water as stipulated by the PRMRWSA contract.

In FY 2015, Charlotte County completed minor modifications to the pumps and piping system that allow this facility to increase water circulation in the west portion of CCU's service area. A new flow meter was installed and shows the circulation is approximately 750 gpm. This change has resulted in increased system pressure and chlorination residual levels in the area that are required to meet FDEP delivery disinfection requirements. The County replaced a faulty human-machine interface (HMI) in FY 2017 and constructed an aluminum cover over the pumps and piping at the site in FY 2018. The County also installed a new flow meter at the interconnect to monitor flows crossing SR 776 in West County.

The following upgrades were made over the last 3 years:

- 2019 – Installed a new Dupolox 400M total chlorine meter.
- 2021 – Built a new canopy beside the existing canopy.
- 2021 – Incorporated chemical injection of sodium hypochlorite and ammonium sulfate into the existing permit.
- 2022 – Installed a chemical dosing system including the following:
    - One double-walled 500-gallon sodium hypochlorite storage tank.
    - One double-walled 120-gallon ammonium sulfate storage tank.
    - One in-line chemical mixer with two chemical injection quills.
    - Two built-in-house chemical injection skids.
    - One eyewash station.

Condition Assessment

Due to damage done by Hurricane Ian, the interconnect was not in operation since the storm. The control panel was flooded, and evidence of a small electrical fire is present. The small office building used as an operator laboratory was blown away. The canopy installed in FY 2021 was damaged and must be re-anchored. The light pole adjacent to the canopy is cracked and should be replaced or repaired. Additionally, the electrical engineer visited on February 21, 2023, to meet with staff and observe the station.

The following deficiencies were noted:

- The operator laboratory/office building is completely gone.
- The control panel is powered but shows signs of water damage and previous fire.
- Conduit to the control panel is rusted.
- The canopy is leaning to one side and is not secure.
- The light pole is cracked and ineffective as the light is directly above the canopy.
- Debris should be cleared from around the station.

4.1.2.7 Myakka – WBS #9

The Myakka Booster Station is at 4070 Railroad Avenue, Port Charlotte, Florida 33953. The property includes a potable water booster station and a wastewater vacuum collection station. The potable water station was built in 2020 and has three 40-HP pumps. The HSPs are skid mounted for future removal and use at other sites. The pumps, electrical components, and water-quality testing appurtenances are in a climate-control room. The station is fenced and has one entrance with a manual gate. The station does not include disinfectant dosing features; however, residual chlorine and ammonia are monitored continuously throughout each day. A diesel generator provides backup power to the station.

The following upgrades were made over the last 3 years:

- 2021 – Increased the suction pressure setpoint.
- 2021 – Rebuilt Pump No. 1.

Condition Assessment

Jones Edmunds last completed an on-site review of the plant on November 15, 2022, as part of CCU's Hurricane Ian Damage Assessments; the information gathered at that time was used to update this section, in accordance with the project scope. CCU staff is aware of the following damages, as recorded during the hurricane assessment, and have been working diligently to address them accordingly. The station is in great condition overall.

The following deficiencies were noted:

- The roof was damaged; it is missing shingles and is wrapped with plastic.

4.1.3 STORAGE

GSTs are typically at WTPs and booster pump stations and are cleaned and inspected every 5 years. The tanks are designed to be filled by system pressure. The water is pumped from the GST and pressurized to the desired system pressure before re-entering the distribution system. The GSTs provide the following functions for the CCU water supply system:

- Store water in case of an interruption of service at the WTP or a main transmission pipe failure.
- Provide local water to booster stations to provide adequate pressure for CCU customers and for firefighting.
- Meet peak demand by storing water during low-use periods for release during high-use periods.

Four operational potable water GSTs are within the main (Mid/West County) CCU service area, ranging in capacity from 1 to 5 MG for a total capacity of 10 MG. Table 4-3 lists the GST capacities and number of HSPs and chemical feed pumps at each booster station.

Table 4-3 WBS GST Capacities, HSPs, and Chemical Feed Pumps

Booster Station Name	GST Capacity (MG)	Number of HSPs	Number of Chemical Pumps
Port Charlotte Golf Course	1	2	6
Gulf Cove	2	4	4
Walenda	2	5	4
Rotonda	5	4	8
Ingraham	0	0	2
Englewood	0	2	4
Myakka	0	3	0
Total	**10**	**15**	**26**

In addition, six 2-MG GSTs (for a total capacity of 12 MG) are at the PRMRWSF. This stored amount of treated water is available to Charlotte County and other PRMRWSA members for water supply for peak use such as fire flow or in case of a temporary loss of treatment at the PRMRWSF.

4.1.4 OPERATIONS

Treated water from the PRMRWSF enters the main CCU service area via four metered regional transmission mains. Although the system is looped, the flow generally continues to the Port Charlotte Golf Course and Walenda Booster Stations, then to the Gulf Cove and Myakka Booster Stations, and lastly to the Rotonda Booster Station. General practice is to fill the Rotonda 5-MG tank through the new Ingraham 24-inch transmission main from a 16-inch water main from the Walenda Booster Station. The 16-inch transmission pipe also serves customers along its route; however, the 24-inch transmission main has no customers connected to the main.

Sodium hypochlorite and ammonium sulfate are injected into the system to maintain proper disinfectant concentrations in the GSTs. Each tank is refilled when its level falls below the two-thirds point, unless there is reason for caution, such as during hurricane season. In such emergency situations, each tank is generally kept full.

Sound O&M processes implemented by a well-trained staff maintain the CCU system's integrity. Expected capacity needs are met through careful forecasting of demands and CIP project planning. The Water Distribution workgroup is responsible for dozens of operational processes with the common goal of maintaining adequate flow rate, volume, quality, and water pressure to CCU customers. CCU has a proactive training program for its staff. The County uses the industry-recognized University of California/Sacramento study books to assist staff in obtaining their operator licenses. CCU requires staff to take the course before sitting for the State certification tests.

4.1.5 WATER REPORT

CCU maintains a continuous, monthly water audit for its Mid/West County water distribution system. Table 4-4 shows the Mid/West County audit results for FY 2022. The audit table compares the water received from the PRMRWSF to the sum of the total water billed to customers, water for distribution system flushing and fire department uses, and water loss due to identified leaks and breaks.

CCU estimates the quantity of water used for flushing the distribution system water lines by the size of the outlet and amount of time flushing has occurred. Water regulations require a minimum chloramine residual throughout the system of 0.6 part per million (ppm). Most of the flushing water used is to maintain chlorine residual levels in the distant, isolated parts of the distribution system.

Water loss due to line breaks is estimated based on the pressure in the line before the break and the size of the pipe. At present, most main breaks are caused by contractors excavating for other utility installations or by aging pipe in the system. For example, new telephone systems are being changed from copper to fiber, new electricity poles are being installed, and underground lines are replacing old pole lines. Loss due to line breaks is estimated at approximately 837,000 gallons per month, roughly 0.2 percent of the total FY 2022 water use.

The unaccounted-for water loss column is the total metered water (Column 2) minus the sum of the known usages (Columns 3 through 8). AWWA considers a range of 10 to 20 percent for unaccounted-for water to be acceptable in a fully metered system. The annual average value for the unaccounted-for water in the CCU Mid/West County system was approximately 16.2 MG per month or 7.3 percent.

Table 4-4 CCU Unaccountable Water Report (Mid/West County) FY 2022

Month	Total Metered Water (gal)	Sold (gal)	Construction Flushing (gal)	Hydrant Flushing (gal)	Construction Fill (gal)	Line Breaks (gal)	Fire Fighting (gal)	Unaccounted-for Water Loss[1] (gal)
Oct-21	351,122,000	251,619,000	634,500	80,300,510	93,960	126,022	50,000	18,298,008
Nov-21	341,871,000	276,893,000	681,580	79,200,021	8,700	1,104,145	50,000	-16,066,446
Dec-21	361,841,000	280,393,000	152,325	33,405,210	17,800	141,900	50,000	47,680,765
Jan-22	368,353,000	336,633,000	709,265	34,347,007	56,216	87,810	50,000	-3,530,298
Feb-22	355,037,000	291,829,000	288,160	32,350,470	10,283	123,593	50,000	30,385,494
Mar-22	412,620,000	321,147,000	444,825	35,496,925	—	290,676	50,000	55,190,574
Apr-22	407,923,000	428,723,000	—	33,244,310	—	818,780	50,000	-54,913,090
May-22	366,959,000	329,822,000	96,495	34,569,180	1,879	2,594,130	50,000	-174,684
Jun-22	332,432,000	280,845,000	1,625	35,361,675	—	1,144,215	50,000	15,029,485
Jul-22	342,929,000	280,183,000	350,000	31,821,700	—	705,155	50,000	29,819,145
Aug-22	342,178,000	259,418,000	1,497,750	32,393,790	207,979	1,525,177	50,000	47,085,304
Sep-22	321,934,000	267,956,000	—	26,858,600	—	1,381,285	50,000	25,688,115
Total (gal)	4,305,199,000	3,605,461,000	4,856,525	489,349,398	396,817	10,042,888	600,00	194,492,372
Monthly Average (gal)	358,766,583	300,455,083	404,710	40,779,117	33,068	836,907	50,000	16,207,698

Note: [1] Negative monthly water loss occurs because the meters are not read on the same day every month.

4.2 South County Distribution System

The CCU South County water distribution system, also known as the Burnt Store system, is wholly separated physically and geographically from the Mid/West County water distribution system. It is owned and operated by CCU. The current service area is concentrated in the south part of Charlotte County and a small area in north Lee County along the County border.

The South County service area is approximately 8 square miles of land in Charlotte County and 2 square miles in Lee County. The system serves the nearly built out Burnt Store Marina residential development in Lee County and sparsely populated but growing residential developments along Burnt Store Road and Tucker's Grade to the northwest. The water is produced by the CCU-owned Burnt Store RO WTP.

Based on existing GIS data at the time of this report, the South County distribution system consists of 74 miles of water main ranging in size from 2- to 24-inch diameter. Water main installations are expected to continue north and south of the WTP extending toward Punta Gorda and into Lee County, respectively. Approximately 319 fire hydrants are throughout the South County distribution system.

4.2.1 Interconnects

The South County distribution system does not have interconnects with neighboring utilities. However, as identified in the Potable Water Master Plan, CCU is considering options to interconnect South County to other systems, such as PRMRWSA. In addition, CCU has completed installing an ammonia sulfate chemical feed system at Burnt Store WTP and is converting to monochloramine disinfection within the South County distribution system; once completed, CCU will achieve disinfection compatibility with the PRMRWSA and the Mid/West County distribution system.

4.2.2 Water Booster Stations

Due to the relatively small size of the South County distribution system, the system has no booster stations or disinfection injection points. The chemicals and pumps are at the Burnt Store RO WTP. However, a WBS improvement near Heritage Landing was identified in the Water Master Plan to address future growth.

4.2.3 Storage

The water storage for the South County distribution system is at the Burnt Store RO WTP; no additional storage is provided within the South County distribution system. However, an elevated storage tank improvement near Tuckers Grade was identified in the Potable Water Master Plan to address future growth.

4.2.4 Operations

Treated water from the Burnt Store RO WTP enters the South County service area through a 20-inch transmission main. The transmission system divides into 16-inch north and 16-inch south transmission pipes within the Burnt Store Road right-of-way.

As with the Mid/West County distribution system, forecasting and capital improvements planning are also conducted for the South County system. The Water Distribution workgroup

is also responsible for maintaining adequate flow rate, volume, quality, and pressure to the South County CCU customers.

4.2.5 WATER AUDIT

CCU maintains a continuous, monthly water audit for its South County water distribution system. The audit is calculated differently than the SWFWMD audit. Table 4-5 shows the results of the 2022 CCU audit for the South County distribution system. The audit table compares the water passing through the discharge meter at the Burnt Store RO WTP to the sum of total water billed to customers, water for distribution system flushing and fire department uses, and water loss due to identified leaks and breaks.

CCU estimates the quantity of water used for flushing the distribution system water lines by the size of the outlet and amount of time flushing has occurred. Water regulations require a minimum free chlorine residual throughout the system of 0.2 ppm. A large portion of the flushing water is used to maintain chlorine residual levels in the distant isolated parts of the distribution system.

At present, most main breaks are caused by contractors excavating for other utility installations or by aging pipe in the system. The South County distribution system has experienced line breaks due to pressure surges in the system. The system includes old PVC water pipes that are thinner than the current CCU standard PVC water pipes. The thinner pipes are more brittle and susceptible to breakage. The pumps that pressurize the South County distribution system have been modified with VFDs to reduce pressure surges.

The unaccounted-for water loss column is the total metered water (Column 2) minus the sum of the known uses (Columns 3 through 8). The unaccounted-for water loss percentage for FY 2022 was approximately 15.5 percent for the South County distribution system.

A water loss percentage over 10 percent requires that a water loss audit be prepared using a SWFWMD-automated water loss calculator. A water-loss-reduction plan was prepared in 2015 with the specific task to determine sources of observed water loss. Since 2015, CCU has been working directly with SWFWMD staff to implement the plan and has mitigated several sources of water loss by completing the following:

- Installed new fixed base meters in every residential water service and checked the accuracy of commercial water meters.
- Performed a leak analysis throughout the South County distribution system.
- Reduced the operating pressure of the system to reduce leaks.
- Continued to investigate the issue by checking the accuracy of the meters and water accounting system.

Following these efforts, SWFWMD conceded that continued search for small leaks is a futile effort that can be stopped by CCU, if requested by letter.

Table 4-5 CCU Unaccountable Water Report (South County) FY 2022

Month	Total Metered Water (gal)	Sold (gal)	Construction Flushing (gal)	Hydrant Flushing (gal)	Construction Fill (gal)	Line Breaks (gal)	Fire Fighting (gal)	Unaccounted-for Water Loss[1] (gal)
Oct-21	14,542,528	10,820,000	415,500	6,000	93,960	19,478	10,000	3,177,590
Nov-21	14,800,680	12,752,000	—	7,250	—	32,970	10,000	1,998,460
Dec-21	15,852,348	12,465,000	—	74,000	—	105,660	10,000	3,197,688
Jan-22	17,846,744	16,246,000	—	18,000	—	39,540	10,000	1,533,204
Feb-22	17,297,856	14,969,000	—	31,608	—	80,400	10,000	2,206,848
Mar-22	20,043,264	15,831,000	—	6,000	—	5,760	10,000	4,190,504
Apr-22	18,545,152	17,476,000	—	6,000	—	32,920	10,000	1,020,232
May-22	14,987,008	12,751,000	—	111,700	—	-	10,000	2,114,308
Jun-22	12,874,816	11,006,000	—	12,000	—	8,785	10,000	1,838,031
Jul-22	13,222,976	10,970,000	—	19,100	—	107,850	10,000	2,116,026
Aug-22	15,760,320	10,458,000	1,335,000	10,900	204,323	412,285	10,000	3,329,812
Sep-22	14,746,368	11,248,000	—	4,100	—	942,660	10,000	2,541,608
Total (gal)	190,520,060	156,992,000	1,750,500	306,658	298,283	1,788,308	120,000	29,264,311
Monthly Average (gal)	15,876,672	13,082,667	145,875	25,555	24,857	149,026	10,000	2,438,693

In 2019, Jones Edmunds completed a water loss investigation of the South County distribution system and determined that the primary source of water loss was background leakage from the distribution system. Although the investigation determined that the leakage volume was within the expected range for the South County distribution system based on physical characteristics such as distribution main length, service connections, and operating pressure, the leakage volume was determined to be over the 10-percent threshold due to the relatively low amount of water supplied, which is a result of the snowbird-driven water use demands observed for many of the residential areas within the system. The investigation also noted that residential meters may be underreporting water use system-wide and recommended that CCU continue its meter testing and replacement program to identify and replace residential meters that are not performing adequately.

4.3 MAINTENANCE

CCU performs three types of maintenance on its water distribution systems: predictive, preventive, and corrective. In predictive maintenance, tests and observations are performed on equipment to predict when failure of the component might occur. An example of a CCU predictive maintenance procedure occurs during the daily inspection of large stations. While at the station, the operator takes infrared readings on motors and other components to measure abnormally high temperature readings. In doing so, an impending failure can be averted by addressing the cause of the temperature spike. Predictive maintenance is most suitable for equipment that is in essentially continuous operation, where abrupt failure would prove detrimental.

Preventive maintenance involves exercising components such as valves and hydrants, changing lubricants, and replacing wearable parts on a schedule of time or usage. Preventive maintenance is most suitable for equipment that must be ready to be operated, even though it is typically not in use.

Corrective maintenance occurs when an abrupt failure occurs or when the system is compromised by others, such as a cable installer puncturing a water main. Corrective maintenance focuses on restoring service as soon as possible, even with a temporary repair to be upgraded later.

4.3.1 SERVICE ORDERS

Maintenance begins with a service order (SO). Predictive and preventive SOs are generated by staff, so there is flexibility as to when they are performed. They are scheduled at such a time to be most efficient in terms of the availability of resources, especially labor.

Corrective SOs are usually generated by a customer phone call. During normal office hours, a CCU dispatcher documents the information and contacts the appropriate foreman to respond. During off-hours, an answering service records the information and contacts the on-call line technician for response. The on-call line technician has the resources to organize a four-person crew after hours, if needed. The level of service, from the customer's perspective, is that a live voice will respond to an emergency call 24 hours a day, 7 days a week. Some corrective SOs are generated by a telemetered alarm when certain parameters are breached, for example, low system pressure. The telemetry system sends a message to the cell phone of the Chief Operator, who deploys the required staff. This procedure allows a problem to be addressed before a loss or reduction of service to the customer occurs.

The response time by the repair crew, even to the farthest point of the service area, is less than 45 minutes. This level of service is maintained in part by distributing crews geographically to reduce response distance. To maintain this level of service during off-hours, emergency staff is equipped with cell phones to expedite communication and wireless-enabled laptop computers. Every crew is in a vehicle equipped with the materials and tools to perform a wide range of maintenance activities, reducing the need for trips to the warehouse. In addition, warehouse personnel are on call 24/7 and are equipped to deliver materials and parts as needed.

4.3.2 Data Management

SOs generate valuable data that can be used to improve O&M based on actual performance. Historically, data were maintained in several media, including electronic and paper based, so it was not always easily retrievable. This condition was greatly improved with the County's implementation of a computerized maintenance management system. Known as an EAMS, it allows data to be stored on a file server and accessible to authorized users. The system has standard reports, but custom reports can be created for specific purposes. EAMS has greatly reduced paperwork and improved efficiency. The system continues to be expanded to other County departments, and staff training continues. A Countywide evaluation of current needs is underway to revise or replace the EAMS.

Information being maintained includes costs to complete an SO in terms of labor, parts, and equipment use, including vehicles and outside contractors, if needed. The data can be used to generate budgets, evaluate the efficiency of processes and particular components of equipment, perform "what-if" scenarios, and conduct many other analyses that were too cumbersome to perform in the past.

4.3.3 Maintenance Activities

The CCU Water Distribution staff perform daily visual inspections, water-quality tests, and temperature checks at each of the booster stations. In addition, each booster station is visited at least monthly to perform mechanical and electrical tests, greasing, and lubrication. Staff perform repairs and replacement of booster station pumps and motors, rather than relying on outsourced services that are expensive and not as responsive. Each in-service booster station has a portable gantry on site to enable pumping units and motors to be pulled and replaced quickly. Due to these maintenance practices, the booster stations and especially the pumps are operating efficiently.

As part of ongoing maintenance, CCU periodically tests water meters for accuracy. The water meters are maintained and warranted for a 20-year replacement cycle, which is the optimum time for replacement. The existing design standards for pipes, valves, and hydrants allow the maintenance staff to be more efficient and cost-effective in maintaining the system. Water valves have been surveyed using a global positioning system (GPS), which allows any valve to be quickly located if it needs to be shut off. Staff regularly exercise hydrants and system valves to increase reliability. Large water meters are checked for accuracy yearly and repairs are conducted when necessary.

Maintenance activities for FY 2022 in both County distribution systems included:

- Completed 7,270 SOs within the distribution systems.
- Responded to 214 water-quality calls and 979 customer calls for leaks.
- Replaced 12 hydrants, repaired 106 hydrants, and performed maintenance on 616 hydrants, including exercising, flow testing, and painting.
- Issued and addressed 68 boil water notices and repaired 47 line breaks on pipes 3 inches or larger.
- Installed two new valves, replaced 12 valves, conducted zero valve insertions, and performed maintenance on 1,783 valves.
- Tested 93 large meters and 6,304 small meters.
- Replaced 8 galvanized-steel service connections.
- All compliance sampling points have been upgraded; progress will no longer be tracked herein this report.
- Replaced WACHS valve machine hand-held controller devices with tablet computer controllers.
- All booster stations were inspected by the Safety Committee and received a security upgrade.

4.3.4 Staff Training and Employee Retention

CCU encourages employees and staff members to participate in training activities to maintain license requirements and attract superior staff among a competitive labor market. The following training was conducted by CCU staff:

- Eight staff members attended Asbestos Supervisor training at Training, Research, and Education for Environmental Occupations (TREEO).
- Three employees attended Florida Water and Pollution Control Operators Association (FW&PCOA) online short school for Level 2 Distribution System Operator (DSO).
- Two staff members attended APWA Leadership Training.
- One staff member attended CDL training.
- Two staff members attended an asbestos training 8-hour course, nine staff members attended the abbreviated 4-hour course, eight staff members attended a week-long supervisor training for asbestos.

As with many organizations, maintaining the proper number of staff is required to complete the maintenance activities that accompany the management of a distribution system. In 2022, the following staffing changes occurred:

- Ten new staff members were hired, in addition to five staff members that retained employment.
- Key positions with personnel changes: new Distribution Superintendent, new Chief Booster Operator, new Water Quality Field Supervisor, and new Administrative Assistant.

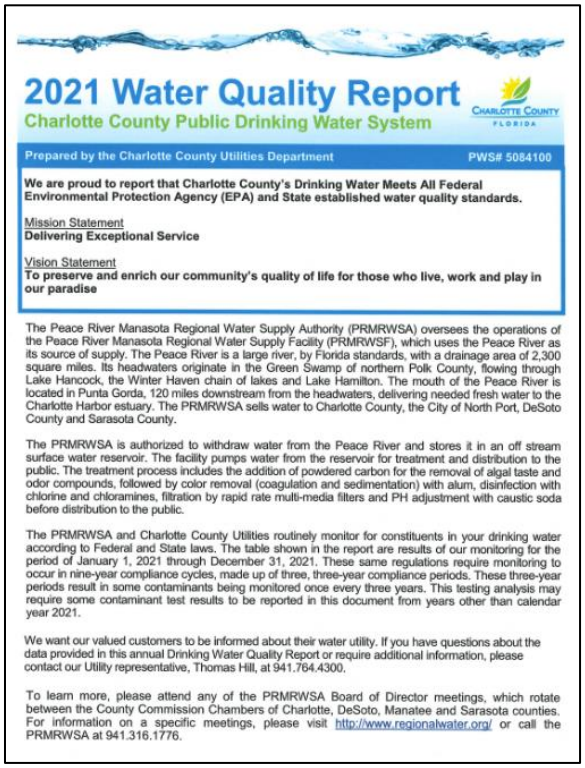
4.4 Consumer Confidence Reports

As required by federal and state regulations for utilities, CCU provides accessibility to every customer to view electronically or obtain a hard copy of the annual water-quality report, also known as the Consumer Confidence Report (CCR). The report tabulates the results of water-quality testing to identify the level of any contaminants detected in the drinking water. All

water, including bottled water, originates from rivers, lakes, streams, ponds, reservoirs, springs, or wells. As water travels over land or through the ground, it dissolves naturally occurring minerals and can also absorb substances that originate from animal or human activity. These contaminants may include:

- Microbial contaminants, such as viruses and bacteria.
- Inorganic contaminants, such as salts, metals, pesticides, and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals.
- Radioactive contaminants, which can be naturally occurring.

To ensure that tap water is safe to drink, EPA regulations limit the concentrations of certain contaminants in water provided by PWSs. All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk.



2021 Water Quality Report

Charlotte County Public Drinking Water System

Prepared by the Charlotte County Utilities Department PWS# 5084100

We are proud to report that Charlotte County's Drinking Water Meets All Federal Environmental Protection Agency (EPA) and State established water quality standards.

Mission Statement
Delivering Exceptional Service

Vision Statement
To preserve and enrich our community's quality of life for those who live, work and play in our paradise

The Peace River Manasota Regional Water Supply Authority (PRMRWSA) oversees the operations of the Peace River Manasota Regional Water Supply Facility (PRMRWSF), which uses the Peace River as its source of supply. The Peace River is a large river, by Florida standards, with a drainage area of 2,300 square miles. Its headwaters originate in the Green Swamp of northern Polk County, flowing through Lake Hancock, the Winter Haven chain of lakes and Lake Hamilton. The mouth of the Peace River is located in Punta Gorda, 120 miles downstream from the headwaters, delivering needed fresh water to the Charlotte Harbor estuary. The PRMRWSA sells water to Charlotte County, the City of North Port, DeSoto County and Sarasota County.

The PRMRWSA is authorized to withdraw water from the Peace River and stores it in an off stream surface water reservoir. The facility pumps water from the reservoir for treatment and distribution to the public. The treatment process includes the addition of powdered carbon for the removal of algal taste and odor compounds, followed by color removal (coagulation and sedimentation) with alum, disinfection with chlorine and chloramines, filtration by rapid rate multi-media filters and PH adjustment with caustic soda before distribution to the public.

The PRMRWSA and Charlotte County Utilities routinely monitor for constituents in your drinking water according to Federal and State laws. The table shown in the report are results of our monitoring for the period of January 1, 2021 through December 31, 2021. These same regulations require monitoring to occur in nine-year compliance cycles, made up of three, three-year compliance periods. These three-year periods result in some contaminants being monitored once every three years. This testing analysis may require some contaminant test results to be reported in this document from years other than calendar year 2021.

We want our valued customers to be informed about their water utility. If you have questions about the data provided in this annual Drinking Water Quality Report or require additional information, please contact our Utility representative, Thomas Hill, at 941.764.4300.

To learn more, please attend any of the PRMRWSA Board of Director meetings, which rotate between the County Commission Chambers of Charlotte, DeSoto, Manatee and Sarasota counties. For information on a specific meetings, please visit http://www.regionalwater.org/ or call the PRMRWSA at 941.316.1776.

The results, as reported in the latest CCRs for the Mid/West and South County distribution systems, indicate the levels of tested water contaminants in the CCU service area are safely below the maximum contaminant level allowed by federal and state regulations and orders and in most cases are well below the level.

The most recent CCRs for the Mid/West (Peace River) and South (Burnt Store) County distribution systems are available at *https://www.charlottecountyfl.gov/departments/utilities/about-utilities/conservation/*.

4.5 Review of Previous Recommendations

Table 4-6 and Table 4-7 summarize the recommendations and status from the 2021 Annual Report for the Mid/West and South County distribution systems, respectively. Table 4-8 summarizes the general recommendations that apply to both distribution systems.

Table 4-6 Mid/West County Distribution System – 2021 Recommendations and Status

Recommendation:	Explore ways to augment the demands on the PRMRWSA treatment facility through economically feasible means including new water sources.
Progress:	Evaluated as part of the Potable Water Master Plan.
Recommendation:	Identify options to increase resilience of the West County water supply (consider redundant water mains or capped wells).[1]
Progress:	Evaluated as part of the Potable Water Master Plan.
Recommendation:	Develop water quality models for each of their distribution systems.[1]
Progress:	Developed as part of the Potable Water Master Plan.
Recommendation:	Create a water system O&M Manual and operating protocols.
Progress:	In progress via the Potable Water Master Plan contract.
Recommendation:	Continue to make improvements at the water storage tank/booster pumping station facilities to increase reliability and control of the pumps to improve water distribution to customers.
Progress:	Ongoing. Several improvements identified in the Water Master Plan.
	<u>Interconnects</u>
Recommendations:	1. Reinstall (turn or lower) the lighting fixture to illuminate the pumps and equipment at the EWD interconnect. 2. Add an intrusion alarm to the CCU radio telemetry units (RTU) panels.[1] 3. Install bollards around the equipment.[1]
Progress:	1. Scheduled to be addressed with Hurricane repairs. 2. Not completed. 3. Ongoing.
	<u>WBS General</u>
Recommendations:	1. Perform a load study to identify any issues related to power quality, quantity, and capacity and to help identify deficiencies in the system, reserve capacities, and potential anomalies that may affect long-term maintenance and serviceability of the equipment. 2. Apply appropriate arc-flash labeling on appropriate switchgear in compliance with NFPA 70E to properly notify O&M personnel of a potential hazard. This may require creating a complete and thorough arc-flash model using the existing switchgear to determine energy levels present. This information would appear on the appropriate arc-flash labeling as required.
Progress:	1. Completed. 2. CCU has completed arc-flash labeling for some facilities and is in process of completing labeling for all facilities.

	River Crossings
Recommendations:	1. Install redundant water main across the Myakka River.[1] 2. Install the Myakka WBS along SR 776 to increase the quantity of water that can be conveyed to West County from the SR 776 transmission main (in-progress).[1]
Progress:	1. Not completed. 2. Completed.
	Port Charlotte Golf Course WBS
Recommendations:	1. Perform yard maintenance around the perimeter fencing.[1] 2. Clearly label chemical storage tanks and fill valves.[1] 3. Label the switchgear to identify parts and components that could be energized.
Progress:	1. Ongoing. 2. Ongoing. 3. Ongoing through load study/arc-flash labeling project.
	Walenda WBS
Recommendations:	1. Replace the generator at the WBS with a properly sized generator to accommodate the loads and maintain reliable operation of the station. 2. Fix the leak on the seal of Pump No. 3. 3. Repair the bonding and re-paint the GST. 4. Replace the missing cover on the junction box. 5. Install bollards around the WBS effluent pipe.[1] 6. Upgrade chain link fencing as installed at other WBSs.[1] 7. Clearly label chemical storage tanks and fill valves.[1] 8. Add additional signage indicating "No Trespassing, Violators will be Prosecuted" along fencing.[1]
Progress:	1. Ongoing. 2. Completed. 3. Completed. 4. Completed. 5. Completed. 6. Ongoing. 7. Scheduled for completion. 8. Not completed.
	Gulf Cove WBS
Recommendations:	1. Perform yard maintenance around the perimeter fencing. 2. Continue to upgrade the WBS by further progressing the replacement project for the Myakka River pipe crossing that supplies water to the WBS. 3. Replace the concrete pipe connecting the GST to the pump station at the WBS. 4. Paint the floor in the sodium hypochlorite chemical injection room to prevent concrete deterioration. 5. Increase the size of the fuel tank to hold additional fuel. 6. Fix the leak on the influent pipe to the GST. 7. Fix the leak on HSP No. 2. 8. Pump out the water in the vault containing the HSP feed piping. 9. Secure the electrical conduit for the gate camera. 10. Provide additional support for the flex conduit bearing the video surveillance system.

	11. Repair conduit in the chemical feed system. 12. Investigate and review of the Gulf Cove WBS power system to identify and repair components as necessary to resolve the issue. 13. Repair the two non-working cameras.[1] 14. Clearly label chemical storage tanks.[1] 15. Continue to monitor water quality entering the Gulf Cove WBS.[1]
Progress:	1. Ongoing. 2. Scheduled for completion. 3. Scheduled for completion. 4. Completed. 5. Scheduled for completion. 6. Completed. 7. Completed. 8. Completed. 9. Completed. 10. Not completed. 11. Not completed. 12. Completed. 13. Completed. 14. Completed. 15. Ongoing.
	Rotonda WBS
Recommendations:	1. Conduct further analysis of the ATS based on the degradation of the enclosure to verify that it is functioning properly. 2. Replace the VFD covers to eliminate gaps between the updated VFDs and the enclosures. 3. Clean the small oil spill inside the generator enclosure. 4. Paint the wall that contains the HMI in the pump room. 5. Replace the incoming main breaker as soon as possible. The failure of this specific device may render the station out of service for an extended period. 6. Further recommend that the gaps surrounding the VFDs be mitigated to prevent potential contact with live parts. 7. Install bollards around the monitoring equipment.[1] 8. Clearly label chemical storage tanks and fill valves.[1] 9. Develop an ERP for WBS bypass and operations without laboratory and control room.[1]
Progress:	1. Scheduled for completion. 2. Not completed. 3. Completed. 4. Completed. 5. Scheduled for completion. 6. Not completed. 7. Completed. 8. Partially completed. 9. Not completed.
	Ingraham Disinfection Station
Recommendations:	Repair the doorstep to the water-quality testing and storage shed.
Progress:	Completed.

Table 4-7 South County Distribution System – 2021 Recommendations and Status

Recommendation:	Continue to replace old "class" PVC pipe in the distribution system with new C-900 PVC pipe.
Progress:	Ongoing.
Recommendation:	Continue developing a computerized hydraulic model for the South County distribution system.
Progress:	Ongoing.

Recommendation:	Plan for future water demands in the South County Service Area by analyzing the water distribution system using the computer water model completed in 2020.
Progress:	Completed as part of the Potable Water Master Plan.
Recommendation:	Identify options to increase resilience of the South County system considering interconnects with neighboring utilities such as the City of Punta Gorda, Lee County, and the City of Cape Coral, and investigate alternative water supplies.[1]
Progress:	Evaluated as part of the Potable Water Master Plan.

Table 4-8 General Distribution System – 2021 Recommendations and Status

Recommendation:	Identify options to increase resilience of the South County system considering interconnects with neighboring utilities or alternative water supplies.[1]
Progress:	CCU is investigating the feasibility of installing interconnects with the City of Punta Gorda, Lee County, and the City of Cape Coral.
Recommendation:	Identify options to increase resilience of the West County water supply (consider redundant water mains or capped wells).[1]
Progress:	Ongoing.
Recommendation:	Update SOP for chemical deliveries, require chain of custody forms, and verification system for proper chemical delivery.[1]
Progress:	Ongoing.
Recommendation:	Develop a wildfire ERP, identify fire hydrant locations, and coordinate with Fire Department for trainings for critical assets.[1]
Progress:	Ongoing.
Recommendation:	Update the ERP for pipe failure for all critical assets.[1]
Progress:	Ongoing.
Recommendation:	Identify a backup chemical and fuel supplier in the event of a chemical or fuel shortage.[1]
Progress:	Completed.
Recommendation:	Develop water quality models for each of their distribution systems.[1]
Progress:	Ongoing.
Recommendation:	Develop an ERP for operating without the support of SCADA.[1]
Progress:	Ongoing.
Recommendation:	Develop a procedure and obtain the equipment for transporting key chemicals (fuel and chlorine) from one site to another if required in an emergency.[1]
Progress:	Completed.
Recommendation:	Link contamination detection to SCADA to immediately shut down or lockout any pump in operation.[1]
Progress:	Ongoing.

Note: [1] Recommendation from RRA Report (March 2020).

5 WASTEWATER COLLECTION SYSTEM

5.1 SEWER SYSTEMS

The purpose of a wastewater collection system is to transport wastewater from customer structures to a treatment facility. The CCU collection system consists of the following components:

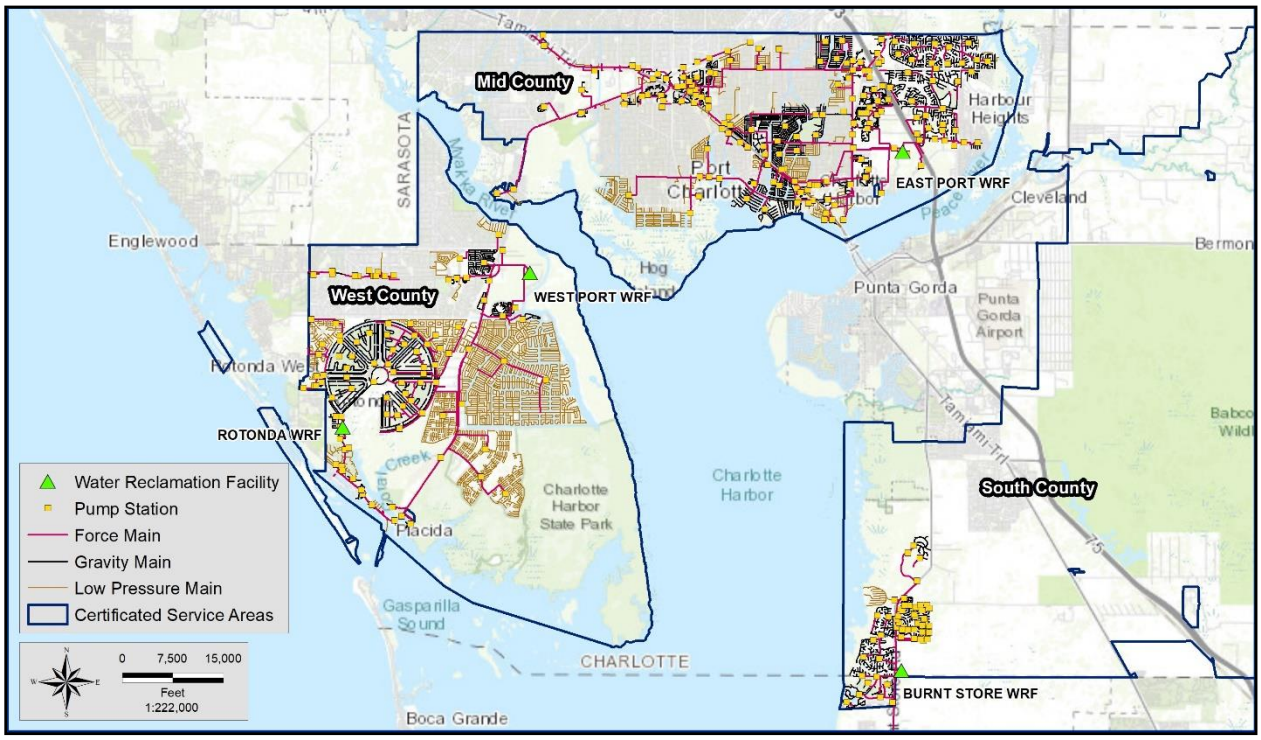
- **Gravity Sewer** – as the name implies, is piping installed at a gradual incline (slope) that allows wastewater to flow exclusively by the energy of gravity. Gravity sewers include manholes that allow maintenance staff entry and equipment use. Flow entering gravity sewers discharges to manholes, lift stations, or a treatment plant.
- **Vacuum Sewer** – moves sewage from an individual service wastewater storage tank to a wastewater pumping station by a vacuum that is created at a pumping station site. This system uses smaller-diameter pipes than a gravity sewer system.
- **Low-Pressure Sewer (LPS)** — is an alternative to a gravity sewer system and requires a small pump at each property. This system costs less to construct (smaller-diameter pipes, shallow-depth piping) but costs more to operate and maintain (electrically driven equipment). Flows within an LPS system move only when pushed by new flow contributions.
- **Force Main** – is a pressured sewer pipe that conveys wastewater in a situation where gravity sewer flow is not possible. This system component is fed by a lift station.
- **Lift Station** – also referred to as pump station, is a facility designed to move wastewater from lower to higher elevations through force mains. This system component provides additional energy to the system where reliance on gravity is not possible. Lift stations are common in Florida because of the flat terrain.
- **Vacuum Station** – houses a collection tank, discharge pumps to send the sewage to the treatment plant, controls to automate the station, and vacuum pumps that create a negative pressure in the vacuum mains.

CCU's service area is served by four collection systems. Each system is tributary to a WRF, discussed further in Chapter 6. Figure 5-1 shows the CCU certificated service area and wastewater collection system infrastructure.

At the end of FY 2022, CCU had 43,932 wastewater customers, an increase of 1,702 customers since FY 2021. CCU is currently in the process of updating GIS information as part of its Cityworks Implementation project. Based on existing GIS information at the time of this report, the wastewater collection system primarily features the following:

- 512 miles of gravity sewer.
- 409 miles of LPS mains.
- 35 miles of vacuum sewers.
- 202 miles of force mains.
- 8,099 manholes.
- 319 lift stations.
- Three vacuum stations (with a fourth in construction).

Figure 5-1 CCU Wastewater Collection Systems



5.1.1 System Expansion

The existing South, Mid, and West County wastewater systems were hydraulically modeled using SewerGEMS™ software as part of a Countywide Wastewater Master Plan. The model has been incrementally and continuously updated since 2017. The model identifies areas where capacity upgrades are needed to support future growth, as well as upgrades needed for future system expansions.

The model is a constant work in progress that it is regularly updated when system changes occur. Most recently, the County is improving the reliability of the model in the West County area and using the Mid, West, and South County models to verify infrastructure sizing for new developments and upcoming septic-to-sewer conversion projects. Recent efforts include Edgewater Drive/Flamingo Boulevard force main sizing in Mid County; SR-776 force main sizing and Harbor Village development in West County; and Tuckers Grade, Starling, and Simple Life developments in South County.

5.2 Lift Stations

As reported by CCU staff at the time of this report, the wastewater collection system had a total of 319 CCU-maintained lift stations – 305 owned by CCU. Vacuum stations are not included in the lift station count. Section 5.3 discusses the vacuum stations. The other 14 stations are owned by Charlotte County, 11 of which are outside the CCU service area. Twenty-five lift stations have permanent auxiliary power through on-site stationary generators; 10 other stations have dedicated trailer-mounted generators that remain on-site. LS 816 does not have permanent auxiliary power, but CCU is purchasing a lot for relocation that will provide permanent auxiliary power. In recent years, CCU has taken steps toward obtaining FEMA grant funding agreements to secure additional generators that are

strategically dispersed throughout the lift stations based on need; CCU staff reports an additional three to five stationary generator installations are currently planned for lift stations that are in design, construction, or undergoing relocation. In addition to the 35 lift stations currently equipped with dedicated auxiliary power (stationary generator or on-site trailer-mounted generator), CCU also maintains 13 spare trailer-mounted generators (ranging from 30 kW to 180 kW) and 10 spare portable generators (15 kW) – all dedicated to lift station use. In a catastrophic event, the ability to provide power to the rest of the collection system is limited. Connections/receptacles for these portable generators are at nearly every lift station within the system. All lift stations allow wastewater pumping from wetwells during emergencies through a portable pump connection or an adaptor that can be installed when needed.

Jones Edmunds personnel and CCU Operations staff conducted site visits on February 15 and February 16, 2023, to three master lift stations, 13 representative lift stations, and two vacuum stations, as selected by CCU staff. Selected stations were dispersed among the South and West areas of the County where construction was planned that would most significantly impact the pumps' hydraulic performance. Table 5-1 lists the 16 lift stations visited; Section 5.3 addresses the vacuum stations. The site-visit assessments will help CCU to identify and prioritize maintenance, rehabilitation, or replacement work at these lift stations.

Table 5-1 Visited Wastewater Collection Systems – Master and Representative Lift Stations

Station No.	Location
MLS 801 Field	Cape Haze and Boundary Boulevard
MLS 882 Oldsmar	Oldsmar Circle and Amicola Street
MLS 422 Heritage Landings Master	Heritage Landings Boulevard and Redbud Lane
LS 404 Big Pine	Big Pine Lane and Bend Circle
LS 407 Vincent	Vincent Avenue and Cedar Rapids Road
LS 408 Cabana	Cabana Road and Cape Horn Boulevard
LS 409 Santa Inez	Santa Inez Road and Peppercorn Road
LS 410 Monza	Monza Road and Acapulco Road
LS 411 San Ciprian	San Ciprian Road and Cape Horn Boulevard
LS 802 Ball Park	Cape Haze Drive and Arlington Drive
LS 803 Store	Kendall Road and Cape Haze Drive
LS 804 Gas Station	Cape Haze Drive and Haitian Road
LS 806 Arlington	Arlington Drive and Cape Haze Drive
LS 807 Post Office	Pompano Street and Tarpon Street
LS 808 Publix	Behind Publix Super Market Plaza on Placida Road and Cape Haze Drive
LS 811 Fishery	Placida Road and Fishery Road

5.2.1 MASTER LIFT STATION 801 – FIELD

The Field Wastewater Master Lift Station (MLS 801) is on the south side of Cape Haze Drive near Boundary Boulevard at the end of a gravel road. This station was built in 2008. The station discharges wastewater through a 12-inch force main that conveys flow to the Rotonda WRF.

The station contains two VFD-operated pumps . The 75-HP Flygt Model 3300.181-5410 submersible pumps have 642-millimeter (mm) impellers and 12-inch high-density polyethylene (HDPE) discharge. The impeller and seals for both pumps were replaced in 2020. The pumps are inside a 10-foot-diameter, 21-foot-deep concrete wetwell with a liner. Each pump has an estimated capacity of 1,786 gpm at approximately 66 feet of head.

The wetwell hatches are in good condition and provide adequate access to remove the pumps on the 2-inch cylindrical-rail retrieval system. The wetwell interior is in great condition. The 12-inch Dezurik plug valves, 12-inch Kennedy check valves, air-release valves, and dedicated discharge connection are above ground near the wetwell. They are all in great condition and do not require repair or replacement at this time. The electromagnetic flow transmitter for the force main does not display flow through the force main and needs to be replaced.

Two biological odor-control units with fans draw air from the wetwell and reduce the hydrogen sulfide odor generated. The air movement also reduces the concentration of hydrogen sulfide in the wetwell, which will lengthen the life of this concrete structure.

The station is fenced and generally well kept with no gaps between the gravel and the bottom of the fence, prohibiting easy access by small animals. Power is provided by a 480-volt, three-phase power service. The station has a SCADA system with a telemetry transmitter/receiver and a telemetry control unit (TCU) that allows monitoring to occur from the CCU central office and treatment plants. This station also contains a 200-kW KOHLER generator with a 400-gallon fuel tank. The control panels have seal-offs, a sun shield, and a mechanical interlock between the main breaker and generator breaker and are not equipped with portable generator receptacles. The station has a potable water hose bibb for washdown.

The following deficiency was noted:

- The electromagnetic flow transmitter does not record and display flow values for the force main.

Proposed improvements to the station include:

- Evaluate replacing the electromagnetic flow transmitter for the force main.

5.2.2 Master Lift Station 882 – Oldsmar

The Oldsmar Master Lift Station (MLS 822) is at the intersection of Oldsmar Circle and Amicola Street. This station was built in 2011. The station discharges wastewater though a 6-inch force main that conveys flow to the West Port WRF.

This station contains two 47-HP Flygt Model CP3201 180-0140126 submersible pumps with 457-mm impellers and 6-inch HDPE discharge. The pumps are inside a 7-foot-diameter, 17-foot-10-inch-deep concrete wetwell. Each pump has an estimated capacity of 768 gpm at approximately 115 feet of head. The station's wetwell interior walls are in good condition and show no signs of corrosion. Since this lift station does not receive much flow, solids build up near the bottom of the wetwell. Wastewater Operations staff spray down the solids with the water service hose once a week to break up the solids. The wetwell hatches are in good condition and provide adequate access to remove the pumps on the 2-inch cylindrical-rail retrieval system. The 6-inch Dezurik plug valves, 6-inch Kennedy check valves, air-release valves, and dedicated discharge are above ground near the wetwell. One of the check vales was replaced in February 2022 and has not been painted yet.

The wetwell is vented and contains an odor-control unit. The biological odor-control unit contains a blower that draws air from the wetwell and reduces the hydrogen sulfide odor generated. The skid for the odor-control unit is heavily corroded but is still intact with the concrete pad.

