SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

Utilities Master Plan Work Session #4 Systems Assessment Update

Board of County Commissioners Meeting

August 12, 2025

Johnny Edwards, PE, Utilities Director

Steve Riley, PE, Jacobs Engineering

Purpose

- Update the Board of County Commissioners prior to DRAFT Capital Improvement Plan (CIP) completion
  - Investment in proactive evaluation of select assets
  - Findings/recommendations
  - Integration into CIP
  - Schedule for remaining work sessions and Master Plan (20-year) completion

Agenda

- Master Plan Work Session Review
- Evaluations
  - Greenwood Lakes Water Reclamation Facility
  - Infiltration and Inflow
  - Advanced Water Treatment Plants
  - Surface Water Treatment Plant
- Project Master Plan Schedule

Work Session #1 Review

- September 2024 – Kickoff, Utility Demand Projections
  - Reviewed Master Plan history
  - Defined the utility areas and main users
  - Discussed benefits of conservation
  - Holistic Water Policy programs
  - Compared water demand projections to anticipated regulatory restrictions

Work Session #2 Review

- November 2024 – Water Supply and Conservation
  - Trends of withdrawal from 26 wells – NE/NW CUP exceedance risk
  - Central Florida Water Initiative – 2025 Rules are more limiting
  - Seminole County compliance plan
    - Expand reclaimed water
    - Conservation efforts
    - Consider alternate water supply and/or mitigation projects

Work Session #3 Review

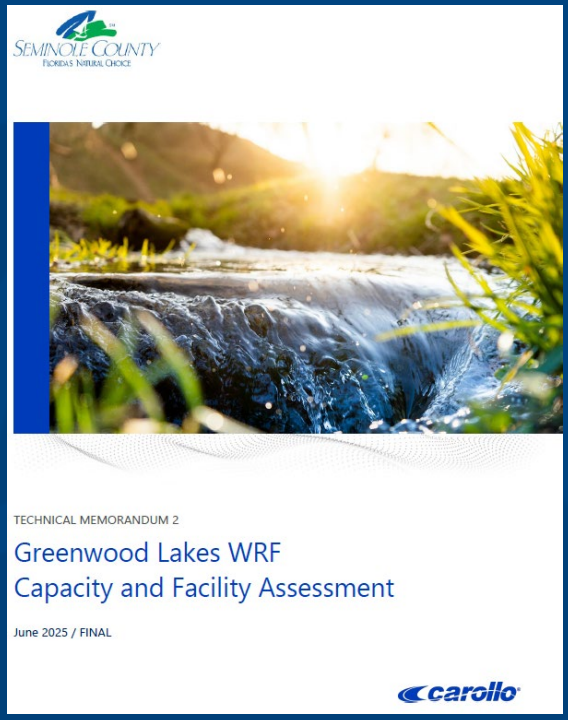
- January 2025 – Treatment and Transmission Mains
  - Maturing utility emphasizing repair and replacement (R&R) rather than substantial new capacity
  - No water treatment plant (WTP) capacity expansions, assuming adequate reclaimed expansion and conservation results
  - WTP R&R focus on ozone and SCADA
  - Water Reclamation Facilities (WRF) need R&R and additional capacity
  - Asset assessments underway

Greenwood Lakes WRF

- Spring 2023 assessment (permit renewal) – Adequate capacity through at least 2032 based on annual average daily flow (AADF).
- Fall 2023 – Updated demands based on large development indicated insufficient capacity for conveyance and treatment
- 2025 – In depth Capacity and Facility Assessment
  - Indicated the plant does not meet Class I Reliability Standards
  - Reviewed options for capacity expansion

