



MEMORANDUM

To: Ms. Moira Homann, Florida Department of Environmental Protection

From: Alan J Garri, P.E.; Kimley-Horn and Associates, Inc.

Date: February 1st, 2024

RE: **Marion County Draft Wastewater Treatment Plan**
Kimley-Horn Project Number 040997166



BACKGROUND

The Florida Clean Waterways Act (F.S.403.067(7)(a)9) requires certain local governments within a Basin Management Action Plan (BMAP) to submit wastewater treatment plans to the Florida Department of Environmental Protection (FDEP). Local governments were selected if the Department determined wastewater treatment facilities contribute to 20% or more of point or nonpoint source pollution in the BMAP or if wastewater treatment remediation is necessary to achieve the total maximum daily load (TMDL). FDEP issued a Final Order outlining the requirements of the wastewater treatment plans. Per FDEP requirements, the wastewater treatment plants are to include an inventory of wastewater treatment plants' capacities, nutrient loadings, and planned improvements over a 20 year planning period. Marion County (the County) lies within the Silver Springs and Rainbow Springs BMAP areas and received the Final Order. On behalf of the County, Kimley-Horn has been contracted to prepare this memorandum as a response to the Final Order.

WASTEWATER TREATMENT PLAN

Marion County owns and operates several Wastewater Treatment Facilities (WWTF). An evaluation of the current WWTF nutrient loads, capacities, and future expansion plans is provided below for each facility in the BMAP.

MCU NORTHWEST REGIONAL WASTEWATER TREATMENT FACILITY (NWR WWTF)

The NWR WWTF (FLA272060) is located at NW 60th Avenue in Ocala, Florida. The current permitted capacity of the facility is 0.8 MGD annual average daily flow (AADF). The plant utilizes an activated sludge process for nutrient removal with a 4-stage Bardenpho process, carbon and alum feed system, two secondary clarifiers, a RAS/WAS pumping system, disc filters, and chlorine contact chambers. Biosolids management at the facility consists of aerated sludge holding, sludge pumping, and a trailer-mounted centrifuge for dewatering. Dewatered biosolids are transported to a landfill for disposal. NWR WWTF has two permitted reuse sites, R-002 and R-003. R-002 consists of land application at the Golden Ocala Golf Course and has a nutrient limit of 10 mg/L for total Nitrogen (TN). R-002 does not have a total Phosphorous (TP) limit. R-003 consists of rapid infiltration basins (RIBs) with a TN limit of 6.0 mg/L. R-003 does not have a TP limit.

Historical Nutrient Concentrations

Discharge monitoring reports (DMRs) were used to evaluate the historical plant flows. The average annual TN and TP concentrations for the past five years are shown below in **Table 1**.

Table 1: Average Annual Nutrient Concentrations		
Year	Average Annual TN (mg/L)	Average Annual TP (mg/L)
2019	46.32	6.77
2020	31.17	6.64
2021	18.73	5.61
2022	8.01	4.46
2023	2.86	4.07

Prior to July 2022, the NRW WWTF did not have a TN limit. In July 2022, the plant underwent major improvements, and the TN limit of 10 mg/L was adopted. The annual average TN concentration has not exceeded 10 mg/L following the plant upgrades.

WWTF Capacity Analysis

The NRW WWTF serves residential developments in Marion County, including Golden Ocala Golf and Equestrian Club, Trilogy at Ocala Preserve, and Ocala Meadows, as well as commercial business located at the I-75 and CR-326 interchange area. **Table 2** summarizes the most recent flow projections for the NRW WWTF, included in the plant's 2020 Capacity Analysis Report.

Table 2: Projected Flows from 2020 Capacity Analysis Report			
Source	2020 (gpd)	2028 (gpd)	2038 (gpd)
Existing Service Area	44,000	NA ₁	NA ₁
Golden Ocala (includes Equestrian lots, Condos, and Convention Center)	NA	148,000	498,000
Golden Ocala – World Equestrian Center	NA	168,000	301,000
Ocala Preserve – Trilogy	NA	176,000	600,000
Ocala Meadows Farms	NA	9,600	36,600
Package Plant Elimination	NA	0	58,400
OSTDS (Septic Tanks) Elimination ₂	NA	0	266,000
Totals	44,000	501,000	1,760,000

The projected flows for this plant do not exceed the 0.8 MGD plant capacity during the planning period.

Plant Improvements

Future plant improvements may include the addition of process trains to expand the plant capacity to 2.0 MGD. The timeline of these improvements is unknown as the plant has adequate capacity for the projected future flows. The cost of the re-rating is unknown at this time.

