

City of Casselberry
Draft- Wastewater Treatment Plan
January 2024



The City of Casselberry (City), located in Seminole County, Florida, and within the Lake Jessup Basin, provides wastewater and reclaimed water utility services. The City's Water Reclamation Facility (WRF), permit number FLA011066, processes wastewater into marketable reuse water for customers within the community.

The WRF services only a portion of the City's collection system, the remainder is conveyed through the South Seminole & North Orange County Wastewater Transmission Authority (SSNOCWTA) to the Orlando Iron Bridge Facility (Permit FL0037966). With exception to the overall service area, this report is only detailing City of Casselberry projects and services.

The City is permitted to dispose of reclaimed water through land application in the form of irrigation or Rapid Infiltration Basis (RIBS). Irrigation services are provided to residents, a golf course, a cemetery, roadway medians, parks and other green spaces within the reuse distribution system.

At the time of this submission, the City's Water Reclamation Facility is working towards renewing its Domestic Wastewater Facility Permit, expiring on December 15, 2024. The renewed permit is expected to be received from the Florida Department of Environmental Protection (FDEP) July 2024. The City also has a contracted engineering firm updating and preparing the City's Utility Master Plan. Sections of this report have been taken from the draft copy submitted to the City.

Since both the Domestic Wastewater Facility Permit Renewal and Utility Master Plan are ongoing projects, some of the information provided in this plan may be updated in the final report to reflect any changes. Information provided, is using current data, information submitted to the City by the contracted engineering firms and Utility Department documentation.

Facility Capacity

The City of Casselberry's Water Reclamation Facility is permitted by the FDEP for 2.2 Million Gallons per Day (MGD) flow for public access. Additionally, the facility is permitted by the FDEP to send flow to a series of Rapid Infiltration Basins (RIBS). The limit permitted by the FDEP for the RIBS is 0.285 MGD.

Permitted Total Nitrogen and Total Phosphorus Effluent Limits

Currently, the City does not have permit limits for total nitrogen (TN) or total phosphorus (TP). The City is required by the FDEP to perform a composite TN and TP sample weekly from the effluent and report monthly and annual averages. Monthly averages from 2019-2023 for TN and TP have been included in this report, see Table 1.

Annual Total Nitrogen (TN) and Total Phosphorus (TP) Loads

This report lists the monthly averages from 2019-2023 for TN, TP and processed reuse water. This data has been analyzed to create a table of approximate TN and TP loading, see Table 1.

Table 1: Five Year TN, TP and Loading

Five Year-Monthly Averages for TN, TP, Processed Wastewater, TN Loading and TP Loading					
Month & Year	Monthly Average Total Nitrogen (mg/L)	Monthly Average Total Phosphorus (mg/L)	Monthly Average Processed Wastewater (MGD)	Monthly Average Loading Total Nitrogen (lbs)	Monthly Average Loading Total Phosphorus Loading (lbs)
Jan-19	6.4	0.3	0.726	38.8	2.0
Feb-19	8.2	0.3	0.746	51.0	1.6
Mar-19	7.3	0.2	0.657	40.0	0.8
Apr-19	7.4	0.2	0.653	40.3	1.0
May-19	7.4	0.5	0.659	40.7	2.5
Jun-19	4.8	0.3	0.835	33.4	1.7
Jul-19	5.2	0.3	0.887	38.5	2.3
Aug-19	4.3	0.2	1.039	37.3	1.8
Sep-19	8.2	0.1	0.895	61.2	0.9
Oct-19	6.3	0.3	0.859	45.1	2.2
Nov-19	8.1	0.8	0.764	51.6	5.2
Dec-19	6.6	0.4	0.815	44.9	2.8
Jan-20	12.3	1.3	0.812	83.3	8.8
Feb-20	14.5	0.0	0.758	91.7	0.2
Mar-20	13.3	0.2	0.770	85.4	1.3
Apr-20	10.7	0.0	0.775	69.2	0.1
May-20	11.2	0.1	0.737	68.8	0.7
Jun-20	N/A	N/A	0.070	N/A	N/A
Jul-20	8.0	0.2	0.710	47.4	1.1
Aug-20	8.6	0.1	0.788	56.5	0.8
Sep-20	7.6	0.2	0.874	55.4	1.3
Oct-20	6.8	0.3	0.829	47.0	2.3
Nov-20	4.9	0.4	0.843	34.5	2.7
Dec-20	13.5	0.2	0.622	70.0	1.1
Jan-21	25.3	1.8	0.742	156.6	11.1
Feb-21	18.0	0.2	0.744	111.7	1.4
Mar-21	6.7	0.2	0.747	41.7	1.2
Apr-21	11.1	0.3	0.875	81.0	2.0
May-21	9.6	0.2	0.784	62.8	1.2
Jun-21	22.7	0.6	0.692	131.0	3.6
Jul-21	4.6	0.1	0.838	32.1	0.8
Aug-21	7.6	0.4	0.884	56.0	2.7
Sep-21	6.8	0.4	1.089	61.8	4.0
Oct-21	5.4	0.1	0.861	38.8	0.9
Nov-21	6.7	0.7	0.945	52.8	5.8
Dec-21	9.4	1.0	0.790	61.9	6.6
Jan-22	7.8	0.2	0.714	46.4	1.2
Feb-22	6.7	0.3	0.709	39.6	1.5
Mar-22	7.9	0.2	0.790	52.0	1.4
Apr-22	7.4	0.3	0.948	58.5	2.5
May-22	6.3	0.2	0.791	41.6	1.4
Jun-22	6.6	1.6	0.768	42.3	9.9
Jul-22	6.9	0.9	0.828	47.6	6.1
Aug-22	7.6	0.2	0.835	52.9	1.0
Sep-22	6.4	0.2	1.039	55.5	1.8
Oct-22	4.9	0.9	1.297	53.0	9.5
Nov-22	4.0	0.2	1.132	37.8	1.7
Dec-22	4.5	0.2	0.765	28.7	1.1
Jan-23	7.6	0.3	0.634	40.2	1.4
Feb-23	7.7	0.2	0.776	49.8	1.0
Mar-23	11.0	0.4	0.826	75.8	2.4
Apr-23	9.3	0.3	0.773	60.0	2.1
May-23	7.3	0.3	0.715	43.5	1.5
Jun-23	6.4	0.3	0.784	41.8	1.6
Jul-23	5.6	0.4	0.853	39.8	2.6
Aug-23	6.1	0.4	0.823	41.9	3.0
Sep-23	7.4	0.3	0.810	50.0	2.1
Oct-23	9.2	0.8	0.805	61.8	5.3
Nov-23	7.8	0.3	0.855	55.6	1.9
Dec-23	12.2	0.3	0.793	80.7	2.1