Greenwood Lakes WRF

Process	Firm Capacity (mgd AADF)(1)	Number of Units	Meets Class I Reliability?	Comments
Master Lift Station	▪ Pumps = 3.9 ▪ Screens = 3.3*	▪ Pumps = 4 ▪ Screens = 2	Yes	*Screening firm capacity only includes the two mechanical screens installed at the Master Lift Station.
Elevated Pretreatment Structure	▪ Vortex Grit Removal Units = 5.25* ▪ Manual Bar Racks = 3.5	▪ Vortex Grit Removal Units = 2 ▪ Manual Bar Racks = 2	*N/A	*There are no Class I Reliability criteria for grit removal systems.
Flow Equalization	▪ EQ Tank = 3.25 ▪ Pumps = 5.00	▪ EQ Tank = 1 ▪ Pumps = 6	Yes	EQ tank capacity evaluated based on EPA guidance and assuming storage provided accounts for 10% of influent flows (EPA, 1974).
Biological Treatment	▪ Nitrification = 3.70 ▪ Aeration = 3.15* ▪ Denitrification = 3.25	▪ Mechanical Aerators = 2 ▪ Supplemental Air Blowers = 2 ▪ IR Pumps = 4	Yes	*Assumes one mechanical aerator out of service and both supplemental air blowers in service.
Secondary Clarifiers	▪ Clarifiers = 2.57* ▪ RAS Pumps = 3.17	▪ Clarifiers = 2 ▪ RAS Pumps = 3 ▪ WAS Pumps = 2 ▪ Scum Pumps = 2	No*	*Clarifiers exceed HLR limit of 1,000 gal/day-sf with one unit out of service (Great Lakes - Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 2014). An additional clarifier is required to achieve Class I Reliability. Clarifier capacity if further limited to 2.4 mgd due to high SVI.
Filtration	▪ Filters = 2.53*	▪ Filter Cells = 8	Yes*	*Despite the filters providing at least 75% of the design PHF with one cell out of service, additional filtration capacity is needed to meet the facility's current permitted capacity. (See section 3.4.3.1)



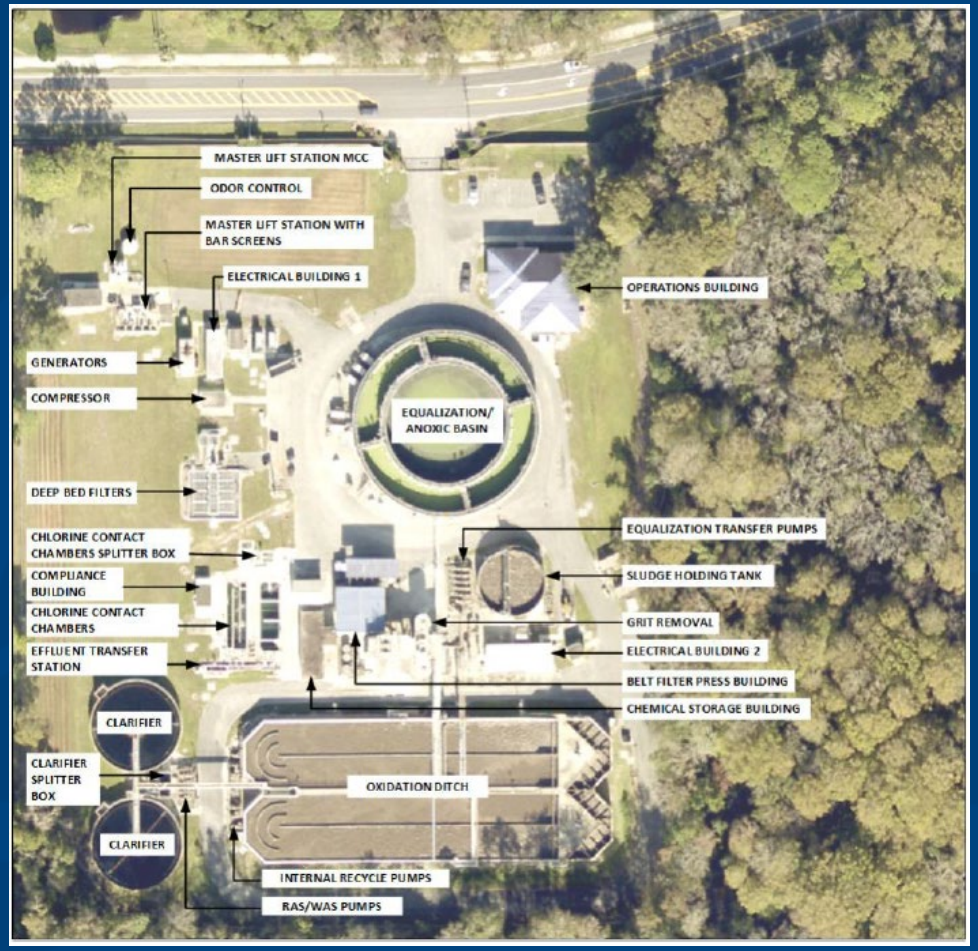
Process	Firm Capacity (mgd AADF)(1)	Number of Units	Meets Class I Reliability?	Comments
Disinfection	▪ Chlorine Contact = 3.0	▪ Chlorine Contact Chambers = 2	Yes	N/A.
Effluent Transfer Station	▪ Pumps = 4.0	▪ Pumps = 4	Yes	N/A.
Solids Handling	▪ Belt Filter Press = N/A*	▪ Belt Filter Press = 1	No*	*A second BFP is required to provide reliability in case the existing BFP is taken out of service.