Power is provided by a 480-volt, three-phase power service. The station contains a telemetry transmitter that allows monitoring to occur from the CCU central office and treatment plants. The antenna mast, damaged by Hurricane Ian, is down and has not been removed from the site. The master lift station contains a 100-kW Kohler generator with a 683-gallon fuel tank. The control panel has a sunshield, seal-offs, and a mechanical interlock between the main breaker and

generator breaker and is equipped with a portable generator receptacle. The station has a potable water hose bibb for washdown.

The site is fenced but is deteriorating and should be replaced. The fence is showing heavy signs of corrosion with missing barbed wire and an outward bulge in the material on the west side near the entrance of the site. Trees have fallen along the fence line on the north side of the site from Hurricane Ian. The gravel driveway up to the wetwell is in good condition.

The following deficiencies were noted:

- The skid for the odor-control unit is heavily corroded.
- The check valve for the lead pump discharge is unpainted.
- The antenna mast, damaged by hurricane winds, is down and taking up substantial space in the middle of the site.
- The site fence is showing major signs of corrosion, has missing barbed wire, and has an opening near the entrance of the site.
- Fallen trees from hurricane winds are along the north side of the site.

Proposed improvements to the station include:

- Evaluate replacing the skid for the odor-control unit.
- Paint the check valve for the lead pump discharge.
- Remove the broken antenna from the site.
- Evaluate replacing the barbed wire and fence around the site.
- Remove the fallen trees from the site.

5.2.3 Master Lift Station 422 – Heritage Landing Master

This Master Lift Station (MLS 422) is in the new Heritage Landing subdivision, which is still undergoing construction. The subdivision is adjacent to Burnt Store Road, just north of Zemel Road. Flows into this station are currently low but are expected to increase over time as the developer finishes construction and homes are filled. This station discharges wastewater through an 8-inch force main that conveys flow to the Burnt Store WRF.

This station contains two 69.7-HP Sulzer model ABS XFP-PE4-100J-CHI-PE520 4J-FM submersible pumps with 359-mm impellers. The pumps are inside a 10-foot-diameter, 28-foot-deep concrete wetwell with a liner. Each pump has an estimated capacity of 1,085 gpm at approximately 128.4 feet of head. The station's wetwell exterior and electrical equipment are in excellent condition. The wetwell hatches are in good condition and provide adequate access to remove the pumps on the 2-inch cylindrical-rail retrieval system. The 8-inch Milliken plug valves, 8-inch Kennedy check valves, air-release valves, and dedicated suction and discharge connections are above ground near the wetwell. A dedicated suction connection is also above grade beneath the pump-out connection.

The wetwell is vented and contains an Evoqua odor-control unit. The biological odor-control unit with a blower draws air from the wetwell and reduces the hydrogen sulfide odor generated.

Power is provided by a 480-volt, three-phase power service. The station contains a telemetry transmitter that allows monitoring from the CCU central office and treatment plants. The master lift station contains a 125-kW Cummins generator with a 631-gallon fuel tank. The generator has a PowerCommand, which allows remote monitoring and control of the generator. The control panel has seal-offs, has a mechanical interlock between the main breaker and the generator breaker, and is equipped with a portable generator receptacle. The station has a SCADA system with a telemetry transmitter/receiver with a TCU. The station also has a potable water hose bibb for washdown. The site is fenced and has proper lighting within the fenced area. The concrete driveway up to the wetwell is in great condition.

No deficiencies were noted at this station.

5.2.4 Representative Lift Stations/Vacuum Stations' Condition Assessments

Jones Edmunds personnel and CCU Operations staff also toured the selected group of neighborhood lift stations on February 15 and February 16, 2022, to develop a general sense of the overall condition of the lift stations that are within the CCU wastewater collection system, focusing on stations whose pump performance would be significantly impacted by upcoming construction. The outcome of the assessment will allow CCU to identify and prioritize maintenance, rehabilitation, or replacement work at these lift stations.

5.2.4.1 Lift Station 404 – Big Pine

The Big Pine Lift Station (LS 404) is at the intersection of Big Pine Lane and Bend Circle. This lift station, built in 2006, receives gravity flows from the surrounding residential area. The station discharges wastewater through a 4-inch force main that conveys flow to the Burnt Store WRF.

The station contains two 5-HP Flygt Model CP3102 submersible pumps with 462-mm impellers. The lead pump was replaced in January 2019. Each pump has an estimated capacity of 79 gpm at approximately 72 feet of head. The pumps are inside an 8-foot diameter, 15-foot-10-inch-deep concrete wetwell. The wetwell hatch and interior are in great condition and provide adequate access to remove the pumps on the 2-inch cylindrical-rail retrieval system. The station's electrical equipment is in excellent condition.

The 4-inch discharge Dezurik plug valves and 4-inch Kennedy check valves are in an underground vault southeast of the station. The valve vault interior has corrosion from standing water. The plug valves, check valves, dedicated discharge connection, and discharge piping are in fair condition with signs of heavy rust and need to be replaced.

Power service to the station is 230 volts, three-phase from a nearby pad-mounted transformer. The station has no odor-control system but is vented. The electrical equipment and control panels are in good condition. The control panel has a mechanical interlock between the main breaker and the generator breaker, is equipped with a portable generator receptacle, and does not have seal-offs. The station does not have a SCADA system with a telemetry transmitter/receiver. The station does not have a potable water hose bibb for washdown.

The site is not fenced, and a fallen tree from Hurricane Ian over the wetwell hatch needs to be removed. The concrete driveway to the wetwell is in great condition.

The following deficiencies were noted:

- Missing seal-offs from the control panel conduit.
- Heavy rust on the pump discharge piping, plug valves, check valves, and dedicated discharge connection in the valve vault.
- Rust and sediment were observed at the site under valves and flanges, indicating rain is entering through the valve vault hatch.
- A fallen tree is over the wetwell from hurricane winds.

Proposed improvements to the station include:

- Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes.
- Evaluate replacing the submersible pump discharge piping, plug valves, check valves, and dedicated discharge connection.
- Replace the valve vault hatch and associated lock.
- Remove the fallen tree from the lift station site.

5.2.4.2 Lift Station 407 – Vincent

The Vincent Lift Station (LS 407) is along the north side of Vincent Avenue near Cedar Rapids Road. This station, built in 1987, receives wastewater from the surrounding residential area. The station discharges through a 4-inch force main that conveys flow to the Burnt Store WRF.

The station contains two Flygt Model 3085 submersible pumps with a 436-mm impeller for the lead pump and a 462-mm impeller for the lag

pump. The pumps are inside a 6-foot-diameter, 17-foot-9-inch-deep concrete wetwell with a liner. The lead pump is 2.3 HP with a 436-mm impeller. The lag pump is 3 HP with a 462-mm impeller. Each pump has an estimated capacity of 83 gpm at approximately 13 feet of head.

The concrete wetwell interior is in great condition and is vented. The wetwell hatch is in good condition and provides adequate access to remove the pumps on the 2-inch cylindrical-rail retrieval system. The 4-inch Dezurik plug valves, 4-inch Kennedy check valves, and dedicated discharge connections are in an underground vault, east of the wetwell. The plug valves, check valves, and discharge piping show minimal signs of rust. The valve vault has standing water and sediment at the bottom, indicating inflow of stormwater and a clogged drain.

Power to the station is 240-volt, one-phase, and a pole-mounted transformer feeds the station. A generator is not on site. The control panel has a mechanical interlock between the main breaker and the generator breaker and does not have seal-offs. It is equipped with a portable generator receptacle that is rusted on the outside and can be replaced. The station does not have a SCADA system with a telemetry transmitter/receiver. The electrical equipment is in relatively good condition.

The station is not fenced and is on an unimproved lot in a residential neighborhood. Low-cut grass is from the sidewalk up to the wetwell and valve vault. The station does not have a potable water hose bibb for washdown.

The following deficiencies were noted:

- Missing seal-offs from the control panel conduit.
- The portable generator receptacle is covered in rust on the outside.
- Standing water and sediment were observed at the site under the valves and flanges, indicating rain is entering through the valve vault hatch.
- The valve vault drain is partially clogged.

Proposed improvements to the station include:

- Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes.
- Replace the generator receptacle.
- Replace the valve vault hatch and associated lock.
- Remove sediment from the valve vault drain opening.

5.2.4.3 Lift Station 408 – Cabana

The Cabana Lift Station (LS 408) is along the north side of Cabana Road near the intersection with Cape Horn Boulevard. This lift station, built in 1996, receives wastewater from the surrounding residential area. The station discharges wastewater through a 6-inch force main that conveys flows to the Burnt Store WRF.

The station contains two 20-HP Flygt Model 3152 submersible pumps with 462-mm impellers inside of a 6-foot-diameter, 20-foot-deep concrete wetwell with a liner. Each pump has an estimated capacity of 735 gpm at approximately 67 feet of head.

The wetwell is vented and has no odor control. The liner on the concrete interior wetwell is faded with some corrosion due to hydrogen sulfide exposure. The wetwell hatch is heavily rusted on the inside and provides adequate access to remove the pumps on the 2-inch cylindrical-rail retrieval system. The 4-inch Dezurik plug valves, 4-inch Kennedy check valves, and dedicated discharge connection are in an underground vault north of the wetwell. The plug valves, check valves, dedicated discharge connection, and discharge piping are in fair condition with signs of heavy rust and need to be replaced. The vault currently has standing water present inside that needs to be pumped out.

Power service to the station is 230 volts, three-phase, with a pole-mounted transformer directly south across Cabana Road. The control panel has a mechanical interlock between the main breaker and generator breaker and does not have seal-offs. It is also equipped with a portable generator receptacle that is rusted on the outside and can be replaced. The station has a SCADA system with a telemetry transmitter/receiver with a TCU. The electrical equipment is in relatively good condition.

The station is not fenced and is on an unimproved lot in a residential neighborhood. Low-cut grass is from the roadway up to the wetwell and valve vault. The station has a potable water hose bibb for washdown.

The following deficiencies were noted:

- Missing seal-offs from the control panel conduit.
- The portable generator receptacle is rusted on the outside.
- The pump discharge piping, plug valves, check valves, and dedicated discharge connection in the valve vault are heavily rusted.
- The wetwell hatch is heavily rusted on the inside.
- Standing water and sediment were observed at the site under the valves and flanges, indicating rain is entering through the valve vault hatch.
- The valve vault drain is clogged.

Proposed improvements to the station include:

- Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes.
- Replace the generator receptacle.
- Evaluate replacing the submersible pump discharge piping, plug valves, check valves, and dedicated discharge connection.
- Replace the wetwell hatch.
- Replace the valve vault hatch and associated lock.
- Remove sediment from the valve vault drain opening.

5.2.4.4 Lift Station 409 – Santa Inez

The Santa Inez Lift Station (LS4 09) is along the east side of Santa Inez Road near the intersection with Peppercorn Road. The station receives flow from the surrounding residential area and discharges wastewater through a 4-inch force main that conveys flow to the Burnt Store WRF.

The lift station contains two 5-HP Flygt Model 3102.060-1830042 submersible pumps with 463-mm impellers in an 8-inch diameter, 20-foot-9-inch-deep concrete wetwell with a liner. Each pump has an estimated capacity of 109 gpm at approximately 36 feet of head.

The wetwell is vented and does not have odor control. The wetwell hatch is showing heavy signs of corrosion on the inside and provides adequate access to remove the pumps along the 2-inch cylindrical-rail retrieval system. The 4-inch Dezurik plug valves, 4-inch Eddy-Iowa check valves, and dedicated discharge connection are in an underground vault east of the wetwell.

The power service to the station is 240-volt, single-phase with a pole-mounted transformer directly west across Santa Inez Road. The station does not have a SCADA system with a telemetry transmitter/receiver. The control panel has a mechanical interlock between the main breaker and the generator breaker, is equipped with a portable generator receptacle, and does not have seal-offs. The electrical equipment is in relatively good condition. The station has a potable water hose bibb for washdown.

The station is not fenced and is on an unimproved lot in a residential neighborhood. Although no odor control was present on site, no odors were present at the time of the site visit. Low-cut grass is from the roadway up to the wetwell and valve vault.

The following deficiencies were noted:

- Missing seal-offs from the control panel conduit.
- Moderate rust on the pump discharge piping, plug valves, check valves, and dedicated discharge connection in the valve vault.

- The wetwell hatch is heavily rusted on the inside.
- Rust and sediment were observed at the site under the valves and flanges, indicating rain is entering through the valve vault hatch.
- The valve vault drain is partially clogged.

Proposed improvements to the station include:

- Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes.
- Evaluate replacing the submersible pump discharge piping, plug valves, check valves, and dedicated discharge connection.
- Replace the wetwell hatch.
- Evaluate replacing the valve vault hatch and associated lock.
- Remove sediment from valve vault drain opening.

5.2.4.5 Lift Station 410 – Monza

The Monza Lift Station (LS 410) is on the east side of Monza Road near the intersection with Acapulco Road. This station receives flow from the surrounding residential area and discharges wastewater through a 4-inch force main that conveys flow to the WRF.

The station contains two 9.4-HP Flygt Model 3126 submersible pumps with 462-mm impellers. The pumps are inside an 8-foot-diameter, 18-foot-deep concrete wetwell. Each pump has an estimated capacity of 281 gpm at approximately 65 feet of head.

The wetwell is vented and does not have odor control. No odors were present at the time of the site visit. The wetwell hatch is heavily rusted on the inside and provides adequate access to remove the pumps along the 2-inch cylindrical-rail retrieval system. Its exterior is in relatively good condition, but the interior concrete wall is showing signs of corrosion and the discharge piping from the pumps is rusted. The station has a valve vault east of the wetwell that contains 4-inch Dezurik plug valves, 4-inch Kennedy check valves, and a dedicated discharge connection. The floor of the vault has rust and sediment beneath the valves and piping.

The station does not have a SCADA system with a telemetry transmitter/receiver. The electrical equipment is in relatively good condition.

The power service at the station is 240-volt, three-phase, with a pole-mounted transformer directly west across Monza Road. The control panel has seal-offs and is equipped with a portable generator receptacle and a mechanical interlock between the generator and the main breaker. This station has no dedicated lighting. The station has a potable water hose bibb for washdown.

The station is not fenced and is on an unimproved lot in a residential neighborhood. Low-cut grass is from the roadway up to the wetwell and valve vault.

The following deficiencies were noted:

- The wetwell hatch is heavily rusted on the inside.
- The pump discharge piping, plug valves, check valves, and dedicated discharge connection in the valve vault are heavily rusted.
- Rust and sediment were observed at the site under the valves and flanges, indicating rain is entering through the valve vault hatch.

Proposed improvements to the station include:

- Replace the wetwell hatch.
- Evaluate replacing the submersible pump discharge piping, plug valves, and check valves, and dedicated discharge connection.
- Evaluate replacing the valve vault hatch and associated lock.

5.2.4.6 Lift Station 411 – San Ciprian

The San Ciprian Lift Station (LS 411) is on the north side of San Ciprian Road near the intersection with Cape Horn Boulevard. The station, built in 1996, receives flow from the surrounding residential area and discharges wastewater through a 6-inch force main that conveys flow to the Burnt Store WRF.

This lift station contains two 20-HP Flygt Model 3152 submersible pumps with 454-mm impellers. The pumps are inside a 12-foot-diameter, 18-foot-9-inch-deep concrete wetwell. Each pump has an estimated capacity of 385 gpm at approximately 86 feet of head.

The wetwell is vented and does not have odor control. No odors were present at the time of the site visit. The wetwell hatch is heavily rusted on the inside and provides adequate access to remove the pumps along the 2-inch cylindrical-rail retrieval system. The wetwell exterior is in relatively good condition, but the interior is showing major signs of rust on the discharge piping from the pumps. The station has a valve vault northeast of the wetwell that contains 6-inch Dezurik plug valves, 6-inch Mueller check valves, and a dedicated discharge. The plugs valves and dedicated discharge piping have minimal rust. The floor of the valve vault has debris and sediment beneath the valves and piping.

The station has a SCADA system with a telemetry transmitter/receiver with a TCU. The electrical equipment is in relatively good condition.

The power service at the station is 240-volt, three-phase with a pole-mounted transformer west of the wetwell. The control panel has no seal-offs and is equipped with a portable

generator receptacle and a mechanical interlock between the generator and the main breaker. The portable generator receptacle is rusted on the outside and should be replaced. The station has no dedicated lighting. The station has a potable water hose bibb for washdown.

The station is not fenced and is on an unimproved lot in a residential neighborhood. Low-cut grass is from the roadway up to the wetwell and valve vault.

The following deficiencies were noted:

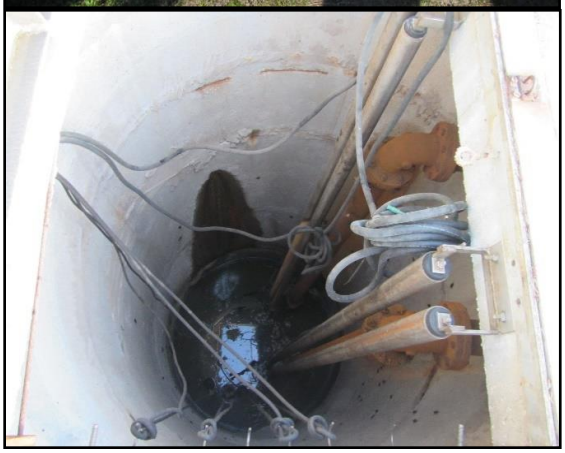
- The wetwell hatch is heavily rusted on the inside.
- The pump discharge piping, plug valves, check valves, and discharge piping in the valve vault are heavily rusted.
- Rust and was observed at the site under the valves and flanges, indicating rain is entering through the valve vault hatch.
- Missing seal-offs from the control panel conduit.
- The portable generator receptacle is corroded on the outside.

Proposed improvements to the station include:

- Replace the wetwell hatch.
- Evaluate replacing the submersible pump discharge piping, plug valves, and check valves.
- Evaluate replacing the valve vault hatch and associated lock.
- Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes.
- Replace the portable generator receptacle.

5.2.4.7 Lift Station 802 – Ball Park

The Ball Park Lift Station (LS 802) is at the intersection of Cape Haze Drive and Arlington Drive. The station receives flow from the surrounding residential area and discharges wastewater through a 6-inch force main that conveys flow to the Rotonda WRF.



The lift station contains two 3-HP Flygt Model 3085 submersible pumps with 463-mm impellers. The pumps are inside a 6-foot-diameter, 10-foot-deep concrete wetwell with a liner. Each pump has an estimated capacity of 219 gpm at approximately 21 feet of head.

The wetwell interior has a crack in the wall that is leaking fluid. The wetwell hatch is in good condition and provides adequate access to remove the pumps along the 2-inch cylindrical-rail retrieval system. The wetwell is vented and no odor was present.

The 4-inch discharge Dezurik plug valves and 4-inch Kennedy check valves are in a valve vault with a dedicated discharge connection. The pump discharge piping is heavily rusted. The floor of the valve vault has moderate sediment.

The power service to the station is 230-volt, three-phase with a pole-mounted transformer east of the wetwell. The control panel does not have has seal-offs and is equipped with a portable generator receptacle and a mechanical interlock between the generator and the main breaker. The station does not have a SCADA system with a telemetry transmitter/receiver. The station has no dedicated lighting. The station does not have a potable water hose bibb for washdown.

The station is not fenced and is on an unimproved lot in a residential neighborhood. The best path for vehicular access to the lift station is down a grass path with overgrown greenery.

The following deficiencies were noted:

- The wetwell wall has a crack that is leaking fluid onto the liner.
- The pump discharge piping is heavily rusted.
- Missing seal-offs from the control panel conduit.

Proposed improvements to the station include:

- Perform thorough rehabilitation including some form of structural improvement and lining repair.
- Evaluate replacing the submersible pump discharge piping.
- Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes.

5.2.4.8 Lift Station 803 – Store

The Store Lift Station (LS 803) is at the intersection of Kendall Road and Cape Haze drive, near the Rotonda WRF. This station, built in 2016, receives wastewater from the surrounding residential area and discharges wastewater through a 4-inch force main that conveys flow to the Rotonda WRF.

The station contains two 10-HP Flygt Model 3127 submersible pumps with 488-mm impellers. The pumps, installed in a 2021, are inside a 6-foot-diameter, 17-foot-5-inch-deep concrete wetwell. Each pump has an estimated capacity of 352 gpm at approximately 41 feet of head.

The wetwell is vented and no odor was present. The wetwell exterior and electrical equipment are in relatively great condition. The wetwell interior is in great condition with no signs of deterioration. The wetwell hatch is in great condition and provides adequate access to remove the pumps along the 2-inch cylindrical-rail retrieval system. The discharge 4-inch Dezurik plug valves, 4-inch Kennedy check valves, air-release valves, and dedicated discharge connection are above ground near the wetwell. They are all in great condition and do not require repair or replacement at this time.

The power service at the station is 230-volt, three-phase with a pole-mounted transformer across street from the station. The station has a SCADA system with a telemetry transmitter/receiver and an RTU box. The control panel has seal-offs and a mechanical interlock between the generator and the main breaker. It also equipped with a generator receptable. The station has no dedicated lighting. The station has a potable water hose bibb for washdown.

The site is in a field near an aboveground storage tank at the Rotonda WRF and is fenced in.

No deficiencies were noted at this station.

5.2.4.9 Lift Station 804 – Gas Station

The Gas Station Lift Station (LS 804) is at the intersection of Cape Haze Drive and Haitian Road. This station, built in 2005, receives flows from the surrounding residential area and discharges wastewater through an 8-inch force main that conveys flow to the Rotonda WRF.

The station contains two 20-HP Flygt Model 3152 submersible pumps with 434-mm impellers. The pumps are inside a 10-foot-diameter, 23-foot-7-inch-deep concrete wetwell with a liner. Each pump has an estimated capacity of 1,003 gpm at approximately 85 feet of head.

The wetwell interior liner is cracked in a few areas and fading due to the presence of hydrogen sulfide. The wetwell hatch is in good condition and provides adequate access to remove the pumps along the 2-inch cylindrical-rail retrieval system. The discharge 8-inch Dezurik plug valves, 8-inch Kennedy check valves, and dedicated discharge connection are in a valve vault near the wetwell.

They are all in great condition and do not require repair or replacement at this time.

The power service to the station is 460-volt, three-phase with a pole-mounted transformer. The control panel is in excellent condition and is equipped with a portable generator receptacle and a mechanical interlock between the generator and the main breaker. Seal-offs are beneath the control panel. The station has a SCADA system with a telemetry transmitter/receiver. The antenna mast is leaning from wind damage by Hurricane Ian and should be repaired even though it is working. The station has no dedicated lighting. A potable hose bibb is provided on site for washdown.

The station's fence and barbed wire are in excellent condition. The concrete driveway up to the wet well and valve vault is also in excellent condition.

The following deficiencies were noted:

- The wetwell interior liner is cracking.
- The antenna mast is leaning.

Proposed improvements to the station include:

- Perform thorough rehabilitation including some form of structural improvement and lining repair.
- Evaluate replacing the antenna mast.

5.2.4.10 Lift Station 806 – Arlington

The Arlington Lift Station (LS 806) is at the corner of Arlington Road and Cape Haze Drive. The station, built in 2010, receives flow from the surrounding residential area and discharges wastewater through a 4-inch force main that conveys flow to the Rotonda WRF.

The station contains two 10-HP Flygt Model 3127 submersible pumps with 484-mm impellers. Each pump has an estimated capacity of 352 gpm at approximately 31 feet of head. The pumps are inside a 6-foot-diameter, 12-foot-6-inch-deep concrete wetwell with a liner.

The wetwell hatch is in good condition and provides adequate access to remove the pumps on the 2-inch cylindrical-rail retrieval system. The wetwell interior has solids built up at the bottom near the submersible pumps. The wastewater technicians break down the solids once a week with potable water from a hose bibb. The discharge 4-inch Dezurik plug valves, 4-inch Kennedy check valves, air-release valves, and dedicated discharge connection are above ground southwest of the wetwell. They are all in great condition and do not require repair or replacement at this time. A Bay Products Inc. biological odor-control unit with a fan draws air from the wetwell and reduces the hydrogen sulfide odor generated. The air movement also reduces the concentration of hydrogen sulfide in the wetwell, which will lengthen the life of this concrete structure.

The power service to the station is 230-volt, three-phase with a pole-mounted transformer northeast of the site. The station contains a telemetry transmitter/receiver that allows monitoring from the CCU central office and treatment plants and a TCU. The control panel has a mechanical interlock between the main breaker and a generator breaker, is equipped with a portable generator receptacle, and has seal-offs. The station has dedicated lighting from the antenna mast. The station has a potable water hose bibb for washdown.

The station has fencing with barbed wire and is generally well kept with no gaps between the gravel and the bottom of the fence, prohibiting easy access by small animals.

No deficiencies were noted at this station.

5.2.4.11 Lift Station 807 – Post Office

The Post Office Lift Station (LS 807) is at the intersection of Pompano Street and Tarpon Street. This station receives flows from the Post Office and the surrounding residential area and discharges wastewater through a 4-inch force main that conveys flow to the Rotonda WRF.

This station contains two 2-HP ABS Model PIRANHA-S30/2 submersible pumps with 150-mm impellers. The pumps have an estimated capacity of 74 gpm at approximately 133 feet of head. The pumps are inside a 6-foot-diameter, 13-foot-2-inch-deep concrete wetwell with a liner.

The wetwell hatch is in good condition and provides adequate access to remove the pumps on the single-cylindrical-rail retrieval system. The wetwell interior liner is faded from hydrogen sulfide exposure. The discharge 4-inch Dezurik plug valves and 4-inch Kennedy check valves are in a valve vault near the wetwell. The dedicated discharge connection is above grade near the valve vault opening. The valve vault interior is in good condition. The pump discharge piping, check valves, and plug vales are showing moderate signs of rust and should be replaced.

Power service to the station is 230-volts 3-phase with a pole-mounted transformer northwest of the site. The station does not have a SCADA system with a telemetry transmitter/receiver. The control panel has a mechanical interlock between the main breaker and a generator breaker, is equipped with a portable generator receptacle, and has seal-offs. The station has a potable water hose bibb for washdown.

The station is not fenced, has no dedicated lighting, and is raised up on a wooden platform. Additionally, the nearby overhead tree branches present a potential obstruction to County staff when operating a crane truck to remove pumps in this area.

The following deficiencies were noted:

- The wetwell interior liner is faded from hydrogen sulfide exposure.
- Moderate rust on the pump discharge piping, plug valves, and check valves in the valve vault.

Proposed improvements to the station include:

- Perform thorough rehabilitation including some form of structural improvement and lining repair.
- Evaluate replacing the submersible pump discharge piping, plug valves, and check valves.

5.2.4.12 Lift Station 808 – Publix

The Publix Lift Station (LS 808) is behind the Publix Super Market Plaza on Placida Road and Cape Haze Drive. This station, built in 1999, receives flow from the commercial development within the plaza and discharges wastewater through a 4-inch force main that conveys flow to the Rotonda WRF.

The station contains two 7.5-HP DAVIS EMU Model FA 10.33 submersible pumps with 233-mm impellers. The pumps are inside a 6-foot-diameter, 14-foot-2-inch-deep concrete wetwell. Each pump has an estimated capacity of 336 gpm at approximately 56 feet of head.

The wetwell is vented, and no odor was present on site. The wetwell hatch is in good condition and provides adequate access to remove the pumps on the single-cylindrical-rail retrieval system. The wetwell interior liner is faded from hydrogen sulfide exposure. The discharge 4-inch Dezurik plug valves, 4-inch Kennedy check valves, and dedicated discharge connection are in a valve vault near the wetwell. The pump discharge piping is showing heavy signs of corrosion and should be replaced. The valve vault has standing water and sediment at the bottom, indicating inflow of stormwater and a clogged drain.

The power service to the station is 208-volts 3-phase with a pad-mounted transformer nearby. The station has an additional breaker room that the staff does not have access to. The control panel has a mechanical interlock between the main breaker and a generator breaker, is equipped with a portable generator receptacle, and has seal-offs. The station contains a telemetry transmitter/receiver that allows monitoring from the CCU central office and treatment plants but no antenna mast. The station has no dedicated lighting. The station does not have a potable water hose bibb for washdown.

The station does not have a secured perimeter fence.

The following deficiencies were noted:

- The wetwell interior liner is faded from hydrogen sulfide exposure.
- The pump discharge piping has heavy corrosion.
- Standing water and sediment were observed at the site under the valves and flanges, indicating rain is entering through the valve vault hatch.

Proposed improvements to the station include:

- Perform thorough rehabilitation including some form of structural improvement and lining repair.
- Evaluate replacing the submersible pump discharge piping.
- Replace the valve vault hatch and associated lock.
- Remove sediment from the valve vault drain opening.

5.2.4.13 Lift Station 811 – Fishery

The Fishery Lift Station (LS 811) is at the intersection of Fishery Road and Placida Road. This station, built in 2009, does not currently receive any flows. Wastewater from this station is pumped through an 8-inch force main that conveys flow to the Rotonda WRF.

The station contains two 10-HP Flygt Model 3127 submersible pumps with 483-mm impellers. The pumps are inside an 8-foot-diameter, 20-foot-2-inch-deep concrete wetwell with a liner. The pumps have an estimated capacity of 368 gpm at approximately 56 feet of head.

The wetwell is vented, and no odor was present on site. The wetwell exterior and electrical equipment are in great condition. The wetwell interior shows no signs of corrosion and odor. The wetwell hatch is in great condition and provides adequate access to remove the pumps along the 2-inch cylindrical-rail retrieval system. The discharge 8-inch Dezurik plug valves, 8-inch Kennedy check valves, air-release valves, and dedicated discharge are above ground near the wetwell. They are all in great condition and do not require any repair or replacement at this time.

The power service to the station is 480-volt, 3-phase with a pole-mounted transformer west of the site. The station has a SCADA system with a telemetry transmitter/receiver and a TCU. The control panel has seal-offs and is equipped with a portable generator receptacle and a mechanical interlock between the generator and main breaker. The station also has dedicated lighting from the antenna mast. A potable water hose bibb is available for washdown.

The station has fencing with barbed wire and is generally well kept with no gaps between the gravel and the bottom of the fence, prohibiting easy access by small animals.

No deficiencies were noted at this station.

5.3 Vacuum Stations

At the end of FY 2022, the system had three vacuum stations, with a fourth in construction, all owned by CCU. The three existing stations have permanent auxiliary power and on-site trailer-mounted generators capable of providing full power for 3 to 5 days.

During site visit assessments conducted by Jones Edmunds personnel and CCU staff on February 15, 2023, two vacuum stations were evaluated, as selected by CCU staff. Table 5-2 lists the vacuum stations visited. The site visit assessments will help CCU to identify and prioritize maintenance, rehabilitation, or replacement work at these lift stations.

Table 5-2 Visited Wastewater Collection Systems – Vacuum Stations

Station No.	Location
VS 1 – Skylark	598 Skylark Lane NW
VS 3 – Harbor Vac	3450 Harbor Boulevard

5.3.1 VS 1 – SKYLARK (FORMERLY LS 59)

The Skylark Vacuum Station (formerly LS 59) is at 598 Skylark Lane NW, southwest of the intersection of Azalea Avenue NW and Skylark Lane NW. This vacuum lift station receives flow from the vacuum collection system in the surrounding area through four 10-inch vacuum lines. LS 59 discharges through a 6-inch metered force main that converts to a 12-inch and ultimately a 20-inch force main and transmits flow to the RTS leading to East Port WRF directly through the force main along Olean Boulevard.

The station contains two 50-HP Cornell centrifugal Model 4514T-VC18DB pumps inside the building. Each pump has a design capacity of 725 gpm at 137.5 feet of head, but the pumps recently had their impellers trimmed to 34-feet TDH @725 gpm and their VFDs modified to account for the improvements made to the system curve after the RTS and GMLS construction. The plastic covers for both pump motor components are missing or broken and need to be replaced. The 8-inch check valve after the discharge of the Cornell pumps is sticking and needs to be replaced.

A 5,000-gallon Augusta fiberglass vacuum tank in the lower level of the building has a design pressure of 5 psi. Access to the lower level is by a stairwell. CCU added a hazard sign near the stairwell to prevent entry by unauthorized personnel. Six 15-HP Busch Mink Model MM 1502 A VA6 vacuum pumps, each rated for 353 actual cubic feet per minute (ACFM) of displacement, force flow into the vacuum tank. A permanent overhead crane has been installed for removing these vacuum pumps.

The building contains a dedicated pump crane for removing the discharge pumps and valves from the lower level. The crane appears aligned with the pumps but does not appear aligned with the valves. The discharge isolation valves are overhead in the lower level and only accessible by the dedicated overhead crane in the building. Additionally, CCU maintains a portable hoist system for use at any vacuum stations.

The station is gated and surrounded by a block wall. The roof and ceiling are being repaired from wind damage by Hurricane Ian. No fire extinguisher is present inside the building. The exit sign for the entrance on the upper level is damaged and needs to be replaced. The station has indoor site lighting and a mulch bed odor-control system using bark media. The mulch bed liner is torn at the top but was noted by CCU staff to be repaired soon. The power service to the station is 480-volt, 3-phase. A 300-kW Cummins generator, rated at 375 kVA, with an ATS and a 519-gallon fuel tank, is installed within the fence on the west end of the site. The

generator is operated once a week each Monday morning to verify standby power capabilities. The station has a SCADA system with a telemetry transmitter/receiver. The station has a potable water hose bibb for washdown.

The following deficiencies were noted:

- The crane pump on site is not aligned with the valves. Some of the valves are vertically below the common discharge line and meter, making them difficult to access with the crane.
- The access for tank maintenance is at the top of the tank without a dedicated access point. CCU staff noted an access platform for this was being designed.
- The check valve after the discharge of the sewage pumps is sticking in the open position.
- Plastic covers for the pump motor components are missing or broken.
- A fire extinguisher is not inside of the building.

Additionally, the Jones Edmunds electrical engineer visited on February 21, 2023, to meet with staff and observe the station. The electrical engineer noted the following:

- The Cummings 352 KW Generator Set was rebuilt after being damaged by a lightning strike four months ago.
- Generator set remote display is almost impossible to read because of its location and provides little to no clearance.
- Staff noted significant voltage issues at this station causing problems with controls and VFDs; FPL to monitor and verify, and County to also monitor and verify.
- Sump pump motor flex conduit has insufficient support.
- Conduit strut stand is missing anchor bolts.

Proposed improvements to the station include:

- Evaluate modifying the overhead crane with a trolley for lateral movement.
- Evaluate a catwalk or dedicated ladder for accessing the top of the tank for maintenance.
- Evaluate replacing the check valve.
- Replace the plastic covers for the pump motor components.
- Add a fire extinguisher inside the building.

5.3.2 VS 3 – HARBOR VAC (FORMERLY LS 143)

The Harbor Vac Lift Station (formerly LS 143) is at 3450 Harbor Boulevard. This vacuum lift station receives flow from two 8-inch vacuum lines, with a third 8-inch influent line for future use. LS 143 collects flow from approximately 200 homes in the surrounding area. LS 143 discharges through two 6-inch force mains that transmit flows to the Southport Master Lift Station (LS 65), which flows directly to the East Port WRF.

The station contains two 25-HP Cornell dry-pit centrifugal Model 4514T-VC18D8 pumps with 10-inch impellers inside the building. Each pump has an estimated capacity of 411 gpm at approximately 92 feet of head.

A 5,000-gallon Duratech Vacuum Tank in the lower level of the building has a design pressure of 5 psi/26-inch vacuum. Access to the lower level is by a stairwell. The County added a hazard sign near the stairwell to prevent entry by unauthorized personnel. Three Busch Mink Model MM 1502 AV vacuum pumps force flows into the vacuum tank; room is available for a fourth pump for future flows.

The building contains a dedicated pump crane for removal of pumps and valves from the lower level; however, the crane is not aligned with the pumps or the valves. The discharge isolation valves are overhead and accessible by the dedicated overhead crane in the building.

The station is gated and surrounded by a 4-foot block wall. The roof and ceiling are being repaired from wind damage by Hurricane Ian. The station has indoor site lighting and a bio-trickling odor-control system using pine bark media. The power service to the station is 480-volt, three-phase. A 175-kW Cummins generator, rated at 218.7 kVA, with an ATS and a 500-gallon fuel tank, is installed within the fence on the north end of the site. The generator is operated once a week each Monday to verify standby power capabilities. The station has a SCADA system with a telemetry transmitter/receiver. The station has a potable water hose bibb for washdown.

The vacuum tank was approaching its scheduled maintenance at the time of the site visit; however, a feasible way to access the equipment on top of the tank to maintain and clean the equipment was not apparent.

The following deficiencies were noted:

- The generator controls are above 6 feet.
- The pump crane on site is not aligned with the pump or the valves.

- The valves are vertically below the common discharge line and meter, making them difficult to access with the crane.
- The tank maintenance access is at the top of the tank without a dedicated access point.
- The overhead door to pull the vacuum pumps is relatively short and has a low ceiling.

Additionally, the Jones Edmunds electrical engineer visited on February 21, 2023, to meet with staff and observe the station. The electrical engineer noted the following:

- Staff reports uninterruptible power supply failure on the control panel, but the cause is unknown.

Proposed improvements to the station include:

- Evaluate stairs or similar access to the generator to return to conformance with the National Electric Code.
- Evaluate modifying the overhead crane with a trolley for lateral movement.
- Evaluate a catwalk or ladder for accessing the top of the tank for maintenance.
- Evaluate a dedicated overhead crane for easier access of the vacuum pumps.
- Verify that the vacuum station site is in accordance with the Occupational Safety and Health Administration (OSHA) and County safety and confined-space requirements.

5.4 Operations

The operation of the wastewater collection system requires the ability to move all service area-generated wastewater to its tributary treatment plant. The wastewater quantity is in constant flux, and CCU Operations staff is tasked with understanding and managing the daily, monthly, and seasonal lows and peaks. The flat terrain of Charlotte County requires more than 300 pumping stations to transfer wastewater from the customer connections to the treatment plants.

CCU maintains a separate department for operating and maintaining the collection systems. Although many of the pumping stations (lift and vacuum stations) are continuously monitored by RTUs, each station is visited a minimum of once a month per FDEP requirements. Most of the daily sewer department effort is involved with maintaining the pumping stations through daily or weekly physical inspections and a proactive maintenance program.

Unforeseen pump station failures require immediate attention. CCU maintains two 6,000-gallon tankers and three 4,000-gallon tankers and has contracts with local septage haulers. These tankers serve a dual purpose. They are used to transport sludge from the wastewater treatment plants but are also available to haul raw wastewater from lift station sites and to supplement vacuum station performance during emergencies. As discussed in Section 5.2, many pump stations include on-site standby power or portable generator receptacles that can be used during power failures and bypass pump connections in the event of a pump failure. With an ongoing effort through FEMA grants and CIP projects, CCU continues to increase the number of stations with dedicated auxiliary power options, as well as acquire additional spare generators for emergency use at any station.

5.5 MAINTENANCE

Maintenance procedures for the wastewater collection system are like those followed for the water distribution systems.

5.5.1 SERVICE ORDERS

The process for generating and completing SOs in the Wastewater Collection workgroup is the same as described for the Water Distribution workgroup. As in Water Distribution, predictive and preventive maintenance SOs are generated internally and processed in a similar manner. A total of 7,981 corrective SOs were generated by customer calls during FY 2022, compared to 6,833 from FY 2021. Designating the SO as being related to wastewater or water is determined by the dispatcher. Table 5-3 denotes the FY 2022 SOs by source and issuer:

Table 5-3 Service Orders – FY 2022

System/Issue	Customer Calls	PM Service Orders
Low-Pressure Sewer	2,972	1,757
Sewer Lines	655	60
Lift Stations	3,772	523
Vacuum Sewer	581	611

5.5.2 DATA MANAGEMENT

The EAMS, as described in the Water Distribution Section, is in full implementation. As its database continues to expand, it will also be shared even more than it is currently. For example, a manager will be able to query the system to determine if open work orders exist in a specific neighborhood, regardless of whether they are water or wastewater related, or if the Public Works Department is planning to pave a street before a planned open-cut repair of a wastewater collection line.

During the planning stages of a new collection system, CCU engages an engineering consultant to perform a feasibility study that includes an economic comparison of installing a conventional or modified gravity system, with its network of lift stations and force mains, versus a low-pressure and/or a vacuum system. The major components of the comparison are initial construction costs and future maintenance costs over the life of the system. Future costs are brought to present day costs, much like an annuity, and added to construction costs to determine total project cost. The final selection of the new collection system is based on these life cycle costs, and the specific needs of each area served.

The EAMS will allow this type of economic analysis to be performed with greater precision in future studies, because costs will be more accurately known.

5.5.3 MAINTENANCE

The wetwells of all lift stations and vacuum stations are inspected regularly. Problems are addressed as they are found. This effort extends beyond the thorough inspection of representative stations, as described in Section 5.2 of this report.

The average age of the CCU gravity system is nearly 50 years. Older sewers were typically installed in swales, which made them more prone to I/I. Also, design and construction standards were not as stringent as the current practices. Pipe material and joints were constructed with material that deteriorates with time. The older gravity sewer pipes are vitrified clay with frequent joints that are sources of infiltration. Vitrified clay pipe is resistant to corrosion but is more brittle than PVC and HDPE pipe. After many years of service, cracks develop and pieces of the clay pipe protrude into the flow stream. Although CCU has relatively few plugged sewers, the broken clay pipe will cause blockage and must be repaired.

CCU Wastewater Collections staff performs in-place pipe repairs to fix most of the broken pipes in the system. Most repairs involve a cast-in-place lining, fold-and-form lining, or PVC lining. These repair methods restore the integrity of the sewer system without requiring excavation.

The gravity sewer system provides considerable storage time during power failures to allow CCU staff time to address the issue. CCU has developed an emergency preparedness program for the systems in the service area. If a power failure occurs in the LPS system, approximately 20 minutes of wastewater storage remains in the LPS system lift station wetwells. This allows CCU to dispatch appropriate tanker truck and/or generator support, as discussed earlier in this chapter.

5.6 Review of Previous Report Recommendations

Table 5-4 summarizes the recommendations and status since the 2021 Annual Report for the wastewater collection system.

Table 5-4 Wastewater Collection System – FY 2021 Recommendations and Status

Recommendation:	▪ Continue the scheduled rehabilitation of sanitary lift stations that have deteriorated due to use and hydrogen sulfide presence, including overseeing the evaluation and design of each improvement.
Progress:	▪ Ongoing.
Recommendation:	▪ Develop a CMOM program to better manage the collection system, investigate capacity limitations, and improve responsiveness to sanitary sewer overflows. The program should focus on high LOS and regulatory compliance.
Progress:	▪ Ongoing.
Recommendation:	▪ Use the wastewater lift station and force main computer model to assess the need for upgrades to the system based on expected demand for services.
Progress:	▪ Ongoing efforts occurring through CCU's Modeling work order. Continued assessment will be conducted under the Sewer Master Plan Update work order.
Recommendation:	▪ Continue to televise and smoke test gravity sewers to locate source(s) of I/I. Repair gravity sewers and manholes as required to mitigate I/I and regain sewer and WRF capacity.
Progress:	▪ Ongoing.

Recommendation:	▪ Continue construction and plan for the next phases of sewer expansion in the Port Charlotte area in accordance with the 2017 Sewer Master Plan.
Progress:	▪ Ongoing. Several projects recommended in the 2017 Sewer Master Plan have already been completed.
Recommendation:	▪ Install odor-control systems at lift stations where hydrogen sulfide concentrations cause odors and deteriorate structures.
Progress:	▪ Ongoing. Action is based on community input of odors.
Recommendation:	▪ Continue acquisition of stand-by generators and pumps to maintain service during power outages when budget allows to meet FDEP requirements.
Progress:	▪ FEMA grant funding is underway for the procurement of new generators. Improvements are actively being made at various lift stations in preparation of these generators.
Recommendation:	▪ Continue to repair and upgrade existing lift stations as required. ▪ Perform the maintenance activities at the specific lift stations that were inspected for each former Annual Report and previously not completed.
Progress:	▪ See comments for each lift station below.
Recommendation:	<u>Master Lift Station No. 65 – South Port</u> 1. Evaluate generator control elevations to conform to code. 2. Evaluate the use of a chopper pump or grinder station to reduce ragging, if necessary. 3. Repair the flow meter. 4. Fence the entire site.
Progress:	1. Not completed. 2. Not completed. 3. Ongoing. 4. Not completed.
Recommendation:	<u>Master Lift Station No. 83 – Maple Leaf</u> 1. Evaluate on-site odor control and consider upgrading unit or evaluating simplistic HIVENT unit, if appropriate.
Progress:	2. Not completed.
Recommendation:	<u>Master Lift Station No. 309 – Bridgewater (Deep Creek)</u> 1. Provide a stationary generator. 2. Coat the wetwell and evaluate structural improvements. 3. Replace concrete control panel and posts with County aluminum standard. 4. Replace/repair piping and check valves in the underground vault. 5. Replace pumps and other related equipment.
Progress:	1. Completed. 2. Completed. 3. Completed. 4. Completed. 5. Completed.

Recommendation:	<u>Master Lift Station No. 816 – Rotonda Boulevard West</u> 1. Coat the wetwell. 2. Repair or rehabilitate the concrete top slab. 3. Modify the valve vault to allow full access to the valves and to prevent them from being buried. 4. Evaluate relocating the power supply underground. 5. Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes. 6. Evaluate the adjacent lot for future lift station conversion.
Progress:	1. Not completed. 2. Not completed. 3. Completed. 4. Not completed. 5. Completed. 6. The County is evaluating moving this lift station to a lot purchased on Boundary Boulevard.
Recommendation:	<u>Lift Station No. 1 – Community Center</u> 1. Paint the aboveground discharge pump and piping. 2. Repair/replace the patched wye connection. 3. Repair cracks in the building. 4. Seal pipe penetrations. 5. Provide an odor-control system. 6. Replace the outdated control panel and bring electrical up to current standards. 7. Perform thorough rehabilitation of the lift station including repairing the building or replace the station with a modern submersible configuration and all new equipment.
Progress:	1. Completed. 2. Not completed. 3. Not completed. 4. Completed. 5. The County determined that no odor-control system is required at this time. 6. Not completed. 7. The County installed a new wet end for the one of the pumps and is considering replacing the station with a modern submersible configuration.
Recommendation:	<u>Lift Station No. 3 – Gardner</u> 1. Evaluate the possibilities for using adjacent land to convert the station to a submersible station.
Progress:	1. The County has this lift station on the Renewal and Replacement (R&R) Projects list in the planning stage.
Recommendation:	<u>Lift Station No. 7 – Pure Oil</u> 1. Evaluate odor-control opportunities. 2. Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes. 3. Evaluate possibilities for a dedicated access to the station. 4. Perform thorough rehabilitation including the improvements listed above or replace the station with a modern submersible configuration and all new equipment.