MCU STONECREST WASTEWATER TREATMENT FACILITY

The Stonecrest WWTF (FLA010741) is located at 17200 SE 115th Avenue in Summerfield, Florida. The current permitted capacity of the facility is 0.67 MGD annual average daily flow (AADF). The plant's design capacity is 1.0 MG. The plant utilizes an activated sludge for nutrient removal with a 4-stage Bardenpho process, influent screening, grit removal, flow equalization, aeration, secondary clarification, chlorination, and aerobic digestion of solids. WWTF effluent is land applied at R-001 which consists of six (6) RIBS and at R-002 which consists of the Stonecrest Golf Course. R-001 has a TN limit of 12.0 mg/L and does not have a TP limit. R-002 does not have TN or TP limits, but the concentrations are to be reported to FDEP monthly.

Historical Nutrient Concentrations

Discharge monitoring reports (DMRs) were used to evaluate the historical plant flows. The average annual TN and TP concentrations for the past five (5) years are shown below in **Table 3**.

Table 3: Average Annual Nutrient Concentrations		
Year	Average Annual TN (mg/L)	Average Annual TP (mg/L)
2019	4.04	3.27
2020	3.05	5.27
2021	3.66	5.34
2022	3.95	5.44
2023	4.01	4.98

The Stonecrest WWTF annual average TN did not exceed 12 mg/L between 2019 and 2023.

WWTF Capacity Analysis

Future Stonecrest WWTF flow projections were included in the plant's 2020 Capacity Analysis Report. A projected growth rate of 2% was utilized to estimate wastewater flow projections shown in **Table 4**. The projections also account for the County's plans to install a force main to divert flows from the Silver Springs WWTF service area to the Stonecrest WWTF, and vice versa.

Table 4: Projected Wastewater Flows through 2040						
Year	AADF (MGD)	TMADF (MGD)	Silver Springs WWTF Flow Diversion (MGD)	Total TMADF (MGD)	% Permit Capacity (0.670 MGD)	% Design Capacity (1.0 MGD)
2019	0.19	0.21		0.21	31%	21%
2020	0.19	0.21		0.21	31%	21%
2021	0.2	0.22		0.22	33%	22%
2022	0.2	0.22	0.15	0.37	55%	37%
2023	0.2	0.23	0.15	0.38	57%	38%
2024	0.21	0.23	0.15	0.38	57%	38%
2025	0.21	0.24	0.15	0.39	58%	39%
2026	0.22	0.24	0.15	0.39	58%	39%
2027	0.22	0.25	0.15	0.4	60%	40%
2028	0.23	0.25	0.15	0.4	60%	40%
2029	0.23	0.26	0.15	0.41	61%	41%
2030	0.23	0.26	0.15	0.41	61%	41%
2031	0.24	0.27	0.15	0.42	63%	42%
2032	0.24	0.27	0.15	0.42	63%	42%
2033	0.25	0.28	0.15	0.43	64%	43%
2034	0.25	0.28	0.15	0.43	64%	43%
2035	0.26	0.29	0.15	0.44	66%	44%
2036	0.26	0.29	0.15	0.44	66%	44%
2037	0.27	0.3	0.15	0.45	67%	45%
2038	0.28	0.31	0.15	0.46	69%	46%
2039	0.28	0.31	0.15	0.46	69%	46%
2040	0.29	0.32	0.15	0.47	70%	47%

The projected flows for this plant do not exceed the 0.67 MGD plant capacity during the planning period.

Plant Improvements

The County does not have any planned plant improvements at this time.

MCU OAK RUN WASTEWATER TREATMENT FACILITY

The Oak Run WWTF (FLA012697) is located at 11400 SW 90th Terrace in Ocala, Florida. The current permitted capacity of the facility is 1.6 MGD annual average daily flow (AADF). The plant utilizes a Modified Ludzack-Ettinger (MLE) process for biological nutrient removal, with mechanical screening, grit removal, flow equalization, anoxic basins, aeration basins, re-aeration basins, secondary clarifiers, disc filters, a chlorine contact basin, and an effluent transfer pump station. Plant effluent is land applied and directed to R-001 which consists of sixteen (16) RIBS, and R-002 which consists of irrigation within a 457.8 acre service

area. R-001 has a TN limit of 6 mg/L and does not have a TP limit. R-002 has a TN limit of 10 mg/L and must report TP.

Historical Nutrient Concentrations

Discharge monitoring reports (DMRs) were used to evaluate the historical plant flows. The average annual TN and TP concentrations for the past five (5) years are shown below in **Table 5**.

Table 5: Average Annual Nutrient Concentrations		
Year	Average Annual TN (mg/L)	Average Annual TP (mg/L)
2019	7.12	4.92
2020	5.52	4.95
2021	5.32	5.06
2022	4.38	3.72
2023	4.19	3.69

The Oak Run WWTF annual average TN did not exceed 10 mg/L between 2019 and 2023.