Greenwood Lakes WRF

Table 6-2. Greenwood Lakes WRF Capacity versus 2024 Measured Flows

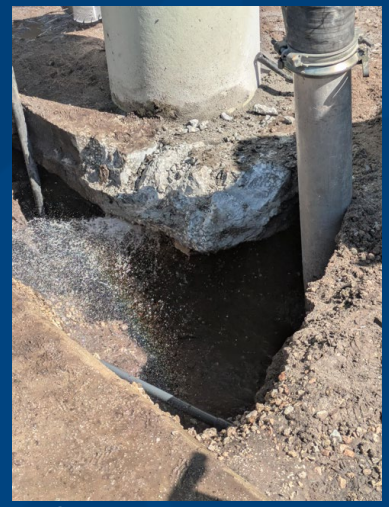
Flow Parameter	Greenwood Lakes WRF						
	Permitted Flow Capacity (MGD)	Basis of Design Flow (MGD)[1]	Measured Flow (MGD)[2]	Measured Flow Peak Factor	Measured Flow to Design Capacity	Measured Effluent Flow (MGD)	Measured Effluent Flow to Design Capacity
Annual Average Daily Flow (AADF)	3.00	3.00	2.426	1.000	80.9%	2.407	81.1%
Maximum Three-Month Average Daily Flow (3MADF)	-	3.17	2.425	1.000	76.5%	2.580	82.2%
Maximum Month Average Daily Flow (MMADF)	-	3.45	2.747	1.132	79.6%	2.722	78.9%
Maximum Daily Flow (MDF)	-	4.8	4.549	1.875	94.8%	4.855	101.1%
Operator-Defined Maximum Daily Flow (MDF) Hydraulic Capacity[3]	-	5.00	4.550	1.875	91.0%	4.855	97.1%
Peak Hour Flow (PHF)	-	10.5	7.050	2.906	67.1%	UKN	UKN

1. Per Greenwood Lakes WRF Improvements Basis of Design 2008 by Reiss Engineering, Inc.
2. AADF is based on 2024 Annual Reuse Report for each facility. All other values are calculated using daily influent flow data provided by SCUD.
3. Based on Plant Operator staff interviews performed on January 31, 2025



Greenwood Lakes WRF

- Applied for SRF funds with 50% forgiveness in June 2025
  - Class I Reliability with new headworks ~$31.6 M
  - 2 MG Equalization Tank ~$7.1M
  - New Generator ~$2.7M
  - Conveyance improvements ~$15M