Progress:	1. Completed. The County determined that no odor-control opportunities need be considered at this time. 2. Completed. 3. Not completed. 4. The County has ordered a replacement for one of the submersible pumps is considering replacing the station with a modern submersible configuration.
Recommendation:	<u>Lift Station No. 9 – Church</u> 1. Evaluate possibilities for converting the station to submersible; otherwise evaluate concrete repair and restoration for the site.
Progress:	1. The County has this lift station on the R&R Projects list in the planning stage.
Recommendation:	<u>Lift Station No. 20 – Lake Worth</u> 1. Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes.
Progress:	1. Completed.
Recommendation:	<u>Lift Station No. 24 – Charlotte Square</u> 1. Evaluate the wetwell for lining replacement and potential structural repair. 2. Evaluate constructing a separate, isolated valve vault for operator safety, including a standard dedicated discharge. 3. Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes.
Progress:	1. Not completed. 2. Not completed. 3. Completed.
Recommendation:	<u>Lift Station No. 28 – Peachlove</u> 1. Evaluate re-lining the wetwell or specifically address the exposed penetrations and seams.
Progress:	1. Not completed.
Recommendation:	<u>Lift Station No. 44 – Liberty Elementary</u> 1. Perform thorough rehabilitation including some form of structural improvement and lining repair. 2. Evaluate replacing the check valves. 3. Evaluate possibilities for a dedicated access to the station.
Progress:	1. The County has this lift station on their Capital Maintenance Plan (CMP) list as a priority lift station. No work has been started for this lift station.
Recommendation:	<u>Lift Station No. 45 – Woodbury</u> 1. Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes. 2. Evaluate incorporating a simplistic HIVENT odor-control unit, if appropriate. 3. Rehabilitate the invert coming to the station.
Progress:	1. The County has installed seal-offs to conform with current codes. 2. The County installed a HIVENT odor-control unit. 3. The County proposed a bid package to replace the invert coming to the station.

Recommendation:	Lift Station No. 55 – Meadow Park 1. Evaluate odor control or simplistic HIVENT system for lift station site. 2. Evaluate whether the odor is a pump issue, including whether a pump seal might have blown. 3. Evaluate implementing a surge-protection device on the main breaker. 4. Install a mechanical interlock between the generator breaker and main breaker to return o code conformance.
Progress:	1. Not completed. 2. Not completed 3. Not completed. 4. Not completed.
Recommendation:	Lift Station No. 150 – Maracaibo 1. No significant deficiencies were noted.
Progress:	1. No action required.
Recommendation:	Lift Station No. 303 – Constantine 1. Install an interlock on the electrical equipment and perform a detailed electrical code review to return to conformance with code. 2. Install seal-offs and perform a detailed electrical code review to return to conformance with code. 3. Perform thorough rehabilitation on the wetwell and prepare for construction of the improved design to allow safe access. 4. Prepare for construction of the improved design to allow safe access, inclusion of appropriate valves, and inclusion of bypass piping.
Progress:	1. Completed. 2. Completed. 3. Not completed. 4. Not completed.
Recommendation:	Lift Station No. 442 – Doredo 1. Evaluate an adjacent lot for future lift station conversion to allow safe access and inclusion of appropriate valves and bypass piping. 2. Evaluate installing a secondary stand-by pump.
Progress:	1. Not completed. 2. Not completed.
Recommendation:	Lift Station No. 809 – Placida Harbor 1. Install seal-offs on any electrical equipment within 10 feet of the wetwell to return to conformance with current electrical codes. 2. Repair the station and replace pumps and pump bases as necessary to return to standard operation. 3. Install battery backups to provide redundancy for signaling to Operations staff. 4. Replace or repair the high-level alarm to allow notification to Operations staff. 5. Evaluate incorporating a dedicate access for Operations staff, including access for pump trucks. 6. Evaluate incorporating a water service near the station.

Progress:	1–7. The County has this lift station on their CMP list as a priority lift station. No recommendations have been completed for this lift station.
Recommendation:	Lift Station No. 813 – Marina 1. Install seal-offs on any electrical equipment within 10 feet of the wetwell and perform a detailed electrical code review to return to conformance with current electrical codes. 2. Evaluate rehabilitating the lift station to meet standard codes. 3. Secure the mechanical interlock behind the dead front to between the generator and the main breaker. 4. Evaluate covering the wetwell temporarily until full rehabilitation or replacement of the station can be coordinated.
Progress:	1. The County has this lift station on their CMP list as a priority lift station. No recommendations have been completed for this lift station. The County is coordinating with the HOA for improvements of this lift station.
Recommendation:	Vacuum Station No. 1 – Skylark 1. Evaluate modifying the overhead crane with a trolley for lateral movement. 2. Complete design to implement access to the top of the tank for maintenance.
Progress:	1. Not completed. 2. Not completed.
Recommendation:	Vacuum Station No. 3 – El Jobean 1. Evaluate a catwalk or dedicated ladder for accessing the top of the tank for maintenance. 2. Verify the vacuum station site is in accordance with OSHA and County safety and confined-space requirements. 3. Evaluate a portable hoist or dedicated overhead crane for easier access to the vacuum pumps. 4. Evaluate fall protection needs while removing pumps for maintenance and repair.
Progress:	1. Not completed. 2. Completed. 3. Not completed. 4. Not completed.

6 WASTEWATER TREATMENT FACILITIES

CCU owns and operates four WRFs throughout Charlotte County and one leachate treatment facility (LTF) for the County landfill as shown in Figure 6-1. The East Port WRF serves Mid County, the West Port and Rotonda WRFs serve the West County service area, and the Burnt Store WRF serves the South County service area. This Chapter presents each facility independently since each WRF is unique in its design and treatment approach. In addition, this Chapter reviews CCU's wastewater pre-treatment and biosolids handling and disposal programs. Table 6-1 lists permitted treatment capacities of CCU's WRFs.

Figure 6-1 CCU Wastewater Treatment Facilities

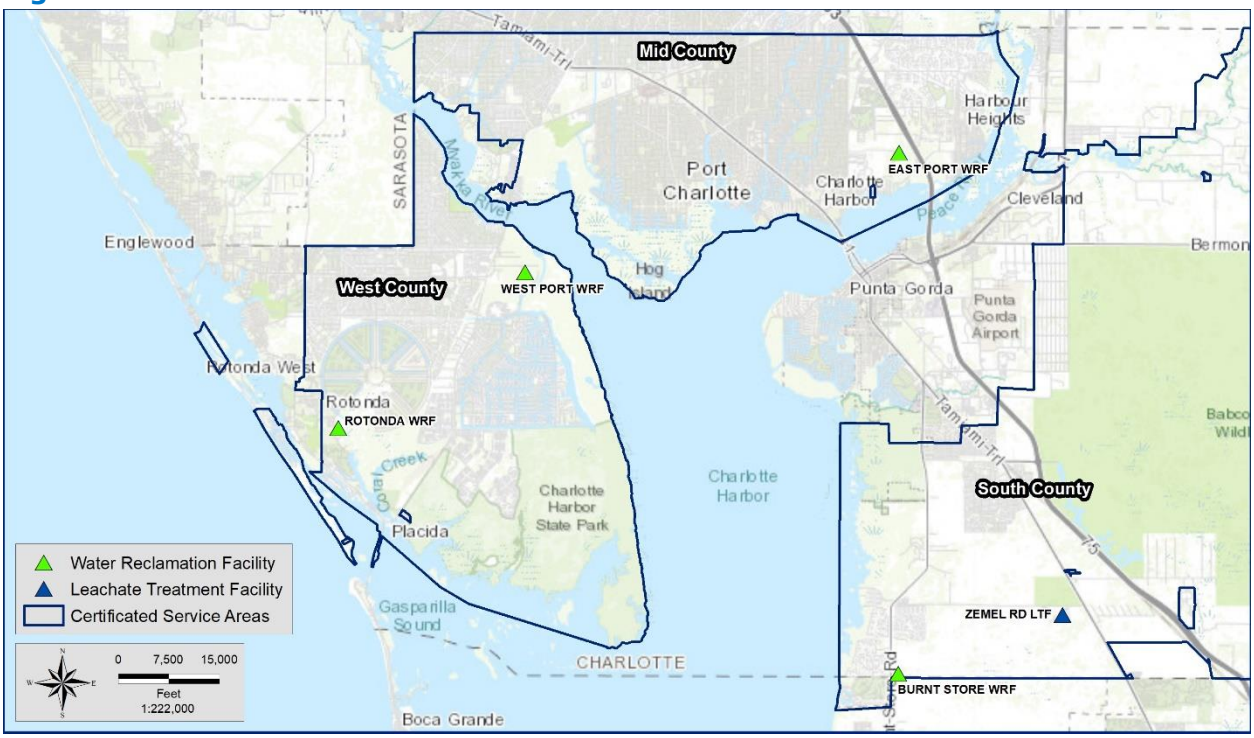


Table 6-1 CCU Water Reclamation Facilities and Design Capacities

WRFs	Permitted Capacity (MGD)
East Port	6.0[a]
West Port	1.2[b]
Rotonda	2.0[b]
Burnt Store	0.5[c]
Total	**9.7**

Notes:

[a] Construction for plant expansion to 9.0 MGD expected to be complete by December 2025.
[b] Design for expansion and evaluation of future use to begin in Summer 2023.
[c] Construction for plant expansion to 2.5 MGD expected to be complete by Summer 2026.

6.1 WASTEWATER PRETREATMENT COMPLIANCE

CCU has a wastewater pretreatment program for receiving and collecting septage and FOG within the collection system to serve their residents with septic systems, enhance treatment, and prevent overflows in the collection system. CCU's Pretreatment Program includes:

- Transported Waste Receiving Program.
- Restaurant Grease Interceptor Inspection Program.
- Investigation of unauthorized discharges to the wastewater system.

6.1.1 TRANSPORTED WASTE RECEIVING PROGRAM

CCU is proud of the Waste Receiving Program, which provides an environmentally safe disposal option for septic waste, reducing land application and environmental impacts. Located at the East Port WRF, the septage receiving station (SRS) combines the hauled waste with plant influent to achieve reclaimed water-quality effluent and beneficial reuse of biosolids. Once on site, septage haulers enter a code to activate the SRS and then another code to identify their hauled septage as either In-County or Out-of-County septage for billing purposes.

In FY 2019, the SRS hours of operation were changed to 7:00 a.m. to 4:30 p.m., Monday through Friday, which allowed CCU staff to better monitor operations. This approach prolongs the life of the equipment by ensuring compliance with disposal requirements and eliminating mixed loads that damage equipment. In FY 2022, the program accepted 10,000,881 gallons from 41 permitted haulers.

6.1.2 RESTAURANT GREASE INTERCEPTOR INSPECTION PROGRAM

This program helps prevent sanitary sewer overflows in the CCU sanitary sewer collection system by removing FOG at the source. Program staff perform spot inspections and monitor grease interceptors at more than 240 restaurants and other food-preparation facilities County-wide to maintain compliance with the required pump-out schedule (e.g., 30, 60, or 90 days) and other required maintenance. The focus has been on older buildings and facilities that might have inadequate grease interceptors. Plans for new restaurants and other food preparation facilities are reviewed by CCU's Engineering Services Division for adherence to County specifications. This coordination with the Building Department has made the program more efficient. In FY 2022, 1,936 work orders were completed including 1,776 grease trap inspections, 137 grease trap re-inspections, 20 spill sample inspections, and 3 new installation inspections.

Through a partnership with Liquid Environmental Solutions (LES), the FOG is transformed into biodiesel and other beneficial byproducts. LES receives restaurant grease directly from haulers and partially processes it for recycle use at a facility on the East Port WRF site. FOG is not treated through the East Port WRF process.

6.1.3 INVESTIGATION OF UNAUTHORIZED DISCHARGES

Investigation and prevention of unauthorized discharges are important for protecting the treatment capabilities of the WRFs and the environment. These unauthorized discharges are pollutants that enter the municipal waste stream and have an adverse effect on the treatment process. Fortunately, no significant or categorical users are in the CCU collection system,

eliminating the need for a full Industrial Pretreatment Program. When plant Operations staff report issues pertaining to the treatment process at any WRF, Pretreatment staff begin investigating by sampling upstream lift stations and manholes, reviewing activities from local connections, and working closely with lift station crews and plant personnel. The goal is to determine the source of the illegal discharge, take steps to eliminate the problem up to and including fines, and return the plant to normal operations.

6.2 EAST PORT WRF

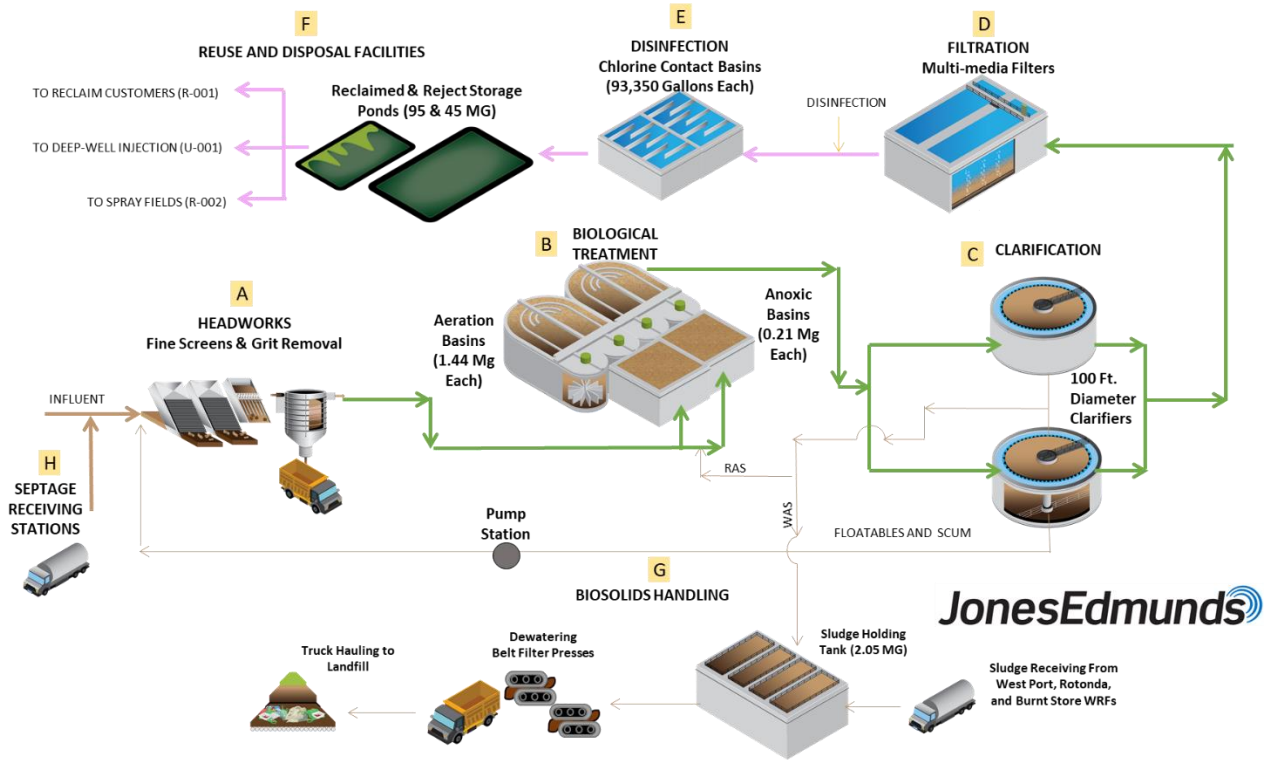
The East Port WRF is at 3100 Loveland Boulevard, Port Charlotte, Florida, and acquired as part of the 1991 GDU purchase. The WRF began its current operations in 1996 with a current permitted operating capacity of 6.0 MGD AADF. East Port WRF uses a two-stage activated-sludge process to treat domestic wastewater collected from the Mid-County service area. Emergency power is provided by two diesel emergency generators in an on-site building with an ATS to maintain operation of critical facilities in the case of electrical power failure.

The East Port WRF is also the location of a National Environmental Laboratory Accreditation Program (NELAP)-certified East Port Laboratory (EPLAB) at the main operations building. The WRF site includes 51 acres of conservation easement, with the remaining area consisting primarily of woodlands. The site is home to more than 20 varieties of birds, including great egrets, osprey, and Carolina wrens. Many other wildlife species including gopher tortoises, scrub jays, bobcats, armadillos, cottontails, and alligators make the East Port WRF their home.

The East Port WRF is permitted to distribute 8.79-MGD AADF of reclaimed-quality water to the Master Reuse System (R-001) for unrestricted-public-access reuse, inject 9.60-MGD AADF into a deep well injection system (U-001), and apply 1.70-MGD AADF to a slow-rate restricted-access land application system (R-002). The WRF is classified as a Type I, Category II, Class A domestic wastewater treatment facility under FAC 62-699 and is required to meet Class III Reliability standards in accordance with Chapters 62-600 and 62-610, FAC. The restricted irrigation system consists of 187 acres on site using slow-rate irrigation (R-002 Spray Fields). About 45 acres of the spray fields were abandoned in 2018 for use by the Charlotte County Sheriff Department.

Figure 6-2 shows the East Port WRF process flow diagram. The key components of the East Port process are described in the following sections.

Figure 6-2 East Port WRF Process Flow Diagram



A) Headworks: Raw wastewater enters the WRF headworks structure where mechanical screening and grit removal take place. After screening, wastewater flows into one of the two vortex-type grit-removal units for grit separation. Compacted screening and separated grit are dewatered and discharged to dumpsters for disposal. Internal plant flows from the In-Plant Pump Station No. 1 are introduced back to the headworks, including septage, biosolids dewatering system filtrate, tank and unit process drain flows, and supernatant decant from the aerobic digesters.

B) Biological Treatment: Wastewater from the headworks splits between two treatment trains configured in a 2-Stage Anoxic/Aerobic, Modified Ludzack-Ettinger (MLE) Process. Each train includes an anoxic basin and oxidation ditch (aeration basin) for organics and Total-Nitrogen removal. Mixers keep solids suspended and homogenous in the anoxic zones. Mechanical surface agitators keep the oxidation ditches aerated and maintain a channel velocity to keep mixed liquor in suspension. Internal recycle (IR) pumps send mixed liquor rich in Nitrate-Nitrogen from the oxidation ditch (aeration basin) to the anoxic basins to enhance Total-Nitrogen removal.

C) Clarification: Flow from the biological treatment process splits between two clarifiers. The clarifiers provide a quiescent environment to promote solids separation. The clarifiers are skimmed to remove floating materials and scum, which are sent to the aerobic digester for treatment. The clarifier effluent flows over a circumferential weir into a final effluent launder trough. Weir washers travel along the scum skimmer to remove algae from the weirs and trough. Settled solids from the secondary clarifiers are pumped to the front of the anoxic basins as return-activated sludge (RAS) to replenish the microbial community and to the aerobic digesters as waste-activated sludge (WAS).

D) Filtration: Clarified water splits between two multi-media (sand and anthracite) traveling bridge filters to remove remaining Total Suspended Solids (TSS) to a level at or below 5 mg/L TSS to meet requirements for high-level disinfection. A metal canopy over the filters was designed for use with an ultraviolet (UV) shade cloth to inhibit algae growth within the filter and provide equipment protection from sun exposure. Filter backwash is sent to In-Plant Pump Station No. 2, which pumps backwash water to the headworks structure.

E) Disinfection: Filtered water splits between two chlorine contact chambers (CCCs) where liquid sodium hypochlorite is dosed for disinfection. CCC No. 1 is designated for reclaimed water production that meets high-level disinfection requirements. CCC No. 2 is designated for disposal to restricted-access sites (e.g., Class I deep injection wells or spray fields) that meet basic-level disinfection requirements. Sodium hypochlorite is stored in one storage tank with a capacity of 6,000 gallons. Non-reagent analyzers are used to adjust chlorine feed rates and for chlorine residual compliance measurement.

F) Reuse and Disposal Facilities: Transfer pumps (Nos. 1, 2, and 3) in the clearwell of CCC No. 2 pump reclaimed water to the 95-MG reclaimed water Storage Pond. HSPS No. 1 is in the CCC No. 1 clearwell and pumps reclaimed water to the plant-water system 8-inch force main loop. The clearwells of CCC No. 1 and No. 2 are connected by a 4-foot-wide slide gate that is normally open. The gate is currently inoperable and held in the open position. The 95-MGD reclaimed water pond is connected to the 9-MGD HSPS No. 2 via a 30-inch suction line. This pump station pumps directly to the 36-inch distribution line that feeds the Mid and West County public access reclaimed water system. The WRF's public-access reuse system is operated in accordance with the WRF's Monitoring and Operating Protocol for the Reclaimed Water System (latest version).

   Water not meeting reclaimed water standards is rejected to the 45-MG reject pond by opening and closing automated valves. From the 45-MG pond, reject water can be sent to the slow-rate restricted-access reclaimed water spray fields or the two Class I injection wells (IW-1 and IW-2) with permitted capacities of 1,420 gpm (2.045 MGD) and 5,250 gpm (7.560 MGD), respectively.

G) Biosolids Handling: WAS is pumped from the clarifiers to the 2.0-MG sludge holding tank where blowers provide aeration to aerobically digest the sludge before dewatering using two Ashbrook 2-Meter belt filter presses (BFPs). The East Port WRF digester is permitted to accept waste sludge from the West Port, Rotonda, and Burnt Store WRFs. The County owns two 6,000-gallon tanker trucks that make daily hauls from the other three WRFs and off-load into the East Port WRF digester. Operations staff decant the digested sludge several times a week, and the supernatant is pumped backed to the headworks. The sludge transfer pumps at the digester are operated by control panels at each BFP to pump thickened WAS to the dewatering units. Sludge is dewatered to 17-percent TS and is hauled to the Charlotte County Zemel Road Class I Municipal Landfill for disposal at the Synagro Biosolids and Yard Waste Co-Compost Facility.

H) Septage Receiving Stations: The WRF has two Lakeside Raptor Septage Receiving Stations for domestic septage tank haulers to off-load septage. The septage haulers

are provided unique access codes for off-loading and invoice generation. Septage haulers enter their access code in the receiving station control panel, the valve opens to allow off-load, and the flow meter records the septage volume for billing each hauler. The system allows for fast off-loading, minimal operations oversight, and administrate features to collect and record hauler data for invoicing. The septage is screened and directly pumped to the WRF headworks.

6.2.1 Regulatory Considerations

The East Port WRF operations are regulated by FDEP under the provisions of Chapter 403, Florida Statutes, and the applicable FAC rules. The following permits govern plant operations:

- Plant Operating Permit (FL0040291-029-DW1P) – Expiration Date: November 30, 2027.
  - Authorization for expansion to 9.0 MGD including upgrades to meet AWT standards. Authorization to discharge reclaimed water to West Port Community Development District stormwater management system (D-004).
  - Notice of Minor Revision (FL0040291-031-DWF) to increase frequency of analysis of monitoring for BOD, TSS, TN, and TP parameters.
  - The 2017 Plant Operating Permit renewal was divided into expansion stages to address the needed improvements while allowing the schedule of the expansion to be determined by CCU based on projected service area growth.
  - Stage 1 and 2 Improvements were completed in FY 2016 and addressed upgrading the electrical, I&C, and SCADA systems for future expansion. Process treatment components upgrades included the headworks screens and grit pumps, biological treatment process – dissolved oxygen (DO) control system, effluent filter rebuilds, and addition of the 2.0-MG sludge holding tank and related biosolids improvements.
  - Stage 5 Improvements were prioritized ahead of Stages 3 and 4 to enhance reclaimed water storage in the 95-MG pond and increase the transmission capacity to 9 MGD to provide more reclaimed water to Mid and West County. Stage 5 design work was bid in Spring 2017, construction was completed in FY 2019, and operation training was provided in March 2020.
  - Stage 3 and 4 Improvements included a 9-MGD expansion (originally designed in 2014), which is being re-evaluated and re-designed by modify some items and adding new facilities such as a new septage receiving facility, AWT facility, and dewatering facility by Jones Edmunds and CCU Staff. The 9-MGD expansion is designed to accommodate an additional expansion in the future to 12 MGD. The 9-MGD expansion includes a oxidation ditch splitter box sized for 12 MGD, equalization tank and transfer pump station, third oxidation ditch, AWT diversion structure and AWT structure sized for 12 MGD, third and fourth clarifiers, new scum pump stations, third and fourth effluent filters and CCCs, effluent transfer pump station, chemical storage and feed system, fourth digester, dewatering facility with two screw presses and room for a third, septage receiving stations, associated electrical, I&C, and SCADA improvements. For the future 12-MGD expansion, the improvements include a 12-MGD headworks, fourth oxidization ditch, fifth effluent filter, fifth CCC, additional chemical storage, additional dewatering unit in the dewatering facility, associated electrical, I&C, and SCADA improvements. The Stage 3 and 4 Improvements are planned to be bid in Spring of 2023, with construction completed at the end of 2024. early 2025.

- IW-1 Permit (0330486-004-UO/1M) – Expiration Date: October 17, 2027.
  - The previous MIT was performed on IW-1 on September 5, 2019. The next MIT will be due by September 4, 2024.
- IW-2 Permit (0330486-003-UO/1M) – Expiration Date: May 4, 2026
  - The previous MIT was performed on IW-2 on July 2, 2020. The next MIT will be due by July 1, 2025.

6.2.2 Wastewater Flows and Loads

The East Port WRF permitted capacity is 6.0-MGD AADF. In FY 2022, the AADF was 4.81 MGD, and the East Port WRF was operating at 80 percent of the plant permit capacity. The maximum average daily flow (MADF) occurred in June 2022 at 10.83 MGD. The highest TMADF of 5.58 MGD occurred in September 2022, which is 93 percent of the plant permitted capacity. The plant permit capacity is based on AADF, so the facility remains in compliance with the plant permitted capacity of 6.0 MGD. Although the plant is operating at 80 percent of the rated capacity of 6.0 MGD AADF, the ongoing efforts and completed plant improvement design described above are prepared to increase the design capacity of the East Port WRF to 9.0 MGD. Table 6-2 summarizes the influent flows as reported in the Discharge Monitoring Reports (DMRs).

Table 6-2 East Port WRF Influent Flows FY 2022

Month	MADF (MGD)	AADF (MGD)[1]	TMADF (MGD)	MDF (MGD)	TMADF Percent Capacity (%)
Oct-21	4.42	4.50	4.93	5.00	82
Nov-21	4.91	4.50	4.86	7.89	81
Dec-21	4.31	4.49	4.55	4.59	76
Jan-22	4.36	4.49	4.53	4.65	75
Feb-22	4.43	4.51	4.37	4.64	73
Mar-22	4.37	4.53	4.39	4.54	73
Apr-22	4.18	4.54	4.33	4.78	72
May-22	4.27	4.59	4.27	5.12	71
Jun-22	5.72	4.74	4.72	10.83	79
Jul-22	5.10	4.70	5.03	5.72	84
Aug-22	5.62	4.75	5.48	7.04	91
Sep-22	6.03	4.81	5.58	7.64	93

Notes: MDF = Maximum daily flow.

[1] Permitted plant capacity of 6.0 MGD; measured at monitoring site CAL-10.

At the end of FY 2022, the average annual influent load for 5-day Carbonaceous Biochemical Oxygen Demand (BOD) was 6,387 pounds per day (lb/day) and for TSS was 7,448 lb/day. The maximum monthly average BOD load was 8,101 lb/day in April 2022. The maximum monthly average TSS load was 9,547 lb/day in April 2022. Table 6-3 summarizes the wastewater characteristics of the East Port WRF influent as reported in the DMRs.

Table 6-3 East Port WRF Influent Water Quality FY 2022

Month	BOD		TSS	
	Monthly Avg. Concentration (mg/L)[1]	Monthly Avg. Load (lb/day)	Monthly Avg. Concentration (mg/L)[1]	Monthly Avg. Load (lb/day)
Oct-21	157	5,784	167	6,147
Nov-21	154	6,080	162	6,390
Dec-21	189	6,841	180	7,091
Jan-22	202	7,367	214	7,793
Feb-22	211	7,761	233	8,592
Mar-22	192	6,990	220	8,023
Apr-22	230	8,101	268	9,547
May-22	169	6,049	222	7,972
Jun-22	122	5,517	160	7,458
Jul-22	127	5,345	149	6,265
Aug-22	121	5,587	143	6,641
Sep-22	112	5,218	157	7,459

Note: [1] Measured at monitoring site INF-01.

6.2.3 Treatment Objectives and Effluent Quality

The East Port WRF is designed to treat wastewater to three effluent standards: one for disposal to the deep injection wells (U-001 and U-002), one for public-access reuse (R-001) levels requiring high-level disinfection, and one for the on-site spray fields (R-002) requiring basic level disinfection. Table 6-4 lists the flows and primary water quality requirements for each effluent reuse and disposal method. Currently, the WRF has 100-percent backup to the reuse system with disposal to U-001.

Table 6-4 East Port WRF Effluent Requirements

Reuse/Disposal Method	R-001	R-002	U-001
Max Flow (MGD)	10.233[a]	1.45[a]	9.6[a]
Max BOD (mg/L)[1]	20[a] /30[b]/45[c]/60[d]	20[a]/30[b]/40[c]/60[d]	20[a]/30[b]/45[c]/60[d]
Max TSS (mg/L)[1]	5[d]	20[a]/30[b]/45[c]/60[d]	20[a]/30[b]/45[c]/60[d]
Total Fecal (#/mL)	25[d]	200[a] /200[e]/800[d]	Not applicable
Total Nitrogen[1]	Report [d]	N/A	N/A
Total Phosphorus[1]	Report [d]	N/A	N/A

Notes: Statistical Bases: [a]annual average; [b]monthly average; [c]weekly average; [d]single sample; [e]monthly geometric mean.

[1] Frequency of analysis increased from 5 days per week to 7 days per week, effective immediately, per Notice of Permit Revision dated February 28, 2023.

Table 6-5 summarizes the effluent flow and water quality of the East Port WRF. The East Port WRF is producing a high-quality reclaimed water and operating within the permitted flow limits. In FY 2022, the annual average effluent flow for to the master reuse system (R-001) and sprayfields (R-002) were 1.8 MGD and 0.01 MGD AADF, respectively. Wells IW-1 and IW-2 (U-001) totaled 3.01 MGD AADF, which is below the permitted capacity of 9.6 MGD AADF.

The maximum single sample BOD and TSS values were 6.9 mg/L and 2.5 mg/L, respectively, showing no violations of the single-sample limits for BOD or TSS were recorded in FY 2022. Consequently, the BOD and TSS annual average, monthly, and weekly concentration requirements were also met in FY 2022. The maximum fecal coliform counts rarely exceeded 1 per 100 milliliters (1/100mL) except for one event in July 2022.

Table 6-5 East Port WRF Effluent Flow and Water Quality

Month	Reuse and Disposal Method				Water Quality		
	R-001 Monthly Avg. Flow (MGD)[1]	R-002 Monthly Avg. Flow (MGD)[2]	IW-1 Monthly Avg. Flow (MGD)[3]	IW-2 Monthly Avg. Flow (MGD)[4]	Maximum BOD Conc. (mg/L)[5]	Maximum TSS Conc. (mg/L)[6]	Maximum Fecal Count (#/100mL)[5]
Oct-21	1.7	0	0.2	2.0	2.2	0.8	<1
Nov-21	1.3	0	0.3	3.3	3.6	0.5	<1
Dec-21	1.3	0	0.3	2.6	2.8	0.4	<1
Jan-22	1.2	0	0.3	2.5	6.9	0.4	<1
Feb-22	1.5	0.1	0.3	3.4	3.7	0.7	2
Mar-22	2.3	0	0.2	2.1	2.3	0.7	<1
Apr-22	3.1	0	0.1	0.8	0.9	0.4	<1
May-22	2.4	0	0.1	1.2	1.4	0.7	<1
Jun-22	1.9	0	0.5	5.2	5.8	0.6	<1
Jul-22	1.9	0	0.2	1.7	1.8	2.5	2420
Aug-22	1.5	0	0.6	3.9	4.4	0.4	<1
Sep-22	1.0	0	0.4	4.1	4.5	0.5	2

Note: [1]Monitoring site FLW-02; [2]Monitoring site FLW-04; [3]Monitoring site FLW-03; [4] Monitoring site FLW-05; [5]Monitoring sites EFA-01 and EFA-02; [6]Monitoring sites EFA-02 and EFB-01.

6.2.4 Treatment Components and Condition Assessments

Jones Edmunds last completed an on-site review of the plant on November 15, 2022, as part of CCU's Hurricane Ian Damage Assessments; the information gathered at that time was used to update this section, in accordance with the project scope. Jones Edmunds personnel met with the Chief Operator, Mike McCrumb, to review plant conditions and operations; records were collected and reviewed as part of Annual Report efforts. Access to the facility is through a secure gate in a fence that surrounds the wastewater plant and the on-site irrigation and deep injection well areas. The WRF site, stormwater pond, and spray field sites are routinely mowed, brush cleared, and are well maintained.

The Operations Building includes the office of the Treatment Facilities Division Manager, the EPLAB, Backflow and Reclaimed Water Coordinator, conference room, administrative space, operations room, break room, and offices for Operations staff and other related staff.

General observations noted during the site visit include:

- All valves appear to be regularly exercised.
- Process piping is painted and clearly marked.
- All compliance meters are being calibrated every 6 months, and calibration tags are up to date.

Required documents maintained on site include:

- Operating permits for the treatment facility and deep injection wells.
- Operator's licenses.
- Facility logbook.
- Facility Standard and Emergency Operating Plans.
- DMRs.
- Effluent Analysis Reports.
- Annual Reuse Report.
- Pathogen Monitoring Report (Giardia and Cryptosporidium).
- Reports required to complete the last permit application (in process).
- Certification of the EPLAB.
- Sampling plan.
- Groundwater monitoring plan (contained in permit).
- Laboratory results.
- Flow meter calibrations.
- Chlorine and pH meter calibrations (one/day).
- Chain-of-custody forms for samples that are sent to laboratories.
- Monthly residual and marketing report (reported in dry tons/month).
- Facility O&M Manuals.
- Maintenance records (EAMS electronic data system).
- Reuse Operating Protocol.
- Facility Record Drawings.
- Daily temperature logs.
- Spill protocol and record of spills.

The Cross-Connection and Backflow Prevention Manuals are kept at the Reclaimed Water Coordinator's office at the East Port WRF.

6.2.4.1 WRF Influent Sampling Location

The East Port WRF monitored influent water quality and flow for permit compliance. The influent water quality sampling location (INF-01) and flow monitoring (FLW-01) locations at the East Port WRF are clearly marked, and the refrigerated influent composite sampler and flow meter are in good operating condition.

6.2.4.2 Headworks

The overall condition of the headworks is good, but the aluminum grating at the influent channel is missing and needs to be replaced. The adjacent old grease dewatering building is now demolished, and the piping from the new GMLS and Interceptor has been connected to the existing headworks. The screening and grit bagging system that was attached to the chutes that discharge into the dumpsters has significantly reduced the water on the floor, flies, and odors that usually accompany headworks' dumpster areas. The floor is clean and dry. At the top of the headworks, the hose bibb was disconnected and no longer in use.

The two septage-receiving stations require constant maintenance due to the high number of septage haulers that use the facilities and the nature of the waste. The septage-receiving units are reaching their useful life and are included in the 9.0-MGD WRF upgrade.

The septage receiving units and the adjacent driveway area collect grit and spillage of septic waste. A hose is used by the haulers to clean the area. The wash water is collected in the plant sewer system and pumped to the headworks for treatment. A steam cleaner is used by CCU WRF staff for cleaning this area periodically.

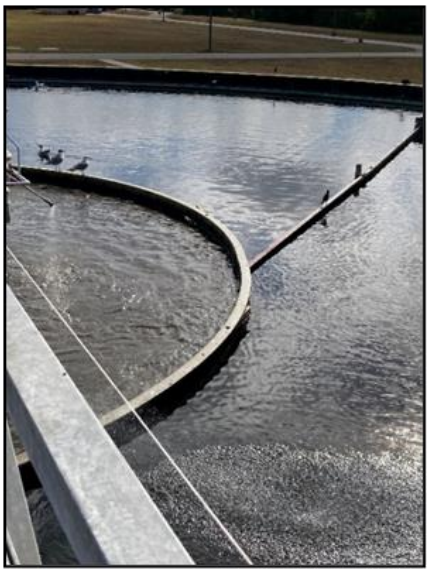
6.2.4.3 Flow Equalization

The East Port WRF currently does not have flow equalization (EQ) storage for peak-hour influent flows and loads. However, the 1.48-MG cast-in-place concrete tank that previously served as the aerobic digester is being modified and retrofitted to serve as an influent EQ Tank as part of the 9-MGD plant expansion design.

6.2.4.4 Biological Treatment

The overall condition and operation of the MLE process are good following the Stage 1 and 2 Improvements in 2016. Four VFD-controlled surface aerators are in operation in the oxidation ditches. The aerator speed is adjusted based on the DO probe at the end of the ditches. The aerators are well maintained. The DO-control system helps the WRF lower its power consumption and improve the denitrification process by minimizing DO carry-over to the anoxic zone. Six VFD-controlled IR pumps were replaced in the Stage 1 and 2 Improvements. These pumps are controlled by the SCADA based on operators' settings. The IR pumps are well maintained and in good working order. At the time of the site visit on February 4, 2022, Oxidation Ditch No. 2 anoxic zone was observed to have areas where a significant amount of floatable solids were gathered and forming an island on the water surface. A mixer may not have been in service at the time of the visit. Smaller areas were also observed at Oxidation Ditch No. 1. If this issue persists, we recommend adding plant water spraying to coax a better mixing zone and prevent floatable solids from collecting. The light pole for both oxidation ditches is leaning from its base due to high winds from Hurricane Ian and needs to be repaired.

6.2.4.5 Clarification



In 2016, the two clarifiers were rehabilitated as part of the Stage 1 and 2 upgrades, which included replacing the clarifier scraper mechanisms. The overall condition of the sedimentation process is well maintained and clean, and the clarifiers are producing a high-quality effluent. The light pole on the walkway between the two clarifiers is completely blown off at the base by Hurricane Ian and needs to be replaced. The five RAS pumps are VFD controlled. The two WAS pumps are controlled by operators' settings in the SCADA system. Both pumping systems are well maintained and in good working order.

The existing scum ejectors will be replaced with a cost-effective scum-pumping system as part of future plant expansion to 9 MGD.

A "weir washer" system was installed on Clarifier No. 1 and Clarifier No. 2 in 2017 and 2018, respectively. The weir washers eliminate the need to have O&M staff enter the clarifier effluent launders to remove algae, eliminating associated safety concerns. The weir washers do an excellent job of keeping the clarifier effluent weirs and troughs clean. An excellent-quality effluent is being produced by both clarifiers.

6.2.4.6 Filtration

The overall condition of the effluent filtration system is good with a few damages from Hurricane Ian. The emergency alarm does not work, and its associated conduit and support structure is damaged. The pump and piping for one of the filters is out of service due to hurricane wind damage. The filters were rehabilitated as part of the Stage 1 and 2 Improvements. The two-traveling bridge sand/anthracite filters were in operation and was backwashing at the time of the site visit. Turbidity results indicate that the filters are producing an excellent effluent for unrestricted public-access reuse water. A galvanized metal frame was installed over the filters in the Stage 1 and 2 Improvements to support a fabric roof constructed of UV shade cloth. However, the cloth rips in the wind and will be replaced with roof panels bolted to the galvanized frame for the 9-MGD expansion.

6.2.4.7 Disinfection and Effluent Sampling

6.2.4.7 Disinfection and Effluent Sampling

The CCCs are in good condition, well maintained, and operated to produce reclaimed water for unrestricted public-access reuse. CCC No. 1 was recently painted to improve high-level disinfection. CCC No. 2 was drained during the time of the site visit. Liquid sodium hypochlorite (12.5 percent) is stored in a 6,000-gallon dual-containment tank and is used for disinfection to maintain a residual of ≥1.0 mg/L to meet unrestricted public-access reuse standards. The ladder cage and overflow vent pipe for the liquid sodium hypochlorite tank are broken from heavy winds by Hurricane Ian. In 2018, the old liquid reagent chlorine residual analyzer was replaced with a non-reagent analyzer to control chlorine feed rates. Another non-reagent analyzer is used for chlorine residual compliance measurement. The new skid-mounted chlorine feed system is encased in a clear plastic enclosure to control the spray of liquid chlorine for safety purposes. The overall chemical feed systems and instrumentation are well operated and maintained to meet regulatory permit requirements. The effluent flow and monitoring locations (EFA-01 and EFA-02) are clearly marked, and the refrigerated effluent composite samplers are in good operating condition.

6.2.4.8 Reuse, Disposal, and Storage

Reuse Facilities

Effluent that meets reclaimed water standards from the East Port WRF is conveyed to CCU's Master Reuse System (discussed in Chapter 7) using the reclaimed water HSPSs. The East Port WRF has two reclaimed water HSPS. The reclaimed water HSPS No. 1 has three VFD-controlled 100-HP vertical turbine pumps that pump reclaimed water from the clearwell adjacent to CCC No. 1 into the WRF plant water system. The reclaimed water service pumps are well maintained and operated. The VFD controls allow the pumps to operate at high speeds to meet distribution system demand and at low speeds to provide non-potable water on site for O&M purposes.

The reclaimed water HSPS No. 2 has five VFD-controlled pumps, can pump 9.0 MGD at 108 psi, and was completed in 2019 as part of the Stage 5 Improvements. Due to heavy winds by Hurricane Ian, paint on the pumps and their associated piping was lost. The system includes four 120-micron self-cleaning filters manufactured by ORIVAL and was submitted as a value-engineering substitution. The units are currently bypassed due to fouling issues. The bypass around these filters is not impacting reclaimed water quality to end users.

The East Port WRF also contains a 95-MG lined storage pond that provides reclaimed water and wet-weather storage. In FY 2016/2017 the 95-MG pond was drained and cleaned, and the pond liner repaired. In 2019, a new automatically cleaned intake screen feeding HSPS No. 2 was installed in the pond as part of the Stage 5 Improvements. The liner in this storage pond is torn by heavy winds from Hurricane Ian. The tearing of the liner also damaged the berm and released reclaimed water from the pond. The County will need to replace the liner and geotextile material and compact and refill the berm.

Reject Storage and Alternate Disposal

Excess reclaimed water or effluent not meeting reclaimed water standards (reject water) is disposed of through two deep injection wells and a restricted-access, on-site slow-rate irrigation system (on-site spray field). Effluent transfer pumps are well maintained but are showing signs that they need to be repainted. CCU also maintains a 45-MG lined effluent storage pond that is used before injection well and/or spray field disposal. It also serves as additional wet weather storage. The pond liner is in good condition.

The irrigation pump station is on the east bank of the 45-MG pond and pumps water from the pond to the deep injection wells or the spray field. Both deep injection wells are well maintained and in good working order. All valves are exercised regularly. All associated meters are calibrated semi-annually and are up to date.

Wet-Weather Storage

The on-site 95-MG reclaimed water pond and 45-MG reject storage pond are available for wet-weather storage of reclaimed water.

6.2.4.9 Biosolids Handling Facilities

The overall conditions of the biosolids storage/digestion tanks, associated piping, truck off-loading facilities, decant supernatant pumping, and BFP feed pumps at the new biosolids handling and storage tanks constructed under the Stage 1 and 2 Improvements are good. The facilities receive waste biosolids from the East Port WRF and the three other CCU WRFs and are well maintained and operated. CCU has two tankers used for hauling liquid sludge from the other WRFs and off-loading into the aerobic sludge-holding tanks before dewatering.

The Lead Operator noted in 2020 that the capacity of the aerobic digesters and the BFP to handle biosolids from all four facilities is starting to become an issue where sufficient time to allow tank decanting is limited due to the increased sludge flows. In addition, when a BFP is down for service, insufficient digester capacity is available to allow decanting. CCU is investigating this issue under the East Port WRF expansion design project. This issue is being resolved as part of the 9.0-MGD expansion with the addition of another digester and a dewatering unit.

Operators on site noted that the belts for both BFPs are torn by heavy winds from Hurricane Ian and need to be completely replaced.

6.2.4.10 Electrical Components and Circuitry

The East Port WRF contains one 1,250-kW generator serving the primary WRF as standby power. An additional 1,500-kW generator was installed as part of the Stage 5 Reclaimed Water Improvements. One standby generator serving the Administration building was relocated from another facility in used condition. The facility has five primary electrical switchgear locations – the Administration building, the generator/MCC building, the new primary incoming switchgear building, the new electrical building #2, and the blower building. The Administration building has a separate service drop from the power company. The rest of the WRF is served through two new parallel transformers serving the incoming switchgear building recently constructed. The Administration building, incoming switchgear building, and electrical building #2 were all constructed within the last 8 years. The generator/MCC building had upgrades and improvements to existing original equipment and generators. The blower building has been in service for several years.

The incoming service and distribution transformers at the Administration building are relatively new and in excellent condition with no obvious signs of concern. The standby generator functions properly and is in good condition. Since it was relocated from another location, it does show signs of wear and deterioration but with no major issues to interfere with its function. The distribution switchgear of the Administration building was in excellent condition with minor issues (see below). Overall, the electrical equipment is in good functioning condition based on information from Operations staff.

The incoming switchgear building was constructed only a few years ago. As such, all equipment is in excellent condition. The facility is fed from two power company transformers, also newly installed. A thermographic survey of the facility showed no anomalies or issues.

The generator/MCC building is an existing building with older equipment and new equipment installed under Stage 5 and Stage 1 and 2 Improvements. The existing switchgear appears to be in good condition. The switchgear includes complete arc-flash labeling required by NFPA 70E. The existing 1,250-kW generator is in overall good condition, but the Chief Operator reported that it requires upgrades and an overhaul in 2020. The generator set shows minor points of fluids seepage.

The distribution switchgear was in excellent condition with minor issues. Overall, the electrical equipment is in good functioning condition based on information from the Operations staff.

The following briefly lists minor issues at other locations throughout the plant. None of these constitute a significant issue but are documented here for reference and for future action:

- Headworks – Several conduits and their supports to the handrails and elsewhere were broken or damaged and need to be replaced or repaired.
- Oxidation Ditches Controller Panels – The screens on the controllers for the probes at the effluent of the oxidation ditches are showing some signs of sun damage, and we recommend that sunshields be installed over the front of the three-sided enclosures.

- Storage Building – A portion of the wall siding and a downspout are bent from hurricane winds.
- Blower Building – Most of the equipment is new and in service as part of the GMLS. There is a loss of roof drip edge at the top of the building.
- Electrical Building# 1 – As recognized in a previous report, the VFDs within this building are extraordinarily loud and hearing protection is required. The appropriate signs and warnings need to be provided.
- Electrical Building# 2 – Panel LE section 2 circuit #63 should be investigated for possible fault.
- Power Pole – Is leaning over along Old Landfill Road because of hurricane winds.
- Generator Building #1 – Two fans on the roof of the building are missing shrouds.
- Generator Building #2 – The ceiling is damaged on the inside of the building seepage of water from the internal roof drains. The air terminals are hanging loose on the side of the building.
- Construction Trailer – The concrete foundation is damaged and the plumbing for the trailer needs to be repaired.
- Clarifier No. 1 – Shows unsupported conduit that needs to be properly supported per code. It is out of service with the center drive motor missing.
- Chlorine Contact Tanks – The chlorine pumps on Tank No. 1 and 2 are missing flex support, have broken cable connectors, and are missing waterproof covers.
- Stormwater Structure – Erosion of soil has occurred around this structure that is adjacent to the front gate entrance and a sewer manhole.
- Irrigation Pump Station – CCU staff reported several issues with the existing breakers. These include not having a proper actuation handle, which prevents them from being operated without opening the cover, in violation of the NEC. This represents a significant issue and should be remedied immediately. The switchgear in this station is also in poor condition, reaching the end of its reasonable service life and should be considered for replacement soon.
- Site Perimeter Fence – The fence along the southwest portion of the site perimeter is damaged from fall trees by hurricane winds.

