

City of Palm Coast, Florida

Agenda Item

Agenda Date: 1/14/2020

Department	Utility	Amount	\$																						
Item Key		Account	#																						
Subject	RESOLUTION 2020-XX APPROVING THE FACILITIES PLAN FOR THE EXPANSION OF WASTEWATER TREATMENT PLANT #2.																								
Background :	<p>The City of Palm has been back in a growth mode now for several years. This growth has seen a year over year increase in residential construction every year for over five years. This city controlled growth is good for our community but it does create the need to increase our city wastewater capabilities when our wastewater flows hit certain daily average permitted flows.</p> <p>The City Utility Five Year Capital Improvement Plan currently has plan monies for expansion of the plant in Fiscal Years 2020 through 2023 for the Wastewater Treatment Facility #2. The Utility also has a Wastewater Capacity Analysis Report, which is completed roughly every two years or so depending on flows and growth. This report is the overall planning document for tracking wastewater plant flows, outstanding committed capacity to developers/customers and ultimately providing the data to determine the timing for beginning the process of Wastewater Facility Expansion needs for our community.</p> <p>Our Design consultants, CPH Engineers, have worked with staff to start the process to expand our current Wastewater Treatment Facility No. 2 from its current permitted capacity of 2.0 million gallons a day (MGD) to 4.0 MGD. This process from the beginning of application for State Revolving Funds and Facilities Plan and Capital Financing Plan to the activation of the new facilities is a rather lengthy one. Some of the highlighted steps and estimated time frames would be:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 70%;">City Council Adoption of Facilities Plan and Capital Finance Plan (CFP)</td> <td>January 2020</td> </tr> <tr> <td>City approval of Engineering Design Contract</td> <td>January 2020</td> </tr> <tr> <td>Design Loan Application and Council Approval</td> <td>March 2020</td> </tr> <tr> <td>Request for Inclusion (RFI) – SRF Loan for Construction</td> <td>October 2020</td> </tr> <tr> <td>Final Design, Permitting, and Specification Completion</td> <td>December 2020</td> </tr> <tr> <td>City Council Approval of and Adoption of the CFP</td> <td>December 2020</td> </tr> <tr> <td>FDEP SRF Public meeting for Construction Loan</td> <td>February 2021</td> </tr> <tr> <td>Construction Loan Approval</td> <td>April 2021</td> </tr> <tr> <td>Bidding and Awarding of the Construction Contract</td> <td>May 2021</td> </tr> <tr> <td>Construction Completion</td> <td>November 2022</td> </tr> <tr> <td>Facility Testing and Commissioning</td> <td>January 2023</td> </tr> </table> <p>In today's packet is a request for two resolutions that will be needed to advance this lengthy process of continuing to be good stewards of the environment while growing our community in a controlled method that shows good planning practices. This item is for a proposed resolution to ACCEPT THE CITY OF PALM COAST WASTEWATER MANAGEMENT SYSTEM FACILITIES PLAN, DATED SEPTEMBER, 2019.</p> <p>The City began the original construction of WWTP#2 back in early 2016 and completed the activation in the summer of 2018. The initial permitted capacity of the facility was 2.0 MGD. This facility site was laid out, designed and constructed to be expanded in 2.0 MGD segments for an ultimate site capacity of 6.0 MGD of permitted wastewater treatment capability. This would be the first of two probable site expansions.</p>			City Council Adoption of Facilities Plan and Capital Finance Plan (CFP)	January 2020	City approval of Engineering Design Contract	January 2020	Design Loan Application and Council Approval	March 2020	Request for Inclusion (RFI) – SRF Loan for Construction	October 2020	Final Design, Permitting, and Specification Completion	December 2020	City Council Approval of and Adoption of the CFP	December 2020	FDEP SRF Public meeting for Construction Loan	February 2021	Construction Loan Approval	April 2021	Bidding and Awarding of the Construction Contract	May 2021	Construction Completion	November 2022	Facility Testing and Commissioning	January 2023
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Recommended Action :

ADOPT RESOLUTION 2020-XX - APPROVING THE FACILITIES PLAN FOR THE EXPANSION OF WASTEWATER TREATMENT PLANT #2

RESOLUTION 2020 - _____
WASTEWATER MANAGEMENT SYSTEM FACILITIES PLAN

A RESOLUTION OF THE CITY OF PALM COAST, FLORIDA, ACCEPTING THE CITY OF PALM COAST WASTEWATER MANAGEMENT SYSTEM FACILITIES PLAN, DATED SEPTEMBER, 2019; PROVIDING FOR AUTHORIZATION TO EXECUTE THE NECESSARY DOCUMENTS; PROVIDING FOR SEVERABILITY; PROVIDING FOR CONFLICTS; PROVIDING FOR IMPLEMENTING ACTIONS AND PROVIDING AN EFFECTIVE DATE

WHEREAS, The City of Palm Coast currently owns and operates the City of Palm Coast Water and Wastewater Utility; and

WHEREAS, The City Council of the City of Palm Coast has consistently recognized the need to diligently protect the natural resources of the City of Palm Coast and the State of Florida, as well as the need to ensure that the environment is carefully and adequately protected; and