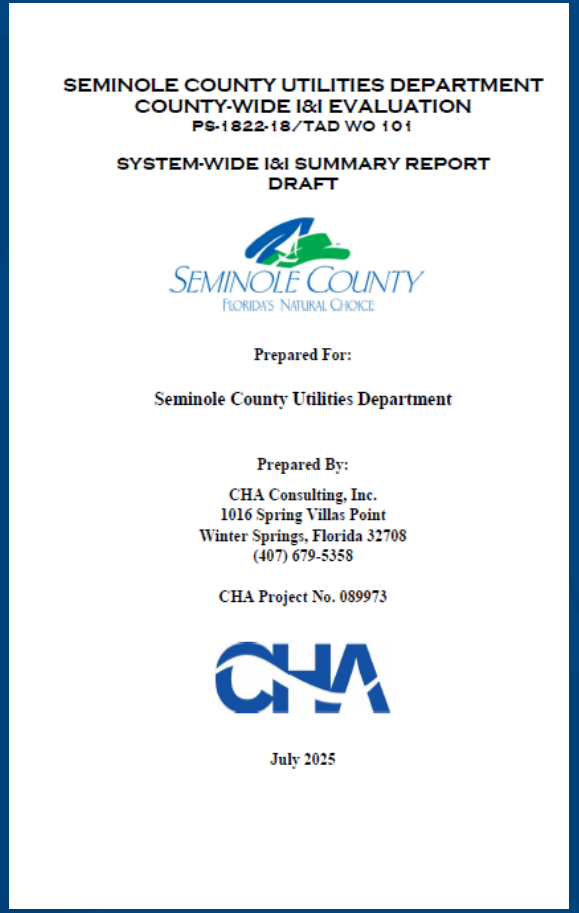
- Reviewing capacity expansion needs and options

Groundwater Infiltration and Stormwater Inflow (I&I)

- I&I results from cracks, or leaks in the gravity sanitary sewer collection system, often at joints in manholes or pipes. May also include cracks in pipes, or structures; missing cleanout caps; or unpermitted stormwater connections.
- I&I is higher when the water table is higher, and peaks during, or following significant rain events.
- Increases risk of sanitary sewer overflow (SSO) at pump stations and treatment plants and changes the water quality at a plant.

I&I Evaluation

- Recent (2023) Florida Department of Environmental Protection rules require a collection system action plan that includes evaluating at least 25% of the sewer collection system every five years
- Summer of 2024 – installed 50 flow meters to measure actual sewer flows covering about 35% of- the collection system



SEMINOLE COUNTY UTILITIES DEPARTMENT
COUNTY-WIDE I&I EVALUATION
PS-1822-18/TAD WO 101

SYSTEM-WIDE I&I SUMMARY REPORT
DRAFT

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Prepared For:

Seminole County Utilities Department

Prepared By:

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CHA Project No. 089973

CHA

July 2025

I&I Evaluation

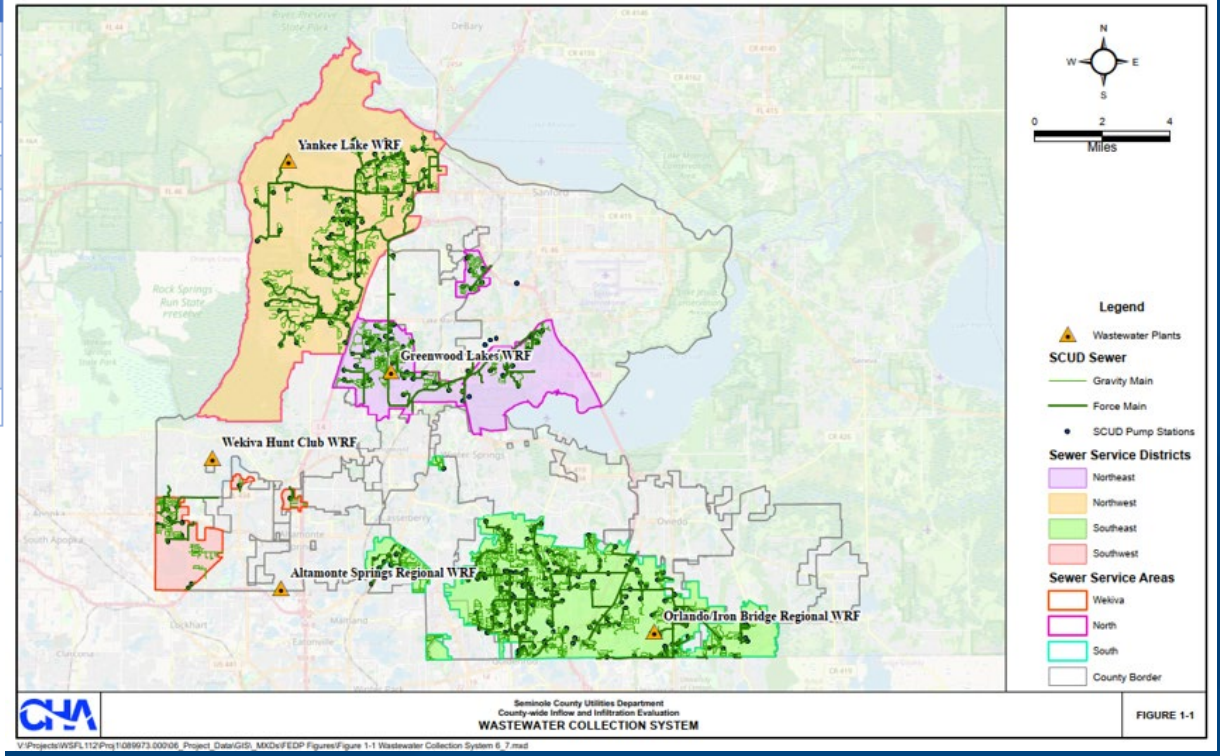
Table 2-4. Gravity Main Age Summary

Pipe Installation Date	North County Length (Feet)	South County Length (Feet)	Wekiva (Feet)	Total (Feet)
1950-1959	0	11,580	0	11,580
1960-1969	5,291	26,714	0	32,005
1970-1979	27,336	81,650	33,382	142,368
1980-1989	171,370	352,101	34,701	558,172
1990-1999	277,624	197,089	28,810	503,524
2000-2009	247,277	111,384	3,592	362,254
2010-2019	53,186	64,660	856	118,702
2020-2025	21,996	18,229	0	40,225
Unknown Installation Year	7,468	8,454	4,555	20,476
Total	**811,548**	**871,862**	**105,897**	**1,789,307**

Table 2-5. Manhole Age Summary

Installation Date	North County	South County	Wekiva	Total
1950-1959	0	39	0	**39**
1960-1969	18	65	0	**83**
1970-1979	98	298	139	**535**
1980-1989	829	1,475	156	**2460**
1990-1999	1,265	902	112	**2279**
2000-2009	1,287	622	21	**1930**
2010-2019	348	402	14	**764**
2019-2024	179	121	3	**303**
Unknown Installation Year	195	172	56	**423**
TOTAL	**4,219**	**4,096**	**501**	**8,816**

Figure 1-1. Seminole County Wastewater Collection System



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I&I Results

Table 5. Summary of Basins RDII Peaking Factors – Comparison to Design and USEPA Standards

Flow Range (ADF)	Peak Factor	Number of Basins Does Not Exceed Standard = Less than Peaking Factor, Needs Further Review = Up to 6, Needs Action = Greater than 6								
		North			South			Wekiva		
		Meets Standard	Requires Review	Requires Action	Meets Standard	Requires Review	Requires Action	Meets Standard	Requires Review	Requires Action
0 to 0.250 MGD	3.0	20	4	5	7	8	6	3	1	-
0.251 to 1.000 MGD	2.5	2	-	-	2	2	-	-	-	-
1.001 to 4.000 MGD	2.0	2	-	-	-	-	-	-	-	-
USEPA Standard	*4.0*	*28*	-	*5*	*14*	*7*	*6*	*3*	*1*	-

Table 6. Basins Exceeding SCUD Design Peaking Factors During Significant Wet Weather Events