6.2.5 OPERATIONS

The East Port WRF produces a high-quality reclaimed water by using biological nutrient removal with an MLE process, clarification, effluent sand/anthracite filtration, and high-rate chlorine disinfection. The WRF can be operated to produce secondary effluent without filtration, but this alternative operation is only used for maintenance purposes, and excess and/or unfiltered effluent is diverted to storage ponds for on-site spray irrigation or disposal in the two on-site deep IWs.

The East Port WRF accepts septic tank waste through two septage pretreatment units. This service provides a necessary waste treatment component for local septage hauling companies that serve locations outside the CCU collection system service area.

The East Port WRF accepts and treats sludge from East Port, West Port, Rotonda, and Burnt Store WRFs. The East Port WRF sludge-holding capacity has experienced issues in 2019, 2020, and 2021 when receiving increased volumes of waste sludge from all four WRFs. The limited sludge-storage capacity results in reducing the frequency of sludge hauling trips to the East Port WRF from the other facilities, which reduced wasting volumes and frequency and, as a

result, reduced performance. The operators at West Port and Rotonda WRFs have also expressed concerns with the limited capabilities to haul sludge by truck to East Port WRF, resulting in a reduction in the ability to waste sludge at the West Port and Rotonda WRFs.

As part of the undergoing planned East Port WRF expansion, the sludge-storage capacity at the East Port WRF will be increased to handle projected volumes of sludge from the East Port WRF and the other facilities and additional sludge dewatering provided. Sludge thickening to 4- to 5-percent solids can be evaluated at the other facilities to reduce waste sludge volumes (up to a factor of 3), reduce number of hauling events, and reduce required volume at the East Port WRF sludge aerobic digester.

The East Port WRF is staffed 24 hours per day, 7 days a week by licensed operators who also monitor the other WRFs within the CCU system 24 hours per day. Alarms are evaluated, and operators or maintenance personnel are dispatched to take corrective action, if necessary.

6.2.6 Maintenance

Routine maintenance is performed on a scheduled basis. Rehabilitation of major pieces of equipment is completed in accordance with the CIPs that are revised annually. Maintenance that is required to keep the WRF in compliance with regulations is performed immediately using in-house maintenance personnel or outside contractors.

6.2.7 Review of Previous Report Recommendations

Stages 1 and 2 of the East Port WRF upgrade were completed in FY 2016. Stage 5 Reclaimed Water Improvements were completed in FY 2019 and put into operation in March 2020. The expansion to 9.0 MGD, with many processes designed to accommodate future expansion to 12.0-MGD, is in progress. Construction of the 9-MGD expansion is expected to begin Winter 2023, and the future construction expansion to 12.0 MGD will be done as funding, growth, and development dictate. Table 6-6 summarizes the 2021 recommendations and status of each item.

Table 6-6 East Port WRF 2021 Recommendations and Status

Recommendation:	▪ Apply for the permit renewal for IW-1 at the East Port WRF.
Progress:	▪ Completed.
Recommendation:	▪ Complete the design of the East Port WRF expansion project and proceed to construction to address increased wastewater flows.
Progress:	▪ Design nearing completion. Construction expected to bid in Summer 2023.
Recommendation:	▪ Replace the irrigation pumping station electrical switchgear.
Progress:	▪ Not completed.
Recommendation:	▪ Provide a fixed panel cover over the CCC.
Progress:	▪ Not completed.
Recommendation:	▪ Paint the aboveground piping within the next 2 to 3 years at the headworks.
Progress:	▪ Hurricane Ian damaged painted piping and equipment across the County; those assets are in process of being repainted.

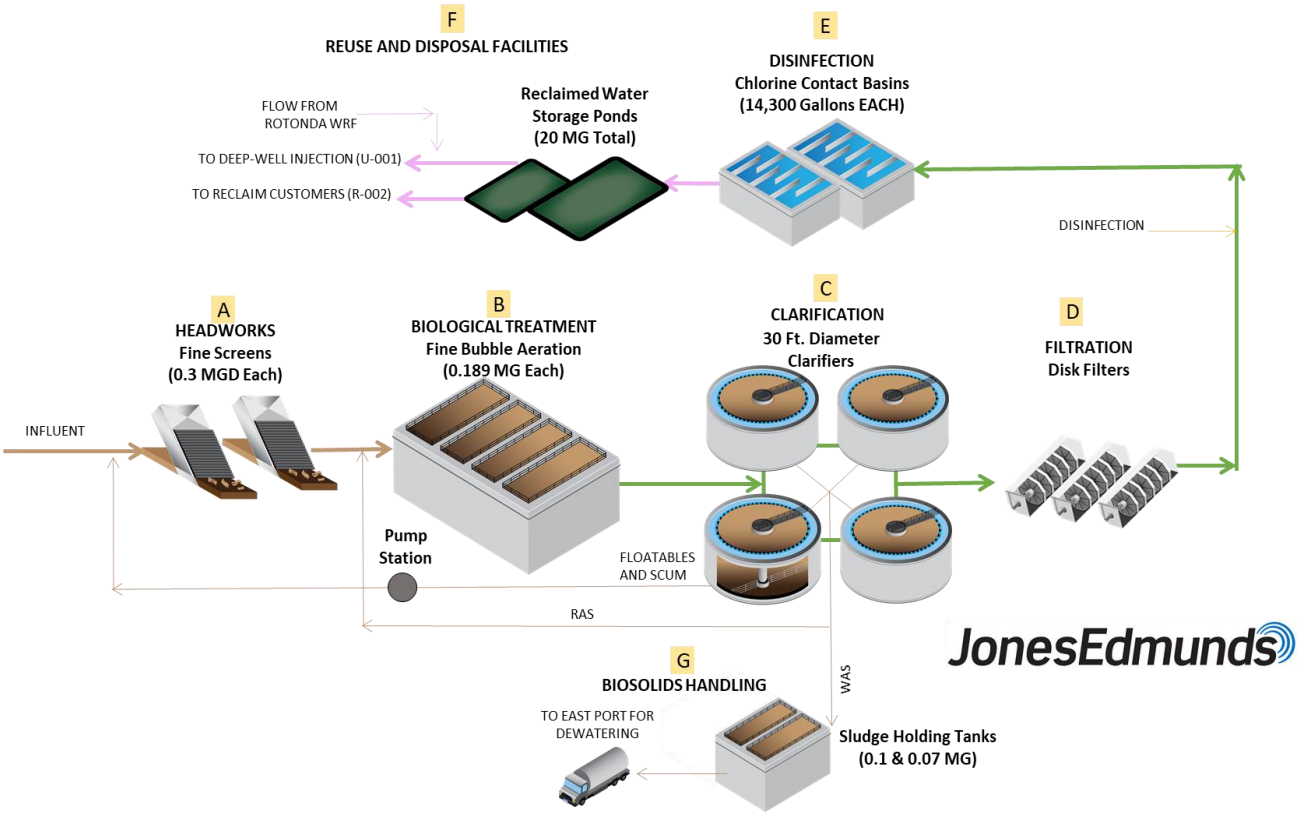
Recommendation:	▪ Replace hose bib connections at the headworks.
Progress:	▪ The hose bibbs were replaced.
Recommendation:	▪ Replace insultation for Probe SC100 piping on Oxidation Ditch No. 2.
Progress:	▪ This will be addressed in the next expansion.
Recommendation:	▪ Include more bird deterrents near the Clarifiers.
Progress:	▪ Additional bird deterrents were added to the headworks. Clarifiers will be addressed in the next expansion.
Recommendation:	▪ Rails for the backwash mechanism at the Filters are in fair condition, but the wall support is beginning to rust. The wall support should be painted.
Progress:	▪ This will be addressed in the next expansion.
Recommendation:	▪ Replace the base of pump heads at HSPS No. 1 and the Pond Transfer Pumps.
Progress:	▪ This will be addressed in the next expansion.
Recommendation:	▪ Paint the Sludge Transfer Pumps and associated pipes within the next 3 to 5 years.
Progress:	▪ Hurricane Ian damaged painted piping and equipment across the County; those assets are in process of being repainted.
Recommendation:	▪ Provide a sun shield for the control panel at HSPS No. 2.
Progress:	▪ This will be addressed in the next expansion.
Recommendation	▪ Coat and repaint the RCW meter pipes at HSPS No. 2.
Progress:	▪ Not completed.
Recommendation:	▪ Replace the irrigation pumping station electrical switchgear.
Progress:	▪ This will be addressed in the next expansion.

6.3 West Port WRF

The West Port WRF is in the Gulf Cove area of West Charlotte County at 15005 Cattle Dock Point Road, Port Charlotte, Florida. This WRF was upgraded in 2005 and has a current permitted capacity of 1.20 MGD AADF. The West Port WRF uses an activated sludge process to treat domestic wastewater collected from part of the West County service area. The West Port WRF is permitted to distribute reclaimed-quality water to unrestricted public-access reuse sites and inject into a deep well injection system. Two diesel-powered emergency generators with ATSs provide standby power to the WRF.

Figure 6-3 shows the West Port WRF process flow diagram.

Figure 6-3 West Port WRF Process Flow Diagram



A) Headworks: Raw wastewater from the West County service area collection/ transmission system enters the headworks where it is screened to remove large inorganic material by four rotary influent screens. A manual bar screen is also available for bypass purposes. Screenings are collected in a dumpster and hauled to the landfill for disposal. Internal plant flows from the on-site pump station are introduced at the bar screens.

B) Biological Treatment: Screened wastewater is split equally into four aeration basins where aeration and microorganisms are used to treat biodegradable material. Blowers aerate the wastewater through fine-bubble diffusers in each aeration basin.

C) Clarification: Flow from the biological treatment process is split between four secondary clarifiers for solids separation. The clarifiers have rotating skimmer arms to remove floatables and scum before the effluent flows over a circumferential weir. Telescoping valves adjust sludge withdrawal from the bottom of each clarifier and convey it to the sludge-return chamber. The sludge exits the return chamber where it is conveyed to the front of the aeration basins as RAS to replenish the microbial community or to the sludge holding/aerobic digestion tanks as WAS.

D) Filtration: Clarified water enters three automatic cleaning, disc-type cloth media filters for tertiary filtration to remove the remaining solids. The filters are housed in individual steel tanks.

E) Disinfection: The filtered water enters the CCCs where liquid sodium hypochlorite is dosed for disinfection. Only one chamber is currently in use.

F) Reuse and Disposal Facilities: Reclaimed-quality water is pumped to two lined storage ponds for storage and distribution to the reclaimed water system. Excess reclaimed water and water not meeting reclaimed water standards are pumped to the Class I injection well by three equally sized pumps. The West Port and Rotonda reclaimed water systems are interconnected, allowing Rotonda WRF to dispose of excess reclaimed water using the injection well.

G) Biosolids Handling: WAS is pumped from the clarifiers to the sludge-holding tanks where blowers provide aeration through coarse-bubble diffusers. The sludge is gravity thickened and decanted before being hauled to the East Port WRF for aerobic digestion, dewatering, and transport to the Charlotte County Zemel Road Landfill where it is processed into compost available for sale as a soil conditioner.

6.3.1 Regulatory Considerations

The West Port WRF operations are regulated by FDEP under the provisions of Chapter 403, Florida Statutes, and the applicable FAC rules. The following permits govern the plant operations:

- Plant Operating Permit (FLA014048) – Expiration Date: February 24, 2026.
- Deep Well (IW-1) Permit (0330461-002-UO/1M) – Expiration Date: May 4, 2026.
  - The last MIT was performed on IW-1 on June 17, 2020. The next MIT will be due by June 16, 2025.

6.3.2 Wastewater Flows and Loads

The West Port WRF permitted capacity is 1.20 MGD AADF. At the end of FY 2022, the AADF was 0.78 MGD, and the West Port WRF was operating at 65 percent of the plant permit capacity. The MADF occurred in September 2022 at 0.89 MGD. The highest TMADF of 0.82 MGD occurred in September 2022, which is 68 percent of the plant permit capacity, demonstrating the influence of wet weather and I/I to the facility. Table 6-7 summarizes influent flows as reported in the DMRs.

Table 6-7 West Port WRF Influent Flows in FY 2022

Month	MADF (MGD)	AADF (MGD)[1]	TMADF (MGD)	MDF (MGD)	TMADF Percent Capacity (%)[1]
Oct-21	0.70	0.75	0.76	0.74	63
Nov-21	0.79	0.75	0.75	0.93	63
Dec-21	0.76	0.75	0.75	0.86	62
Jan-22	0.80	0.75	0.78	0.88	65
Feb-22	0.82	0.75	0.79	0.89	66
Mar-22	0.79	0.76	0.80	0.84	67
Apr-22	0.73	0.76	0.78	0.80	65
May-22	0.73	0.76	0.75	0.80	62
Jun-22	0.82	0.78	0.76	1.04	63
Jul-22	0.79	0.78	0.78	0.99	65
Aug-22	0.78	0.77	0.80	0.84	66
Sep-22	0.89	0.78	0.82	1.16	68

[1] Permitted capacity = 1.2 MGD AADF, measured at monitoring site FLW-01.

In FY 2022, the average annual influent load for BOD was 758 lb/day and for TSS was 1,136 lb/day. The maximum monthly average BOD load was 1,176 lb/day, occurring in January 2022. The maximum monthly average TSS load was 2,114 lb/day in January 2022, which corresponds with seasonal residents and the dry season. Table 6-8 summarizes the wastewater characteristics of the West Port WRF influent.

Table 6-8 West Port WRF Influent Water Quality in FY 2022

Month	BOD		TSS	
	Monthly Avg. Concentration (mg/L)[1]	Monthly Avg. Load (lb/day)	Monthly Avg. Concentration (mg/L)[1]	Monthly Avg. Load (lb/day)
Oct-21	98	551	145	815
Nov-21	116	735	172	1,079
Dec-21	162	1,014	283	1,796
Jan-22	179	1,176	322	2,114
Feb-22	128	865	181	1,225
Mar-22	151	981	192	1,242
Apr-22	143	847	182	1,077
May-22	105	624	156	927
Jun-22	82	533	109	704
Jul-22	82	517	122	768
Aug-22	77	493	116	745
Sep-22	75	609	149	1,211

Note: [1] Measured at monitoring site INF-01.

6.3.3 Treatment Objectives and Effluent Quality

The West Port WRF is designed to treat wastewater to two effluent standards – one for disposal to the deep injection well (U-001) and the other for public-access reuse (R-002), which requires high-level disinfection. Table 6-9 lists the flow and primary water quality requirements for each effluent reuse and disposal method.

Table 6-9 West Port WRF Effluent Requirements

Reuse/Disposal Method	R-002	U-001
Max Flow (MGD)	Report[a,b]	4.75[e]
Max BOD (mg/L)	20[a]/30[b]/45[c]/60[d]	20[a] /30[b] /45[c]/60[d]
Max TSS (mg/L)	5[d]	20[a] /30[b] /45[c]/60[d]
Total Fecal (#/mL)	25[d]	Not Applicable

Notes: Statistical Bases – [a]annual average; [b]monthly average; [c]weekly average; [d]single sample; [e]instantaneous maximum.

Table 6-10 summarizes the effluent flow and water quality of the West Port WRF. In FY 2022, the annual average effluent flow for the reuse system (R-002) was 0.47 MGD. The maximum daily flow of the underground injection well (U-001) was 2.95 MGD, indicating that the WRF is meeting its effluent flow requirements. The maximum single-sample BOD and TSS values

were 2.0 mg/L and 2.4 mg/L, respectively, showing that no violations of the single-sample limits for BOD or TSS were recorded in FY 2022. Consequently, the BOD and TSS annual average, monthly, and weekly concentration requirements were also met in FY 2022. The maximum fecal coliform counts rarely exceeded 1/100 mL except for three events occurring in June, August, and September 2022. In 2022, fecal coliform counts exceeded single-sample limits on only 2 consecutive days in June; however, compliance was maintained by discharging the effluent via U-001.

Table 6-10 West Port WRF Effluent Flow and Water Quality

Month	Reuse and Disposal Method		Water Quality		
	R-002 Monthly Avg. Flow (MGD)[1]	U-001 Max. Day Flow (MGD)[2]	Maximum BOD Conc. (mg/L)[3]	Maximum TSS Conc. (mg/L)[4]	Maximum Fecal Count (#/100mL)[3]
Oct-21	0.78	0.31	<2.0	1.0	<1
Nov-21	0.16	2.34	<2.0	1.3	<1
Dec-21	0.61	0.49	<2.0	0.7	<1
Jan-22	0.58	1.80	<2.0	1.1	2
Feb-22	0.55	1.46	<2.0	1.0	<1
Mar-22	0.58	0.63	<2.0	1.3	<1
Apr-22	0.66	0.38	<2.0	2.1	<1
May-22	0.54	0.81	<2.0	1.8	<1
Jun-22	0.28	1.60	<2.0	1.6	52
Jul-22	0.33	1.90	<2.0	1.4	13
Aug-22	0.46	0.75	<2.0	1.4	35
Sep-22	0.11	2.95	<2.0	2.4	1986

Notes: [1] Monitoring site FLW-04; [2] Monitoring site FLW-02; [3] Monitoring sites EFA-01 and EFA-02; [4] Monitoring site EFB-01.

6.3.4 Treatment Components and Condition Assessment

Jones Edmunds completed an on-site review of the WRF on February 9, 2023. Our personnel met with Thomas Cimino, Chief Operator of the West Port WRF, to review plant conditions, operations, and records. Access to the facility is through a secure gate in a fence that extends to a water moat surrounding the WRF and reclaimed water storage ponds. A warning sign is on the access gate, and multiple warning signs are outside the moat near the property boundary.

In general, the plant site is well kept and maintained. Staff has done a good job in groundskeeping and facility appearance. The area of mowed grass outside the reclaimed water storage pond is an aesthetic welcome to plant visitors. The Operations Building and shop area are clean and organized. The stormwater pond near the headworks requires clearing and reconditioning.

The plant operators continue to exercise all valves regularly. All compliance meters are calibrated every 6 months, and calibration tags were up to date at the time of the site visit.

Required documents maintained on site include:

- Operating permits for the treatment facility and deep injection wells.
- Operators' licenses.
- Facility logbook.
- Facility SOPs and Emergency Operating Plans.
- DMRs.
- Effluent Analysis Reports.
- Annual Reuse Report.
- Pathogen Monitoring Report (Giardia and Cryptosporidium every 2 years).
- Reports required to complete the last permit application.
- Certification of EPLAB.
- Sampling Plan.
- Groundwater Monitoring Plan (contained in permit).
- Laboratory results.
- Flow meter calibrations.
- Chlorine and pH meter calibrations (one/day).
- Chain-of-Custody forms for samples that are sent to laboratories.
- Monthly residual and marketing report (reported in dry tons/month).
- Facility O&M Manuals.
- Maintenance records (EAMS electronic data system).
- Reuse Operating Protocol.
- Facility Record Drawings.
- Daily temperature logs.
- Spill protocol and record of spills.

The Cross-Connection and Backflow-Prevention Manuals are kept at the Reclaimed Water Coordinator's office at the East Port WRF. The Chief Operator has prepared a binder of required documents that is readily available for inspection.

6.3.4.1 WRF Influent Sampling Location

6.3.4.1 WRF Influent Sampling Location

The WRF includes a 24-inch influent force main and 16-inch flow meter assembly that have been in service since January 2014. The influent water quality sampling location (INF-01) and flow monitoring locations are clearly marked, and the refrigerated influent composite sampler and flow meter are in good operating condition.

6.3.4.2 Headworks

The overall condition of the headworks structure was considered good at the time of the site visit. In 2021, the County completed a headworks rehabilitation project where the headworks structure, pumps, and piping were re-coated; all four drum screens were replaced; and four new chain-operated influent valves were installed. The drum screens and rotating equipment continue to corrode due to hydrogen sulfide. Adding odor control through chemical addition will extend the service life of the drum screens. The bottom of the headworks structure and dumpster appeared to be clean and orderly.

A fiberglass grating over the influent flow splitter area had been supported by two carbon-steel beams. These beams were replaced with aluminum beams in FY 2015. The fiberglass grating is showing minor signs of fraying.

The WRF has no grit removal system. Grit usually accumulates in aeration basins and at the on-site lift station. Grit is removed from the system periodically by vacuum trucks. The Chief Operator indicated that the vacuum truck has easier access to the outer basins than the inner basins that require more physical labor to remove grit.

Although the lack of a grit removal system is an issue, the grit content of the wastewater entering the WRF is probably lower than most plants because nearly all flow is received from septic tank effluent pumps.

6.3.4.3 Flow Equalization

The West Port WRF does not have flow EQ storage for peak-hour flows. Introducing flow EQ would improve the efficiency and capacity of plant operations. An alternative would be to install VFDs on the major lift stations that directly pump to the WRF. Flow EQ should be considered as part of the West Port WRF expansion.

6.3.4.4 Biological Treatment

The overall condition of the activated-sludge facilities is good. The mixed liquor suspended solids (MLSS) are sampled every morning by the Operations staff. The WRF has four aeration basins – all basins were in service at the time of the site review. New fine-bubble diffusers were installed in all basins in 2013 and 2014. This has had a positive effect on the treatment process by providing a more even air flow distribution. However, the lack of grit removal continues to

present a maintenance challenge since deposited grit levels rise to block the diffusers. Basin No. 3 was cleaned of grit, and damaged aerators were repaired in FY 2016.

All three blowers were operating properly. Usually, one blower is operated at a time to meet aeration requirements. The operators cycle the blowers weekly. The plant typically operates between a pH of 6.6 and 6.7 but adjusts seasonally by running an additional blower. A timer is used to turn the blower on and off throughout the day. Using pH for operational control is not the most practical method for treating wastewater; an alternate control method including DO and oxygen-reduction potential (ORP) should be evaluated. The outlet weirs of the aeration tanks require manual cleaning when debris catches on the weirs. The steel supports of the walkway over the aeration tank effluent splitter box were touched up with paint in FY 2017, and the aeration tanks were repainted in 2018.

6.3.4.5 Clarification

Although most of the unit process tanks are made of concrete or Type 304 stainless steel, the four secondary clarifiers consist of carbon steel and require constant paint maintenance every 2 years. The overall condition of the clarification process is fair. High sudden increases in influent flows can cause further issues with the clarifier performance when one of the four clarifiers are out of service. Installing submerged stamford baffling in the clarifiers could aid with sludge settlement and prevent solids from billowing up the walls and potentially entering the effluent launder.

The rubber on the skimmer arms on most or all the clarifiers appeared to not evenly contact the water surface when it traveled around the clarifier, which may indicate that the skimmer arm and mechanism may not be level. The feed well had noticeable foam that would occasionally exit from the feed well into the main part of the clarifier. This foam would remain in the main clarifier area contained by the scum baffle but was not sufficiently removed by the uneven skimmer arms.

Plant Operations staff follow a routine schedule of clarifier inspection, repair, and painting. At the time of inspection, three clarifiers were in service. Clarifier No. 1 was taken offline for service and painting. The effluent launder/overflow weir will be replaced during this service period. The stairways leading to the bridges of the aboveground clarifiers were painted in 2020, but show signs of moderate fraying.

Overflow weirs are hosed daily and brushed every 2 weeks to keep them clean. The overflow weirs were leveled in FY 2017. According to 2022 DMR data, West Port WRF effluent water quality complies with FDEP permit conditions. New weirs were installed in Clarifier No. 1 and Clarifier No. 2 in 2018. Clarifier No. 3 and Clarifier No. 4 received new weirs in FY 2020 and FY 2021, respectively.

The sludge return chambers on the side of each clarifier have telescoping valves used to adjust sludge withdrawal from the bottom of the clarifier. The sludge is then conveyed to the four RAS/WAS pumps that are housed under a sheet-metal roof. Floatables accumulate in the sludge chambers and are periodically removed by manually skimming the 5-foot-by-5-foot boxes from the clarifier bridge when the chambers are full. The telescopic valves were operating properly, and the RAS/WAS pumps are in good operating condition. The pumps were painted in 2017.

6.3.4.6 Filtration

The filters are in good condition. The tanks are cleaned every month with 5 gallons of bleach. A UV cover was put on the filter tanks and then removed because access to the filters during maintenance activities was blocked. Also, using the UV cover requires weekly cleaning due to increased bug life beneath the UV cover. The filter water surface, exposed interior equipment, and interior tank walls are sprayed with a bleach solution once or twice a week by Operations staff to prevent algae growth. Regular bleach spraying mitigates algae growth but may cause long-term issues in with exposed components such as motors. The filter will likely be replaced as part of the future expansion.

Three filters were in operation at the time of the site visit and were working properly. All three filters were using the same filter cloths that were replaced in 2021. The Chief Operator stated that a higher-quality effluent is obtained when all three filters are operating in parallel.

The filters are constructed of Type 304 stainless steel, but the fiberglass grating platform between the filters is supported by carbon steel angles. The paint is in good condition with some staining and rust on some exposed components that are not stainless

6.3.4.7 Disinfection and Effluent Sampling

The overall condition of the chlorination system is excellent with the exception of the permanent roof structure. The roof was blown off due to wind damage when Hurricane Ian made landfall in September 2022. Only CCC No. 1 was in operation at the time of the site visit. CCC No. 2 was reported to be in good working condition. Each CCC has two trains. Good turbulent flow in the inlet boxes to the CCCs creates effective mixing. The pH and chlorine analyzers are in good working order. Plant operators clean the analyzer assemblies at regular intervals to remove any algae buildup. They also periodically alternate the CCCs to clean them.

In June 2017, a new chlorine feed system with two chemical feed pumps for each CCC and new storage tanks was installed in a new chlorine storage and feed area between the two CCC structures. This will enable two parallel CCCs to operate when peak hourly flows exceed 955 gpm. The new dosing pumps have double-containment protection.

The CCC effluent is monitored by the effluent composite water quality sampler (EFA-01). The overall condition of the effluent monitoring, storage, and disposal system is good.

6.3.4.8 Reuse, Disposal, and Storage

Reuse Facilities

The West Port WRF reclaimed water pump station feeds part of the Master Reuse System that interconnects with the Rotonda WRF and the East Port WRF reclaimed water systems. The station contains two reclaimed water HSPs and one jockey pump. This provides flexibility to serve existing and future reclaimed water customers. The two reclaimed HSPs were replaced in 2021. The main customer for the reclaimed water produced at the West Port WRF is the Coral Creek Golf Club Golf Course, which receives reclaimed water through a 7-mile-long, 10-inch-diameter main constructed by the golf course owners. Chapter 7 provides additional information about the Master Reuse System.

The West Port WRF has two lined reclaimed water storage ponds – one 5 MG and one 15 MG. The stored water can be pumped to the reclaimed water distribution system or the deep injection well. The ponds had some algae growth at the time of inspection. The Chief Operator reported in the last annual report update that they plan to add some fine-bubble diffusers to the pond in the future.

Reject Storage and Disposal

Effluent that does not meet public-access reclaimed water standards is conveyed to a clearwell for disposal via a deep injection well. Three new deep-well pumps are used to convey effluent through a 16-inch manifold pipe into the deep well. All compliance monitoring equipment and pumps were fully functioning and in good condition at the time of the inspection. The building housing the pumps suffered wind damage when Hurricane Ian made landfall in September 2022.

MIT for the deep injection well will be performed in 2023. Any effluent not meeting reclaimed water standards during the testing period will be automatically diverted to the existing on-site sprayfields. The Chief Operator is also considering using the 5-MG wet-weather storage pond as a temporary reject pond for the MIT test, but it will require cleaning before it can be used for reclaimed water storage again.

Wet-Weather Storage

The on-site reclaimed water ponds provide up to 20 MG for wet-weather storage of reclaimed water. At the time of the site visit, the pond linings appeared to be in good condition. The ponds had some algae growth at the time of inspection. The Chief Operator reported in the last annual report update that they plan to add some fine-bubble diffusers to the pond in the future.

6.3.4.9 Biosolids Handling

The sludge produced as a byproduct of treatment is pumped to aerobic sludge-holding tanks and then gravity thickened at the West Port WRF before being truck hauled in liquid form to the East Port WRF for sludge dewatering and final disposal at the compost facility. The overall condition of the sludge-holding tanks is good; however, the aerobic sludge-holding tank volume is too small and prevents proper decant thickening, resulting in a decant-thickened sludge of 1-percent solids or less. Additional sludge-holding tank volume and decant-thickening capabilities should be provided to allow a thickened sludge of 1.5- to 2.0-percent TS, which will reduce the sludge-hauling volume by 50 to 100 percent and hauling costs. CCU is evaluating the feasibility of adding

more biosolids-handling capacity at the West Port WRF to handle biosolids generated at the West Port and Rotonda WRFs.

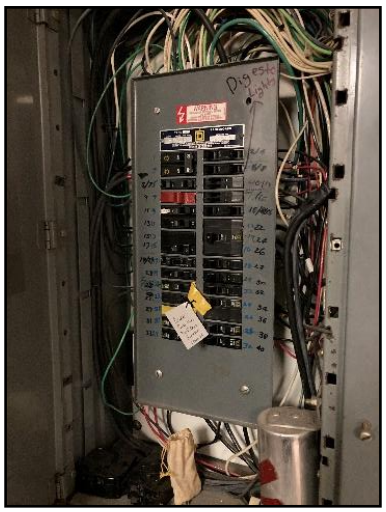
Sludge is transferred between tanks and loaded onto tanker trucks by a sludge-transfer pump. Valve changes determine where sludge is directed. The liquid sludge load-out pump was replaced in 2017. The WRF has four emergency sludge-drying beds. Typically, two are used for the on-site collection system and two are used for emergency plant operations.

The Chief Operator indicated that the plant is experiencing limited hauling issues with sludge hauling services, and excess sludge stored in the biosolids-handling facilities has not exceeded system capacity. The situation is being closely monitored by Operations staff. The expansion of the storage and dewatering at the biosolids handling facilities at East Port WRF is currently part of the ongoing 9.0-MGD expansion project to increase the receiving capacity from West Port WRF.

Electrical Components and Circuitry

The incoming switchgear and distribution transformer appear in good condition with no obvious signs of significant concern. The incoming power via overhead aerial was installed a few years ago. The WRF is served from two 400-kVA generators connected in parallel that are fed from a subbase tank and an auxiliary tank adjacent to them. A 6,000-gallon fuel tank and pad for the generators was installed in 2020; however, the Chief Operator reported issues with the tank's functionality and expects the tank to be removed and/or replaced in the future. Overall, the electrical equipment is in good functioning condition based on information from the Operations staff, except for the generator MCC building's roof and side panels due to wind damage when Hurricane Ian made landfall in September 2022. Additionally, the hurricane caused some water damage to computer equipment. Generators were used during the entirety of the storm; however, Generator Set No. 2 was damaged and is currently pending repairs.

Additionally, an electrical equipment site visit assessment was conducted by the Jones Edmunds electrical engineer on February 21, 2023. No specific issues were reported by Operations staff. The incoming power to the plant was upgraded a few years ago and would have sufficient capacity for a significant plant upgrade; however, the internal power systems would require upgrades.



Overall, the following deficiencies were noted:

- Generator Set No. 2 was out of service due to Hurricane Ian. The generator vendor states a new generator is required.

- Staff indicated issues with incoming power where imbalance occurs and trips the blower breakers; staff indicated they plan to monitor and record power to verify this.
- The lighting panel in MCC No. 1 is missing a cover.
- Electrical room adjacent to the generator set was damaged due to Hurricane Ian; the facility is currently missing the roof and CCU has installed a temporary cover.
- Sludge bed sump pump conduit broken.
- Blower MCC building outside conduit cover open.
- MCC Building No. 2 outside conduit cover open.
- Digestor No. 2 area light conduit support missing.
- Clarifier No. 1, 2, 3, and 4 missing conduit clamps on area lights.

- Clarifier No. 1 and 2 have broken conduit and are missing an line-box-style fitting cover.
- The conduit supports on the north wall of the headworks/ aeration basin have broken, leaving the conduit unsupported.

6.3.5 Operations

The West Port WRF produces reclaimed water using biological treatment, cloth filtration, and high-level chlorine disinfection. The plant can be operated to produce secondary effluent without filtration, but this alternative operation is rarely used.

The West Port WRF is staffed 16 hours per day, 7 days per week. Key plant components are automatic with continuous effluent monitoring, allowing the plant to produce high-quality effluent 24 hours per day. The East Port WRF operators monitor the operations of the West Port WRF 24 hours per day through a County-wide telemetry system. Alarms are evaluated, and operators or maintenance staff can be dispatched to the West Port WRF to address issues, if necessary. Effluent not meeting the reclaimed water standards is automatically diverted to the deep injection well for disposal. Reclaimed water is also automatically diverted to the deep injection wells when the reclaimed water storage ponds are full.

6.3.6 Maintenance

Routine maintenance is performed on a scheduled basis. Rehabilitation of major pieces of equipment is completed in accordance with the CIPs that are revised annually. Maintenance required to keep the WRF in compliance with regulations is performed immediately using in-house maintenance personnel or outside contractors.

6.3.7 Review of Previous Report Recommendations

Table 6-11 West Port WRF 2021 Recommendations and Status

Recommendation:	▪ Provide additional aerobic sludge holding tank volume and decanting capacity to improve decant thickening.
Progress:	▪ To be re-evaluated as part of the future WRF expansion.
Recommendation:	▪ Resolve hydraulic constraints in the irrigation wet well for the injection well pumps to allow disposal of excess reclaimed water from West Port during wet-weather events.
Progress:	▪ To be re-evaluated as part of the future WRF expansion.

Recommendation:	▪ Check leveling on all four clarifier effluent launders and skimmer arms and re-level as necessary.
Progress	▪ Completed.
Recommendation:	▪ Apply appropriate arc-flash labeling on all appropriate switchgear in compliance with NFPA 70E to properly notify operations and maintenance personnel of the potential hazard. This may require creating a complete and thorough arc-flash model using the existing switchgear to determine the energy levels present. This information would appear on the appropriate arc-flash labeling as required.
Progress:	▪ Completed.
Recommendation:	▪ Complete the load study to identify any issues related to the system power quality, quantity, and capacity. The load study would help identify deficiencies in the system such as the issues related to the blowers unable to properly operate when energized by the generators. This study can support the efforts made by the County to identify reserve capacities and potential anomalies that may affect long-term maintenance and serviceability of the equipment.
Progress:	▪ Ongoing.
Recommendation:	▪ Evaluate a DO or ORP control system to replace the pH control approach currently used in the aeration basins.
Progress:	▪ Not complete but will be reviewed as part of the future WRF expansion.
Recommendation:	▪ Prepare a study to evaluate adding a flow EQ tank or installing VFDs on the major lift station contributors to improve plant operations and manage peak flows and flow surges at the West Port WRF.
Progress:	▪ To be re-evaluated as part of the future WRF expansion.
Recommendation:	▪ Inspect the reclaimed water HSP pumps to evaluate the condition of shafts and other components.
Progress:	▪ In progress.
Recommendation:	▪ Secure all electrical switchgear to prevent unauthorized access or inadvertent exposure to live parts.
Progress:	▪ In progress.

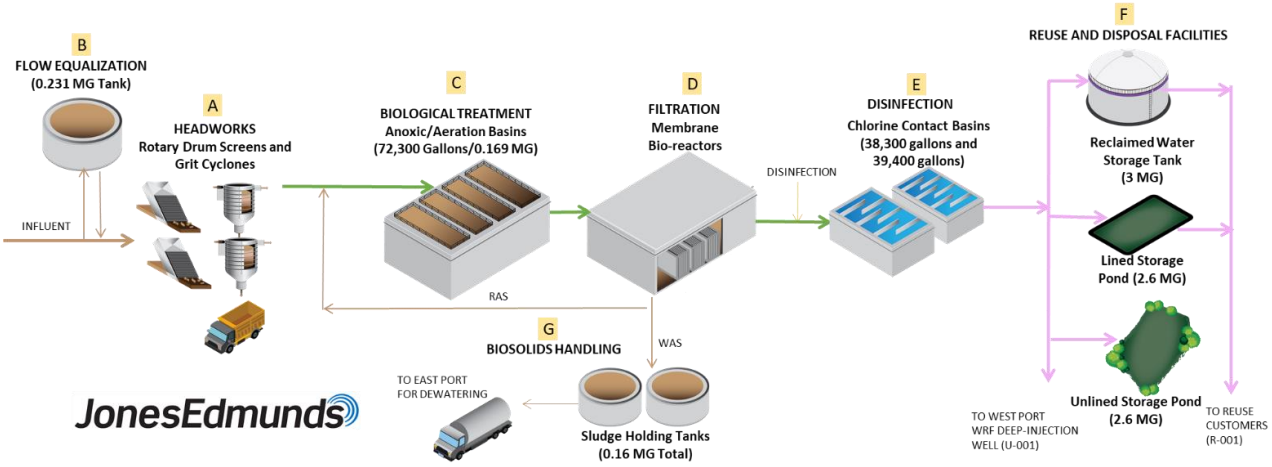
6.4 ROTONDA WRF

The Rotonda WRF is at 3740 Kendall Road, Rotonda West. This facility was purchased by Charlotte County from a private utility, Aqua Source, in 2000. The Rotonda WRF is permitted to distribute reclaimed-quality water to unrestricted-public-access reuse sites and to use the West Port WRF deep well injection system. The Rotonda WRF serves the west side of the Placida Peninsula including the inside of the circular Boundary Boulevard of the 7.5-square-mile Rotonda development; areas filling in the northeast and northwest corners outside the circular development; and adjacent areas along Cape Haze Boulevard, Pine Valley, White Marsh, Long Meadow, Broadmoor, Pinehurst, Pebble Beach, Oakland Hills, and Cape Haze neighborhoods.

A phased plant expansion was completed during FY 2009 and was cleared for service by FDEP on November 19, 2009. The expanded facility has a rated treatment capacity of 2.0 MGD AADF and a rated reclaimed water disposal capacity of 1.005 MGD AADF. The site has space for expansion to increase the capacity to 3.0 MGD. The Rotonda WRF uses activated sludge in an MBR configuration to treat wastewater.

Effluent can be distributed as reclaimed water to the unrestricted-public-access master reuse system or transferred to West Port for injection into a deep well injection system. Figure 6-4 shows the Rotonda WRF process flow diagram. Two diesel-powered emergency generators in an on-site building have ATSs for providing emergency power to the WRF.

Figure 6-4 Rotonda WRF Process Flow Diagram



The Rotonda WRF treatment process consists of the following components:

A) Headworks: Raw wastewater from the West County service area enters the Rotonda WRF headworks for screening and grit removal. Two Baycor rotary drum fine screens

remove larger inorganic material. Grit removal is achieved in two grit concrete tanks immediately downstream of the rotary drum screens. Settled grit is pumped through two grit cyclones and one grit "snail" washer to remove organics. Solids removed by these two processes are collected and hauled to the landfill for disposal. Flows from the on-site lift station are introduced here.

B) Flow Equalization: During peak flows, excess wastewater pours over a weir at the headworks and is diverted to a 300,000-gallon EQ tank. Pumps at the EQ tank return the wastewater to the system as influent flows return to average conditions. The EQ tank is equipped with two forced-air pumps to maintain the biological medium and prevent hypoxic conditions.

C) Biological Treatment: Wastewater from the pretreatment structure enters two activated-sludge treatment trains that consist of an aerobic zone, anoxic zone, and swing zone that can be an aeration or anoxic zone. This configuration allows the biodegradation of organics and removal of excess nitrogen. Blowers and fine-bubble diffusers are used to provide oxygen to the wastewater in the aeration zone.

D) Filtration: From the biological treatment process, the wastewater flows to the four MBR filtration trains. Each train contains three cassettes. Hollow-tube membranes housed in individual cassettes provide a high level of filtration and take the place of secondary clarifiers and tertiary filters used at the other WRFs. The cassettes are periodically emptied and refilled with sodium hypochlorite during cleaning events. Sludge produced in the treatment process is pumped to two locations – to the aeration basins as RAS to support microbial activities and to the two sludge-holding tanks as WAS.

E) Disinfection: The filtered water enters the CCC splitter box that directs the flow into one of two CCCs. Three chlorine feed pumps introduce liquid sodium hypochlorite for reclaimed water disinfection requirements. The chlorine is thoroughly mixed using a static mixer in the CCC influent pipe. The sodium hypochlorite is controlled by flow meters on the MBR effluent piping. The three sodium hypochlorite storage tanks have a total usable capacity of 4,080 gallons.

F) Reuse and Disposal Facilities: Reclaimed water enters the on-site 3.0-MG GST and a 2.64-MG reclaimed water storage pond. An on-site pump station provides flow to the reclaimed water transmission system that is interconnected with the Master Reuse System. During wet weather, excess reclaimed water can be disposed of in the West Port WRF deep injection well.

   The Rotonda WRF also has a lined reject pond with a storage capacity of 5.182 MG. Water is diverted to this pond when it does not meet the unrestricted-public-access reclaimed water quality standards and must be retreated through the WRF.

G) Biosolids Handling: WAS pumped to the two sludge-holding tanks (170,000-gallon total capacity) is gravity thickened and hauled to the East Port WRF for aerobic digestion and dewatering. The tanks are converted clarifiers with center surface aerators. Decanted supernatant recirculates to the headworks. Thickened sludge is hauled to the East Port WRF for digestion, dewatering, and final disposal at a compost facility at the Charlotte County Zemel Road Landfill.

6.4.1 Regulatory Considerations

The Rotonda WRF operations are regulated by FDEP under the provisions of Chapter 403, Florida Statutes, and the applicable FAC rules. The following permit governs plant operations:

- Plant Operating Permit (FLA014098) – Expiration Date: May 30, 2027.

6.4.2 Wastewater Flows and Loads

The Rotonda WRF's permitted capacity is 2.0 MGD AADF. In FY 2022, the AADF was 1.16 MGD, and the Rotonda WRF was operating at 58 percent of the plant permit capacity. The MADF of 1.66 MGD occurred in September 2022. The maximum TMADF of 1.36 MGD occurred in September 2022, which is 68 percent of the plant permit capacity, demonstrating the influence of wet weather and I/I on flows to the facility. Table 6-12 summarizes influent flows as reported on DMRs in FY 2022.

Table 6-12 Rotonda WRF Influent Flows in FY 2022

Month	MADF (MGD)	AADF (MGD)[1]	TMADF (MGD)	MDF (MGD)	TMADF Percent Capacity (%)
Oct-21	1.07	1.13	1.32	1.20	66
Nov-21	1.22	1.13	1.23	1.77	62
Dec-21	1.05	1.12	1.11	1.13	56
Jan-22	1.10	1.11	1.12	1.27	56
Feb-22	1.11	1.11	1.09	1.24	54
Mar-22	1.02	1.11	1.08	1.13	54
Apr-22	0.91	1.11	1.02	0.98	51
May-22	1.06	1.13	1.00	1.33	50
Jun-22	1.26	1.17	1.08	1.76	54
Jul-22	1.18	1.16	1.17	1.64	58
Aug-22	1.23	1.14	1.22	1.82	61
Sep-22	1.66	1.16	1.36	2.21	68

[1] Permitted plant capacity 2.0 MGD.

In FY 2022, the average annual influent load for BOD was 856 lb/day and for TSS was 936 lb/day. The maximum monthly average for BOD load was 1,019 lb/day occurring in March 2022. TSS load typically exceeded 1,000 lb/day in the summer months. The maximum monthly average TSS load was 1,725 lb/day, occurring in July 2022, which corresponds with seasonal residents. Table 6-13 summarizes the wastewater characteristics of the Rotonda WRF influent in FY 2022.

Table 6-13 Rotonda WRF Influent Water Quality in FY 2022

Month	BOD		TSS	
	Monthly Avg. Concentration (mg/L)[1]	Monthly Avg. Load (lb/day)	Monthly Avg. Concentration (mg/L)[1]	Monthly Avg. Load (lb/day)
Oct-21	73	629	79	677
Nov-21	79	788	65	664
Dec-21	107	941	109	954
Jan-22	101	913	57	521

Month	BOD		TSS	
	Monthly Avg. Concentration (mg/L)[1]	Monthly Avg. Load (lb/day)	Monthly Avg. Concentration (mg/L)[1]	Monthly Avg. Load (lb/day)
Feb-22	103	936	69	626
Mar-22	121	1,019	111	924
Apr-22	109	809	65	487
May-22	88	769	92	807
Jun-22	77	802	119	1,252
Jul-22	98	919	184	1,725
Aug-22	87	914	133	1,411
Sep-22	61	832	86	1,185

Note: [1] Measured at monitoring site INF-01.

6.4.3 Treatment Objectives and Effluent Quality

The Rotonda WRF is designed to treat wastewater for two effluent standards: one for disposal to the deep injection well (U-001) and the other for a slow-rate public-access system (R-001) for which high-level disinfection is required. Table 6-14 lists the flow and primary water-quality requirements for each effluent reuse and disposal method.

Table 6-14 Rotonda WRF Effluent Requirements

Reuse/Disposal Method	R-001	U-001
Maximum Flow (MGD)	Report[a,b]	4.75[a]
Maximum BOD (mg/L)	20[a]/30[b]/45[c]/60[d]	Not applicable
Maximum TSS (mg/L)	5.0[d]	Not applicable
Total Fecal (#/100mL)	25[d]	Not applicable

Notes: Statistical Bases: [a]annual average; [b]monthly average; [c]weekly average; [d]single sample.

Table 6-15 summarizes the effluent flow and water quality of the Rotonda WRF. In FY 2022, the annual average effluent flow for the slow-rate public-access system (R-001) was 1.09 MGD. The maximum daily flow of the well was 2.95 MGD, which included the West Port WRF flows and indicates that the WRF is meeting its effluent flow requirements. The maximum single-sample BOD and TSS values were 2.1 mg/L and 0.4 mg/L, respectively, showing no violations of the single-sample limits for BOD or TSS were recorded in FY 2022. Consequently, the BOD and TSS annual average, monthly, and weekly concentration requirements were also met in FY 2022. The maximum fecal coliform counts never exceeded 1/100mL and were well within public-access reuse standards.

Table 6-15 Rotonda WRF Effluent Flow and Water Quality

Month	Reuse and Disposal Method		Water Quality		
	R-001 Monthly Avg. Flow (MGD)[1]	U-001 Maximum Daily Flow (MGD)[2]	Maximum BOD Conc. (mg/L)[3]	Maximum TSS Conc. (mg/L)[4]	Maximum Fecal Count (#/100 mL)[3]
Oct-21	1.02	0.31	<2.0	0.40	12
Nov-21	1.14	2.34	<2.0	0.40	<1
Dec-21	0.98	0.49	<2.0	0.40	<1
Jan-22	1.02	1.80	<2.0	0.40	<1
Feb-22	1.04	1.46	2.1	0.40	<1
Mar-22	0.96	0.63	2.1	0.40	<1
Apr-22	0.85	0.38	<2.0	0.40	<1
May-22	1.00	0.81	<2.0	0.40	<1
Jun-22	1.17	1.60	<2.0	0.40	<1
Jul-22	1.20	1.90	<2.0	0.40	<1
Aug-22	1.08	0.75	<2.0	0.40	<1
Sep-22	1.67	2.95	<2.0	0.40	<1

Note: [1] Monitoring site FLW-03; [2] Monitoring site FLW-02 at Westport WRF;[3] Monitoring sites EFA-01; [4] Monitoring site EFB-01.