Capacity Analysis

A Capacity Analysis has been created to examine how potential population growth will impact the WRF over time. The City is largely built-out with few undeveloped parcels available for development and few areas eligible for redevelopment. Due to these factors, significant population growth should not be experienced within the City over the course of the next twenty years.

The data used for this Capacity Analysis was derived from the 2019 Domestic Wastewater Permit for the City's WRF. The information provided in that document was extended to meet the 20-year requirement, see Table 2. As previously mentioned, the City is currently renewing its permit for the WRF. The final report may contain an updated Capacity Analysis based on the updated information provided by the contracted engineer.

Table 2: Capacity Analysis

Year	2023	2025	2030	2035	2040	2043
Service Area Population	59,785	60,643	62,837	65,092	67,422	68,856
Potable Demand ADD (MGD)	5.99	6.06	6.29	6.51	6.73	6.86
WRF ADD (MGD)	0.96	0.97	1.01	1.05	1.08	1.11
Permitted Capacity	2.2	2.2	2.2	2.2	2.2	2.2
Percent Capacity (%)	44	44	46	48	49	50

Based on the population projections within the City's service area as well as the projected flows, the City will have adequate capacity over the next 20 years.

Facility Construction, Expansions and Costs as Well as Projected Timelines for Construction

The City is proactive in repair and maintenance of its wastewater collection system (including Lift Stations), reclaim distribution system and Water Reclamation Facility. System upgrades and rehabilitation projects are also regularly scheduled by the Utility Department to anticipate needs and to prevent downtime due to breaks and failures, see Table 3.

Table 3: Wastewater Collection, Transmission, Distribution, and Treatment Plant Projects