Flow Range (ADF)	Peak Factor	September 4th – September 5th Wet Weather Event			Hurricane Milton		
		North	South	Wekiva	North	South	Wekiva
0 to 0.250 MGD	3.0	2	12	0	18	17	3
0.251 to 1.000 MGD	2.5	0	2	0	1	4	0
1.001 to 4.000 MGD	2.0	0	0	0	0	0	0
Total		16			43		

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I&I Recommendations

Recommendation	No. of Basins	Length of Pipe
Additional Flow Monitoring	7	398,476
Additional Flow Monitoring and Smoke Testing	8	98,584
CCTV	14	267,324
No Action	8	153,425
Smoke Testing	18	177,085
Smoke Testing and CCTV	13	137,621

Recommendation	Unit Cost	Length	Estimated Cost
Total Smoke Testing	$1.50	413,290	$620,000
Total CCTV	$5.50	404,945	$2,228,000

Recommendation	Amount	Unit	Estimated Cost
Estimated CIPP	369,755	LF	$22,186,000
Estimated Replacement	22,819	LF	$45,639,000
Total Pipeline Rehabilitation	**392,574**	**LF**	**$67,825,000**
Estimated Manhole Lining	370	EA	$1,184,000

Note: Additional flow monitoring is excluded from the cost summary due to variability in metering needs and duration.

2025 Water Treatment Plant Condition Assessment

- Jacobs conducted detailed condition assessment of the facilities' critical assets:
  - Buildings / structures
  - Electrical system and emergency power
  - Advanced treatment processes
  - Chemical systems
  - Pumps
  - Supervisory Control and Data Acquisition (SCADA)
  - Water supply wells

Country Club WTP Condition Assessment

- SCADA process control system presents the highest risk to plant operation – outdated processors have inadequate capacity, functionality, reliability & proprietary service vendors.
- Operations and maintenance (O&M) needs for renewal and replacement (R&R) of aging equipment.
- $9M needed between 2025 and 2045.

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Markham Regional WTP Condition Assessment

- Inadequacies of SCADA process controller system create risk of operational failure.
- O&M improvements are largely related to R&R of aging equipment.
- $19M needed between 2025 and 2045.

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Southeast Regional WTP Condition Assessment

- The Southeast Regional WTP serves as the SCADA hub and control center for the entire utility.
- SCADA control processors need to be replaced with modern equipment.
- $10M needed for R&R between 2025 and 2045.

The Yankee Lake Surface WTP treats surface water to supplement reclaimed water for irrigation.

- The limited need to operate the plant has created problems with mechanical equipment, chemical storage, and feed systems resulting from long periods of idleness.
- SCADA process controllers need to be replaced with modern equipment.
- O&M improvements are largely related to R&R of aging equipment, as well as maintenance of structures for corrosion control and general upkeep of the facilities.
- SCUD engineering consultant is also recommending process enhancements.
- $8M needed for R&R between 2025 and 2045.

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2025 WTP Operations and Maintenance Review

Jacobs conducted a review of O&M performance including:

- Process control
- Regulatory compliance
- Maintenance management
- Health and safety management
- Staffing adequacy

2025 WTP Operations and Maintenance Review – Summary of Findings

- Regulatory Compliance - All four WTPs are in compliance with Florida Department of Environmental Protection (FDEP) regulations.
- WTPs are operated well with no major operational issues observed.
- Maintenance assessment:
  - Staffing is inadequate at the four WTPs. Currently, only two mechanics are on staff for the entire SCUD. A total of 6 are recommended. Twenty other vacant positions need to be filled.
- Replacement of the SCADA process controllers is a high priority.
- $46M needed for R&R between 2025 and 2045.

Work Session Schedule

- ~~September 2024 – Kickoff, Utility Demand Projections - COMPLETE~~
- ~~November 2024 – Water Supply and Conservation - COMPLETE~~
- ~~January 2025 – Treatment and Transmission Mains~~
- August 12, 2025 – Asset Assessment
- November 18, 2025 – Capital Improvements Plan (CIP)
- December 9, 2025 – Final Master Plan Report

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BCC DISCUSSION

Utilities Master Plan Work Session #4
Systems Assessment Update

August 12, 2025

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