6.4.4 Treatment Components and Condition Assessments

Jones Edmunds completed an on-site review of the WRF on February 9, 2023. Our personnel met with Dan Atkisson, Chief Operator of the Rotonda WRF, to review plant conditions, operations, and records. Access to the facility is through a secure gate in a fence that surrounds the WRF and effluent storage ponds. The facility site is well maintained, and the equipment is in working condition; however, the MBR filters are nearing the end of their normal lifecycle. Some painted exterior walls and piping showed signs that repainting should continue for 2023. A portion of the above-grade piping and HSPS No. 1 were repainted in 2021, and larger portions of piping and equipment were repainted in 2022. This project is ongoing, and the remainder of the above-grade piping is being repainted in 2023.

The plant operators continue to exercise all valves regularly. All compliance meters are calibrated every 6 months, and calibration tags were up to date at the time of the site visit.

Required documents maintained on site include:

- Operating permits for the treatment facility and deep injection wells.
- Operators' licenses.
- Facility logbook.
- Facility Standard and Emergency Operating Plans (guidance book created in-house).
- DMRs.
- Effluent Analysis Reports.
- Annual Reuse Report.
- Pathogen Monitoring Report (Giardia and Cryptosporidium).
- Reports required to complete the last permit application (in process).

- Certification of the EPLAB.
- Sampling Plan.
- Groundwater Monitoring Plan (contained in permit).
- Laboratory results.
- Flow meter calibrations.
- Chlorine and pH meter calibrations (one/day).
- Chain of custody forms for samples that are sent to laboratories.
- Monthly residual and marketing report (reported in dry tons/month).
- Facility O&M Manuals.
- Maintenance records (EAMS electronic data system).
- Reuse Operating Protocol.
- Facility Record Drawings.
- Daily temperature logs.
- Spill protocol and record of spills.

The Cross-Connection and Backflow Prevention Manuals are kept at the Reclaimed Water Coordinator's office at the East Port WRF and at the Rotonda WRF Operations building.

6.4.4.1 WRF Influent Sampling Location

The influent water-quality sampling (INF-01) and flow monitoring (FLW-01) locations are clearly marked, and the refrigerated influent composite sampler and flow meter are in good operating condition. The two main influent valves to the headworks screens are inoperable and were scheduled to be replaced in 2019. However, this was deferred to FY 2023, and these valves will be replaced as part of the headworks improvement and rehabilitation/replacement project currently under design and expected to be completed in February 2024. An actuator was added to Screen No. 1 in FY 2019.

6.4.4.2 Headworks

The overall condition of the headworks is fair to poor. The headworks is undergoing an improvement and rehabilitation/replacement project that will include new piping and fine screens as well other improvements to the headworks.

At the time of the site visit, both screens were operational. These screens are critical process units. Each screen rotates on four drum rollers that support the stainless-steel perforated screen as it rotates. The worn rollers were last replaced in 2016. The rate of rotation has been slowed to extend the life of mechanical components. In 2017, the drums were welded, and the roller wheels, chains, and drive gears were replaced. A wash water spray was added to the screening compactors, which improved operation and lengthened the life of the lower bearing units. The chain and sprockets of Screen No. 2 were replaced in FY 2019. The drum screen roller drive and drum gears for each unit were replaced in 2021. The Chief Operator

informed us that Huber screens have been ordered and are expected to be installed in February 2024 as part of the headworks improvement project.

In 2020, the screening handlers (conveyors, compactors, etc.) were replaced with stainless steel and half-pipe corrugated HDPE chutes. The replacement system is operating as intended. The grit removal process operates as intended. The organic wastewater component of the pumped mixture is returned to the wet wells. Separated grit slurry is pumped to two cyclone units where the grit is further concentrated. The separated grit passes to a grit "snail" washer before being deposited into a dumpster. The grit "snail" washer includes a conveyor system that allows the grit to shed water as it proceeds to the dumpster. In 2017, Grit Pump No. 2 was replaced, and the cyclones are scheduled for replacement in FY 2023 as part of the headworks improvement project.

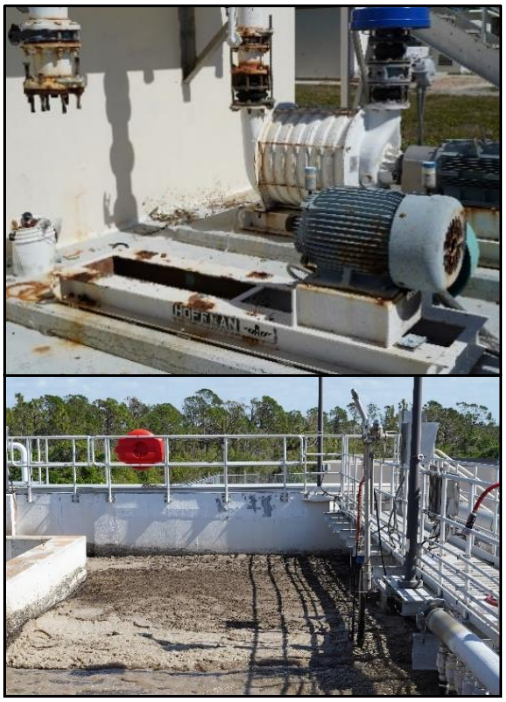
The screenings and grit dumpsters are emptied once per week. The dumpster area is clean and with a minor presence of odors.

6.4.4.3 Flow Equalization

The overall condition of the 0.3-MG EQ tank is good. The EQ tank, which attenuates high hourly flows, is filled through a gravity system initiated by an overflow weir at the headworks structure. The EQ tank contents are returned to the headworks for treatment at a steady flow over 24 hours using VFD pumps. This has proven to be a valuable asset to the operation of the facility. The Chief Operator noted that Lift Station No. 801 sends 1,500 gpm to the Rotonda WRF for about 20 minutes and then turns off for 20 to 30 minutes. The operation of the EQ tank has been adjusted to respond to the intermittent discharge from Lift Station No. 801. Dry-pit submersible pumps are used to return EQ tank contents to the treatment stream. The EQ tank positive displacement blowers are run intermittently to save power. Oil sight glasses and fill ports were added by CCU to improve maintenance. The EQ tank was painted in FY 2019. The Chief Operator informed us that an additional EQ tank is necessary to respond to additional surges and continue to maintain a steady flow to the MBRs.

6.4.4.4 Biological Treatment

The overall condition of the activated sludge facilities is good. The aeration tanks operate in a plug flow regime with anoxic, aerobic, and swing zones. The anoxic zones and the use of automatic DO probes to control blower speeds have contributed to the high level of treatment while conserving energy use. The aeration tanks are run at a MLSS concentration of 4,500 to 5,000 mg/L. The aeration tanks were last drained for inspection in FY 2012. The aeration basins were pressure-cleaned and painted in FY 2017. A layer of foam was on the water surface in the anoxic zone at the time of inspection. The Chief Operator recommended that additional tank volume is necessary to increase denitrificaton capacity.



The aeration system continues to supply air to the aeration tanks. The facility has four multi-stage centrifugal Hoffman blowers to serve the aeration trains with room for an additional blower. Generally, one blower meets air requirements. Additional units are brought online during higher demands. Blower No. 2 has been repaired multiple times including a new motor in FY 2014 and new bearings in FY 2016; however, the blower motor was again repaired in FY 2017. During the site visit, we observed that Blower No. 2 was removed from service; staff reported replacement of Blower No. 2 hardware will occur in 2023. Blower Nos. 1 and 4 were replaced in FY 2020 and FY 2019, respectfully. The installed blower and motors were in good condition. Blower No. 5 was replaced in FY 2021, but requires replacing with a lower standard cubic foot per minute (scfm)-capacity blower to maintain oxygen levels.

One of the DO probes in the aeration basin was replaced in FY 2017. All four probes are functioning properly. One DO probe controller screen was severely faded and degraded by UV from the sunlight, and other screens showed similar signs of UV damage. The controller with the damaged screen likely transmits data to plant operations staff via SCADA; however, the damaged controllers should be replaced for field operational purposes. We also recommended installing sun shields on the front of all the controller three-sided enclosures to extend the life of existing equipment.

6.4.4.5 Filtration: Membrane Bioreactor

The MBR system continues to produce a high-quality effluent. The system contains four trains with three membrane cassettes each. The MBRs are cleaned once every other day with a weak solution of bleach to maintain their treatment efficiency and remove organics. The cassettes are periodically cleaned in place with concentrated chlorine bleach twice a year and are removed once a year for citrus cleaning to remove inorganics. The MBR system is in fair condition, but MBR No. 3 was not in use during the site visit. Permeate pump No. 3 cavitates and affects the flow meter for MBR No. 3. MBR No. 3 cannot be placed in service as a result.

In FY 2017, three mixed-liquor volatile suspended solids (MLVSS) return/recycle pump motors were replaced and are in good working order. The frame on the MLVSS Return/Recycle Pump No. 2 was rehabilitated in FY 2022, and the frame and skid floor were repainted in FY 2022.

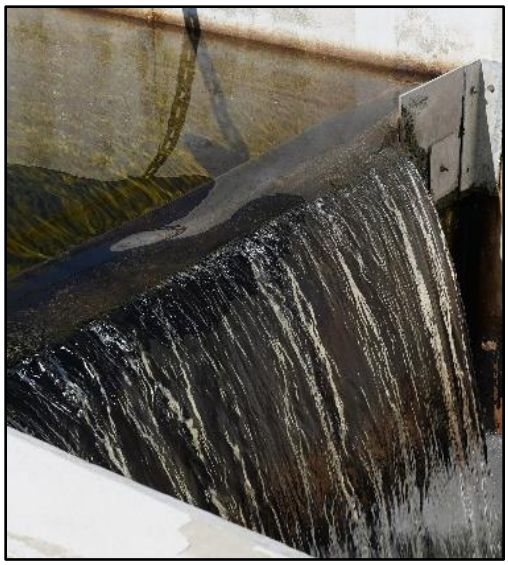
A turbidity sample is collected from the MBR effluent header pipe before the flow enters the CCC splitter box. All turbidity meters were replaced in FY 2018.

In May 2019, HDR conducted a membrane evaluation and made the following observations and/or recommendations:

- The membranes are in good condition except for some cracked potting headers.
- The slack should be checked and adjusted within the next few months.
- Purchase a few module blanks for top and bottom headers and wait to observe membrane effluent turbidity spikes, which would indicate that one of the cracked potting headers has breached the membrane integrity. Remove the compromised membrane module and install module blanks in its place until the new purchased membrane module is received. Once the new membrane module is received, install the new membrane in the middle of the cassette and move an existing module where the compromised module was. This could prolong the new membrane module potting header life.
- Continue monitoring and trending membrane permeability data and add temperature to the data collected weekly so that permeability can be corrected with temperature to account for seasonal changes in water viscosity.
- Constantly monitor membrane permeability trend, especially for Train Nos. 3 and 4, for which end of life is estimated to be FY 2024 and FY 2026, respectively; this trend can accelerate or decelerate.

- A year before scheduled replacement (currently estimated in FY 2023 for Train No. 3 and FY 2024 for Train No. 1), order membrane modules. Install new membranes modules in Train No. 3. Do not install new membrane modules with existing membrane modules in the same train. Move the existing membrane modules from Train No. 3 to Train No. 4. Train No. 4 will then have six membrane cassettes, which will extend the life of the membranes. The same procedure was recommended for Trains No. 1 and No. 4. Train No. 4 will receive the existing modules, and No. 1 will receive the new modules.

6.4.4.6 Disinfection and Effluent Sampling



The overall condition of the chlorination system is good. The two concrete CCCs are in good condition. The CCCs are used alternately, but only one is required to meet the required contact time under current flows. Wind from Hurricane Ian in September 2022 caused the UV filter cloth and metal roof to be blown off the CCC, and it was still missing at the time of our site visit. During the site visit, neither CCC had a UV filter cloth.

Replacement of Chlorine Storage Tank No. 3 began in FY 2017 and finished in FY 2018. Two new storage tanks with secondary containment were installed in FY 2021. All storage tanks feature polyethylene open-top tank secondary containment. Small-diameter corrugated HDPE drain piping coming from the secondary containments appeared to be in fair condition, and the in-line valves were open during the site visit. The tank piping to the feed pumps is exposed to the sunlight and did not appear to have secondary containment piping. A pipe break to one of these pipes could result in the tank fully draining and spilling on the ground, creating environmental concerns. We recommend that CCU review the drain piping to ensure that Operations staff follow applicable regulations or add secondary containment piping (double-walled piping).

Prominent Feed Pump No. 3 was replaced in FY 2018. Prominent Feed Pump No. 2 was replaced in FY 2019. Prominent Feed Pump No. 1 was replaced in FY 2021. The two total chlorine analyzers were replaced in FY 2019. The metal backplates for the chlorine analyzers have experienced substantial corrosion and staining and should be replaced. The chlorine feed line from the in-plant road was replaced in FY 2018.

6.4.4.7 Reuse, Disposal, and Storage

Reuse Facilities

Reclaimed water meeting public-access water quality is sent to the Master Reuse System using the HSPs at HSPS No. 1 and HSPS No. 2. HSPS No. 1 uses three vertical turbine pumps with VFDs to provide reclaimed water to golf course storage ponds north of the Rotonda WRF. The golf course's high-pressure pumps then increase pressure for irrigation system use. The motors for Pumps No. 1 and No. 3 failed and were replaced in FY 2022. These motors are only for temporary use since they are not rated for outdoor use. These indoor motors will continue to be used until outdoor motors can be acquired.

HSPS No. 2 contains two HSPs and one jockey pump that are primarily used to convey reclaimed water to golf courses south of the WRF. One of the two HSPs was replaced in FY 2019. HSP No. 2 was rebuilt and replaced in FY 2021. The jockey pump was replaced in FY 2018. The HSPSs and above-ground piping were repainted in FY 2021.

Reclaimed water quality effluent can also be stored in the Rotonda WRF on-site 3.0-MG GST and unlined reclaimed water storage pond. The GST was drained and cleaned in FY 2017. Reclaimed water from the GST can be pumped to pressurized reuse customers using HSPS No. 2. The unlined reclaimed water storage pond has a reduced capacity due to groundwater percolation into the pond. The Chief Operator expressed that the unlined storage pond is not being used at this time or in the foreseeable future. Jones Edmunds recommends this pond be removed from the permit. It can then be filled with compacted suitable soil and replaced with a 3.0-MG GST.

Effluent Disposal Facilities

As mentioned previously, the Rotonda WRF provides reclaimed water to the Master Reuse System. This allows for excess reclaimed-quality effluent to be sent to West Port's reclaimed water storage ponds or deep injection well (capacity 4.75 MGD) for final disposal. The Rotonda WRF also contains an on-site lined reject pond with a storage capacity of 5.182 MG. Water diverted to this pond does not meet reclaimed water standards and must be retreated through the WRF. A small pumping station pumps reject water back to the headworks.

Wet-Weather Storage

The on-site reclaimed water pond (2.64 MG), on-site GST (3.0 MG), and off-site Palms Pond (7.44 MG) are available for wet-weather storage of reclaimed water. The on-site reclaimed water pond is not currently in use due to groundwater percolation into the pond.

6.4.4.8 Biosolids Handling Facilities

The overall condition of the solids-handling facilities is good. The decant mechanism for the sludge-holding tanks was designed as telescoping valves, but the telescoping valves can only be lowered to one-half the depth of the tank. Currently, decanting is done daily for 10 to 12 hours per day to attempt to maintain the holding tank capacity. The operators have replaced the designed method of decanting by using bottom-feed submersible pumps suspended on ropes held by cleats bolted to handrails. A small winch should be added to each pump site for better control of the pump level as a temporary solution.

Pump out station pumps for truck loading were not operating during the site visit and are scheduled to be replaced in FY 2023. The Chief Operator indicated that the plant is experiencing limited sludge-hauling capabilities, and excess sludge stored in the biosolids handling facilities has not exceeded system capacity. The situation is being closely monitored by Operations staff. Expanding the storage and dewatering at the biosolids handling facilities at East Port WRF is currently part of the ongoing 9.0-MGD expansion project to increase the receiving capacity from Rotunda WRF.

6.4.4.9 Electrical Components and Circuitry

In addition to a general review of electrical equipment conducted by Jones Edmunds field staff on February 9, 2023, the Rotonda WRF was also inspected by the Jones Edmunds electrical engineer on February 21, 2023. Generally, the overall condition of the plant was good, although significant signs of deterioration are apparent in many systems. The incoming switchgear and distribution transformer appear in good condition. The plant is served from two 810-kW generators configured to operate in parallel. In FY 2019, Operations staff indicated several issues occurred with the generator switchgear and their operations but were resolved before FY 2022. During our site visit, Generator No. 2 was not operable; staff reported similar issues as previous years regarding the generator's inability to run under load. The switchgear and computer control system will be replaced in FY 2023 to address Generator No. 2 reverse power concerns. Our review of the electrical equipment in Building MCC-1 and the associated generator set revealed storm damage. This equipment is labeled with the appropriate NFPA 70E arc-

flash warnings. Overall, the electrical equipment in Building MCC-2 is in good functioning condition based on information from Operations staff. This equipment is also labeled with the appropriate NFPA 70E arc-flash warnings. The following deficiencies were noted:

- Identified as part of previous annual reports, a two-pole circuit breaker in an unlabeled 480-V panel (breaker #28/30) showed during a thermal inspection that one of the two poles was reading a much higher temperature than the other. This is extremely uncharacteristic of a two-pole breaker system since the expected current between both sides of the breaker should be the same. The imbalance in temperature between the two contact points may indicate that one of the sides of the breakers is failing or that the connection is loose or impaired. A loose or impaired connection may increase the potential for an arc-flash failure.

- The EQ tank pumping station east of the headworks contains three pumps. These pumps are submersible-style pumps but are mounted above ground on a pad. Because these pumps are intended for submersible use, they come with a flexible power cord that is connected at the motor housing. These power cords are unsupported, unprotected from damage, and lay across the concrete slab, creating a potential hazard. Of much greater concern is the physical connection where these flexible cords attach to the motors. Normally, these would be supported if they were installed in a submersible condition; however, mounted as they are, the cords are unsupported and the insulation around them is severely degraded, causing a potential fault condition.
- Atop the headworks are two rotary drum screens. Old instrumentation/power connections are on the sides of each of them. Whatever was originally connected has been removed, but the conductors in the wiring were simply abandoned in place. Whether these were live conductors was not determined, but even if abandoned they are considered to be a hazard unless identified as out of service or removed.

- The biosolids handling facility has a floating mixer that is being fed from flexible cordage. The mixer is currently operational and meets NEC however this cordage is wholly unsupported except for one small clip. This deficiency is a repeat listing from previous years.
- The blower assemblies use flexible conduit to provide power to the motor operated valves. This conduit is longer than 6 feet and is unsupported.
- At the chlorine contact tank above the inlet splitter box are two outdoor receptacles intended for wet weather use. They are both missing covers.
- The on-site lift station is reported to handle implant wastewater flows. The conduit traveling from the wetwell to the adjacent control panel does not contain conduit seal-offs in violation of NEC since this is considered a classified area. This deficiency is a repeat listing from previous years.
- MCC Building No. 1 and 3 sustained Hurricane Ian damage such that interior lighting fixtures are hanging from wires – representing a significant hazard to staff (see photo to right).

- Headworks local equipment control panels have retained substantial damage from weather and UV.
- Headworks Filter No. 1 and 2 conduit-to-solenoid connection has been disconnected.
- Headworks discharge motor-operated valve conduit has been damaged.
- MBR Blowers No. 1 and 4 pneumatic control gate valves are not in operation due to disconnected lines; valves unable to close.
- The probing conduit in the chlorine storage area is broken.

6.4.5 Operations

The WRF consistently produces high-quality reclaimed water due to the use of MBR units; however, the treatment process is more energy intensive than conventional secondary treatment with filtration and requires a higher level of operator attention and understanding to balance flow and load through the MBR units. The Operations staff has done an excellent job maintaining the facility and the MBR membranes.

Plant operators staff the Rotonda WRF 16 hours per day, 7 days per week. The WRF can be continuously monitored by the East Port WRF operators through a County-wide telemetry system that allows the Rotonda WRF to continue to produce reclaimed water 24 hours per day. The Wonderware SCADA software has been replaced with VTSCADA. Alarms are evaluated, and operators or maintenance staff can be dispatched to the Rotonda WRF to address issues, if necessary. Effluent not meeting reclaimed water standards is automatically diverted to the reject storage pond for retreatment.

6.4.6 Maintenance

Routine maintenance is performed on a scheduled basis. Rehabilitation of major pieces of equipment is completed in accordance with the CIPs that are revised annually. Maintenance that is required to keep the WRF in compliance with regulations is performed immediately using in-house maintenance personnel or outside contractors.

6.4.7 Review of Previous Annual Report Recommendations

Table 6-16 Rotonda WRF 2021 Recommendations and Status

Recommendation:	▪ Evaluate different aeration systems for the reclaimed water storage pond.
Progress:	▪ Not completed.
Recommendation:	▪ Evaluate aquifer storage and recovery (ASR) for additional reclaimed water storage at the Rotonda WRF.
Progress:	▪ Not completed.
Recommendation:	▪ Address previous recommendations for the headworks including influent valves, flow control, grit cyclones, and screens should be addressed as part of the headworks improvement project.
Progress:	▪ In progress and to be completed with the headworks improvement project.
Recommendation:	▪ Add an MBR cassette to the trains as capacity needs dictate.
Progress:	▪ Not completed.

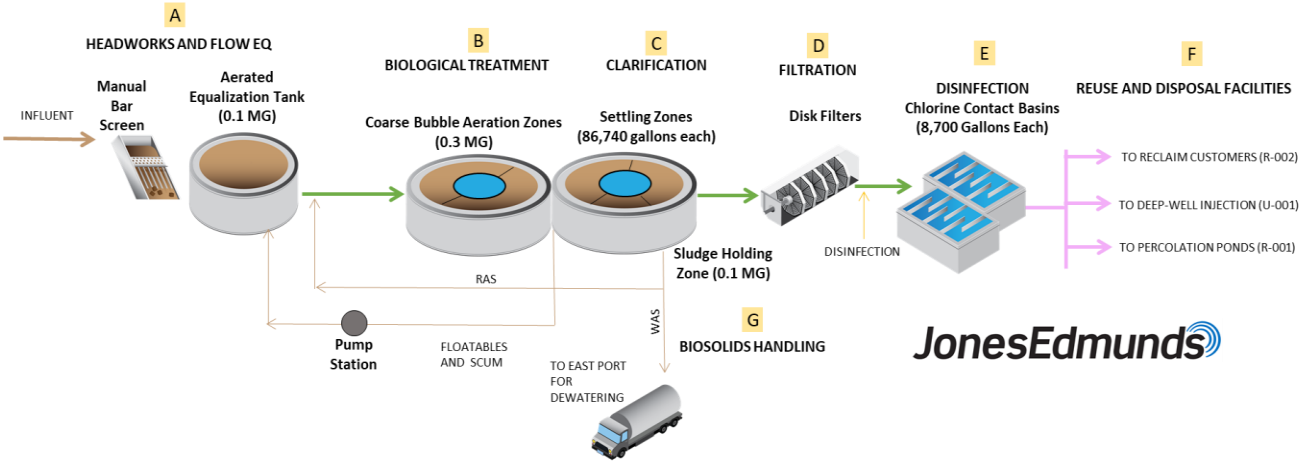
Recommendation:	▪	Add a galvanized metal frame and UV shade cloth to the CCCs.
Progress:	▪	Completed before Hurricane Ian in September 2022, but the structure was damaged during the storm. CCU is evaluating replacement of the structure.
Recommendation:	▪	Add a small winch to each decant pump in the sludge-holding tanks for better control of the pump level.
Progress:	▪	Not completed.
Recommendation:	▪	Complete installation of the reclaimed water pipe to the Cape Haze Golf Course and the Placida Corridor.
Progress:	▪	Completed.

6.5 Burnt Store WRF

The Burnt Store WRF was acquired December 12, 2003, when CCU purchased Florida Water Services' Burnt Store Division. Located in southwest Charlotte County on Burnt Store Road, the WRF serves south Charlotte County along Burnt Store Road and 2 square miles of residential golf course/marina in Lee County. The WRF shares the site with the Burnt Store RO WTP.

The WRF uses conventional activated sludge with effluent filtration and high-level chlorine disinfection to produce reclaimed water. The facility's permitted capacity is 0.5-MGD AADF. Effluent can be distributed as reclaimed water to unrestricted-public-access reuse sites, injected into a deep well injection system, and applied to a slow-rate restricted-access land application system. The deep injection well system is shared with the adjacent Burnt Store RO WTP. Figure 6-5 shows the Burnt Store WRF process flow diagram.

Figure 6-5 Burnt Store WRF Process Flow Diagram



The Burnt Store WRF process consists of the following components:

A) Headworks and Flow EQ: Raw wastewater from the South County service area collection/transmission system enters the WRF manual bar screen and flows into the EQ tank. Blowers equipped with timers and coarse-bubble diffusers aerate the wastewater and suspend solids. Internal plant flows from the on-site pump station are also pumped into the EQ tank.

   The EQ transfer pumps are equipped with VFDs that operators periodically adjust based on season and historical trends. The EQ tank is equipped with ultra-sonic level sensors that turn off the pumps based on a low level and trigger an alarm condition if the EQ tank level gets above the high-level alarm.

B) Biological Treatment: The activated-sludge treatment occurs in two steel-ring package treatment units. The wastewater from the EQ tank enters the outer ring of a package-type treatment basin equipped with coarse-bubble diffusers where it is combined with RAS flow from the settlers. The MLSS are aerated to achieve extended aeration treatment, and the air-flow rate of the diffusers is adjusted to achieve Nitrogen removal.

   The plant has three Gardner Denver centrifugal blowers: one dedicated to the aeration tanks, one dedicated to the sludge digestion tank, and one on stand-by. A fourth smaller blower provides air to the EQ tank.

C) Clarification: The two-steel circular secondary clarifiers are within the center of each package treatment unit for gravity solids separation. The clarifiers are skimmed to remove floatables and scum before clarifier effluent flows over a circumferential weir to the tertiary filters.

   Sludge pumps convey settled solids to the activated sludge tank (RAS) or the sludge holding tank (WAS). The RAS pumps turn on 10 minutes before and turn off 10 minutes after the EQ pumps turn on and turn off. Scum is collected in a scum trough and sent to the plant lift station where it is returned to the EQ tank.

D) Filtration: Clarified water from the settlers enters four disk filters, each having 5-micron filter cloths. The disk filter unit is installed in a steel filter tank that allows water to flow from outside the disk filters into a manifold system of the filter unit.

E) Disinfection: The filtered water can be sent to two CCCs where liquid sodium hypochlorite is introduced for disinfection. Two chemical feed pumps are controlled by a chlorine analyzer to dose sodium hypochlorite. A mixing pump is provided at the chemical feed point, and the chambers are baffled and sized to meet disinfection requirements. The chlorine analyzer measures chlorine concentration at the beginning of the CCC and adjusts the chlorine feed rates. A reagent-less analyzer measures the chlorine residual at the CCC discharge weir for compliance with regulatory limits. Sodium hypochlorite is stored in two tanks with a total capacity of 2,200 gallons.

F) Reuse and Disposal: Effluent water meeting reclaimed water standards is conveyed through the unrestricted-public-access reclaimed water system via a HSP station. The HSP station consists of two large HSPs and two smaller jockey pumps. Effluent water not meeting reclaimed water standards is conveyed to two Class I deep injection wells, and four percolation ponds are available for disposal of excess reclaimed water or treated water that does not meet reclaimed water standards.

   IW-2 is currently being used as the primary means of effluent disposal, with the older well, IW-1, maintained as a backup. Currently, a maximum of 380 gpm can be diverted to the deep well. Effluent flow that exceeds the deep well flow setpoint is diverted to the percolation pond system by way of a splitter mechanism at the CCC. The deep injection wells are also used for disposal of concentrate from the Burnt Store WTP RO facilities. Flows from the WTP and WRF are combined in a wetwell at the injection well pumping station. Two equally sized vertical turbine pumps are used to inject water into the injection well.

G) Biosolids Handling: Three crescent-shaped sludge-holding tanks are in one steel ring tank, providing a total capacity of nearly 300,000 gallons. Sludge is hauled to the East Port WRF and combined with the sludge from the other Charlotte County WRFs for digestion, dewatering, and final disposal at the compost facility at the County's Zemel Road Landfill. One blower is dedicated to the sludge-holding/aerobic digestion tank.

6.5.1 Regulatory Considerations

The Burnt Store WRF operations are regulated by FDEP under the provisions of Chapter 403, Florida Statutes, and the applicable FAC rules. The following permits govern plant operations:

- Plant Operating Permit (FLA014083) – Expiration Date: December 28, 2026.
- IW-1 Permit (0271367-007-UO/1I) – Expiration Date: May 14, 2024.
  - The last MIT was performed on IW-1 on June 5, 2020. The next MIT is due by June 4, 2025.
- IW-2 Permit (0271367-008-UO/1X) – Expiration Date: August 22, 2027.
  - The last MIT was performed on IW-2 on May 31, 2018, and the next MIT is due by May 30, 2023.

- A renewal MIT plan was submitted and approved by the Department on September 13, 2022; the MIT is scheduled to be performed and should be renewed upon completion prior to May 30, 2023.

6.5.2 Wastewater Flows and Loads

The Burnt Store WRF's permitted capacity is 0.500-MGD AADF. In FY 2022, the AADF was 0.32 MGD, and the Burnt Store WRF is operating at 64 percent of the plant permit capacity. The MADF occurred in September 2022 at 0.51 MGD. The maximum TMADF of 0.42 MGD occurred in September 2022, which is 84 percent of the plant permit capacity. Table 6-17 summarizes influent flows as reported on the FY 2022 DMRs.

As the data show, the Burnt Store WRF has reached a percent-of-capacity use that requires a capacity analysis report (CAR) every year to assess the previous year flows and their impact on the capabilities of the plant to meet its permitted effluent requirements. Historically, WRF flows were consistent, but a substantial population growth has been observed in this area in recent years. CCU is in the design phase for the expansion of this WRF, which will increase the capacity of the Burnt Store WRF plant through a phased approach to meet projected needs.

Table 6-17 Burnt Store WRF Influent Flows in FY 2022

Month	MADF (MGD)	AADF (MGD)[1]	TMADF (MGD)	MDF (MGD)	TMADF Percent Capacity (%)
Oct-21	0.25	0.31	0.29	0.28	59
Nov-21	0.31	0.30	0.29	0.41	58
Dec-21	0.27	0.29	0.27	0.32	55
Jan-22	0.33	0.29	0.30	0.42	60
Feb-22	0.34	0.29	0.31	0.38	62
Mar-22	0.33	0.29	0.33	0.37	66
Apr-22	0.26	0.29	0.31	0.31	62
May-22	0.23	0.30	0.27	0.28	54
Jun-22	0.30	0.30	0.26	0.42	53
Jul-22	0.34	0.30	0.29	0.49	58
Aug-22	0.41	0.31	0.35	0.76	70
Sep-22	0.51	0.32	0.42	1.25	84

Note: [1] Permitted plant capacity 0.500 MGD; measured at monitoring site FLW-01.

For FY 2022, the average annual influent load for BOD was 301 lb/day and for TSS was 382 lb/day. The maximum monthly average BOD load was 391 lb/day occurring in January 2022. The maximum monthly average TSS load was 560 lb/day in June 2022, which corresponds with seasonal residents and the dry season. Table 6-18 summarizes the wastewater characteristics of the WRF influent.

Table 6-18 Burnt Store WRF Influent Water Quality in FY 2022

Month	BOD		TSS	
	Monthly Avg. Concentration[1] (mg/L)	Monthly Avg. Load (lb/day)	Monthly Avg. Concentration[1] (mg/L)	Monthly Avg. Load (lb/day)
Oct-21	121	252	131	273
Nov-21	117	290	122	306
Dec-21	131	288	120	266
Jan-22	147	391	200	526
Feb-22	128	363	126	360
Mar-22	142	387	NA	NA
Apr-22	180	381	200	418
May-22	116	215	136	253
Jun-22	117	285	228	560
Jul-22	80	242	133	398
Aug-22	68	220	115	377
Sep-22	66	305	100	468

Note: [1] Measured at monitoring site INF-01.

6.5.3 WRF Treatment Objectives and Effluent Quality

The Burnt Store WRF is designed to treat wastewater to three effluent standards: one for disposal to the deep injection wells (U-001), one for the percolation pond systems (R-001) which requires basic disinfection and contains a nitrate limit, and one for public-access reuse (R-002) which requires high-level disinfection. Table 6-19 lists the flow and primary water quality requirements for each effluent reuse and disposal method.

Table 6-19 Burnt Store WRF Effluent Requirements

Reuse/Disposal Method	R-001	R-002	U-001
Max Flow (MGD)	0.25[a]	2.2603[a]	3.444[d]
Max BOD (mg/L)	20[a]/30[b]/45[c]/60[d]	20[a]/30[b]/ 45[c]/60[d]	20[a]/30[b]/45[c]/60[d]
Max TSS (mg/L)	20[a]/30[b]/45[c]/60[d]	5[d]	20[a]/30[b]/ 45[c]/60[d]
Total Fecal (#/mL)	200[a]/200[e]/800[d]	25[d]	Not Applicable

Notes: Statistical Bases: [a]annual average; [b]monthly average; [c]weekly average; [d]single sample; [e]monthly geometric mean.

Table 6-20 summarizes the effluent flow and water quality of the Burnt Store WRF. In FY 2022, the annual average effluent flow for the percolation ponds (R-001) and reuse system (R-002) were 0.10 MGD and 0.01 MGD, respectively. The MDF of the well was 0.52 MGD indicating that the WRF is meeting its effluent flow requirements. The maximum single-sample BOD and TSS values were 15.1 mg/L and 8.8 mg/L, respectively. The maximum single sample TSS limit is 5 mg/L; however, this only applies for discharge to R-002, which was not used that day. No other single samples exceeded 5 mg/L. Therefore, no violations of the single-sample limits for BOD or TSS were recorded in FY 2022. Consequently, the BOD and TSS annual average, monthly, and weekly concentration requirements were also met in FY 2022. The maximum fecal coliform counts rarely exceeded 1/100mL and were well within public-

access reuse standards. The plant experienced an unusually high fecal coliform sample of 3.1 mg/L; however, it was within compliance.

Table 6-20 Burnt Store WRF Effluent Flow and Water Quality

Month	Reuse and Disposal Method			Water Quality		
	R-001 Monthly Avg. Flow[1] (MGD)	R-002 Monthly Avg. Flow[2] (MGD)	U-001 Max Day Flow[3] (MGD)	Maximum BOD Conc.[4] (mg/L)	Maximum TSS Conc.[5] (mg/L)	Maximum Fecal Count[5] (#/100mL)
Oct-21	0.08	0.003	0.37	2.3	1.9	<1
Nov-21	0.11	0.012	0.44	<2.0	2.2	<1
Dec-21	0.09	0.007	0.35	<2.0	2.0	<1
Jan-22	0.08	0.008	0.48	3.7	8.8	<1
Feb-22	0.08	0.007	0.45	2.5	3.1	<1
Mar-22	0.15	0.013	0.42	3.1	8.1	<1
Apr-22	0.06	0.013	0.36	6.9	7.6	3.1
May-22	0.09	0.013	0.29	15.1	4.5	<1
Jun-22	0.08	0.009	0.42	<2.0	0.4	<1
Jul-22	0.08	0.010	0.46	<2.0	0.4	<1
Aug-21	0.11	0.020	0.52	11.1	2.3	<1
Sep-21	0.20	0.008	0.51	<2.0	0.4	<1

Notes: [1] Monitoring site OTH-01; [2] Monitoring site OTH-02; [3] Monitoring site OTH-03; [4] Monitoring site EFA-01; [5] Monitoring sites EFA-01 and EFA-02.

6.5.4 Treatment Components and Condition Assessments

Jones Edmunds completed an on-site review of the plant on February 9, 2023. Our personnel met with Gerry Mills, Chief Operator of the Burnt Store WRF, to review plant conditions and operations and discuss records. Usually, access to the facility is through a secure gate in a fence that surrounds the water and wastewater plants. At the time of the conditions assessment, the gate mechanism that was damaged by Hurricane Ian could not be opened or closed remotely, so it was left open throughout the day. The plant site is well kept and maintained including mowing and storage of used equipment in suitable locations.

Required documents maintained on site include:

- Operating permits for the treatment facility and deep injection well.
- Operators' licenses.
- Facility logbook.
- Facility Standard and Emergency Operating Plans.
- DMRs.
- Effluent Analysis Reports.
- Annual Reuse Report.
- Pathogen Monitoring Report (Giardia and Cryptosporidium every 5 years per permit).
- Reports required to complete the last permit application.
- Certification of the EPLAB.
- Sampling Plan.
- Groundwater Monitoring Plan (contained in permit).
- Laboratory results.

- Flow meter calibrations.
- Chlorine and pH meter calibrations (one/day).
- Chain-of-custody forms for samples that are sent to laboratories.
- Monthly residual and marketing report (reported in dry tons/month).
- Facility Operations and Maintenance Manuals.
- Maintenance records (EAMS electronic data system).
- Reuse Operating Protocol.
- Facility Record Drawings.
- Daily temperature logs.
- Spill protocol and record of spills.

6.5.4.1 WRF Influent Sampling Location

The influent water quality sampling location (INF-01) is clearly marked, and the refrigerated influent composite sampler is in good operating condition. The influent flow monitoring location (FLW-01) is clearly marked, and the flow meter is in good operating condition.

6.5.4.2 Headworks

The headworks overall condition is poor. It consists of one manually cleaned bar rack. The headworks does not include grit removal, and the influent manual-screening system cannot prevent moderate-sized debris from entering the facility's EQ tank, pumping systems, and process tanks. Currently, the only way to remove floatables that pass through the manual bar screen is by using a bucket to remove them from the EQ tank.

The lack of fine screening and grit removal creates operational and mechanical problems for the EQ tank and pumps. Staff clears the EQ transfer pumps weekly during the peak season and biweekly during the off-peak season. The staff also clears the pipelines of debris annually to remove clogs in the system.

6.5.4.3 Flow Equalization

The Aquastore EQ tank is in poor condition. The EQ tank has signs of rust around the upper steel rim, which likely originates from the RO WTP waste line. Internal piping is in poor condition with leaks at flanged fittings, and one of the drop diffusers inside the EQ tank has been damaged and is no longer secure. Since no grit-removal facilities are provided, grit accumulation occurs in the EQ tank and reduces treatment capacity. The grit accumulation is currently being managed by having a vendor periodically pump out the grit in the EQ tank while in operation.

The EQ tank can transfer flow to the treatment process train by gravity (gravity mode) and/or pumped using the EQ transfer pump station. The gravity mode allows diurnal loads to be equalized using the entire tank volume. The gravity mode uses a splitter box with gravity flow piping to split flow between the two activated-sludge treatment basins. However, the capacity of the gravity piping is too small to pass the maximum daily flows. As such, Operations staff

pump the raw wastewater from the EQ tank to the two aeration basins. The equalization pumps and motors were replaced in January 2021. The system is capable of pumping 400 gpm with one pump running at a time. The pumps send water to the splitter box, and the raw effluent runs by gravity to the aeration basin. The Chief Operator noted that EQ Pump No. 2 cannot be removed for maintenance because it is fused to the volute. The flow does not reach a 2-foot-per-second velocity, and the operators have experienced issues with the 12-inch feed pipes clogging.

Due to these operational concerns and the condition of the headworks and EQ tank, CCU is re-designing the Burnt Store headworks as part of the Burnt Store expansion project.

6.5.4.4 Biological Treatment

The activated-sludge facilities are steel-ring package plants consisting of two aeration tanks and two secondary clarifiers. At the time of the site visit, the aeration basins appeared to have adequate air distribution throughout the tank. All blowers were rebuilt in 2017, and new VFDs were provided for two of blowers in 2022. Blower No. 1 was undergoing motor repairs. The Chief Operator noted that the blowers are undersized for the volume of wastewater that the plant has been experiencing recently. The operation of the blowers is based on timers, but no DO sensors are provided to adjust blower operation. The hinged sluice gates separating the two aeration tanks are not functioning as intended, allowing wastewater to flow to the adjacent tank during maintenance. The tanks have minimum free-board (<1 foot), creating concerns of overflowing during high-flow conditions or if a downstream flow obstruction occurs. At the time of site visit, minor tank overflow was noted due to valves being broken; the Chief Operator stated that CCU had already notified FDEP of the minor overflow; also, that FDEP was scheduled for an observational site visit and repairs for the tank had been scheduled. Discussions with CCU staff post-site-visit reported the tank has since been repaired by a certified diver.

6.5.4.5 Clarification

The clarifier portions of the tanks are in good working order and cleaned of excessive algae growth on the weirs as needed; a significant amount of floatables passes through the headworks and collects in the clarifiers. The floatables are returned to the headworks and accumulate in the WRF until they are manually removed. The two RAS/WAS pumps that draw solids from the bottom of the tanks are in poor condition and operating at their end of lifetime. The Chief Operator reported issues with the drives and chains being faulty. The chains were last replaced in December 2021. The pipe pumping design makes it difficult for operators to de-rag the pumps. The County continues to maintain and repair these systems until the WRF expansion is completed.

Overall, the tanks appear to be in good condition and were recently painted. The Burnt Store WRF expansion project has identified that these tanks could likely be repurposed during the preliminary design discussions.

6.5.4.6 Filtration

The effluent filtration system is a cloth-media disk filter with 5-micron cloths, housed in a painted carbon-steel tank and controlled by a series of backwash actuators. The cloths were replaced in 2021. The backwash actuators were replaced in 2019 and are in excellent condition. The operator indicated that the filter is producing a good-quality effluent but backwashes frequently during periods of high flow, which can cause overflows to the CCC. However, the overall condition of the filtration system is good though it is not sized to meet future flow conditions.

6.5.4.7 Disinfection and Effluent Sampling Station

The overall condition of the chlorination system is good. CCC No. 2 is not in service since it does not provide sufficient contact time due to the chlorine injection location. The concrete CCCs are in good condition. A UV cover had been installed on CCC No. 1 but was missing at the time of site visit. A submersible mixing pump is used to enhance chlorine mixing. A sampling pump is used to pump CCC effluent to the chlorine analyzer for compliance monitoring, which replaced an old gravity-fed system and improved reliability.

The two sodium hypochlorite tanks are well kept and meeting regulatory requirements. An emergency eyewash and shower are at the sodium hypochlorite storage tank and chemical feed pump area. A concrete containment wall has been constructed around the entire chlorine storage and pumping area. Two new diaphragm chlorine metering pumps were installed in FY 2019. The Chief Operator noted several efforts of maintenance and/or replacement of chemical dosing Walchem pumps in the past 5 months; some pumps have been restored to functional; however, the frequency of failure should be further investigated. The effluent monitoring locations (EFA-01 and EFA-02) are clearly marked, and the refrigerated effluent composite sampler is in good operating condition.

6.5.4.8 Reuse, Disposal, and Storage

As mentioned previously, the Burnt Store WRF has three permitted effluent reuse and disposal options including public-access reuse (R-002), deep injection well (UIC), and a percolation pond system (R-001). Effluent meeting reclaimed water standards is conveyed to the reclaimed water customers within the Burnt Store WRF service area if the demand is present. If the effluent does not meet reclaimed water standards or the demand is not present in the reuse system, the effluent is conveyed to the deep injection well or percolation ponds.

Reuse Facilities

The Burnt Store WRF reuse facilities include a reclaimed water pump station and clearwell, which are in overall good condition. The reclaimed water pump station is located above the clearwell following the CCCs. Two HSPs and two booster pumps are used to convey up to 0.5 MGD AADF of reclaimed water to customers. The booster pumps are currently used to

satisfy demand in the reuse system, but the two large HSPs are working properly and are tested regularly. The reclaimed water HSPs and jockey pumps are well maintained and show no signs of deterioration. Flow to the reclaimed water pump station is monitored by an ultrasonic flow meter and primary weir device, which became obsolete when the WRF began transferring flow to the deep injection well system. A new flow meter is needed to monitor the pump discharge line and measure reclaimed water flow. In addition, no on-site reclaimed water storage is available, which will require future major reclaimed water users to be served through direct distribution to the user's reclaimed water holding facility or require storage to be added on site. These limitations will be addressed in the design of the Burnt Store WRF expansion project. Chapter 7 provides additional information about the Burnt Store Reuse System.

Effluent Disposal Facilities

The Burnt Store WRF also has two alternate options for disposing of excess reclaimed water or effluent not meeting reclaimed water standards including two injection wells (IW-1 and IW-2) and four on-site percolation reuse ponds. IW-1 has a rated capacity of 0.564 MGD. IW-2 is designed for an ultimate capacity of 9.5 MGD. However, due to hydraulic and supply limitations associated with available test water, IW-2 was tested at a flow rate of 2.88 MGD. Thus, the initial capacity rating for IW-2 is 2.88 MGD.

The deep injection wells are well maintained and in good working order, but some improvements and flow limitations have been noted on the system. The improvements include the replacement of an IW pump in 2018 and a 16-inch valve on the IW-2 inlet line in FY 2019. The deep well pumping station is limited to 380 gpm since the effluent flows by gravity to the wetwell through a 6-inch-diameter pipe, which is insufficient to move peak flows. Flow that does not reach the deep well overflows to the percolation ponds. This situation impacts the WRF's ability to handle peak flows and limits the capacity of the deep wells.

Operations personnel exercise IW-1 once per month for a minimum of 24 hours to maintain its integrity. Four shallow monitoring wells around the IW-1 deep injection well were installed as part of the injection well construction. These wells should not be plugged because they may be needed if any rehabilitation work is performed on IW-1 or IW-2.

Table 6-21 lists the average flow pumped into IW-1 and IW-2 and the total monthly volumes sent to the deep wells and percolation ponds. As the data show, the wells are well within their rated capacities, and IW-2 is the primary well used for disposal. In FY 2022, a total volume of approximately 102.5 MG was sent to the deep injection wells and 36.7 MG were sent to the percolation ponds.

Table 6-21 Burnt Store WRF Average and Total Injection Well Flows

Month	Average IW Flow (MGD)	Total IW Volume (MG)	Total Pond Volume (MG)
Oct-21	0.245	7.60	2.56
Nov-21	0.274	8.21	3.18
Dec-21	0.271	8.39	2.86
Jan-22	0.352	10.91	2.33
Feb-22	0.349	9.76	2.30
Mar-22	0.248	7.69	4.71
Apr-22	0.270	8.10	1.91
May-22	0.200	6.20	2.95
Jun-22	0.278	8.34	2.46
Jul-22	0.315	9.75	2.55
Aug-22	0.284	8.79	3.46
Sep-22	0.314	8.80	5.42
Annual Avg	0.283	—	—
Annual Total	—	102.5	36.7

Note: The Burnt Store WRF IWs also receive the concentrate flows from the Burnt Store RO WTP.