Title	Description	Department	Project Type	Total Project Cost	Year					
					FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028-2035*
Collection Renewal and Replacement Projects										
Combined Gravity Sewer Rehabilitation	Combined gravity sewer rehabilitation - Prioritized based on Inspection	Collection	Gravity Sewer Rehab	\$2,900,000	\$400,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000
Force Main Repair and Replacement Projects										
Winter Woods Replacement	Approximately 5,700 LF 12" AC. Mix of pipe bursting and directional drill	Transmission	R&R	\$2,130,376	\$213,038	\$1,917,338				
Betty Street Replacement	Approximately 750 LF of 4" CI replacement	Transmission	R&R	\$120,750		\$120,750				
Lake Howell Arms Replacement	Approximately 750 LF of 8" HDPE directional drilled	Transmission	R&R	\$210,094			\$20,250	\$189,844		
Wren Drive Replacement	Approximately 4,800 LF of C200 PVC via pipe bursting	Transmission	R&R	\$960,000				\$960,000		
Derbyshire Replacement	Approximately 1,500 LF 6" PVC via pipe bursting	Transmission	R&R	\$300,000				\$300,000		
Queens Mirror Replacement	Approximately 2,800 LF of 6" AC pipe bursting under City road	Transmission	R&R	\$582,400				\$58,240	\$524,160	
Elm Drive Replacement	Approximately 500 LF of 4" AC pipe bursting	Transmission	R&R	\$58,500					\$58,500	
Eastbrook II	Directional drill approximately 600 LF 6" CI pipe	Transmission	R&R	\$120,900					\$120,900	
Salina Replacement	Approximately 800 LF 4" PVC pipe replacement	Transmission	R&R	\$145,600					\$145,600	
Woodcrest Replacement	Approximately 2,900 LF of 6" AC via pipe bursting	Transmission	R&R	\$626,400						\$626,400
Priority 2 & 3 Force Main Lining	Various sizes and lengths of future force main lining	Transmission	R&R	\$1,222,000						\$1,222,000
Lift Station Repair and Renovation Projects										
Lift Station Pumps	General lift Station pump replacement - based on inspection and need	Lift Station	R&R	\$150,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
LS 53 Wren - 9.4 HP Duplex	Discharge Piping replacement, well lining, and lid replacement	Lift Station	R&R	\$192,500	\$192,500					
LS 77 Quintuplet	Pre-established City Project - Complete rehabilitation of LS 77 with a larger wet well	Lift Station	R&R	\$690,000	\$69,000	\$621,000				
LS 44 Live Oak	Lining of wet well only	Lift Station	R&R	\$18,000			\$18,000			
LS 33 Carmel by the Lake - 3 HP Duplex	Lining of wet well and pump replacement	Lift Station	R&R	\$60,000			\$60,000			
LS 52 Eagle South	Full rehabilitation of LS 52	Lift Station	R&R	\$500,000				\$500,000		
LS 61 Wyndham Woods - 3 HP Duplex	Lining of wet well only	Lift Station	R&R	\$18,750				\$18,750		
LS 27 Largo Vista - 5HP Duplex	Complete station replacement	Lift Station	R&R	\$617,500				\$61,750	\$555,750	
LS 32 Salina	Wet well lining, base plate replacement, and pump replacement	Lift Station	R&R	\$130,000					\$130,000	
LS 74 Hunters Chase - 3HP Duplex	Wet well lining, base plate replacement, pump replacement, and valve replacement	Lift Station	R&R	\$303,750						\$303,750
LS 47 Windward Square - 15 HP Duplex	New roof, exhaust fans, steel door replacement, and wt well lining	Lift Station	R&R	\$810,000						\$810,000
Priority 3-4 Lift Stations	Future lift station rehabilitation	Lift Station	R&R	\$4,410,000						\$4,410,000
Control Panel Replacements	Annual cost for control panel replacements	Lift Station	R&R	\$290,000	\$28,000	\$28,000	\$28,000	\$28,000	\$28,000	\$150,000
Treatment Plant Improvements										
WRF Improvements Phase 2	Continued Improvements to Water Reclamation Facility (Convert sand filter to disk filter, replace 3 effluent reclaim pumps & convert all effluent pumps to VFD's	Wastewater	R&R	\$1,466,000	\$350,000	\$1,116,000				
SCADA Replacement	SCADA Replacement at WRF	Production	R&R	\$75,000		\$75,000				
WRF 1 Clarifier Rehab	Clarifier rehabilitation, sludge scaper, handrails, & weirs at WRF1	Wastewater	R&R	\$293,000			\$293,000			
Generator Replacement	Generator and generator building	Wastewater	R&R	\$365,000				\$365,000		
Reject and Wet Weather Storage Ponds Re-lining	reject and wet weather pond re-lining	Wastewater	R&R	\$250,000					\$250,000	
Chlorine Storage Tank Replacement	Two 1500 gallon chlorine tanks replacement	Wastewater	R&R	\$85,000					\$85,000	
		Collection Repair and Replacement Project Cost:			\$400,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000
		Force Main Repair and Replacement Project Cost:			\$213,038	\$2,038,088	\$20,250	\$1,508,084	\$849,160	\$1,848,400
		Lift Station Repair and Replacement Project Cost:			\$314,500	\$674,000	\$131,000	\$633,500	\$738,750	\$5,698,750
		Treatment Plant Project Cost:			\$350,000	\$1,191,000	\$293,000	\$365,000	\$335,000	\$0
		Total:			\$1,277,538	\$4,403,088	\$944,250	\$3,006,584	\$2,422,910	\$8,047,150

Additional projects are being identified while updating the City's Utility Master Plan. Using modeling to evaluate the reclaim distribution system, the following projects are also being considered to improve reclaim system pressure and reliability:

- 2027- Construct 2,200 LF of 20-inch diameter of main from the WRF along N. Winter Park Dr (estimated cost \$1,436,000).
- 2042- Construct 860 LF of 10-inch diameter main on Triplet Lake Dr. (estimated cost \$419,000)

As previously mentioned in this document, the City is currently updating the 2024 Master Plan for the Utilities Department. Many items listed in this report may be adjusted and/or added during the review process. Updates to the plan will be included in the final report.