WWTF Capacity Analysis

The County recently developed wastewater flow projections based on the Bureau of Economic and Business Research (BEBR) medium growth rate. **Table 6** summarizes these flows.

Table 6: Oak Run Projected Flows	
Year	AADF (MGD)
2022	1.10
2025	1.20
2030	1.90
2040	2.70

Based on the flow projections above, Oak Run WWTF is expected to exceed its permitted capacity of 1.60 MGD by 2030.

Plant Improvements

The Oak Run WWTF will be expanded to 3.5 MGD with equipment upgrades and the addition of a third process tank. The estimated cost of these improvements is \$18 million and will allow the plant to provide service for the area through 2035.

SILVER SPRINGS SHORES WASTEWATER TREATMENT FACILITY

The Silver Springs Shores WWTF (FLA296651) is located at 450 Emerald Road in Ocala, Florida. The plant's permitted capacity is 1.5 MGD ADF. However, the plant recently underwent a re-rating to 2.0 MGD and applied for a permit renewal in August 2023. The treatment plant consists of influent screening, grit removal, flow equalization, oxidation ditches for nitrification/denitrification, secondary clarification, filtration

(4 parallel filters), liquid chlorination with dewatering and aerobic digestion of biosolids. The Silver Springs Shores WWTF has three (3) land application reuse sites. R-001 consists of a spray field with a TN effluent limit of 6 mg/L and a TP reporting requirement. R-002 consists of four (4) RIBS with a permitted effluent limit of 3 mg/L and no TP limit. R-003 consists of three (3) golf courses and other landscape irrigation areas. The TN limit is 10 mg/L and the plant must report TP.

Historical Nutrient Concentrations

Discharge monitoring reports (DMRs) were used to evaluate the historical plant flows. The average annual TN and TP concentrations for the past five (5) years are shown below in **Table 7**.

Table 7: Average Annual Nutrient Concentrations		
Year	Average Annual TN (mg/L)	Average Annual TP (mg/L)
2019	3.62	5.90
2020	4.58	3.98
2021	3.32	4.03
2022	3.36	4.05
2023	2.25	4.78

WWTF Capacity Analysis

Future Silver Springs Shores WWTF flow projections were included in the plant's 2023 Capacity Analysis Report. A projected growth rate of 171 ERUs/year was utilized to estimate wastewater flow projections shown in **Table 8**. In addition to the 171 ERUs/year, an estimated 198.8 ERUs/year in flows is expected between 2023-2027 from septic to sewer projects.

Table 8: Silver Springs Shores Projected Flows	
Year	AADF (MGD)
2022	1.20
2023	1.27
2024	1.34
2025	1.42
2026	1.49
2027	1.57
2028	1.60
2029	1.63
2030	1.67
2031	1.70
2032	1.74

Table 8 cont.: Silver Springs Shores Projected Flows	
Year	AADF (MGD)
2033	1.77
2034	1.81
2035	1.84
2036	1.87
2037	1.91
2038	1.94
2039	1.98
2040	2.01
2041	2.04
2042	2.08

As shown by these projections, the plant is not expected to exceed the permitted capacity of 2.0 MGD within ten (10) years. The Silver Springs Shores WWTF is projected to exceed 2.0 MGD by 2040.

Plant Improvements

The County does not have any plans for plant expansion or improvements at this time because it will not exceed the permitted capacity of 2.0 MGD.

MCU GOLDEN HOLIDAY MHP WWTF

The Golden Holiday WWTF is located at 3,121 NW 16th Place in Ocala, Florida. The plant has a design capacity of 0.003 MGD and a permitted capacity of 0.0021 MGD. Golden Holiday WWTF is an extended aeration plant consisting of influent screening, aeration, secondary clarification, chlorination, and aerobic digestion of biosolids. It is anticipated that plant flows will be transferred over to the City of Ocala and the agreement is pending finalization.

AJG/CLW/sab

CC: Mark Thomas, P.E., Senior Engineer, Marion County
Jody Kirkman, P.E., Utilities Director, Marion County
Josh Kramer, Deputy Utilities Director, Marion County
File

[https://kimleyhorn.sharepoint.com/sites/AlanGarrisTeamCoordination/Shared Documents/General/WW Treatment Plan OSTDS and BMAP 242270002/Documents/Reports/WWTF/Levy County Wastewater Treatment Plan.docx](https://kimleyhorn.sharepoint.com/sites/AlanGarrisTeamCoordination/Shared%20Documents/General/WW%20Treatment%20Plan%20OSTDS%20and%20BMAP%20242270002/Documents/Reports/WWTF/Levy%20County%20Wastewater%20Treatment%20Plan.docx)