The percolation ponds are used to their maximum permitted capacity to encourage shallow groundwater recharge. The percolation ponds are alternately rested and allowed to dry. The pond bottoms are harrowed to enhance percolation. The interior of the ponds above the water line are mowed. Limitations have been reported in the percolation ponds that have been attributed to the high groundwater conditions in the area.

As part of the WRF upgrades, CCU intends to evaluate other means for transferring greater amounts of effluent flow to the deep well, such as increasing the size of the piping and investigating the need for additional storage, additional filtration, and other redundancies to comply with the corresponding regulations.

Wet-weather Storage

The on-site percolation ponds are available for limited wet-weather storage of reclaimed water at the Burnt Store WRF.

6.5.4.9 Biosolids Handling

The overall condition of the biosolids-handling facilities is good. Two tanks are aerated to provide partial sludge stabilization and the third tank is normally used for thickening and decanting. Hook-up connections are provided for trucks to transport thickened sludge to East Port WRF for further processing. A bottom-feed submersible pump suspended on a winch is used to decant supernatant back to the front end of the facility for treatment.

6.5.4.10 Electrical Components and Circuitry

The incoming switchgear and distribution transformer appear in fair-to-good condition. The incoming power company service transformer exhibits an extensive amount of surface rust, which may soon be impacting the transformer function. The existing primary distribution switchboard outside the MCC room is also exhibiting signs of degradation from the weather. The plant is served from a single generator of an undetermined size, and its water pump was replaced in 2022. The generator was in good condition but exhibited signs of residual diesel fuel on top of the diesel fuel tank. This may be indicative of additional issues. Overall, the electrical equipment in Building MCC-1 is in good functioning condition based on information from the Operations staff, except for the deficiencies listed below.

The following deficiencies were noted:

- The switchgear contains warning labels identifying parts and components as being energized. However, none of the equipment includes the appropriate arc-flash labeling required by NFPA 70E.
- The fiberglass MCC building should be replaced with a concrete structure.
- The main breaker trips when two blowers are started simultaneously.
- The generator is undersized and is not capable of supporting all blowers at one time.

6.5.5 Operations

The Burnt Store WRF is continuously monitored by online instrumentation through SCADA. A new Operations Building, which is shared with the Burnt Store RO WTP staff, was completed in FY 2009. The Operations Building houses the WRF operating system, which is used to monitor critical operations and maintain compliance with regulatory requirements.

Plant Operations staff manages the treatment process effectively and works to address maintenance items in a timely manner. The plant produces effluent meeting the requirements for reclaimed water and injection well disposal. The flow EQ tank helps attenuate diurnal and extreme weather flows to enable proper treatment.

The Burnt Store WRF is staffed 8 hours per day, 7 days per week. The WRF can be continuously monitored by the East Port WRF operators through a County-wide telemetry system that allows the Burnt Store WRF to continue to produce reclaimed water 24 hours per day.

6.5.6 Maintenance

Routine maintenance is performed on a scheduled basis. Rehabilitation of major pieces of equipment is completed according to the CIPs that are revised annually. Maintenance that is required to keep the WRF in compliance with regulations is performed immediately using in-house maintenance personnel or outside contractors. The entire facility was scheduled to be repainted in FY 2018. Painting of the facility was completed in FY 2019.

6.5.7 Review of Previous Report Recommendations

Table 6-22 Burnt Store WRF 2021 Recommendations and Status

Recommendation:	▪ Perform maintenance and equipment replacement as necessary until the WRF expansion can be completed.
Progress:	▪ Ongoing.

6.6 Wastewater Biosolids Transport, Processing, and Disposal

Partially digested biosolids from CCU's four WRFs are processed at the East Port WRF biosolids management and processing facility. CCU owns two 6,000-gallon tankers for biosolids transportation from the West Port, Rotonda, and Burnt Store WRFs. The biosolids are discharged into a 2.05-MG aerated-sludge holding tank for partial stabilization and decant thickening before dewatering. Biosolids dewatering is accomplished by two Ashbrook 2-meter-wide BFPs near the holding tank. The biosolids are dewatered to approximately 17-percent solids and hauled in County-owned 35-cubic yard dump trailers to the Synagro compost facility at the Charlotte County Zemel Road Landfill. The dewatered biosolids are mixed with chipped yard waste, composted to Class A standards, and distributed and marketed for organic amendment for sandy soil enhancement and material for landfill final cover.

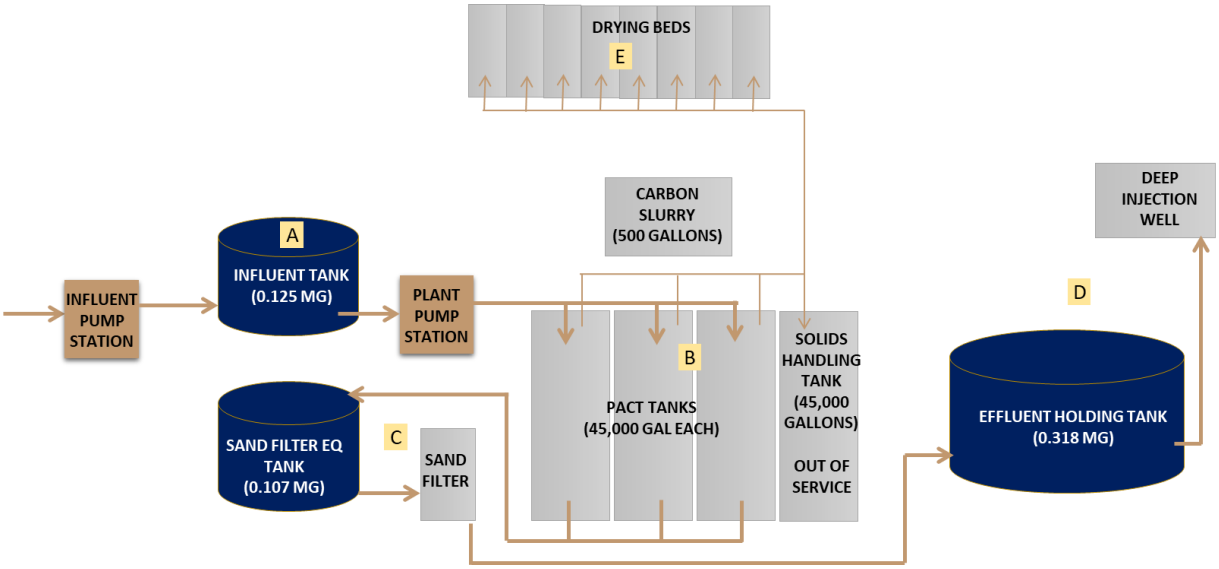
6.7 Leachate Treatment Facility

The Leachate Treatment Facility (LTF) is operated and maintained by CCU for the Charlotte County Municipal Solid Waste Management Department. Leachate generated by the Zemel Road Municipal Solid Waste Landfill is treated at the LTF and disposed of on site. The treatment facility and landfill share a 308-acre parcel in South County at 29751 Zemel Road, Punta Gorda, FL 33955.

The landfill is designed to contain and collect leachate to protect surrounding groundwater and lakes. Leachate is generated as water seeps down through the solid waste, picking up dissolved and suspended solids. A vertical bentonite (clay soil) slurry wall that blends below ground with the natural confining layer of soil surrounding the landfill separates the interior landfill leachate from the natural environment. A leachate collection system installed under the waste drains the liquid to a central location where it is pumped to the LTF.

Figure 6-6 shows the LTF process flow diagram.

Figure 6-6 Zemel Road LTF Process Flow Diagram



The Zemel Road LTF consists of the following components:

A) Influent: Most of the LTF influent originates from the landfill collection system and is conveyed to the LTF through the landfill pump station (PS-1). The landfill leachate is combined with the plant office sanitary sewer, landfill underdrain flows, and runoff from the composting operation. The flows are conveyed through the influent flow meter and enter a steel circular influent-holding tank. The plant pumping station (PS-2) transfers leachate from the influent holding tank to the powder-activated carbon treatment (PACT) system.

B) PAC Treatment: The batch reactor PACT system consists of three separate tanks using aerated activated sludge with carbon particle adsorption. Each PACT tank is a small package plant with separate PAC feed and aeration systems. PAC is mixed with water to form a carbon slurry before combining with the raw leachate. The solution is then aerated to promote aerobic digestion and is followed by a sludge-settling period.

C) Filtration: After settling is completed, the decant water is pumped to the filter feed tank and gravity fed through a sand filter for final polishing. The filter effluent is conveyed to a glass-lined steel effluent storage tank.

D) Effluent Disposal: The LTF effluent is conveyed from the effluent storage tank to a deep injection well and disposed of in a confined saltwater aquifer at an approximate depth of 2,700 feet below ground surface. The effluent sample point at the deep injection well may be seen in the photo provided.

E) Solids Disposal: After decanting the treated leachate, a portion of the solids (mixed carbon/biological sludge) from the PACT tanks are conveyed to the outdoor sludge-drying beds for dewatering. Once dry, the solids are conveyed to a dumpster and hauled to the landfill for final disposal.

6.7.1 Regulatory Considerations

The Zemel Road LTF are regulated by FDEP under the provisions of Chapter 403, Florida Statutes, and the applicable FAC rules. The following permits govern plant operations:

- Class 1 Landfill Permit – Expiration Date: July 15, 2033.
- IW-I and MW-1 Permit (No. 191077-004-UO/1I) – Expiration Date: October 25, 2024 (Permit renewal by Charlotte County Public Works):
  - New permit issued on October 25, 2019.
  - Monthly Summary Reports submitted to FDEP.
  - Quarterly Specific Injectivity Tests completed and submitted to FDEP.
  - The MIT was performed in 2017, next MIT is due in 2022.

6.7.2 Leachate Flows

The LTF's construction permit was issued in 1991 as part of the Class I landfill to treat 0.25 MGD of leachate. The current UIC permit specifies a maximum wellhead pressure of 39 psi, a peak flow rate of 320 gpm, and a maximum injection volume of 0.46 MGD. Table 6-23 summarizes the flows sent from the LTF to the deep injection well. In FY 2022, the maximum wellhead pressure, peak flow rate, and maximum daily injection volume were within permit limits, and the LTF treated a total of 16.88 MG.

Table 6-23 LTF Deep Injection Well Flows – FY 2022

Month	Maximum Wellhead Pressure (psi)	Peak Injection Rate (gpm)	Maximum Injection Volume	Total Monthly Flow (MG)
Oct-21	25	203	0.10	1.29
Nov-21	26	224	0.12	1.45
Dec-21	26	204	0.11	1.64
Jan-22	25	188	0.13	1.51
Feb-22	27	213	0.13	1.6
Mar-22	25	252	0.17	1.66
Apr-22	23	209	0.08	1.35
May-22	23	181	0.1	1.26
Jun-22	25	197	0.09	1.29
Jul-22	25	240	0.09	1.28
Aug-22	24	187	0.09	1.43
Sep-22	24	181	0.09	1.12

6.7.3 Treatment Objectives and Effluent Quality

The LTF uses a PACT batch tank treatment system, which combines PAC and activated sludge (aerobic bacteria) to simultaneously adsorb and metabolize the leachate contaminants to treat the leachate to an acceptable level for deep well injection disposal. The treated leachate is sampled daily for pH, weekly for fecal coliform, TSS, and total alkalinity and monthly for TOC, TDS, BOD, COD, TN, TKN, nitrate, lead, and chlorides. In addition, treated leachate is sampled

and analyzed for the Primary and Secondary Drinking Water parameters semiannually. Table 6-24 summarizes the LTF effluent quality goals prior to disposal of the treated leachate.

Table 6-24 Effluent Quality Goals

Parameter	Effluent Quality Goal
pH	6.0 – 9.5 s.u.
TSS	20 mg/L
BOD	20 mg/L
COD	Acceptable BOD/COD ratio

Note: s.u. = standard units.

A program to operate the Zemel Road Landfill as a landfill bioreactor and recycle leachate to enhance landfill biogas production at the landfill has changed influent leachate flows and characteristics over the years. However, the effluent leachate still meets acceptable final effluent standards for disposal to the 0.46-MGD deep injection well system adjacent to the treatment plant.

6.7.4 Treatment Components and Condition Assessments

Jones Edmunds conducted a site visit of the LTF on February 9, 2023, and met with Tim Bracke, Chief Operator, to review plant conditions, operations, and records. Access to the facility is through a secure gate at the entrance to the landfill. The plant is isolated among landfill operation buildings and adjacent to the yard waste composting facility. The facility appears in good condition and staff does a good job maintaining the grounds and the facility appearance.

The facility is required to maintain plant documents on site. The following summarizes the types of documents generally found at treatment plants. Due to the nature of this facility and since it is permitted under the landfill permit, some traditional documents may not be required for the LTF:

- Operating permit for the deep injection well.
- Operators' licenses.
- Facility logbook.
- Facility Standard and Emergency Operating Plans.
- MORs.
- Effluent Analysis Reports (N/A).
- Reports required to complete the last permit application.
- Certification of the laboratory used for sample analysis.
- Sampling Plan.
- Groundwater Monitoring Plan (N/A).
- Laboratory results.
- Chain-of-custody forms for samples that are sent to laboratories.
- Facility O&M Manuals.
- Maintenance records (EAMS electronic data system).
- Facility Record Drawings.
- Spill protocol and record of spills are kept by the owner of the plant, Charlotte County Public Works Department, and kept on file at the LTF office.

6.7.4.1 LTF Influent

The influent flow is a combination of raw leachate from the landfill collection system, sanitary sewer, and runoff from the co-composting program at the County's Zemel Road Landfill. The composting program combines dewatered biosolids from the East Port WRF with yard waste to create an organic soil conditioner. The composting operation is on a concrete-paved area near the LTF, and FDEP requires the runoff be captured and treated at the LTF. Since the area is remote and no wastewater collection infrastructure is provided in the vicinity, the sanitary sewer from the plant office is also treated at the LTF.

The landfill collection system contains a network of underdrains, trenches, vertical excavations, and a slurry wall to capture and contain leachate seeping through the landfill. The LTF operators are not responsible for the landfill collection system but work with the Solid Waste Operations Manager to balance the flow since LTF operators must maintain a static head differential between the water level on the inside and outside of the landfill slurry wall to keep an inward groundwater gradient across the slurry wall. This operation is completed to prevent leachate from leaving the site as required by permit. The landfill leachate combines with the plant office sanitary sewer and the landfill underdrains outside the slurry wall and enters the influent pump station.

6.7.4.2 Influent Pump Station

Overall, the influent pump station (PS-1) is in good condition. PS-1 is manually controlled and operated to maintain a 1-foot water level difference across the slurry wall. It has a capacity of approximately 150 gpm. Although the influent is primarily fed by the gravity-driven network, a significant amount of storage is within the landfill collection system, which provides some operational flexibility for the LTF and can be used if PS-1 is temporarily out of service.

The influent pumps convey leachate into the 125,000-gallon influent holding tank and through the influent plant flow meter to record the daily influent leachate volumes; some panels on the influent holding tank were replaced in 2021. Field interview with the Chief Operator suggested that the influent holding tank and influent pump station will be fully rehabilitated in FY 2023. A high-level sensor automatically shuts-off the pump in the No. 1 Pump Station to prevent overfilling of the raw leachate tanks.

6.7.4.3 PAC Treatment

The plant pumping station (PS-2) transfers leachate from the influent holding tank to the batch treatment tank units Monday through Friday when operators are present. On weekends, the Chief Operator monitors (PS-1) and the level in the influent tank via SCADA.

The PACT system uses a combination of PAC and active aerobic bacteria to simultaneously adsorb and metabolize leachate contaminants. The LTF contains three parallel treatment units each consisting of a 45,000-gallon tank, chemical feed, aeration, and pumping systems. Approximately 30,000 gallons of raw leachate are pumped from the influent storage tank into the PACT tank for chemical addition, mixing, holding, and settling. One hundred pounds of fresh PAC and 3,500 mL of phosphoric acid are added to each PACT tank. The contents are mixed by aeration for approximately 7 hours. Approximately 135 mL of polymer is added to each PACT tank to assist in settling out the carbon and biomass from the effluent. The material in the PACT tanks settles for approximately 1 hour. After settling is completed, the decant water is pumped to the filter equalization storage tank. The carbon sludge remains in each PACT tank and is reactivated when the next batch of leachate is introduced for processing. Waste sludge is removed from the PACT tanks as necessary (typically weekly) by pumping to the sludge drying beds.

The three PACT units are in good-to-poor condition. The tanks' exteriors and interiors are in good condition since they were partially painted in FY 2017 and completed in FY 2018. Surfaces were pressure washed and rust and lost paint were removed and primed before painting was completed. The polymer feed systems and blower air intakes for the treatment trains should be replaced.

6.7.4.4 Filtration

The filter EQ tank is a glass-lined steel tank with a capacity of 107,000 gallons. The filter feed stream flows by gravity through the sand filter system and is pumped from the sand filter to the effluent storage tank. The sand filter compressor was replaced in FY 2020, but the mechanical parts of the sand filter remain in poor condition and should be replaced. No back-up is provided for the treatment equipment, which makes maintenance and repair work more difficult to coordinate. The installation of a second filter or provisions to provide temporary filtration connection should be investigated as needed based on plant operating conditions.

6.7.4.5 Effluent Storage and Disposal

The effluent disposal system contained a storage tank, submersible pumps, and a deep injection well. LTF effluent is stored and equalized in an effluent storage tank so that the injection well down-hole flow does not exceed 320 gpm. LTF effluent is pumped from the effluent storage tank into the injection well by two dry-pit submersible pumps. Effluent is typically disposed of the same day it is treated. Most of the effluent is pumped into the deep injection well, with a small volume used for dust control at the landfill. The deep injection well typically operates 6 days per week, but operation can be adjusted according to leachate production and effluent disposal requirements.

The effluent storage and disposal systems are in fair condition and are properly maintained to meet the facility needs. The facilities were recently painted. The existing 12-HP pumps were installed by CCU personnel in 2015. The pumps are submersible type and are operating satisfactorily under their typical operating period of approximately 7 hours per day. However, the pumps' exposed exteriors generate high heat, creating a risk of skin exposure to operators.

6.7.4.6 Solids Handling Facilities

The LTF has a sludge digestion tank that historically was used for solids handling but is no longer in operation. Today, waste solids (mixed carbon and biological waste sludge) are conveyed directly from the PACT tanks and allowed to dry through evaporation. The LTF contains eight 725-square-foot (approximately 5,800 square feet total) sludge drying beds. A Bobcat loader is used for sludge removal for maximum maneuverability within the sludge drying beds. Grit is removed from the batch process tanks, as necessary, and dried with biosolids. The Bobcat removes and dumps dried solids into a dumpster that is hauled to the landfill for use as cover on the landfill. The sludge drying beds are well maintained and sufficient drying bed area for dewatering of solids.

6.7.4.7 Auxiliary Power

The LTF has no auxiliary standby power, and according to discussions with staff, power outages used to occur frequently. In FY 2022, only one outage was reported, which was the result of a bird flying into the line. During off hours, the power supply is monitored through the high-level alarm at PS-1, which is monitored at the East Port WRF. Power outages that stop the aeration process for more than a day severely impact the microorganisms and process treatment, resulting in the need for seed sludge to restart the biological process again.

6.7.4.8 Wet-Weather Storage

October to May of FY 2017 was dry with less than 15 inches of rain out of an annual average total of 67 inches County-wide. The single largest storm event was Hurricane Irma, which made landfall on September 10, 2017, and deposited approximately 8 inches of rain in the Charlotte County area. Even with the heavy rains and storm conditions, the LTF was able to sufficiently process the leachate using the storage within the landfill and influent EQ tank.

6.7.5 Operations

The LTF is operated as a batch sequence reactor currently treating leachate 5 days per week, Monday through Friday, during working hours and is manually controlled by staff. During wet-weather periods or following a maintenance or repair event, the Chief Operator may operate on weekends, as determined necessary to process the leachate volume. Adding maintenance staff can support the efforts made by the Chief Operator to appropriately respond to unexpected events.

The overall system, from PS-1 to the injection well, has several capacity differences. If operated continuously, PS-1 has a pumping capacity of 0.22 MGD, the PACT process has a 0.250-MGD capacity, and the injection well has a 0.46-MGD capacity. In the event of excess flows, the operational treatment period could be extended to increase the volume treated per day. Alternately, the sludge digestion tank could be converted to a fourth PACT unit.

6.7.6 MAINTENANCE

The LTF is owned by the Charlotte County Public Works Solid Waste Division and operated by CCU personnel. The Chief Operator and Assistant Operator complete routine maintenance on a scheduled basis. Emergency maintenance and/or and routine maintenance and repairs are performed using in-house Operations personnel or outside contractors to maintain regulatory compliance. A dedicated maintenance worker for the facility or scheduled maintenance worker at the facility during a specific number of days per week will mitigate issues with operators focusing on maintenance issues and performing the work. Rehabilitation or replacement of major pieces of equipment is included in the annual CIP updates, which are coordinated with Public Works and completed at their discretion.

6.7.7 REVIEW OF PREVIOUS ANNUAL REPORT RECOMMENDATIONS

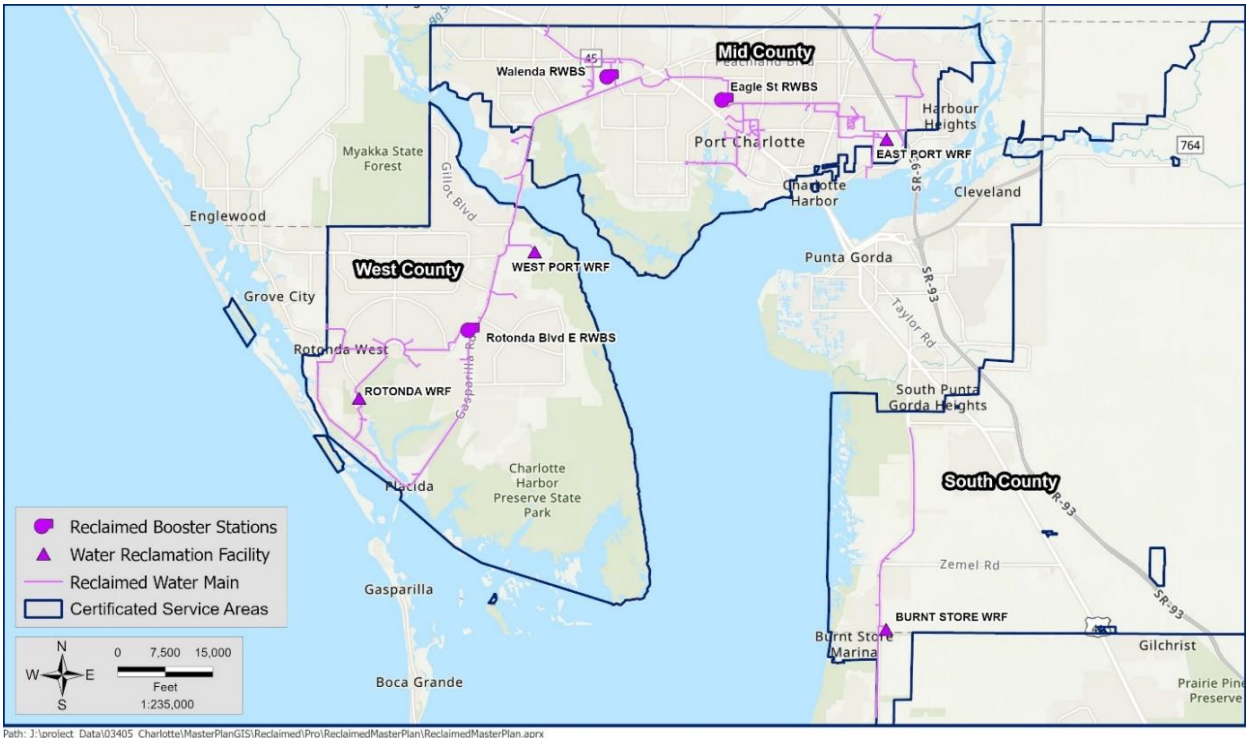
Table 6-25 LTF 2021 Recommendations and Status

Recommendation:	▪ Repair the effluent storage tank.
Progress:	▪ Completed.
Recommendation:	▪ Add a generator to the treatment facility to keep the plant operational during power outages.
Progress:	▪ Currently being pursued through FEMA grants.
Recommendation:	▪ Repair filter feed pump tank.
Progress:	▪ Completed.
Recommendation:	▪ Evaluate adding an additional maintenance staff member to meet increasing demands and minimize overtime at the LTF.
Progress:	▪ New Chief Operator hired. Former Chief Operator serves as a full-time operator at the facility. At the time of this report, CCU is also hiring an additional staff member to train for operations and assist with maintenance.

7 RECLAIMED WATER DISTRIBUTION SYSTEM

One of CCU's goals is to maximize the beneficial use of reclaimed water and reduce the impact on other water resources. This Chapter presents the CCU reclaimed water distribution system components and condition assessments of those system components and reviews CCU's backflow and cross-connection prevention program. Similar to the water distribution systems discussed in Chapter 4, CCU operates two reclaimed water distribution systems. The Mid/West County distribution system water is supplied public-access-quality reclaimed water from the East Port, West Port, and Rotonda WRFs, and the South County reclaimed water distribution system is fed by the Burnt Store WRF. Figure 7-1 shows the County-wide reclaimed water distribution systems.

Figure 7-1 CCU Reclaimed Water Distribution Systems



At the time of this report, the two systems contained approximately 89 miles of reclaimed water mains providing service to 85 reclaimed water customer connections in the Mid/West County distribution system and 6 connections in the South County distribution system. The CCU reclaimed water distribution system consists of the following major components:

- Transmission mains that supply reclaimed water to bulk users and distribution mains serving pressurized customers.
- Reclaimed water booster stations (RWBSs) adjacent to GSTs for maintaining distribution system pressures.
- Lined and unlined ponds at the WRFs for reclaimed water storage during periods of reduced demand.
- Pond discharge sites that allow the operators to remotely shut off the flow of reclaimed water to bulk customers using irrigation ponds.

7.1 MID/WEST COUNTY SYSTEM

CCU's Mid/West County reclaimed water system operates under a Master Reuse Permit approved by FDEP that allows CCU to move reclaimed water from East Port WRF, West Port WRF, and Rotonda WRF to customers. The development of a Master Reuse System arose from an excess of reclaimed water at the East Port WRF and high demands for irrigation water in the west portion of the County. Before the interconnection, each WRF supplied water to separate reclaimed water distribution systems, and the existing or potential customers were assigned to the individual WRF FDEP operating permits. The existing Master Reuse System in Mid/West County has a permitted capacity of 9.6 MGD AADF in combined flows from East Port WRF, West Port WRF, and Rotonda WRF (R-001). The Mid/West County reclaimed water distribution system consists of two aboveground, pre-stressed concrete GSTs with an active combined capacity of 1 MG and three RWBSs.

7.1.1 RECLAIMED WATER BOOSTER STATIONS

The Mid/West County Master Reuse System contains three active RWBSs in the Mid/West County distribution system, two of which include 0.5-MG GSTs. The booster stations are used to maintain the flow and pressure throughout the system and work in conjunction with the reclaimed water pumping stations at the WRFs; currently, the system operates at a target pressure of 95 psi. Jones Edmunds staff visited the RWBSs on February 9, 2023, and describe the RWBS components and condition assessments in this section.

7.1.1.1 Eagle Street – RWBS

The Eagle Street RWBS, constructed in 2008, is approximately 5 miles west of the East Port WRF along the 16-inch reclaimed water transmission main. The station is within a fenced area in a residential neighborhood near Tamiami Trail and contains two concrete buildings and a 0.5-MG concrete GST. The GST is equipped with a level sensor to regulate volume and a check valve to allow reclaimed water to bypass the station. Operations staff indicated this booster station is used when transferring flow to West County. More specifically, the Eagle Street RWBS supplements pressure and flow during times of high demand when the GST at Walenda RWBS operates at low-water level.

The RWBS contains one 125-HP HSP and one 60-HP jockey pump. The HSP has a pumping capacity of 1,440 gpm, and the jockey pump has a pumping capacity of 577 gpm. Each pump is controlled by a VFD to maintain system pressure for instantaneous customer use. The pumps are housed in a concrete building along with unused chemical feed pumps. An inline filter is downstream of the pumps; however, this filter mechanism is currently in bypass mode.

Pump operations, flow, and pressure are monitored 24 hours per day through a County-wide SCADA telemetry system. The PLC and electrical control center are housed in a separate air-conditioned building. Operators can inject sodium hypochlorite after the reclaimed water enters the GST, but disinfection at this location is not currently needed.

A modification to the Walenda RWBS in 2019 provided additional pressure for commercial reclaimed water customers in the Eagle Street area and reduced the dependence on the Eagle Street RWBS.

No O&M improvements were completed at the RWBS over the past 3 years.

Condition Assessment

Jones Edmunds last completed an on-site review of the plant on November 15, 2022, as part of CCU's Hurricane Ian Damage Assessments; the information gathered at that time was used to update this section, in accordance with the project scope. CCU staff is aware of the following damages, as recorded during the hurricane assessment, and have been working diligently to address them accordingly. The electrical room equipment, pump room equipment, and tank were found in good condition. The piping was painted purple but needed repainting. At the time of site visit, the grounds had heavy overgrowth that requires attention. A tree leaning on the south portion of the fence around the station needs to be cut and removed.

The following deficiencies were noted:

- A tree leaning on fence at the south side of the station site.

7.1.1.2 Walenda RWBS

The Walenda RWBS is at 17177 Walenda Avenue, Port Charlotte, approximately 4.5 miles northwest of the Eagle Street RWS. The station was constructed in 2008 and is within a proposed residential/commercial neighborhood known as West Port. In March 2019, the Walenda RWBS was modified to provide pressure to the reclaimed water system along US Highway 41 between Enterprise Boulevard and Cornelius Boulevard.

The site is fenced and contains reclaimed and potable water infrastructure including reclaimed and potable water GSTs. The gates and buildings are kept locked. The reclaimed water GST has a capacity of 0.5 MG and is equipped with a level sensor. The RWBS contains one 125-HP HSP and one 60-HP jockey pump, each equipped with VFDs. At the time of site visit, the 60-HP pump was being repaired. The HSP has a pumping capacity of 1,440 gpm, and the jockey pump has a pumping capacity of 577 gpm. The pumps and chemical feed system are in a concrete building. An inline filter is downstream of the pumps; however, this filter mechanism is currently in bypass mode.

Pump operations, flow, and pressure are monitored 24 hours per day through a SCADA telemetry system. The PLC and electrical control center are housed in a separate air-conditioned building. Like the Eagle Street RWBS, operators can inject sodium hypochlorite after the reclaimed water enters the GST, but disinfection at this location is not currently needed.

The Walenda station is available for pumping and storage but currently operates in an as-needed mode by CCU staff based on system demands. The hydraulic modeling for the reclaimed water system indicates that the Walenda station will be an essential component for meeting the future reclaimed water demands.

Condition Assessment

Jones Edmunds last completed an on-site review of the plant on November 15, 2022, as part of CCU's Hurricane Ian Damage Assessments; the information gathered at that time was used to update this section, in accordance with the project scope. CCU staff is aware of the following damages, as recorded during the hurricane assessment, and have been working diligently to address them accordingly.

The access roads outside the facility are aging and need to be repaved but are in fair condition inside the property. The site fences are damaged and need to be repaired or replaced. Fallen trees are around the site with one leaning against the aboveground storage tank that will require complete removal. The roof over the chemical storage tanks has missing shingles from hurricane winds that need to be replaced. The HSPs are well maintained and functioning properly.

The electrical room equipment, pump room equipment, and storage tank are in good condition. The piping was painted purple but needs repainting. The grounds are well maintained. A small leak in the recirculation valve requires repair.

The following deficiencies were noted:

- The access roads outside the facility are washed out and need to be repaved.
- The site fences are damaged and need to be repaired or replaced.
- The site has fallen trees with one leaning against the aboveground storage tank.
- The roof over the chemical storage tanks has missing shingles.

7.1.1.3 Gertrude RWBS

The Gertrude site is at 21131 Gertrude Avenue, Port Charlotte, approximately 4.6 miles northwest of the East Port WRF. The station was originally used for the potable water system but was decommissioned in 2008. CCU is evaluating the rehabilitation of the site for use as a RWBS. The site currently consists of a 0.5-MG GST and 600-square-foot concrete building. The GST was previously cleaned and lined in 2004. The addition of the station will increase the resilience of the Master Reuse System, provide operational flexibility, and provide pressure and reclaimed water storage in the surrounding area.

Condition Assessment

Due to its currently decommissioned status, this station was not assessed as part of this report. However, CCU continues to evaluate rehabilitation opportunities to use this site and its available equipment.

7.1.1.4 Rotonda Blvd East RWBS

The Rotonda Blvd East RWBS is on Rotonda Boulevard East just west of CR 771. The station was completed in FY 2014 and is an in-line RWBS that does not contain a GST. An architectural wall and chain link fence shield the station from the highway, and access gates are kept locked. The RWBS contains one 100-HP high-head HSP and two 40-HP low-head HSPs, each equipped with VFDs. The 100-HP HSP has a pumping

capacity of 972 gpm, and the 40-HP HSPs have a pumping capacity of 1,045 gpm each. Pump operations, flow, and pressure can be monitored 24 hours per day through a SCADA telemetry system. The PLC and electrical control center are housed under a covered area. The station is currently used to help maintain system pressure in West County and back pressure to Mid County; however, this RWBS can also be used to help convey flows as the County's reclaimed water demands continue to increase in West County.

This is a complex pump station with multiple operational configurations. The RWBS was configured to allow operation in multiple modes, which include pumping from Mid County to West County, pumping from Rotonda WRF to West Port WRF, or pumping from West Port WRF to the West County customers. CCU staff are evaluating the hydraulics of this station to improve the operational configurations and settings for the RWBS.

Condition Assessment

Aside from notable hurricane-related damage, such as extensive architectural fence damage, the physical condition of the RWBS was great; the aboveground piping at the RWBS was painted in 2022. However, HSP No. 2 was out of service for repairs at the time of site visit.

7.1.2 STORAGE

Reclaimed water storage is provided by a combination of lined and unlined storage ponds at the WRFs and GSTs in the distribution system. Table 7-1 lists the storage capacity and type for each of the reclaimed water storage sites. Currently, Operations staff at the East Port WRF monitors reclaimed water levels in the ponds and GSTs through SCADA. The Master Reuse System is now operated as a pressurized system to allow customers to draw reclaimed water when needed. The WRF ponds and GSTs are kept full to meet customer demands. Excess reclaimed flows are conveyed to deep injection wells or other permitted disposal methods as specified in the WRF's permits.

Table 7-1 Reclaimed Water Storage Capacity and Location

Site	Location	Storage Type	Storage Capacity (MG)
East Port WRF	Mid County	Lined Pond	95.0
West Port WRF	West County	Lined Pond Lined Pond	15.0 5.0
Rotonda WRF	West County	GST Unlined Pond	3.0 2.64[1]
Walenda RWBS	Mid County	GST	0.5
Eagle Street RWBS	Mid County	GST	0.5
		Total	**116.6[2]**

[1] Approximately half of the capacity is currently usable.
[2] Values exclude reject pond storage.

The GSTs at the Walenda and Eagle Street sites are filled by system feed and used to maintain the distribution system pressure during peak demand. The GSTs also provide the following functions for the CCU reclaimed water supply system:

- Minimize high pumping pressures at the WRFs.
- Provide local storage for nightly peak irrigation demands when the flows at the WRFs are lowest.

7.1.3 Current and Future Reclaimed Water Customers

Currently, most customers use the reclaimed water for irrigation purposes. CCU's reclaimed water customers are a combination of bulk users who receive water through pond discharges and then repump as needed for irrigation and direct-pressurized customers whose irrigation systems are connected to the reuse system. As noted in the Reclaimed Master Plan, CCU's current focus is on large users to maximize the offset of freshwater supplies.

West County contains nine 18-hole golf courses and residential/commercial developments that have marginal access to good freshwater irrigation sources. Currently, five golf courses and several small reclaimed water customers are receiving reclaimed water for irrigation; however, additional golf courses are committed as future large users. Service of reclaimed water to West County is limited by the amount of reclaimed water that is produced by the two WRFs in west Charlotte County, the Rotonda WRF and the West Port WRF. The ultimate capacity of the reclaimed water system in the East Port WRF, West Port WRF, and Rotonda WRF service areas is extensive due to the number of residential developments, golf courses, and other reclaimed water demands in the area.

Table 7-2 and Table 7-3 list the agreement amounts for current and future reclaimed water users in Mid and West County, respectively. The agreement amount columns and total agreement amount rows indicate ultimate or potential future flows, whereas the current agreement amount row estimates reclaimed water capacity for current users, assuming supply is available. The County has signed agreements for current reclaimed water customers equaling approximately 9.450 MGD of reuse in the Mid/West County system. Additionally, current and future user ultimate flow is expected to add approximately 2.086 MGD of reclaimed water, indicating a total potential near-term demand of up to 11.536 MGD in Mid and West County.

Table 7-2 Current and Future Mid County Reclaimed Water Users

Reclaim Sites	Pond/ Direct	Current/ Future User	Agreement Amount (MGD)
7-Eleven # 37528	Direct	Current	0.001
Auto Zone - 19681 Cochran	Direct	Future	TBD
Biscayne Landings	TBD	Future	TBD
BJs Wholesale Club	Direct	Current	0.011
Burger King - Murdock	Direct	Current	0.001
CCCS - Fire Station # 2	Direct	Current	0.001
CCCS - Sheriff's Office	Direct	Current	0.011
CCCS Parks - 1120 Centennial Blvd(Aquatic)	Direct	Current	0.002
CCCS Parks - 1185 Centennial Blvd(Ball Fields)	Direct	Current	0.050
CCCS Parks - Franz Ross	Direct	Current	0.048
CCCS Parks - McGuire Park & (LS # 11)	Direct	Current	0.006
CCCS Parks - Sports Park	Pond	Current	0.446
CCPW - Edgewater Median 1	Direct	Current	0.010
CCPW - Edgewater Median 2	Direct	Current	0.010
CCPW - Edgewater Median 3	Direct	Current	0.010
CCPW - Edgewater Median 4	Direct	Current	0.010

Reclaim Sites	Pond/ Direct	Current/ Future User	Agreement Amount (MGD)
CCPW - Edgewater Median 5	Direct	Current	0.010
CCPW - Edgewater Median 6	Direct	Current	0.010
CCPW - Edgewater Median 7	Direct	Current	0.010
CCPW - Edgewater Median 8	Direct	Current	0.010
CCPW - Elkam Blvd 1	Direct	Current	0.010
CCPW - Elkam Blvd 2	Direct	Current	0.010
CCPW - Harbor Blvd (median 3115)	Direct	Current	0.010
CCPW - Olean 1 (21175-M)	Direct	Current	0.010
CCPW - Olean 2 (21298-M)	Direct	Current	0.010
CCPW - Olean 3 (21405-M)	Direct	Current	0.010
CCPW - Toledo Blade North of US 41	Direct	Current	0.004
CCPW - US 41 Median north of 776	Direct	Current	0.001
CCPW - US 41 Median north of 776	Direct	Current	0.001
CCPW - US 41 Median north of 776	Direct	Current	0.001
CCPW - US 41 Revitalization PC Blvd	Direct	Current	0.010
CCPW - US 41 south of PC Blvd	Direct	Current	0.002
CCU - LS # 18 Lift Station ODC	Direct	Current	0.010
CCU - LS # 59 Skylark Vac Station	Direct	Current	0.005
CCU - LS # 99 El Jobean Vac Station	Direct	Current	0.005
Charlotte Convenience (7-11)	Direct	Current	0.002
Charlotte Crossing	Direct	Current	0.005
Deep Creek Golf Club	Pond	Current	0.343
Family Dollar - Rampart	Direct	Future	0.001
Gulf Cove United Methodist Church	Direct	Current	0.012
JRE Millennium Phy Group	Direct	Current	0.015
Kia of Port Charlotte	Direct	Current	0.015
Kingsway Country Club (GC)	Pond	Current	0.388
Kravin Chikin	Direct	Future	TBD
Maple Leaf Estates	Pond	Current	0.388
Marylou Home Owners Assoc.	Direct	Current	0.038
Ming Zhou - B.O.A.	Direct	Current	0.001
MRI Partners LLC	Direct	Current	0.001
MRT Landscaping	Direct	Current	0.025
Murphy Oil USA # 7360 - Murdock	Direct	Current	0.001
Myakka RV Park	Direct	Current	0.040
Parkside Memory Cottage	Direct	Current	0.002
Pt Char G. C. - Golf Links	Pond	Current	0.613
Pt. Charlotte Church of Christ	Direct	Current	0.001
Rick Johnson Auto	Direct	Current	0.000
Riverwood (GC)	Pond	Current	1.200
Shorepoint Health Port Charlotte	Direct	Current	0.008
Suncoast Lakes Home Owners	Direct	Current	0.136

Reclaim Sites	Pond/ Direct	Current/ Future User	Agreement Amount (MGD)
Sunnydell Commons II	Direct	Current	0.004
TAMIAMI INVESTMENT PARTNERS, LLC	Direct	Current	0.010
Tommy's Car Wash	Direct	Current	0.002
Wal-Mart # 721	Direct	Future	0.018
Waste Management	Direct	Current	0.008
West Port Community Development District	Pond	Current	0.450
Current Mid County Reclaimed Water Agreements			3.894
Total Mid County Reclaimed Water Agreement Amounts			4.480

Table 7-3 Current and Future West County Reclaimed Water Users

Reclaim Sites	Pond/ Direct	Current/ Future User	Agreement Amount (MGD)
Anglers Club	TBD	Future	0.050
Bel Aire	TBD	Future	TBD
Boca Vista	Direct	Current	0.008
CCPW - 10320 Winborough	Direct	Current	0.001
CCPW - 8110 Wiltshire	Direct	Current	0.001
CCPW - 8400 Wiltshire	Direct	Current	0.001
CCPW - 9100 Winborough	Direct	Current	0.001
CCPW - Gasparilla Road (FUTURE)	TBD	Future	0.010
CCPW - Winchester / Sunset	Direct	Current	0.020
Coast Concrete	Pond	Current	0.060
Colonial Concrete	Direct	Current	0.008
Coral Caye(Placida Commons)	Direct	Current	0.095
Coral Creek Air Park (BK IV AS LLC)	Direct	Current	0.045
Coral Creek Club	Pond	Current	0.308
Dollar General - 322 Ingram	Direct	Current	0.002
Fellowship Church	Direct	Current	0.027
Hacienda Del-Mar	Direct	Current	0.105
Hammocks	TBD	Future	0.060
Harbor West	Pond	Current	0.144
Hills Golf Club	TBD	Future	0.540
Landings at Coral Creek	Direct	Current	0.120
Lemon Bay Golf Course	Pond	Current	0.342
Meadows & Villas Conservation Area - Robin	Direct	Current	1.315
Meadows & Villas Conservation Area - Rot Tr	Direct	Current	0.002
Placida Harbor	Direct	Current	0.019
Preserve at Windward Condominium	Direct	Current	0.005
RGP Links Golf Club	Pond	Current	0.333
RGP Long Marsh North	Pond	Current	0.230
RGP Long Marsh South	Pond	Current	0.230

Reclaim Sites	Pond/ Direct	Current/ Future User	Agreement Amount (MGD)
RGP Palms Golf Club	Pond	Current	0.423
Rotonda NW Golf Club	Pond	Future	0.463
Rotonda Sands	Pond	Future	1.427
Safe Cove Boat Storage	Direct	Current	0.003
South Gulf Cove	Pond	Future	0.409
Windward Patio Homes	Direct	Current	0.250
Current West County Reclaimed Water Agreements			5.556
Total West County Reclaimed Water Agreement Amounts			7.056

7.1.4 Discharge Valve Stations

Many of the large reclaimed water users are golf courses and golf course communities that receive reclaimed water through pond discharge valve stations. These stations generally contain the following:

- A flow meter.
- Gate valves with motorized valve actuators.
- Pond-level indicators.
- Pressure-indicating transmitters.
- Isolation valves.
- Air-relief valves.
- Telemetry and SCADA.

A majority of the pond discharge stations include a valve with a motorized actuator that allows CCU to remotely open or close the valve via SCADA. Most of the motorized actuators also allow the valve to be partially opened to a specified percent-open setting, which throttles the reclaimed water discharge to maintain a set flow rate or system pressure. Motorized valves without a percent-open setting only have an open or closed setpoint, which does not allow control of flow or system pressure.

The discharge ponds also include pond-level indicators to prevent too much reclaimed water from being conveyed to the ponds and leading to overflows. Some community developments such as Aileron Golf Club (formerly Kingsway Country Club), Maple Leaf Golf Course, Deep Creek Golf Club, and West Port Community Development District have stormwater storage lake systems (D-001, D-002, D-003, and D-004, respectively) that are also used for reclaimed water storage. These lakes contain adjustable weir gates and intermittently overflow to stormwater ditches that ultimately drain into the Peace River. Maintaining an adequate level in these lakes to avoid overflowing is a high priority for CCU staff. Table 7-4 summarizes the current pond discharge reclaimed water customers, their control valve type, and whether they are identified in the master reuse permit as a stormwater storage lake.

Table 7-4 Existing Pond Discharges

Reclaimed Water Customer	Pond Discharge Type
Mid County Customers	
Riverwood CDD	Control Valve, Electronic Throttling
Port Charlotte Golf Course	Control Valve, Electronic Throttling
CC Parks Department Sports Park	Control Valve, Electronic Throttling

Reclaimed Water Customer	Pond Discharge Type
Maple Leaf Estates*	Manual Valve, Manual Throttling
Deep Creek Golf Club*	Control Valve, Electronic Throttling
Aileron Golf Club*	Control Valve, Electronic Throttling
West Port Community Development District*	Control Valve, Electronic Throttling
West County Customers	
Lemon Bay Golf Course	Control Valve, Electronic Throttling
Coral Creek Club	Control Valve, Electronic Throttling
RGP Palms Golf Course	Control Valve, Electronic Throttling
RGP Long Marsh South	Control Valve, Electronic Throttling
RGP Long Marsh North	Control Valve, Electronic Throttling
RGP Links Golf Course	Control Valve, Electronic Throttling
Harbor West	Control Valve, Electronic Throttling

*Permitted stormwater storage lake system.

7.1.5 Operations

High-quality reclaimed water produced at the East Port, West Port, and Rotonda WRFs is stored in the on-site storage ponds or off-site GSTs during periods of low demand. Currently, the East Port WRF produces the most reclaimed water within the Mid and West County Master Reuse System. The East Port WRF contains two reclaimed water HSP stations, although HSP No. 2 serves as the primary pump station for conveying reclaimed water from the 95-MG storage pond to Mid and West County, and HSP No. 1 is used for plant water and as a backup to HSP No. 2. CCU attempts to maintain a minimum system pressure of 50 psi to all customers. The direct pressurized and pond customers in Mid County are primarily supplied from the East Port WRF since demand is higher in West County. The Walenda and Eagle Street RWBSs are available for reclaimed water pumping and storage and operate as needed by CCU staff based on system demands. The reclaimed water in the GSTs is recirculated to maintain water quality.

The West County portion of the Master Reuse System is primarily supplied by the West Port and Rotonda WRFs, but also is fed water from East Port WRF via the Master Reuse System. The West Port WRF has two lined reclaimed water storage ponds used to store reclaimed water produced during the day for distribution at night or to store excess reclaimed water during wet-weather periods. West Port WRF contains one reclaimed water pump station that is used to convey flows to the Master Reuse System. Rotonda WRF has an unlined reclaimed water storage pond and GST on site and operates two different reclaimed water pump stations. The reclaimed water infrastructure at these WRFs is used to provide reclaimed water to pressure and the customers through the Master Reuse System and is operated together with constant communication by the operations personnel.

7.2 South County System

The South County reclaimed water distribution system is provided reclaimed water from the Burnt Store WRF. In South County, a 3-mile-long reclaimed water transmission along Burnt Store Road serves as the primary conveyance pipe of the reclaimed water system. The

transmission main was originally constructed in 2006 to serve the community Heritage Landings (previously known as Tern Bay golf course) but never received reclaimed water because the community did not develop as expected. However, three smaller users benefited from the transmission main and currently receive low-pressure reclaimed water from the Burnt Store WRF. As mentioned in Chapter 6, the reuse system is currently permitted for 2.26 MGD; however, significant limitations exist for providing the flows of this quantity including reclaimed water supply, pumping capacity, and storage capacity.

Several large developments are underway or planned in South County that will significantly increase the wastewater and reclaimed water flows in the service area. In 2019, the County engaged the services of consultants McKim & Creed and Jones Edmunds to design an expansion of the Burnt Store WRF. The project will address the current pumping and storage limitations and allow CCU to connect more users to the Burnt Store reclaimed water distribution system and upgrade the WRF to meet advanced AWT standards.

7.2.1 Reclaimed Water Booster Stations

The South County reclaimed water distribution system does not currently contain any RWBS; rather, the pump capacity is provided solely from the Burnt Store WRF reclaimed water pump station. The station contains two constant-speed high-service pumps with a capacity of 900 gpm each. The reclaimed water pumps discharge into a 8.5-mile-long 12-inch/16-inch reclaimed water transmission main that conveys reclaimed water to customers via direct irrigation system delivery or to on-site storage ponds to meet customer-controlled irrigation schedules.

7.2.2 Storage

The South County reclaimed water distribution system has limited storage since no storage exists within the distribution system and the storage at the WRF is limited to the clearwell under the reclaimed water pump station.

However, the Burnt Store WRF expansion project currently proposes to convert the existing RIBs to reclaimed water storage ponds and a reject pond, as well as a GST.

7.2.3 Current and Future Reclaimed Water Customers

Currently, three reclaimed water customers are in South County and use a small amount of reclaimed water for drip irrigation of landscaping along the development entranceways and common areas. CCU is pursuing other potential bulk reclaimed water users, such as golf courses, that have expressed interest in using reclaimed water in irrigation storage ponds, like the Mid/West County system. Table 7-5 lists the current and potential future major reclaimed water users within the Burnt Store WRF service area. Although the total potential future reclaimed water user demand is noted as approximately 2.117 MGD, Heritage Landing has expressed interest in receiving future flows up to 1.5 MGD, which would increase the total to approximately 3.5 MGD.

Table 7-5 South County Current and Potential Future Reclaimed Water Users

Reclaim Sites	Pond/ Direct	Current/ Future User	Agreement Amount (MGD)
Burnt Store Colony 1	Direct	Current	0.008
Burnt Store Colony 2	Direct	Current	0.008
Burnt Store Lakes	Direct	Current	0.048
Burnt Store Marina & GC	Pond	Future	1.920
City of Cape Coral	TBD	Future	0.085
CCCS - Fire Station # 5	Direct	Current	0.001
CCPW - Cape Horn	Direct	Current	0.0001
CCPW - Burnt Store Village Landscape	Direct	Current	0.004
Dollar General (Burnt Store)	Direct	Future	0.003
Heritage Landing	Pond	Future	0.125
Current South County Reclaimed Water Agreements			0.068
Total South County Reclaimed Water Agreement Amounts			2.117

7.2.4 Discharge Valve Stations

Currently, no pond discharge valve stations are in the South County reclaimed water distribution system.

7.2.5 Operations

The WRF's pump station is used to convey reclaimed water from the Burnt Store WTF to the 8.5-mile-long 12-inch reclaimed water transmission main along Burnt Store Road. The system is operated at relatively low pressure, and users are currently responsible for supplying their systems with in-line pumps to boost pressure.

As with the Mid/West County distribution system, forecasting and CIP planning are also conducted for the South County system. The Burnt Store WRF operators are currently responsible for maintaining the reclaimed water components since the vertical infrastructure components are on site. As the system continues to expand, the Reclaimed Water Distribution workgroup will be responsible for maintaining the South County system.

7.3 Maintenance

The reclaimed water distribution system is inspected and monitored daily to meet FDEP requirements. Monthly inspections highlight the distribution equipment that may need repair, calibration, or replacement. An important element of the program is that reclaimed water sites are inspected yearly for possible cross-connections. The Backflow and Reclaimed Services staff coordinate with reclaimed water customers to keep them updated on the reclaimed water supply, inform them of operational problems, and provide information and guidance regarding FDEP and SWFWMD rules and regulations. The workgroup is also involved in documentation, inspection, and minor repairs of the reclaimed water distribution system.

7.4 Backflow and Cross-Connection Prevention Program

The Backflow and Cross-Connection Prevention Program uses two types of surveys to monitor customer water use and type – basic backflow equipment survey and cross-connection control

survey. The basic backflow equipment survey is used to verify the site information of each water user. The cross-connection survey provides information on possible cross-connections and health-hazard levels. The information in the surveys is used to inform customers with the required description of the backflow prevention. A CCU database is being created that includes information on each water user, backflow prevention measures in place at their site, backflow testing requirements, and communication with the customer. This information satisfies the FDEP requirements for implementation of a Backflow and Cross-Connection Prevention Program. CCU's Cross-Connection Control Manual provides the structure by which the program can be administered and a vehicle for changes as needed in the future. The program includes testing and repair of backflow devices at County-owned facilities. This part of the program will increase as the database of backflow information increases.

The Cross-Connection Control Program reports inventory every calendar year, in accordance with FDEP regulations. Inventory reported for FY2022 is as follows:

- Hydrant Meters Repairs/Tests: 14
- Cross-Connections Inspected: 3,015
- Charlotte County Backflow Tests: 190
- Potential Cross-Connections Corrected: 0

7.5 Review of Previous Annual Report Recommendations

Table 7-6 through Table 7-8 summarize the recommendations and status from the 2021 Annual Report for the Mid/West and South County distribution systems, respectively.

Table 7-6 Mid/West County Reclaimed Water Distribution System 2021 Recommendations and Status

Recommendation:	▪ Develop an operational protocol for the Mid/West County Master Reuse System. CCU staff intend to operate the reclaimed water system under a select number of operational configurations and will determine their preferred method for meeting their reclaimed water demands using the hydraulic model.
Progress:	▪ Ongoing. Some operational items are addressed in the Reclaimed Water Master Plan.
Recommendation:	▪ Install throttling control valves at all current major users with pond discharges in the Mid and West County areas.
Progress:	▪ Installed as part of pond discharge assembly. All new pond users will be required to install this equipment per CCU standard.
Recommendation:	▪ Maintain updated hydraulic models for Mid/West and South County to predict the impact of future demand on the reclaimed water transmission systems.
Progress:	▪ Ongoing.
Recommendation:	▪ Evaluate adding another GST to provide storage in West County due to the large number of bulk reclaimed water users.
Progress:	▪ Recommendation to replace Rotonda WRF unlined pond with a GST from the Reclaimed Water Master Plan will increase storage capacity, if implemented. Additionally, storage tank capacity will be reviewed as part of the West Port WRF expansion project.

Recommendation:	▪ CIP recommendations to improve capacities of treatment, storage, and pumping in the Mid/West County and South County systems for future demands are being developed in the Reclaimed Water Master Plan.
Progress:	▪ CCU is finalizing the Reclaimed Water Master Plan with Jones Edmunds.
Recommendation:	▪ Evaluate installing a motorized valve assembly in the easement on Cattle Dock Point Road east of SR 776 to provide operational flexibility from West Port WRF.
Progress:	▪ Currently being evaluated as part of the modeling.
Recommendation:	▪ Evaluate adding piping connections (including controls, pumps, valves, meters, etc.) to increase the number of reclaimed water small users in Mid County.
Progress:	▪ Ongoing, but CCU is currently focused on adding large users and large developments.
Recommendation:	▪ Seek ways to increase the use of reclaimed water currently produced by CCU WRFs including improving reliability and access for customers.
Progress:	▪ Ongoing.
Recommendation:	▪ Create a reclaimed water system O&M Manual and operating protocols.
Progress:	▪ Not completed.

Table 7-7 South County Reclaimed Water Distribution System 2021 Recommendations

Recommendation:	▪ CIP recommendations to improve capacities of treatment, storage, and pumping in the South County system for future demands are being developed as in the Reclaimed Water Master Plan.
Progress:	▪ Ongoing. The Reclaimed Water Master Plan is expected to be finalized in April 2023.

Table 7-8 Backflow and Cross-Connection Prevention Program 2021 Recommendations

Recommendation:	▪ Complete implementation of EAMS, such as *Cityworks,* for utilization as a tool to track cross-connection inspections.
Progress:	▪ Ongoing.

8 ENGINEERING

The Engineering Division is responsible for preparing and managing engineering reports, studies, project designs, and construction observation and management.

8.1 CAPITAL IMPROVEMENT PROGRAM

The CIP is designed to plan and construct improvements to the CCU water, wastewater, and reclaimed water systems. As Charlotte County's population continues to grow, CCU's ability to develop plans that address the projected growth is vital. The following section summarizes CIP projects in progress or initiated in FY 2022. A project is considered major when the expenditure is over $100,000.

8.1.1 CIP PROJECTS – WATER SYSTEM

Table 8-1 lists the water system CIP projects initiated or in progress during FY 2022. The total FY 2022 budget was $250,000 and the total expenditure was $307,000.

Table 8-1 Water System CIP Projects in Progress or Initiated in FY 2022 ($ in Thousands)

Description	Funding Source[1]	Original FY 2022 Budget	2022 Expenditures	Percent of Budget Expended
Potable Water Master Plan	Oper	$ —	$ 173	0%
Potable Water Master Plan	Oper	$ —	$ 268	0%
Emergency Interconnect to Punta Gorda-Burnt Store	Conn-Wtr	$ —	$ —	0%
Walenda Booster Station Upgrade	Conn-Wtr	$ —	$ —	0%
Potable Water Master Plan Recommended	Conn-Wtr	$ —	$ —	0%
Burt Store RO WTP-Plug-Abandon Well	Oper	$ —	$ —	0%
Campbell St to Chancellor to Myakka River 24-inch Water Main	Conn-Wtr	$ —	$ —	0%
Toledo Blade from Hillsborough to US41 24-inch Water Main	Conn-Wtr	$ —	$ —	0%
Rotonda Booster Station Upgrades	Conn-Wtr	$ —	$ —	0%
Golf Course Booster Station Upgrades	Conn-Wtr	$ —	$ —	0%
Gillot Blvd Water Main Upsizing	Conn-Wtr	$ —	$ —	0%
Potable Water Storage Tank-South County	Conn-Wtr	$ —	$ —	0%
Potable Water Elevated Tank-Mid County	Conn-Wtr	$ —	$ —	0%
Potable Water Elevated Tank-West County	Conn-Wtr	$ —	$ —	0%
Calumet to Robin Rd – Waterway Crossing SGC to Rotonda Meadows	Conn-Wtr	$ —	$ —	0%
Hillsborough/Cranberry Intersection Water Main (North Port)	Conn-Wtr	$ —	$ —	0%

Description	Funding Source[1]	Original FY 2022 Budget	2022 Expenditures	Percent of Budget Expended
Water Meter Study Recommended Improvements	Conn-Wtr	$ —	$ —	0%
Major Water Transmission Lines	Conn-Wtr	$ 250	$ 30	12%
Major Water Transmission Lines	R & R	$ —	$ —	0%
Myakka River 24-inch Water Main	Conn-Wtr	$ —	$ —	0%
Myakka River 24-inch Water Main	SRF Pending	$ —	$ —	0%
Myakka Potable Water Booster Station	SRF	$ —	$ —	0%
Myakka Potable Water Booster Station	Conn-Wtr	$ —	$ —	0%
Totals		$250	$307	123%

[1] Funding sources: D.P. = Debt Proceeds; Oper = O&M Fund; L.E = Line Extension; R&R = Renewal & Replacement Fund; Sinking = Sinking Fund; Conn-Wtr = Water Connection Fee Fund.

8.1.2 CIP Projects – Wastewater System

Table 8-2 lists the wastewater system CIP projects initiated or in progress during FY 2022. The total wastewater budget allotted for FY 2022 was $68,726,000 and the total amount spent was $16,396,000.

Table 8-2 Wastewater System CIP Projects in Progress or Initiated in FY 2022 ($ in Thousands)

Description	Funding Source[1]	Original FY 2022 Budget	2022 Expenditures	Percent of Budget Expended
Wastewater Force Mains	Conn-Swr	$ 250	$ 34	14%
Wastewater Force Mains	Oper	$ —	$ —	0%
Wastewater Force Mains	Conn-Swr	$ 600	$ 1,229	205%
Spring Lake MSBU Wastewater Expansion	Oper	$ —	$ —	0%
Spring Lake MSBU Wastewater Expansion	Grants	$ —	$ —	0%
Spring Lake MSBU Wastewater Expansion	SRF	$ —	$ —	0%
Spring Lake MSBU Wastewater Expansion	MSBU	$ —	$ 16	0%
Wastewater Force Main Replacements	R & R	$ 37	$ 1,904	5,146%
Wastewater Force Main Replacements	Conn-Swr	$ —	$ 6	0%
Wastewater Force Main Replacements	SRF	$ —	$ —	0%
Master Lift Stations	Conn-Swr	$ 750	$ —	0%
Grand Master LS - Loveland Blvd	U.C.P.F	$ —	$ 31	0%

Description	Funding Source[1]	Original FY 2022 Budget	2022 Expenditures	Percent of Budget Expended
Grand Master LS - Loveland Blvd	Conn-Swr	$ 186	$ —	0%
Grand Master LS - Loveland Blvd	SRF	$ —	$ —	0%
Burnt Store Phase 2	Conn-Wtr	$ —	$ —	0%
Burnt Store Phase 2	Conn-Swr	$ —	$ —	0%
Burnt Store Phase 2	R & R	$ —	$ 4	0%
Burnt Store Phase 2	U.C.P.F	$ —	$ 84	0%
Charlotte Harbor Water Quality Initiative Ph 2	BP	$ —	$ 1	0%
Charlotte Harbor Water Quality Initiative Phase 2	Grants	$ —	$ —	0%
Charlotte Harbor Water Quality Initiative Phase 2	SRF	$ —	$ —	0%
Charlotte Harbor Water Quality Initiative Phase 2	MSBU	$ —	$ 961	0%
Burnt Store WRF Expansion	Conn-Swr	$ —	$ 1,684	0%
Burnt Store WRF Expansion	Pending SRF	$ 51,480	$ —	0%
East Port WRF Expansion	Pending SRF	$ —	$ —	0%
East Port WRF Expansion	Conn-Swr	$ —	$ 845	0%
Charlotte Harbor Water Quality Project Septic to Sewer	S.T.	$ —	$ —	0%
CMOM Recommended Utility Improvements	Conn-Swr	$ —	$ —	0%
CMOM Recommended Utility Improvements	D.P.	$ —	$ —	0%
Wastewater Force Main – SR 776 Snybrk to Gasp CR 771	Conn-Swr	$ —	$ 27	0%
Odor Control System for Midway Blvd & Loveland Blvd	Oper	$ —	$ —	0%
East Port WRF Wetwell Cover and Ozone System	Oper	$ —	$ —	0%
West Port WRF Perimeter Fencing	Oper	$ —	$ 445	0%
East Port WRF Deep Well Supply Line	Conn-Swr	$ —	$ —	0%
Veterans Wastewater Force Main US41 to Peachland	Conn-Swr	$ —	$ —	0%
East Port WRF Equalization System	Conn-Swr	$ —	$ —	0%
Olean Blvd. Force Main – Easy Street to Loveland	Conn-Swr	$ —	$ —	0%
Olean Blvd. Force Main – Easy Street to Loveland	R & R	$ —	$ —	0%
West Port WRF Expansion 1.2- to 3-MGD	Conn-Swr	$ —	$ —	0%

Description	Funding Source[1]	Original FY 2022 Budget	2022 Expenditures	Percent of Budget Expended
West Port WRF Deep Injection Well Capacity Increase	Conn-Swr	$ —	$ —	0%
Replace Filters at East Port WRF Stage 5	Oper	$ —	$ —	0%
Safety Improvements at Vacuum Pump Stations	Oper	$ —	$ —	0%
Sewer Master Plan Update Recommended Improvements	Conn-Swr	$ —	$ —	0%
Sewer Master Plan Update Recommended Improvements	D.P.	$ —	$ —	100%
Water Transmission/Wastewater Collection Reim	Conn-Wtr	$ 500	$ 347	69%
Water Transmission/Wastewater Collection Reim	Conn-Swr	$ 500	$ —	0%
CCU Business Services Customer Software	Oper	$ 800	$ —	0%
Parkside Gertruce Avenue and Aaron Street Imp	U.C.P.F	$ —	$ 612	0%
Parkside Olean Blvd (US41 to Easy Street) Imp	U.C.P.F	$ —	$ —	0%
CHWQ – Countryman & Ackerman	Oper	$ —	$ 368	0%
CHWQ – Countryman & Ackerman	MSBU	$ 824	$ 5,463	663%
CHWQ – Countryman & Ackerman	Conn-Wtr	$ 1,282	$ 189	15%
CHWQ - Countryman & Ackerman	SRF	$ 5,943	$ —	0%
CHWQ - Countryman & Ackerman	Restore	$ 1,530	$ —	0%
CHWQ – Countryman & Ackerman	R & R	$ 2,432	$ 1,527	63%
UW 41 Southbound Utility Improvements	Oper	$ —	$ —	0%
UW 41 Southbound Utility Improvements	R & R	$ —	$ —	0%
Relocation Needs Utility Pipe Replace	R & R	$ 1,742	$49	0%
SCADA System Upgrades	Oper	$ —	$ 318	0%
Harbor View Rd Widening – Utility Improvements	R & R	$ —	$ 1	0%
US 41 Commercial Corridor Utilities Expansion	R & R	$ —	$ —	0%
US 41 Commercial Corridor Utilities Expansion	Conn-Wtr	$ —	$ 1	100%
US 41 Commercial Corridor Utilities Expansion	Conn-Swr	$ —	$ 39	0%
Lake View Midway Septic & Water Expansion	Oper	$ —	$ 209	100%
Burnt Store Tuckers Point Utility Infrastructure	Conn-Wtr	$ —	$ —	0%

Description	Funding Source[1]	Original FY 2022 Budget	2022 Expenditures	Percent of Budget Expended
Burnt Store Tuckers Point Utility Infrastructure	Conn-Swr	$ —	$ —	0%
US 41 Northbound Utility Improvements	Conn-Swr	$ —	$ —	0%
US 41 Northbound Utility Improvements	R & R	$ —	$ —	0%
Edgewater-Flamingo Corridor Connection	Conn-Wtr	$ —	$ —	0%
Edgewater-Flamingo Corridor Connection	Conn-Swr	$ —	$ —	0%
Kings Hwy I-75 to Desoto County Line Utility Improvements	R & R	$ —	$ —	0%
Kings Hwy I-75 to Desoto County Line Utility Improvements	Conn-Swr	$ —	$ —	0%
Utility Relocations and/or Improvements – FDOT Minor Projects	R & R	$ —	$ —	0%
Fiber Optic Installs for Utility Plants and Booster Stations	Oper	$ —	$ —	0%
Water & Sewer Waterway Crossings	R & R	$ —	$ 36	0%
Water & Sewer Waterway Crossings	Conn-Wtr	$ 60	$ —	0%
Water & Sewer Waterway Crossings	Conn-Swr	$ 60	$ —	0%
	Totals	$ 68,726	$ 16,396	24%

[1] Funding sources: R&R = Renewal & Replacement Fund; Conn-Wtr = Water Connection Fee Fund; BP = British Petroleum; Oper = O & M Fund; SRF = State Revolving Fund; MSBU = Municipal Service Benefit Unit; S.T. = Sales Tax; Sinking = Sinking Fund; Grant = Grant Funding; Bond = Bond Funding; Conn-Swr = Sewer Connection Fee Fund; U.C.P.F. = Utility Capital Projects Fund; DEV = Developer Proceeds.

8.1.3 CIP Projects – Reclaimed Water System

Table 8-3 lists the reclaimed water system CIP projects initiated or in progress during FY 2022. The total amount budgeted for FY 2022 was $150,000, and $3,000 was expended.

Table 8-3 Reclaimed Water System CIP Projects in Progress or Initiated in FY 2022 ($ in Thousands)

Description	Funding Source[1]	Original FY 2022 Budget	2022 Expenditures	Percent of Budget Expended
US 41 Reclaimed Water Lines	Conn-Swr	$ 150	$ 3	2%
US 41 Reclaimed Water Lines	R & R	$ —	$ —	0%
Reclaimed Water Service Connection	Conn-Swr	$ —	$ —	0%

Description	Funding Source[1]	Original FY 2022 Budget	2022 Expenditures	Percent of Budget Expended
Reclaimed Water Master Plan Recommended	Conn-Swr	$ —	$ —	0%
Reclaimed Water Automated Valves	Conn-Swr	$ —	$ —	0%
Rotonda WRF Reclaimed Water Storage Pond	Oper	$ —	$ —	0%
West Port WRF Reclaimed Water Pond	Oper	$ —	$ —	0%
	Totals	$ 150	$ 3	2%

[1] Funding sources: R&R = Renewal & Replacement Fund; Conn-Wtr = Water Connection Fee Fund; C.P.F. = Capital Projects Fund; S.T. = Sales Tax; Grant = Grant Funding; Conn-Swr = Sewer Connection Fee Fund; DEV = Developer Proceeds; SRF = State Revolving Fund.

8.1.4 CIP – 5-YEAR PLAN

CCU develops and maintains a 5-year CIP to plan for the growth in Charlotte County. CCU also maintains a 20-year capital needs assessment project list developed as part of their master plans. Table 8-4 summarizes projects included in CCU's 5-year CIP for the water, wastewater, and reclaimed water systems.

Table 8-4 Capital Improvement Program – 2022 and Future CCU Project Costs ($ in Thousands)

Project Names	Prior Years Actual	Actual FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Future Years	Total
Potable Water Master Plan	$ 375	$ 268	$ —	$ —	$ —	$ —	$ —	$ —	$ 643
Emergency Interconnect to Punta Gorda-Burnt Store	$ —	$ —	$ 890	$ —	$ —	$ —	$ —	$ —	$ 890
Walenda Booster Station Upgrade	$ —	$9	$ —	$ —	$ —	$ —	$ —	$ —	$ 9
Potable Water Master Plan Recommended Improvements	$ —	$ —	$ 1,000	$ 1,000	$ 1,000	$ 900	$ 800	$ —	$ 4,700
Burnt Store RO WTP - Plug/Abandon Well #15	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Campbell St to chancellor to Myakka River 24" Water Main	$ —	$ —	$ —	$ —	$2,000	$ —	$ —	$ —	$ 2,000
Toledo Blade from Hillsborough to US41 24" Water Main	$ —	$ —	$ —	$ 1,000	$ —	$ —	$ —	$ —	$ 1,000
Rotonda Booster Station Upgrades	$ —	$ —	$ 500	$ —	$ —	$ —	$ —	$ —	$ 500
Golf Course Booster Station Upgrades	$ —	$ —	$-	$ 250	$ —	$ —	$ —	$ —	$ 250
Gillot Blvd Water Main Upsizing	$ —	$ —	$ 500	$ —	$ —	$ —	$ —	$ —	$ 500
Potable Water Storage Tank South County	$ —	$ —	$ —	$ 225	$ 4,000	$ —	$ —	$ —	$ 4,225
Potable Water Elevated Tank-Mid County	$ —	$ —	$ —	$ 225	$ 4,000	$ —	$ —	$ —	$ 4,225
Potable Water Elevated Tank-West County	$ —	$ —	$ —	$ 225	$ 4,000	$ —	$ —	$ —	$ 4,225
Calumet to Robin Road – Waterway Crossing SGC to Rotonda Meadows	$ —	$ —	$ —	$ —	$ —	$ —	$ 500	$ —	$ 500
Hillsborough/Cranberry Intersection Water Main (North Port)	$ —	$ —	$ —	$ 280	$ —	$ —	$ —	$ —	$ 280
Water Meter Study Recommended Improvements	$ —	$ —	$2,000	$ —	$4,000	$ —	$ —	$ —	$ 6,000
Major Water Transmission Lines	$ 8,012	$ 30	$ 250	$ 250	$ 250	$ 250	$ 250	$ 3,225	$12,517
Wastewater Force Mains Expansionary	$ 4,652	$1,229	$ 600	$ 600	$ 600	$ 600	$ —	$ —	$ 8,281
Reclaimed Water Lines	$ 516	$ 3	$ 150	$ 150	$ 150	$ 150	$ 150	$ 1,650	$ 2,919

Project Names	Prior Years Actual	Actual FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Future Years	Total
Spring Lake MSBU Wastewater Expansion	$17,191	$ 16	$ —	$ —	$ —	$ —	$ —	$ —	$17,207
Wastewater Force Mains Replacement – Deep Creek	$ 4,858	$1,910	$ 35	$ 33	$ 31	$ 31	$ 30	$ 177	$ 7,105
Master Lift Stations	$452	$ —	$ 750	$ 750	$ 750	$ 750	$ 750	$750	$ 4,952
Reclaimed Connections for County Facilities	$ 49	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$49
Grand Master Lift Station & Gravity Interceptor – Loveland	$17,904	$ 31	$ 177	$ 167	$ 157	$ 157	$ 150	$ 803	$19,546
Myakka River 24-inch Water Main	$ 1	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ 1
Myakka Potable Water Booster Station	$ 3,106	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ 3,106
Burnt Store Phase 2	$ 3,178	$ 88	$ —	$ —	$ —	$ —	$ —	$ —	$ 3,266
Charlotte Harbor Water Quality Initiative Phase 2 – EL Jobean	$ 7,413	$962	$ —	$ —	$ —	$ —	$ —	$ —	$ 8,375
Burnt Store WRF Expansion	$ 1,620	$1,684	$ 6	$ 6	$ 6	$ 5	$ 273	$5,410	$ 9,010
East Port WRF Expansion	$ 1,448	$845	$ 5	$ 5	$ 4	$ 199	$ 380	$3,561	$ 6,447
Charlotte Harbor Water Quality Project Septic to Sewer	$ —	$ —	$ —	$ 6,500	$ —	$ —	$ —	$ —	$ 6,500
CMOM Recommended Utility Improvements	$ —	$ —	$ 3,000	$ 3,000	$ 500	$ 500	$ —	$ —	$ 7,000
Wastewater Force Main SR 776 Sunnybrook to Gasparilla CR 771	$ —	$ 27	$ 2,500	$ —	$ —	$ —	$ —	$ —	$ 2,527
Reclaimed Water Master Plan Recommended	$ —	$ —	$ 3,250	$ —	$ —	$ —	$ —	$ —	$ 3,250
Reclaimed Automated Valves	$ —	$ —	$ 500	$ —	$ —	$ —	$ —	$ —	$ 500
Odor Control System for Midway Blvd & Loveland Boulevard	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Rotonda WRF Reclaimed Storage Pond	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
West Port WRF Reclaimed Water Pond	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
East Port WRF Wetwell Cover and Ozone System	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —

Project Names	Prior Years Actual	Actual FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Future Years	Total
West Port WRF Perimeter Fencing (Homeland Security)	$ —	$ 445	$ —	$ —	$ —	$ —	$ —	$ —	$ 445
East Port WRF Deep Well Supply Line	$ —	$ -	$ —	$ —	$ —	$ —	$ —	$ —	$ -
Veterans Wastewater Force Main US 41 to Peachland	$ —	$ —	$ —	$ —	$ —	$ 800	$3,492	$ —	$ 4,292
East Port WRF Equalization System	$ —	$ —	$ —	$ —	$ 2,000	$ 2,000	$-	$ -	$ 4,000
Olean Blvd. Force Main – Easy Street to Loveland	$ —	$ —	$ —	$ —	$ 5,000	$ —	$ —	$ —	$ 5,000
West Port WRF Expansion 1.2- to 3-MGD (Including Equalization	$ —	$ -	$ 1,000	$ 5,000	$43,000	$ —	$ —	$ —	$49,000
West Port WRF Deep Injection Well Capacity Increase	$ —	$ —	$ —	$ 1,000	$ —	$ —	$ —	$ —	$ 1,000
Replace Filters at East Port WRF Stage 5	$ —	$ —	$ 300	$ —	$ —	$ —	$ —	$ —	$ 300
Safety Improvements at Vacuum Pump Stations	$ —	$ —	$ 200	$ —	$ 200	$ —	$ —	$ —	$ 400
Sewer Master Plan Update Recommended Improvements	$ —	$ —	$ 1,000	$ 1,000	$ 500	$ 500	$ —	$ —	$ 3,000
Water Transmission/ Wastewater Collection Reimbursement	$ 467	$ 347	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 4,000	$ 9,814
CCU Business Services Customer Billing and Database	$ 1,531	$ —	$ 800	$ 800	$ 800	$ 800	$ 800	$ 1,600	$ 7,131
Parkside – Gertrude and Aaron Street Improvements	$ 2,531	$612	$ —	$ —	$ —	$ —	$ —	$ —	$ 3,143
Parkside – Olean Blvd (US 41 to Easy Street) Improvements	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Central County Infrastructure	$ 8,354	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ 8,354
Charlotte Harbor Water Quality Initiative Phase 2 – Countryman & Ackerman	$ 5,446	$ 7,547	$ 18	$17	$ 133	$ 240	$ 229	$ 2,028	$15,658
Utility Equipment Replacements	$193	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ 193
UW 41 Southbound Utility Improvements	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —

Project Names	Prior Years Actual	Actual FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Future Years	Total
Relocation Needs Utility Pipe Replace	$ 282	$ 49	$ 1,742	$ 1,742	$1,742	$1,742	$1,742	$ —	$ 9,041
Scada System Upgrades	$ 575	$ 318	$ 2,500	$ 1,500	$ 1,000	$ —	$ —	$ —	$ 5,893
Harbor View Rd Widening – Utility	$ —	$1	$ —	$ —	$13,125	$ —	$ —	$ —	$13,126
US 41 Commercial Corridor Utilities Expansion	$ 38	$ 40	$ —	$ —	$ —	$ —	$ —	$ —	$78
Lake View Midway Septic & Water Expansion	$ —	$ 209	$ —	$ —	$42,370	$ —	$ —	$ —	$42,579
Burnt Store Tuckers Point Utility Infrastructure	$ —	$ —	$ —	$ 186	$ 1,550	$ —	$ —	$ —	$ 1,736
US 41 Northbound Utility Improvements	$ —	$ —	$ 3,000	$ 7,500	$ —	$ —	$ —	$ —	$10,500
Edgewater-Flamingo Corridor Connection	$ —	$ —	$ —	$ —	$ 1,720	$10,000	$9,200	$9,600	$30,520
Kings Hwy I-75 to Desoto County Line Utility Improvements	$ —	$ —	$ —	$ —	$ 631	$ 537	$ —	$ —	$ 1,168
Utility Relocations and/or Improvements – FDOT Minor Projects	$ —	$ —	$ —	$ 1,200	$ 1,150	$ —	$ —	$ —	$ 2,350
Fiber Optic Installs for Utility Plants and Booster Stations	$ —	$ —	$ —	$ —	$ 737	$ 737	$ —	$ —	$ 1,474
Waterway Crossings for Public Works (Water & Sewer)	$ 4,906	$ 36	$ 120	$ —	$ —	$ —	$ —	$ —	$ 5,062
Totals	$95,098	$16,706	$27,793	$35,611	$138,106	$21,898	$19,746	$32,804	$387,762

8.2 Review of Design, Reports, and Studies

The following describes reports and studies prepared by CCU Engineering or submitted by external engineering consultants in FY 2022. Prior year reports and annual reoccurring reports are also included for reference.

8.2.1 Reports Completed in FY 2022

- CCU 2021 Annual Report, Jones Edmunds, March 2022.
- CCU Modeling Tasks, Jones Edmunds, Ongoing.
    - Tuckers Pointe Development – Water and Wastewater
    - Simple Life Development – Water and Reclaimed Water
    - Edgewater Drive/Flamingo Blvd Main Sizing – Water, Wastewater, and Reclaimed Water
    - Cattledock Pointe Valve Station – Reclaimed Water
    - SR-776 Main Sizing - Wastewater
    - Harbor Village Development – Water, Wastewater, and Reclaimed Water
    - Starling Development – Water, Wastewater, and Reclaimed Water
    - The Cove Development – Water, Wastewater, and Reclaimed Water
- East Port WRF Permit Renewal and Application and Authorization for Substantial Modification, Jones Edmunds, November 2022. The application included multiple supplemental reports for continued operations and expansion of the East Port WRF.
- Burnt Store WRF Permit Renewal Application and Authorization for Substantial Modifications, Jones Edmunds, July 2021 and revised March 2022. The application included adding Advanced Wastewater Treatment to the Burnt Store WRF expansion.
- Lake View – Midway Water Quality Improvements Preliminary Design Report, Giffels-Webster Engineers Inc., September 2022, First Revision November 2022, Second and Final Revision January 2023.
- Manchester Waterway Boat Lock Removal Plan Annual Report – CCU completed an annual compliance report on the status of sewer connections in the Alligator Drainage Basin area to satisfy a Net Ecosystem Benefit requirement in accordance with FDEP Permit No. 08-0210682-001.
- El Jobean Sewer Expansion Charlotte County, Florida Final Report FDEP Agreement No. NF063 October 2022 – CCU completed a final report to meet the compliance criteria for sewer connections in El Jobean that were partially funded by EPA through an agreement/contract with the Nonpoint Source Management Program of the FDEP.
- Preliminary Engineering Report Green Dolphin Drive Water Main Project # 22-0005, July 6, 2022 – CCU completed a report to provide the most cost-effective and feasible option for replacing a disabled potable water main. The proposed project will provide a redundant connection to the island area.

8.2.2 Reports Completed in FY 2021

- CCU 2020 Annual Report, Jones Edmunds, March 2021.
- Unaccounted Water Investigation for the Burnt Store Service Area, Jones Edmunds, January 2021.

- Burnt Store WRF Permit Renewal Application and Authorization for Substantial Modifications, Jones Edmunds, July 2021. The application included multiple supplemental reports for continued operations and expansion of the Burnt Store WRF.
- CCU Security Risk Assessment Report, CTCH Security Business Consulting LLC, April 2021.
- Manchester Waterway Boat Lock Removal Plan Annual Report – CCU completed an annual compliance report on the status of sewer connections in the Alligator Drainage Basin area to satisfy a Net Ecosystem Benefit requirement in accordance with FDEP Permit No. 08-0210682-001.
- Technical Memorandum Regional Transmission System, Interceptor and Grand Master Lift Station Impacts on Connected Lift Stations – WO #22, Jones Edmunds, February 24, 2021. The memorandum evaluated the impacts on the regional transmission system and lift stations due to the interceptor and grand master lift station project. Pump selections and other lift station improvements were identified through hydraulic modeling and analysis as a result of the significant change to the regional transmission system.

8.2.3 Reports Completed in FY 2020

- Facilities Quarterly Reports, Stantec, 2020 – The quarterly update reports are based on DMRs and flow information provided to Stantec monthly. The quarterly report highlights upcoming permit requirements and includes a completion schedule for required permit tasks.
- Manchester Waterway Boat Lock Removal Plan Annual Report – CCU completed an annual compliance report on the status of sewer connections in the Alligator Drainage Basin area to satisfy a Net Ecosystem Benefit requirement in accordance with FDEP Permit No. 08-0210682-001.
- CCU 2019 Annual Report, Jones Edmunds, March 2020 – The annual report is conducted to provide the public with a utilities status update and to fulfill Revenue Bonds requirements for CCU.
- CCU SCADA Master Plan – McKim & Creed, March 2020 – The primary goal of this plan is to define and document a road map for the implementation of the technology, practices, and organization required to meet CCU's short-term goals and long-term vision for SCADA.
- Water Systems Risk and Resilience Assessment, Jones Edmunds, March 2020 – An RRA was completed on the utilities water systems in fulfillment of the America's Water Infrastructure Act of 2018 (AWIA) requirements that must be completed every 5 years.
- CCU Emergency Response Plan, Jones Edmunds, September 2020 – CCU's ERP was updated to reflect the findings of the RRA and to fulfill AWIA requirements.
- Charlotte County Cyber Security Audit (2020) – In December 2020, McKim & Creed, in association with CrimsonResolve, completed the first cybersecurity audit of the Charlotte County SCADA system. The report assessed the County's cybersecurity components to fulfill AWIA requirements.
- East Port WRF IW-2 Operating Permit Renewal Application, Stantec, January 2020. – The report and application renewal were prepared to continue operations of the East Port IW.
- East Port WRF IW-2 Mechanical Integrity Test Report, Stantec, July 2020. – The MIT test and report were prepared to fulfill the FDEP UIC permit requirements, which must be completed every 5 years.
- West Port WRF IW-1 Operating Permit Renewal Application, Stantec, January 2020.
- West Port WRF IW-1 Mechanical Integrity Test Report, Stantec, June 2020.

8.2.4 REPORTS COMPLETED IN FY 2019

- Facilities Quarterly Reports, Stantec, 2019.
- CCU 2018 Annual Report.
- Manchester Waterway Boat Lock Removal Plan Annual Report – CCU completed an annual compliance report on the status of sewer connections in the Alligator Drainage Basin area to satisfy a Net Ecosystem Benefit requirement in accordance with FDEP Permit No. 08-0210682-001.

9 UTILITY SUPPORT SERVICES

9.1 STATE-CERTIFIED LABORATORY

The East Port Laboratory (EPLAB) is a part of CCU and is at the East Port WRF. EPLAB provides regulatory and operational support for CCU facilities including four WRFs, one WTP, one LTF, six deep injection wells, and the potable water distribution systems. EPLAB is a National Environmental Laboratory Accreditation Program (NELAP)-certified laboratory (Florida Department of Health [FDOH] ID E54436, which was renewed July 1, 2022, and reissued for EPA Method Update Rule in September 2022) and a member of the National Environmental Laboratory Accreditation Conference (NELAC) Institute (TNI). The current EPLAB staff includes the Laboratory Manager, Laboratory Quality Assurance Specialist (QAS), and three additional laboratory support personnel (laboratory technicians). The laboratory accreditations include performing analyses for potable water microbiology, non-potable water general chemistry, and non-potable water microbiology.

9.1.1 ACCREDITATION AND CERTIFICATIONS

EPLAB operates in compliance with the 2016 Environmental Laboratory Sector Standards set by TNI and in accordance with Chapter 64E-1, FAC (Certification of Environmental Testing Laboratories), FDEP Quality Assurance requirements (Chapter 62-160, FAC), and FDOH Environmental Laboratory Certification requirements. As required by current TNI standards and FDEP regulations, the EPLAB must assess laboratory operations every 2 years, conduct annual management reviews, and perform proficiency tests every 6 months as a part of the continuing certification process. All laboratory personnel are required to obtain certification to perform specific analyses in the laboratory including documentation of Initial and Continuing Demonstrations of Capability (IDOC/CDOC) and analysis of Proficiency Testing samples. Results from the test samples are sent to FDOH for regulation compliance and compared to results from other laboratories nationwide. EPLAB staff typically excel at proficiency tests usually passing within two standard deviations of the national average. The frequency of reviews, tests, and audits conducted at the EPLAB and required for maintaining certifications and CCU goals are listed herein:

- The Laboratory Manager performs a Management Review of the EPLAB quality system and environmental testing activities each year, as required by the TNI Standards.
- An engineering consultant performs an operations review of the EPLAB annually.
- FDOH requires a laboratory audit every 2 years. The most recent biannual FDOH assessment was conducted by a private company under contract with FDOH. It was scheduled for October 2022, but was postponed and conducted in November 2022 because of Hurricane Ian.
- Proficiency tests are conducted semi-annually, typically in August and February. EPLAB received the tests February 8, 2023, and will be conducting the test in February 2023.
- Internal audits are completed periodically for ensuring system quality.

Table 9-1 lists the current certifications of the EPLAB, which are renewed July 1 each year.

Table 9-1 Laboratory Certifications

Analyte	Method/Tech	Category	Matrix
Escherichia coli	SM 9223 B	Microbiology	Drinking Water
Total coliforms	SM 9223 B	Microbiology	Drinking Water
Ammonia as N	EPA 350.1	General Chemistry	Non-potable Water
Ammonia as N	SM 4500-NH3 D-2011	General Chemistry	Non-potable Water
Biochemical Oxygen Demand (BOD)	SM 5210 B-2016	General Chemistry	Non-potable Water
Carbonaceous BOD (CBOD)	SM 5210 B-2016	General Chemistry	Non-potable Water
Chloride	SM 4500-Cl^- E	General Chemistry	Non-potable Water
Conductivity	EPA 120.1	General Chemistry	Non-potable Water
Enterococci	ENTEROLERT / QUANTI-TRAY	Microbiology	Non-potable Water
Fecal Coliforms	COLILERT®-18	Microbiology	Non-potable Water
Fecal Coliforms	SM 9222 D-2015	Microbiology	Non-potable Water
Kjeldahl Nitrogen - Total	EPA 351.2	General Chemistry	Non-potable Water
Nitrate as N	EPA 353.2	General Chemistry	Non-potable Water
Nitrate as N	SM 4500-NO3 H-2016	General Chemistry	Non-potable Water
Nitrite	SM 4500-NO2-B-2011	General Chemistry	Non-potable Water
Nitrite as N	EPA 353.2	General Chemistry	Non-potable Water
Phosphorus, total	EPA 365.4	General Chemistry	Non-potable Water
Residue-Filterable (TDS)	SM 2540 C-2015	General Chemistry	Non-potable Water
Residue-Nonfilterable (TSS)	SM 2540 D	General Chemistry	Non-potable Water
Sulfate	ASTM D516-16	General Chemistry	Non-potable Water
Total Nitrate-Nitrite	EPA 353.2	General Chemistry	Non-potable Water
Total Nitrate-Nitrite	SM 4500-NO3 H-2016	General Chemistry	Non-potable Water

Note: SM – Standard Method; ASTM - American Society for Testing and Materials.

9.1.2 Quality Assurance and Quality Control

The EPLAB has implemented a robust quality system that encompasses Quality Assurance (QA) and Quality Control (QC) activities. The EPLAB staff maintain a comprehensive guidance document, referred to as the *Quality Manual*, to document the processes and steps of QA/QC. The EPLAB Quality Manual was revised on February 2, 2023, to include corrective actions implemented because of the November 2022 FDOH audit; the revised version (3.8) has been effective since February 2, 2023.

The document contains 28 sections, including organization, document control, purchasing services and supplies, client service, control of records, data integrity, environmental conditions, calibration, sample handling, quality assurance, and reporting methods. TNI

standards are referenced for each section of the Quality Manual, which allows for quick reference between this local document and the TNI standards. In addition, staff have also developed in-house standard operating procedures (SOPs) for select tasks. The SOPs are maintained and revised annually to coincide with new TNI standards in accordance with FDOH's Environmental Laboratory Program. Hardcopies of the most current Quality Manual and SOPs are readily available to EPLAB staff in the laboratory. A Master List of all documents currently in use in the laboratory including effective date, revision number, and location is maintained by the QAS.

QA procedures are well documented, and all laboratory personnel have received documented training on all quality assurance/control protocols. Chain-of-custody documentation is strictly adhered to during sample receipt and handling. Laboratory equipment is tested for accuracy in accordance with the Quality Manual. Samples are arranged efficiently for analysis by batches to reduce the numbers of blanks, calibration standards, and QC samples needed per analysis.

Electronic entry of data at the laboratory station or output of an automatic analyzer directly to report forms has eliminated one source of potential errors. Organization of data in an electronic format would allow direct input into FDEP forms, which would eliminate another source of data entry error. Currently, FDEP water quality forms are not compatible with LIMS. The FDEP forms are expected to be updated soon. QA by a responsible person-in-charge is required to check hand-entered data entries. All data are reviewed and approved by the Laboratory Manager or QAS before being released to the client or FDEP. Laboratory results from the outside laboratories are received, reviewed, and forwarded to the WTP and WRF Chief Operators for use in compliance reporting.

9.1.3 Record Keeping

The Quality Assurance Manual and SOPs are kept in a neat and organized manner and are easily accessible to all laboratory personnel. Safety Data Sheets (SDSs) required by the Hazard Communication Standard (29 CFR 1910.1200(g)) are available for all chemicals used in the laboratory. Copies of FDOH certifications for the outside laboratories are maintained by the QAS. Personnel records, including documentation of training and IDOC/CDOC, are maintained by the Laboratory Manager and QAS. All sample data are cross-referenced to sampling information, standards and reagent information, and analysis logbooks using chain-of-custody and the assigned unique sample ID. Electronic data are backed up daily, and historical data are archived on an external hard-drive. Paper and electronic records are well maintained to meet regulatory requirements. Sampling schedules for each facility are clearly posted for staff to review, and all upcoming special sampling events (e.g., Annual Effluent Analysis, Cryptosporidium, and Giardia) are clearly posted with their due dates. Sample receiving and documentation procedures have been upgraded to be fully electronic, but the chain of custody is managed and tracked by hard copy.

9.1.4 Data Management

The laboratory uses the EthoSoft web-based X-LIMS (Laboratory Information Management System) for data management. The LIMS software is used to prepare paper documentation forms and to assign unique sample identification numbers to samples for recording and tracking results. The LIMS can be used to track samples through the storage, analysis, and reporting phases, reducing the possibility of error. The Laboratory Manager can produce daily status reports of all current laboratory work through LIMS. The LIMS is also capable of monitoring quality control results and chemical use to manage supplies ordering. A hardcopy tracking system, developed by the Laboratory Manager, is also used in conjunction with LIMS for those analytes not suited to electronic tracking. Data in the LIMS and on all computers used in the laboratory are backed-up daily by the County's IT Department and to the EthoSoft off-site server ("the Cloud"). All analytical data are also downloaded annually by the QAS onto an external hard drive for long-term storage.

9.1.5 Laboratory Operations and Site Visit

Jones Edmunds staff visited the EPLAB on February 9, 2023, and met with the Laboratory Manager, Sandra Lavoie, to discuss operations in FY 2022. The Laboratory Manager reviews the WRF's permits, provides operators with pre-labeled sampling bottles, and coordinates sampling events to account for the lab's staffing and analytical capabilities, sample holding times, and water quality compliance schedules. During FY 2022, the EPLAB received 8,066 samples and conducted 30,694 analyses. EPLAB sends some samples to outside laboratories that are certified to perform tests that EPLAB is not certified to perform. The EPLAB used external laboratories to process an additional 3,245 analyses for a total of 33,939 analyses.

The Laboratory Manager indicated that the increase in sample load was due to the continuing long-term monitoring program for Spring Lake that includes eight wells and two channels of sampling that began in early 2020 for the East Port and Burnt Store WRFs and other events that occurred such as Hurricane Ian and its aftermath. The number of samples and analyses required from the laboratory are expected to increase with the future AWT upgrades to the WRFs, requiring frequent sampling of total phosphorus, which is a labor-extensive process due to the digestion steps. The laboratory received a new automatic analyzer that will increase reliability (using the old analyzer as a backup) and sampling capabilities. Training on the new analyzer is currently underway as they continue with the normal duties of the EPLAB.

The following reviews, tests, reports, and trainings were completed in FY 2022:

- The annual Management Review of the EPLAB quality system and environmental testing activities was submitted in 2022.
- The EPLAB participated in and passed two TNI/FDOH-mandated Proficiency Testing studies (in February 2022 and August 2022). Staff achieved a score of 100 percent. The next set of proficiency testing is scheduled for the first quarter in 2023 and EPLAB has received the tests and is underway with this testing.
- The Quality Integrity System Report was completed in December 2022.
- The annual Ethics and Data Integrity training for all laboratory staff in the EPLAB was completed in August 2022.
- The Laboratory performed the water quality testing for clear drinking water systems after Hurricane Ian.

The EPLAB workspace consists of five main rooms:

- Sample receiving and storage.
- Un-refrigerated chemicals and equipment storage.
- Administrative workstations for laboratory technicians.
- Main laboratory benches.
- Drinking water laboratory.

No deficiencies were noted by Jones Edmunds during the February 2023 laboratory site visit. The areas are kept clean and orderly, and staff does an excellent job of maintaining the workspaces. Review of internal laboratory documentation indicates that all IDOC/CDOC records are complete and up to date, SOPs for all certified methods were reviewed and revised (as needed) during 2022, and all laboratory staff received appropriate quality assurance, SOP, and data integrity training. As noted by the Laboratory QAS, the laboratory staff continues to demonstrate their diligence in ensuring all laboratory data entries, chain-of-custody forms, bench sheets, etc., are correctly transferred to the final laboratory analysis report, which is used for reporting to regulatory agencies.

9.1.6 Review of Previous Report Recommendations

Table 9-2 CCU EPLAB FY 2021 Recommendations and Status

Recommendation:	▪ Continue implementation of the LIMS system. Evaluate hiring IT support that can work exclusively on the set-up and implementation of the LIMS or purchase a service package from the vendor to do the set-up of laboratory-specific forms and reports with remote installation.
Progress:	▪ Although some progress has been made in the LIMS implementation, time constraints on laboratory personnel due to sample load as well as instrument integration issues appear to have slowed progress. IT support or vendor technical support is being coordinated.
Recommendation:	▪ Evaluate staffing requirements and the ability to provide sampling services. The Laboratory Manager indicated that the EPLAB may be taking over field sampling services since current field samplers are changing departments and duties and will no longer be available to collect and/or transport samples. This includes spill sampling, water-quality sampling, groundwater sampling, surface water sampling, miscellaneous sampling, and sample transport. Current laboratory staffing does not appear to be appropriate for the expected analytical workload for FY 2023. Adding sampling services may require at least one additional EPLAB staff member.
Progress:	▪ The Laboratory Manager indicated that the field sampling services that were being provided by the laboratory staff have stopped so that the staff can focus on the additional regulatory requirements and QC measures as well as the increase in sampling and analyses that has occurred. An additional laboratory technician should be added in FY 2023 to have sufficient training time and to prepare for the additional items noted above including the additional samples and analyses that will be required when the WRFs are upgraded to AWT.

Recommendation:	▪ Update personnel on new sampling procedures including the need for accuracy in use of collection bottles, sample storage, and delivery to the laboratory.
Progress:	▪ Reoccurring. EPLAB has had meetings to continue to improve and keeping personnel updated.
Recommendation:	▪ Recommend seeking certification for potable water TDS and Sulfate.
Progress:	▪ Ongoing. Currently, sufficient sample load to warrant these certifications for this matrix are not apparent.

9.2 ASSET MANAGEMENT

Asset management is the practice of managing capital assets to minimize cost of operations to owners and establish individual level(s) of service to be delivered. Asset management plans are developed as a tool to record all the owner's asset management practices and strategies. Typically, an EAMS such as Cityworks is used to manage asset data.

According to the *Reference Guide for Asset Management Tools* (June 2020), EPA has identified that an Asset Management Plan (AMP) should include the following components:

- Introduction – Identifies goals, strategic plan, mission statement, and other relevant background information.
- Staff Information – Identifies system staffing structure and asset management team. Includes stakeholder education and outreach.
- Level of Service – Defines the system operation and expectations for customer service delivery.
- Asset Inventory – Identifies and evaluates system assets. Includes evaluation of criticality, probability/consequence of failure, and remaining useful life.
- Operation and Maintenance – Identifies and tracks applicable operating procedures and required maintenance routines.
- Capital Improvements – Identifies short- and long-term asset rehabilitation and replacement projects based on Asset Inventory and O&M data.
- Financial Strategy – Determines if system revenue(s) will be adequate to fund current and future O&M and Capital Improvements. This component reasonably ensures the desired LOS is economically feasible.
- Compliance – Identifies and tracks requirements for system compliance with respect to federal and state guidelines.
- Preparedness – Identifies emergency procedures to maintain system operations such as emergency power backup.

The EPA Reference Guide also identifies the following as additional components that may be included to increase the value and effectiveness of an AMP, although they are not noted as required: energy management, water efficiency, climate change, regional planning, and multi-sector asset management.

CCU does not currently have an AMP; however, over recent years the BCC has taken a forward approach in continuing to develop its Strategic Plan. The Charlotte County Strategic Plan is updated every fiscal year and includes goals, initiatives, and highlighted past achievements

for identified "strategic focus areas." In 2020, the BCC streamlined the Strategic Plan by narrowing the number of focus areas from nine to four. The current Strategic Plan focus areas are described as follows:

- Public Services – To maintain a safe and healthy community by delivering essential services from skilled, professional, and dedicated public servants.
- Economic and Community Development – To create a business climate that promotes a diversified, growing economy consistent with sustainable growth management plans, environmental stewardship, and enhanced quality of life.
- Infrastructure - To build and maintain countywide infrastructure that meets our evolving needs and enhances our community appearance, improves public safety, and protects our natural resources.
- Efficient and Effective Government - To manage fiscally sound county operations with a culture of transparency, accountability, citizen engagement and innovation.

In 2020, Charlotte County retained Jones Edmunds to implement Cityworks EAMS in support of the County's Strategic Plan. Cityworks EAMS will be used to standardize the work and asset tracking process in a robust system with capabilities to schedule routine maintenance and tasks, identify and track hot spots and issues with infrastructure, and report on key performance indicators across County Departments. Initially, Cityworks will be implemented in the Utilities, Facilities, and Public Works Departments.

As part of these efforts, Jones Edmunds and CCU began with a review of current GIS data, as Cityworks is built on the spatial data for assets in the system. The Jones Edmunds team recommended GIS database schema edits to bring the data in conformance with industry standards as well as adding the necessary fields for Cityworks use. Part of the scope included development of a vertical asset schema for the CCU plants, which organizes specific plant assets into database tables that are then related to the physical plant location or room where they reside, which is then captured spatially within the GIS. Polygons for plant process areas were created as part of this project for this purpose. The CCU team is currently developing the final list of assets, both vertical assets for plants, and linear assets such as pipes, valves, hydrants, etc. The GIS data will be published to the database to be used by Cityworks and will become the database of record for all work done within the County.

Jones Edmunds met with the various groups within CCU including Water Distribution, Wastewater Collection, Engineering, Reclaimed Water, Treatment Facilities, and Instrumentation and Control to learn about current workflow processes and work that is done on the CCU assets (scheduled and routine maintenance, emergency maintenance asset replacement, etc.). These meetings, combined with the 2018 departmental work process evaluation performed by LA Consulting, assist in configuring Cityworks to capture the work and needed information for the EAMS. Configuration includes the elements of:

- Domain and Groups set up to determine how information can be shared across department boundaries.
- GIS configuration and Map Development specifically configured for CCU staff to use in the field.
- Work Orders, which will reflect activities performed.
- Service Requests, which will capture internal and external requests for information on the CCU assets.

- Inspections, which will hold custom questions and information routinely checked for assets in the system.
- Crews, which provides efficient association of costs to each Work Order.
- Projects, to streamline activity tracking.
- Inboxes, which will support the major workflow activity tracking for each department.
- Dashboards and Reporting, which will employ both out-of-the-box and custom reports for data analysis and data mining.
- Storeroom, the Cityworks warehousing add-on that tracks materials influx, use and stock on hand. Different Storerooms will be set up for the CCU Storerooms as well as each of the trucks and their rolling stock.

The effort also includes integration with two global and three utilities-specific software packages in use at the County. Eden integration has been completed and will allow for an up-to-date employee record for assigning work in Cityworks. PublicStuff will soon be connected to Cityworks such that a complaint filed by a citizen or entered via a call center will result in a Service Request assignment within Cityworks for one of the CCU departments as applicable. An integration with Banner, the customer information system, will be designed to cut down on duplication of work entered between the two systems. An integration with SCADA will allow the creation of Work Orders based on alarms and equipment run times. Finally, the effort will integrate Cityworks with GraniteNET so that the County can more easily pass information between Cityworks and the CCTV pipe inspection system.

The current schedule for full implementation is for CCU to go-live with the software in Summer 2023. Before the go-live, a small group of "super users" will be trained and will spend time doing User Acceptance Testing. Following a testing period, the system can be tweaked with necessary adjustments to accommodate needs of CCU, then the remainder of Cityworks users will be trained on the updated system. Setup of the Cityworks add-on Performance Budgeting will follow go-live for users. This is the facet of Cityworks that will assist with planning and budgeting for future fiscal years, as well as the ability to compare planned effort versus actual effort across departments.

9.3 Operation and Information Technology

CCU operates facilities 24 hours per day, 365 days per year, to provide safe drinking water for Charlotte County while collecting and treating wastewater so it can be distributed for beneficial re-use by reclaimed water customers. An integral part of daily operations involves monitoring and controlling facilities using the SCADA system, either on site or remotely; many smaller facilities such as lift stations are primarily operated remotely. Of equal importance is the Utility's ability to concurrently operate the numerous processes involved. Automation of these tasks, as for most cases in the CCU system, allow CCU to deliver their utility services at the lowest feasible cost to the customer. However, automated systems are more susceptible to network threats, so cybersecurity should be considered and evaluated as a forefront issue for every SCADA or network improvement.

The existing CCU utility systems include many acquired assets. Several facilities represent multiple projects involving different engineers, bid contractors, and SCADA system integrators. This has resulted in a SCADA system of mixed hardware, software, and architectures that includes diverse and separate operations. Supporting and maintaining information for sharing and use can become problematic even for the most basic operations. CCU completed the SCADA Master Plan (McKim & Creed, March 2020) to improve this situation with a goal of standardizing hardware and software platforms and improving the overall system operations.

The primary goal of the SCADA Master Plan was to define and document a road map for the implementation of the technology, practices, and organization required to meet CCU's short-term goals and long-term vision for SCADA.

CCU's short-term SCADA goals include:

- Assess CCU's current SCADA infrastructure.
- Identify equipment and systems that are inefficient, aging, or obsolete.
- Evaluate the best, most cost-effective options for improvements for equipment, communications, and software.
- Recommend standards for equipment, communications, and software.
- Identify and cost projects to implement these goals.

CCU's long-term SCADA goals include:

- Bring all services onto a common SCADA platform to be shared throughout CCU.
- Provide a central location to monitor all CCU operations during non-business hours and during weather emergencies.
- Expand SCADA services to supplement future utility service expansions in the most efficient manner.
- Provide management with timely operational data to better monitor and optimize operations.
- Provide SCADA data to integrate with other County software packages, such as the new EAMS.

These goals were used in the SCADA Master Plan to develop recommendations to incorporate into CCU's current and future planning, CIP, and O&M programs. Many improvements are inter-related. Specific recommendations from the SCADA Master Plan are included in Chapter 10 and are summarized as follows:

- Conduct a cybersecurity audit of the SCADA system to assess the vulnerability of the system and prepare for AWIA compliance.
- Establish and implement new CCU standards for software, equipment, and communications. These standards will help minimize the number of platforms in use by CCU, reducing the investment in spare parts and the training requirements as well as improving the knowledge and efficiency of the maintenance staff. This will also allow CCU to better manage and control future SCADA project implementations.
- Define and implement new policies and procedures for changes in management, contingency, and disaster recovery.

- Migrate from the two SCADA software platforms currently in use at CCU to a single SCADA platform provided by Trihedral's VTScada. CCU began converting to VTScada in 2021 and should continue to implement VTScada in accordance with the SCADA Master Plan.
- Upgrade the control systems equipment at CCU major facilities as outlined in the SCADA Master Plan. Some of this work can be accomplished as stand-alone projects and other work can be implemented as part of planned CIP projects.
- Work with the County IT Department to expand the County's fiber optic network to include all major CCU facilities, specifically the Rotonda WRF and Burnt Store facilities. Expansion to include smaller facilities (existing and future) should be included as it is deemed cost-effective.
- Establish a Central Command Center at the East Port WRF. The Central Command Center would give CCU greater day-to-day operational flexibility and would provide monitoring and control of remote facilities during an extreme weather event.
- Integrate the new SCADA system with other CCU systems such as LIMS, EAMS, and GIS. This integration will decrease manual data entry and related errors, increase efficiency and automation of the process, and provide an infrastructure to apply analytics and artificial intelligence.

10 CONSOLIDATED RECOMMENDATIONS

10.1 PLANNING RECOMMENDATIONS

Table 10-1 through Table 10-7 summarize the Planning Recommendations from the FY 2022 Annual Report. The recommendations have been compiled from each chapter and summarized for each CCU workgroup.

In general, CCU should continue planning for repairs of facilities and assets from damage due to Hurricane Ian, as documented by the FEMA assessments conducted in November 2022 by Jones Edmunds, Kimley-Horn, and HDR.

10.1.1 ADMINISTRATIVE

Table 10-1 Administration Planning Recommendations

Recommendation:	Continue CCU's vision to ensure safe, reliable utility services at fair and reasonable rates.
Recommendation:	Continue developing and updating standards for water and sewer construction to ensure the most effective use of capital improvement funds.
Recommendation:	Continue developing options for water, sewer, and reclaimed water service in the County to meet a growing demand for municipal utility services.
Recommendation:	Continue developing the Utilities' Information System functions to update/replace software and computer equipment to increase operating efficiencies and cost savings.
Recommendation:	Continue exploring regional solutions to water and wastewater service needs for the mutual benefit of Charlotte County and adjoining counties and cities.
Recommendation:	Verify that Murdock Building meets Category 3 or higher building standards.[1]
Recommendation:	Continue to document planned and proposed developments to assist with future planning.
Recommendation:	Continue to pursue FEMA funding for rehabilitation of utility assets damaged by Hurricane Ian.
Recommendation:	Continue to evaluate the feasibility of rehabilitating the damaged Administration Building.
Recommendation:	Develop/update the Business Continuity Plan.[1]
Recommendation:	Become a member of an intrastate mutual aid and assistance program.[1]
Recommendation:	Remove USB port slots from select desktops to limit the vulnerability of the SCADA system.[1]
Recommendation:	Develop a cybersecurity culture through training and internal programs.[1]
Recommendation:	Require equipment vendors for HMI, field controllers, field devices, etc., and software suppliers for data management to provide information on cybersecurity and updates for their products.[1]

Recommendation:	Weigh the options for automation in future designs to consider cyber threats and include manual components where applicable to increase infrastructure resilience.[1]
Recommendation:	Complete a rate study evaluation to determine fair adjustments to current water, sewer, and reclaimed water rates as it relates to ongoing and future projects (current rates were established in 2021).
Recommendation:	Continue to develop and host public education events to educate the community on the benefits water of reclaimed water.

[1] Recommendation from the RRA Report (March 2020).

10.1.2 Water Treatment Plants

Table 10-2 Water Treatment Planning Recommendations

Recommendation:	Develop a wildfire ERP, identify fire hydrant locations, and coordinate with Fire Department for trainings for critical assets.[1]
Recommendation:	Update the ERP for pipe failure for all critical assets.[1]
Recommendation:	Identify a backup chemical and fuel supplier in the event of a chemical or fuel shortage.[1]
Recommendation:	Develop an ERP for operating without the support of SCADA.[1]
Recommendation:	Develop a procedure and obtain the equipment for transporting key chemicals (fuel and chlorine) from one site to another if required in an emergency.[1]
Recommendation:	Link contamination detection to SCADA to immediately shut down or lockout any pump in operation.[1]
Recommendation:	Prepare staff training for monochloramine conversion of the Burnt Store system.
Recommendation:	Evaluate installation of monitors in operators' offices in operations building for improved security surveillance.
Recommendation:	Evaluate the feasibility of constructing a new water treatment plant to treat water from the Babcock Ranch Wellfield.
Recommendation:	Continue to coordinate with PRMRWSA to better determine available PRMRWSA future capacity and reserve additional capacity, as needed based on CCU's projected future flows.

[1] Recommendation from RRA Report (March 2020).

10.1.3 Water Distribution System

Table 10-3 Water Distribution Planning Recommendations

Recommendation:	Continue to update the water system hydraulic computer model and use it as a planning tool for future water system improvements.
Recommendation:	Continue the AMI Water Meter Replacement Program.
Recommendation:	Continue to integrate acquired utilities into the overall CCU water system to maximize reliability and reduce costs to CCU customers.
Recommendation:	Explore ways to augment the demands on the PRMRWSA treatment facility through economically feasible means including new water sources.
Recommendation:	Continue to make improvements at the water storage tank/booster pumping station facilities to increase reliability and control of the pumps to improve water distribution to customers.

Recommendation:	Continue to develop and update water quality models for each distribution systems for use in ongoing development reviews.
Recommendation:	Create a water system O&M Manual and operating protocols.
Recommendation:	Develop a best management practice plan to standardize pump and motor sizing across CCU pumping facilities to better facilitate maintenance and replacement of equipment.

10.1.4 Wastewater Collection System

Table 10-4 Wastewater Collection System Planning Recommendations

Recommendation:	Continue the scheduled repair of sanitary lift stations that have deteriorated due to age and hydrogen sulfide presence.
Recommendation:	Continue to use the wastewater lift station and force main computer model to assess the need for upgrades to the system based on expected demand for services.
Recommendation:	Continue to televise and smoke test gravity sewers to locate source(s) of I/I. Repair gravity sewers and manholes as required to mitigate I/I and regain sewer and WRF capacity.
Recommendation:	Continue construction and plan for the next phases of sewer expansion in the Port Charlotte area in accordance with 2017 Sewer Master Plan.
Recommendation:	Install odor-control systems at lift stations where hydrogen sulfide concentrations cause odors and deteriorate structures.
Recommendation:	Complete construction of the Ackerman Vacuum Station.
Recommendations:	Master Lift Station No. 801 – Field ▪ Evaluate replacing the electromagnetic flow transmitter for the force main.
Recommendations:	Master Lift Station No. 882 – Oldsmar ▪ Evaluate replacing the skid for the odor-control unit. ▪ Evaluate removing the fallen trees from the site.
Recommendations:	Lift Station No. 404 – Big Pine ▪ Evaluate replacing the submersible pump discharge piping, plug valves, check valves, and dedicated discharge connection.
Recommendations:	Lift Station No. 408 – Cabana ▪ Evaluate replacing the submersible pump discharge piping, plug valves, check valves, and the dedicated discharge connection.
Recommendations:	Lift Station No. 409 – Santa Inez ▪ Evaluate replacing the submersible pump discharge piping, plug valves, check valves, and dedicated discharge connection. ▪ Evaluate replacing the valve vault hatch and associated lock.
Recommendations:	Lift Station No. 410 – Monza ▪ Evaluate replacing the submersible pump discharge piping, plug valves, and check valves, and dedicated discharge connection. ▪ Evaluate replacing the valve vault hatch and associated lock.

Recommendations:	Lift Station No. 411 – San Ciprian ▪ Evaluate replacing the submersible pump discharge piping, plug valves, and check valves. ▪ Evaluate replacing the valve vault hatch and associated lock.
Recommendations:	Lift Station No. 802 – Ball Park ▪ Perform thorough rehabilitation including some form of structural improvement and lining repair. ▪ Evaluate replacing the submersible pump discharge piping.
Recommendations:	Lift Station No. 804 – Gas Station ▪ Perform thorough rehabilitation including some form of structural improvement and lining repair. ▪ Evaluate replacing the antenna mast.
Recommendations:	Lift Station No. 807 – Post Office ▪ Perform thorough rehabilitation including some form of structural improvement and lining repair. ▪ Evaluate replacing the submersible pump discharge piping, plug valves, and check valves.
Recommendations:	Lift Station No. 808 – Publix ▪ Perform thorough rehabilitation including some form of structural improvement and lining repair. ▪ Evaluate replacing the submersible pump discharge piping.
Recommendations:	Vacuum Station No. 1 – Skylark (LS 59) ▪ Evaluate modifying the overhead crane with a trolley for lateral movement. ▪ Evaluate a catwalk or dedicated ladder for accessing the top of the tank for maintenance. ▪ Evaluate replacing the check valve.
Recommendations:	Vacuum Station No. 3 – Harbor (LS 143) ▪ Evaluate stairs or similar access to the generator to return to conformance with the National Electric Code. ▪ Evaluate a catwalk or ladder for accessing the top of the tank for maintenance. ▪ Evaluate a dedicated overhead crane for safer and easier access of the vacuum pumps. ▪ Verify that the vacuum station site is in accordance with OSHA and County safety and confined-space requirements.

10.1.5 Wastewater Treatment Facilities

Table 10-5 WRF Planning Recommendations

Recommendation:	Evaluate the need for technical support from the software company or from the County's IT group with hours set aside to work exclusively on data transfer and report set-up and implementation to expand and optimize the LIMS capabilities.
Recommendation:	Evaluate cost-effective disposal alternatives for dewatered biosolids other than transporting to Synagro and the landfill as part of the plant upgrade.
Recommendation:	Replace septage receiving pre-treatment units when repair is no longer cost effective and modify to allow septage treatment in aerated sludge-holding tank and/or pump to the headworks.
Recommendation:	Complete financing and project preparations for bidding and construction of the East Port WRF expansion project.
Recommendation:	Complete financing and project preparations for bidding and construction of the Burnt Store WRF expansion project.
Recommendation:	Prepare an MIT plan for IW-1 at the East Port WRF for approval by FDEP. The next MIT should be completed and submitted to FDEP prior to September 4, 2024.
Recommendation:	Complete MIT for IW-1 at the Burnt Store WRF. The renewal MIT plan was submitted and approved by FDEP on September 13, 2022. The renewal MIT should be completed and submitted to FDEP prior to May 30, 2023.
Recommendation:	Complete evaluation for expansion of West Port WRF and determining future use of Rotonda WRF, based on future flows. See previous Annual Reports for CIP recommendations related to West Port WRF.
Recommendation:	Evaluate different aeration systems for the reclaimed water storage pond at the Rotonda WRF.
Recommendation:	Evaluate additional denitrification capacity for Rotonda WRF.
Recommendation:	Evaluate adding another EQ tank to respond to additional surges at Rotonda WRF.
Recommendation:	Evaluate additional reclaimed water storage at the Rotonda WRF.
Recommendation:	Create O&M Manuals for each plant based on EPA criteria.
Recommendation:	Evaluate the existing Burnt Store WRF generator performance to determine limitations that may occur prior to construction of plant expansion, which will include a new generator.

10.1.6 Reclaimed Water Distribution System

Table 10-6 Reclaimed Water System Planning Recommendations

Recommendation:	Maintain updated hydraulic models for Mid/West and South County to predict the impact of future demand on the reclaimed water transmission systems.
Recommendation:	Develop and complete a community survey to better determine potential reclaimed water customers. Results of the study can be used to determine economic feasibility of water delivery.

Recommendation:	Evaluate adding piping connections (including controls, pumps, valves, meters, etc.) to increase the number of small users in Mid County.
Recommendation:	Seek ways to increase the use of reclaimed water currently produced by CCU WRFs including improving reliability and access for customers.
Recommendation:	Create a reclaimed water system O&M Manual and operating protocols.
Recommendation:	Continue to develop and host public education events to educate the community on the benefits water of reclaimed water.

10.1.7 Utility Support Services

Table 10-7 Utility Support Services – Planning Recommendations

Recommendation:	Evaluate staffing, sample courier service, testing procedures, and equipment as it relates to future monitoring requirements. AWT expansions of East Port WRF and Burnt Store WRF will require additional testing; also, as of March 2023, the frequency of analysis for BOD, TSS, total nitrogen, and total phosphorus at East Port WRF increased from 5 days per week to 7 days per week.
Recommendation:	Develop Change Management/Version Control Standards.[1]
Recommendation:	Develop Contingency and Disaster Recovery Plan.[1]
Recommendation:	Develop Transition Plan for Lift Station Sites.[1]
Recommendation:	Hire New I&C Staff.[1]
Recommendation:	Use Cityworks implementation to develop Utility AMP to track water, wastewater, and reclaimed distribution systems and facilities.
Recommendation:	Continue to convert as-builts and incorporate complete projects into the existing GIS system. When possible, require contractors to provide as-built shapefiles as part of major construction project close-out.
Recommendation:	Fully complete transition to VT Scada at applicable facilities.[1]

[1] Recommendations from SCADA Master Plan (McKim & Creed, March 2020).

10.2 Capital Improvements

Table 10-8 through Table 10-21 summarize the CIPs that were identified and recommended during the FY 2021 condition assessments. Capital improvement recommendations refer to items that are expected to exceed $100,000 to accomplish. The recommendations have been compiled from each chapter and are summarized for each CCU Workgroup.

10.2.1 Administrative Buildings

Table 10-8 East Port Environmental Campus - CIP Recommendations

Recommendation:	Continue to evaluate rehabilitation of the Administration Building and other local facilities damaged by Hurricane Ian.

[1] Recommendation from RRA Report (March 2020).

10.2.2 Water Treatment Plants

Table 10-9 Burnt Store RO WTP – CIP Recommendations

Recommendation:	Install additional permitted groundwater wells as needed to meet future demands as identified in the Water Master Plan. CCU should initiate plans to install at least one new well in 2023.
Recommendation:	Complete repair and rehabilitation of assets damaged by Hurricane Ian, maximizing use of available FEMA funds.

10.2.3 Water Distribution System

Table 10-10 Mid/West County Distribution System – CIP Recommendations

Recommendations:	<u>WBS General</u> ▪ Complete load studies and arc-flash labeling for electrical equipment in order to meet compliance with NFPA 70E. ▪ Complete repair and rehabilitation of assets damaged by Hurricane Ian, maximizing use of available FEMA funds. ▪ Complete construction of the new O'Hara WBS and place the new WBS into service. This improvement was identified in the Water Master Plan as a water quality improvement which would significantly reduce flushing. ▪ Begin design of the new Robin WBS and place the new WBS into service. This improvement was identified in the Water Master Plan as a water quality improvement which would significantly reduce flushing.
Recommendations:	<u>Walenda WBS</u> ▪ Complete the generator replacement project at the WBS, including a new generator and fuel tank designed above the flood plain. ▪ Continue to monitor performance of the electrical systems to ensure proper functionality and replace insufficient components as needed. Electrical equipment is being evaluated as part of the WBS Upgrades project.
Recommendations:	<u>Gulf Cove WBS</u> ▪ Replace the concrete pipe connecting the GST to the pump station at the WBS.[1] ▪ Complete the generator replacement project at the WBS, which includes a new generator and fuel tank designed above the flood plain. ▪ Complete HSP #2 repairs and place pump back into service. ▪ Continue to monitor performance of the electrical systems to ensure proper functionality and replace insufficient components as needed. Electrical equipment is being evaluated as part of the WBS Upgrades project.
Recommendations:	<u>Rotonda WBS</u> ▪ Replace approximately 1,100 feet of 12-inch piping that restricts flow/capacity of the 24-inch line (from the tank to just north of Conway Road) feeding the Rotonda water booster tank. ▪ Continue to monitor electrical systems performance to ensure proper functionality and replace insufficient components as needed. Electrical equipment is being evaluated as part of the WBS Upgrades project.

[1] Recommendation from RRA Report (March 2020).

Table 10-11 South County Distribution System – CIP Recommendations

Recommendation:	Continue replacing old "class" PVC pipe in the distribution system with new C-900 PVC pipe.
Recommendation:	Continue developing a computerized hydraulic model for the South County distribution system.
Recommendation:	Investigate the feasibility of installing interconnects with neighboring utilities.[1]
Recommendation:	Complete repair and rehabilitation of assets damaged by Hurricane Ian, maximizing use of available FEMA funds.

[1] Recommendation from RRA Report (March 2020).

10.2.4 Wastewater Collection Systems

Table 10-12 Sewer and Lift Station Systems – CIP Recommendations

Recommendation:	Complete repair and rehabilitation of assets damaged by Hurricane Ian, maximizing use of available FEMA funds.
Recommendations:	Master Lift Station No. 882 – Oldsmar ▪ Replace the barbed wire and fence around the site.
Recommendations:	Lift Station No. 404– Big Pine ▪ Evaluate replacing the submersible pump discharge piping, plug valves, check valves, and dedicated discharge connection.
Recommendations:	Lift Station No. 408 – Cabana ▪ Evaluate replacing the submersible pump discharge piping, plug valves, check valves, and the dedicated discharge connection.
Recommendations:	Lift Station No. 409 – Santa Inez ▪ Evaluate replacing the submersible pump discharge piping, plug valves, check valves, and dedicated discharge connection.
Recommendations:	Lift Station No. 410 – Monza ▪ Evaluate replacing the submersible pump discharge piping, plug valves, and check valves, and dedicated discharge connection.
Recommendations:	Lift Station No. 411 – San Ciprian ▪ Evaluate replacing the submersible pump discharge piping, plug valves, and check valves.
Recommendations:	Lift Station No. 802 – Ball Park ▪ Perform thorough rehabilitation including some form of structural improvement and lining repair.
Recommendations:	Lift Station No. 804 – Gas Station ▪ Perform thorough rehabilitation including some form of structural improvement and lining repair.
Recommendations:	Lift Station No. 807 – Post Office ▪ Perform thorough rehabilitation including some form of structural improvement and lining repair. ▪ Evaluate replacing the submersible pump discharge piping, plug valves, and check valves.
Recommendations:	Lift Station No. 808 –Publix ▪ Perform thorough rehabilitation including some form of structural improvement and lining repair.

Recommendations:	Vacuum Station No. 1 – Skylark (LS 59) ▪ Evaluate modifying the overhead crane with a trolley for lateral movement. ▪ Evaluate a catwalk or dedicated ladder for accessing the top of the tank for maintenance.
Recommendations:	Vacuum Station No. 3 – Harbor Vac (LS 143) ▪ Evaluate a catwalk or ladder for accessing the top of the tank for maintenance. ▪ Evaluate a dedicated overhead crane for safer and easier access of the vacuum pumps.

Table 10-13 Vacuum System – CIP Recommendations

Recommendation:	Evaluate staffing requirements and ability to provide additional sampling support to Operations staff.
Recommendation:	Complete repair and rehabilitation of assets damaged by Hurricane Ian, maximizing use of available FEMA funds.
Recommendation:	Evaluate hiring IT support that can work exclusively on the set-up and implementation of the LIMS or purchase a service package from the vendor to do the set-up of laboratory-specific forms and reports with remote installation.

10.2.5 Wastewater Treatment Facilities

Table 10-14 East Port WRF – CIP Recommendations

Recommendation:	The previous CIP recommendations have been consolidated and incorporated into the East Port WRF expansion project.
Recommendation:	Provide a fixed panel cover over the CCC.

Table 10-15 West Port WRF – CIP Recommendations

Recommendation:	Repair wind damage to the CCC's roof, the generator MCC building, and the deep well injection pump building.
Recommendation:	Resolve hydraulic constraints in the irrigation wet well for the injection well pumps to allow disposal of excess reclaimed water from West Port during wet-weather events.
Recommendation:	Install a galvanized metal frame and UV cover above each filter tank to prevent algae growth in the filters.
Recommendation:	Clear and recondition the stormwater pond near the headworks.

Table 10-16 Rotonda WRF – CIP Recommendations

Recommendation:	Previous recommendations for the headworks including influent valves, flow control, grit cyclones, and screens have been consolidated and incorporated into the headworks improvement project at Rotonda WRF.
Recommendation:	Add an MBR cassette to existing trains as capacity needs dictate.
Recommendation:	Add galvanized metal frame and UV shade cloth to the CCCs.
Recommendation:	Add a small winch to each decant pump in the sludge-holding tanks for better control of the pump level.

Recommendation:	Complete repairs to generator No. 2.
Recommendation:	Replace HSPS No. 1 motors with outdoor-rated ones to match HSPS No. 2.
Recommendation:	Replace the permeate pump to MBR No. 3.
Recommendation:	Complete replacement of Blower No. 2.

Table 10-17 Burnt Store WRF – CIP Recommendations

Recommendation:	The previous CIP recommendations have been consolidated and incorporated into the Burnt Store WRF expansion project.

Table 10-18 Leachate Treatment Facility – CIP Recommendations

Recommendation:	Complete rehabilitation of the influent holding tank. Work scheduled to be performed in 2023.
Recommendation:	Complete rehabilitation and upgrades of the influent pump station. Work scheduled to be performed in May 2023.

10.2.6 Reclaimed Water Distribution System

Table 10-19 Reclaimed Water Distribution System – CIP Recommendations

Recommendation:	CIP recommendations to improve capacities of treatment, storage, and pumping in the Mid/West County and South County systems for future demands are being developed as in the Reclaimed Water Master Plan.

10.2.7 Utility Support Services

Table 10-20 EPLAB – CIP Recommendations

Recommendation:	Investigate the benefit of purchasing analytical equipment to process additional sampling required for the AWT upgrades at the WRFs and increase of frequency of analysis for BOD, TSS, TN, and TP, at East Port WRF.
Recommendation:	Evaluate hiring IT support that can work exclusively on the set-up and implementation of the LIMS or purchase a service package from the vendor to do the set-up of laboratory-specific forms and reports with remote installation.

Table 10-21 Operation and Information Technology – CIP Recommendations

Recommendation:	Add Headworks PLC at Rotonda WRF to SCADA.
Recommendation:	Add PLCs at East Port WRF to SCADA.
Recommendation:	Build the Central Control Center at East Port WRF.
Recommendation:	Complete Cybersecurity Audit.
Recommendation:	Fully transition to VTScada Software at all plant facilities.
Recommendation:	Convert to VTScada Software (remote sites).
Recommendation:	Develop Lift Station/Reclaimed Water Booster Station Design Standards.

Recommendation:	Develop SCADA Specifications and Standards.
Recommendation:	Improve Septage Billing at East Port WRF.
Recommendation:	Replace PLC at Gulf Cove WBS, Walenda WBS, Englewood WBS, Golf Course WBS, Myakka WBS, Ingraham Disinfection Station, & Rotonda WRF.
Recommendation:	Install fiber at Gulf Cove WBS, Walenda WBS, Englewood WBS, Golf Course WBS, Ingraham Disinfection Station, El Jobean Vacuum Station, Harbor Vacuum Station, Skylark Vacuum Station, Rotonda RWBS, West Port RWBS, Walenda RWBS, Eagle Street RWBS, Rotonda WRF.
Recommendation:	Replace DH+ Network at West Port WRF.
Recommendation:	Replace Reclaimed Water Delivery Site Control Panels.
Recommendation:	Replace Switchgear at East Port WRF.

Note: All recommendations from SCADA Master Plan (McKim & Creed, March 2020).

10.3 Operation and Maintenance

Table 10-22 through Table 10-32 summarize the O&M items that were identified and recommended during the FY 2022 condition assessments. O&M recommendations refer to items that can be completed by CCU staff or within the Operations budgets (i.e., tasks that are expected to be less than $100,000). The recommendations have been compiled from each chapter and summarized for each CCU Workgroup.

10.3.1 Water Treatment Plants

Table 10-22 Burnt Store RO WTP – O&M Recommendations

Recommendation:	Perform yard maintenance around the perimeter fencing.[1]
Recommendation:	Repair the security gate mechanism so that it can be opened and closed remotely.
Recommendation:	Continue to inspect and tighten the connections for the scale inhibitor, sodium hydroxide, sodium hypochlorite, and sulfuric acid pipes daily to prevent leakage.
Recommendation:	Replace multiple end caps that are leaking on Train Nos. C and D.
Recommendation:	Install a cover over the transfer pumps and piping near the degasifier towers to prevent sun damage and prolong equipment life.
Recommendation:	Continue to spray wash the concentrate disposal wetwell as needed.
Recommendation:	Continue maintenance of controlled burns on the property to maintain shrub growth and fire buffer around wells.[1]
Recommendation:	Install bollards around the influent transformer box.[1]
Recommendation:	Install fire hose connections on the well piping.[1]
Recommendation:	Develop an ERP for valve failure in the clearwell and begin exercising the valve.[1]
Recommendation:	Repair or replace the pump at Well No. 8.
Recommendation:	Replace the media in the degasification towers. According to CCU staff, cleaning and inspection determined that replacement of media was most economically feasible solution.

[1] Recommendation from RRA Report (March 2020).

10.3.2 WATER DISTRIBUTION SYSTEM

Table 10-23 Mid/West County Distribution System – O&M Recommendations

Recommendation:	General ▪ Complete repair and rehabilitation of assets damaged by Hurricane Ian, maximizing use of available FEMA funds.
Recommendations:	Interconnects ▪ Lower the lighting fixtures under the canopy to illuminate the pumps and equipment at the EWD interconnect. ▪ Add an intrusion alarm to the CCU RTU panels.[1] ▪ Install bollards around the equipment.[1]
Recommendation:	Port Charlotte Golf Course WBS ▪ Perform yard maintenance around the perimeter fencing.[1] ▪ Clearly label chemical storage tanks and fill valves.[1] ▪ Label the switchgear to identify parts and components that could be energized.
Recommendation:	Walenda WBS ▪ Perform yard maintenance around the perimeter fencing.[1] ▪ Trim tree limbs on the northwest corner of the pump room.[1] ▪ Install bollards around the WBS effluent pipe.[1] ▪ Clearly label chemical storage tanks and fill valves.[1] ▪ Add additional signage indicating "No Trespassing, Violators will be Prosecuted" along fencing.[1] ▪ Continue to monitor performance of the electrical systems to ensure proper functionality and replace insufficient components as needed. Electrical equipment is being evaluated as part of the WBS Upgrades project.
Recommendations:	Gulf Cove WBS ▪ Pump out the water in the vault containing the HSP feed piping. ▪ Secure the electrical conduit for the newly installed cameras. ▪ Replace the exhaust fan in the ammonia chemical feed room. ▪ Continue to monitor water quality entering the Gulf Cove WBS.[1] ▪ Properly secure the pressure transducer at the back of the GST. ▪ Replace the corroded copper sodium hypochlorite chemical injection quill with a Schedule 80 material. ▪ Repaint the Pump Building. ▪ Continue to monitor performance of the electrical systems to ensure proper functionality and replace insufficient components as needed. Electrical equipment is being evaluated as part of the WBS Upgrades project.

	Rotonda WBS
Recommendation:	▪ Continue to monitor performance of the electrical systems to ensure proper functionality and replace insufficient components as needed. Electrical equipment is being evaluated as part of the WBS Upgrades project. ▪ Paint the wall that contains the HMI in the pump room. ▪ Replace the incoming breaker as soon as possible. The failure of this specific device may render the station out of service for an extended period. ▪ Further recommend that the gaps surrounding the VFDs be mitigated to prevent potential contact with live parts. ▪ Install bollards around the monitoring equipment.[1] ▪ Clearly label chemical storage tanks and fill valves.[1] ▪ Develop an ERP for WBS bypass and operations without laboratory and control room.[1] ▪ Develop a standard schedule for tank fill operations.
	Ingraham Disinfection Station
Recommendation:	▪ Clearly label chemical storage tanks.

[1] Recommendation from RRA Report (March 2020).

10.3.3 Wastewater Collection Systems

Table 10-24 Wastewater Collection System – O&M Recommendations

	Master Lift Station No. 882 – Oldsmar
Recommendation:	▪ Paint the check valve for the lead pump discharge. ▪ Remove the broken antenna from the site. ▪ Replace the barbed wire and fence around the site.
	Master Lift Station No. 404 – Big Pine
Recommendation:	▪ Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes. ▪ Replace the valve vault hatch and associated lock. ▪ Remove the fallen tree from lift station site.
	Lift Station No. 407 – Vincent
Recommendations:	▪ Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes. ▪ Replace the valve vault hatch and associated lock. ▪ Replace the generator receptacle. ▪ Remove sediment from valve vault drain opening.
	Lift Station No. 408 – Cabana
Recommendations:	▪ Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes. ▪ Replace the generator receptacle. ▪ Replace the wetwell hatch. ▪ Replace the valve vault hatch and associated lock. ▪ Remove sediment from valve vault drain opening.
	Lift Station No. 409 – Santa Inez
Recommendations:	▪ Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes. ▪ Replace the wetwell hatch. ▪ Remove sediment from valve vault drain opening.
	Lift Station No. 410 – Monza
Recommendations:	▪ Replace the wetwell hatch.

Recommendations:	Lift Station No. 411 – San Ciprian ▪ Replace the wetwell hatch. ▪ Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes. ▪ Replace the portable generator receptacle.
Recommendations:	Lift Station No. 802 – Ball Park ▪ Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes.
Recommendations:	Lift Station No. 808 – Publix ▪ Replace the valve vault hatch and associated lock. ▪ Remove sediment from valve vault drain opening.
Recommendations:	Vacuum Station No. 1 – Skylark (LS 59) ▪ Replace the plastic covers for the pump motor component. ▪ Add a fire extinguisher to the inside of the building.
Recommendations:	Vacuum Station No. 3 – Harbor Vac (LS 143) ▪ Verify the vacuum station site is in accordance with OSHA and County safety and confined-space requirements.

10.3.4 Wastewater Treatment Facilities

Table 10-25 East Port WRF – O&M Recommendations

Recommendation:	Convey Digester Decant, In-Plant Pump Station No. 1, and No. 2 Plant Recycle flows into the EQ Tank once expansion is complete.
Recommendation:	Repaint all faded or chipped paint on aboveground piping and pumps throughout the plant within the next 2 to 3 years.
Recommendation:	Repair damaged conduits, connectors, and conduit supports throughout plant, as identified in Section 6.2.
Recommendation:	Repair construction trailer and restore plumbing operations.
Recommendation:	Repair hurricane-related damage identified in Section 6.2.
Recommendation:	Replace hose bibs connections at the headworks.
Recommendation:	Replace insultation for Probe SC100 piping on Oxidation Ditch No. 2.
Recommendation:	Include more bird deterrents near the clarifiers.
Recommendation:	Rails for backwash mechanism at the filters are in fair condition but wall support is beginning to rust. The wall support should be painted.
Recommendation:	Replace base of pump heads at the HSPS No. 1 and Pond Transfer Pumps.
Recommendation:	Replace the irrigation pumping station electrical switchgear.

Table 10-26 West Port WRF – O&M Recommendations

Recommendation:	Inspect the reclaimed water HSP pumps to evaluate condition of shafts and other components.
Recommendation:	Secure all electrical switchgear to prevent unauthorized access or inadvertent exposure to live parts.

Table 10-27 Rotonda WRF – O&M Recommendations

Recommendation:	Add UV protection to the CCCs.
Recommendation:	Add UV protection to the sides of the chlorine storage tanks to protect from direct sun light.
Recommendation:	Replace Blower No. 5 with the correct lower scfm-capacity blower to lower oxygen levels and improve nitrogen removal.
Recommendation:	Continue to paint tanks, buildings, and pipes in the next 2 years.
Recommendation:	Adjust the membrane slack as soon as possible. These membranes are at the end of their life cycle and this maintenance is critical for their longevity.
Recommendation:	Continue monitoring and trending membrane permeability data and add temperature to the data collected weekly so permeability can be corrected with temperature to account for seasonal changes in water viscosity.
Recommendation:	Constantly monitor membrane permeability trend, especially for Train Nos. 3 and 4, for which end of life is estimated to be 2024 and 2026, respectively, since this trend can either accelerate or decelerate.
Recommendation:	Replace damaged pump at the pump-out station for truck loading.
Recommendation:	Complete electrical load study and arc-flash labeling.
Recommendation:	Purchase a few module blanks for top and bottom headers and wait to observe membrane effluent turbidity spikes, which would indicate that one of the cracked potting headers has breached the membrane integrity. Remove the compromised membrane module and install module blanks in its place until new purchased membrane module is received. Once the new membrane module is received, install the new membrane in the middle of the cassette and move an existing module where the compromised module was. This could prolong the new membrane module potting header life.
Recommendation:	A year before scheduled replacement, order membrane modules. Install new membrane modules in Train No. 1. Do not install new membrane modules with existing membrane modules in the same train. Move the existing membrane modules from Train No. 1 to Train No. 4. Train No. 4 will then have six membrane cassettes, which will extend the life of the membranes.

Table 10-28 Burnt Store WRF – O&M Recommendations

Recommendation:	Perform maintenance and equipment replacement as necessary until the WRF expansion can be completed.
Recommendation:	Investigate high frequency of replacement of chemical feed pumps. Consider replacement using different manufacturer and/or equipment model.
Recommendation:	Complete motor repairs for Blower No. 1 and place back in service.
Recommendation:	Repair front access gate from hurricane-related damage and fully establish security.
Recommendation:	Continue to evaluate and repair composite sampling units as necessary.
Recommendation:	Evaluate replacement of EQ tank Pump No. 2 due to fused volute and lack of maintenance access.

Table 10-29 Leachate Treatment Facility – O&M Recommendations

Recommendation:	Add a generator to the treatment facility to keep the plant operational during power outages.
Recommendation:	Evaluate ways to address the effluent tank transfer pumps having high heat output and being open to exposure, prioritizing safety. Potential solutions include installation of safety features, installation of cooling jackets, or replacement of pumps with non-submersible type pumps.
Recommendation:	Install the new carbon holding tank. Staff noted the tank has been ordered.

10.3.5 Reclaimed Water Distribution System

Table 10-30 Reclaimed Water Distribution System –O&M Recommendations

Recommendation:	Develop an operational protocol for the Mid/West County Master Reuse CCU staff intend to operate the reclaimed water system under a select number of operational configurations and will determine their preferred method for meeting their reclaimed water demands using the hydraulic model.
Recommendation:	Install throttling control valves at all current and future major reclaimed water users with pond discharges.
Recommendation:	Complete repairs for facilities and assets that experienced hurricane-related damage.

10.3.6 Utility Support Services

Table 10-31 EPLAB – O&M Recommendations

Recommendation:	Continue implementation of LIMS.
Recommendation:	Continue working with sampling personnel on sampling protocols; in particular, sample labeling in the field, correct completion of chain-of-custody information, and sample submittal.

Table 10-32 Operation and Information Technology – O&M Recommendations

Recommendation:	Revise Fiber Optic Network for Physical Redundancy at East Port WRF.
Recommendation:	Integrate MBR System into SCADA at Rotonda WRF.
Recommendation:	Integrate SCADA into LIMS.

Note: All recommendations from SCADA Master Plan (McKim & Creed, March 2020).