WHEREAS, a Public Hearing has been held and the information contained within the Plan and referenced documents have been provided to the public for input; and

WHEREAS, the City Council of the City of Palm Coast authorized the creation of a Wastewater Management System Facilities Plan which identifies and assesses the most significant needs and requirements of the City of Palm Coast relative to wastewater services and their associated costs; and

WHEREAS, the City Council of the City of Palm Coast has reviewed the Wastewater Management System Facilities Plan as presented at their January 21, 2020 City Council meeting and approves said plan; and

WHEREAS, the City Council of the City of Palm Coast understands that this project will cost approximately \$20,000,000.00 and

WHEREAS, the City Council of the City of Palm Coast hereby recognizes the need to proceed and importance of proceeding with the improvements identified in the City of Palm Coast Wastewater Management System Facilities Plan

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF PALM COAST, FLORIDA AS FOLLOWS:

SECTION 1. APPROVAL OF RESOLUTION. The City Council of the City of Palm Coast hereby takes the following actions relating to the City of Palm Coast Wastewater Management System Facilities Plan, dated September, 2019:

- (1) The City of Palm Coast Wastewater Management System Facilities Plan is hereby accepted and adopted.
- (2) The City Manager is hereby delegated authority to take any and all actions necessary and desirable pertaining to the implementation of the City of Palm Coast Wastewater Management System Facilities Plan.

SECTION 2. AUTHORIZATION TO EXECUTE. The City Manager, or designee, is hereby authorized to execute the necessary documents.

SECTION 3. SEVERABILITY. If any section or portion of a section of this Resolution proves to be invalid, unlawful, or unconstitutional, it shall not be held to invalidate or impair the validity, force, or effect of any other section or part of this Resolution.

SECTION 4. CONFLICTS. All resolutions or parts of resolutions in conflict with any of the provisions of this Resolution are hereby repealed.

SECTION 5. IMPLEMENTING ACTIONS. The City Manager is hereby authorized to take any actions necessary to implement the action taken in this Resolution.

SECTION 6. EFFECTIVE DATE. This Resolution shall take effect immediately upon adoption by the City Council.

DULY PASSED AND ADOPTED by the City Council of the City of Palm Coast, Florida, on this 21st day of January 2020.

CITY OF PALM COAST, FLORIDA

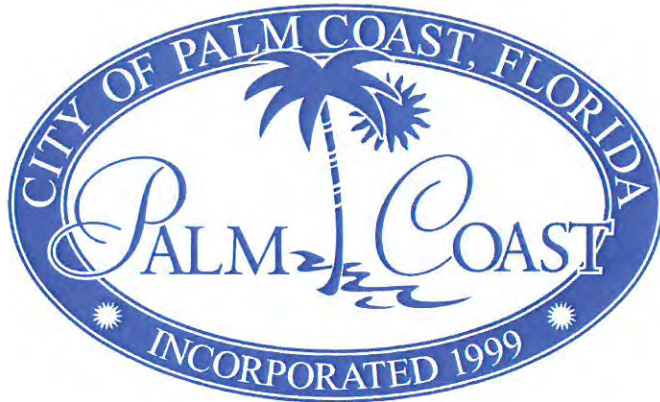
ATTEST:

MILISSA HOLLAND, MAYOR

VIRGINIA A. SMITH, CITY CLERK

Approved as to form and legality

William E. Reischmann, Jr., Esq.
City Attorney



CITY OF PALM COAST

Wastewater Management System Facilities Plan

September 2019

Prepared by:



Engineers
Planners
Landscape Architects
Surveyors
Construction Management
Design/Build

Certificate of Authorization No. 00003215

520 Palm Coast Parkway, SW
Palm Coast, Florida 32137
Phone: (386) 445-6569
Fax: (386) 447-8991
www.cphcorp.com

CPH Job No. P61255

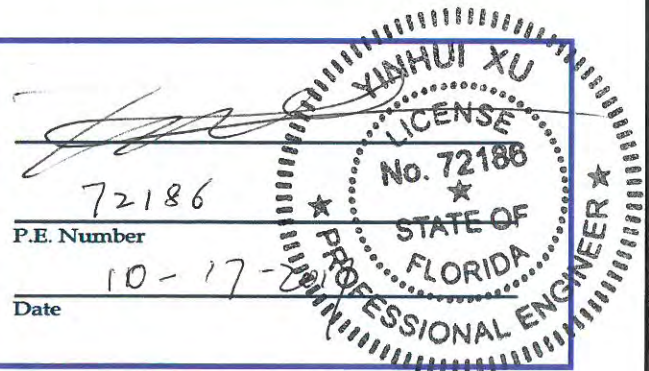


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Appendix A Environmental Assessment Document for SRF Planning, September 2019

SECTION 1.0 EXECUTIVE SUMMARY

1.1 INTRODUCTION

Currently the City of Palm Coast (City) owns and operates two wastewater treatment facilities (WWTFs) with a total capacity of 8.384 MGD, annual average daily flow (AADF). **Figure 1**, Current Wastewater and Reuse Service Area Map, shows the City limits and the Wastewater Utility Service Area. The City's projected growth indicates that the treatment capacity will be exceeded within the next 3-5 years.

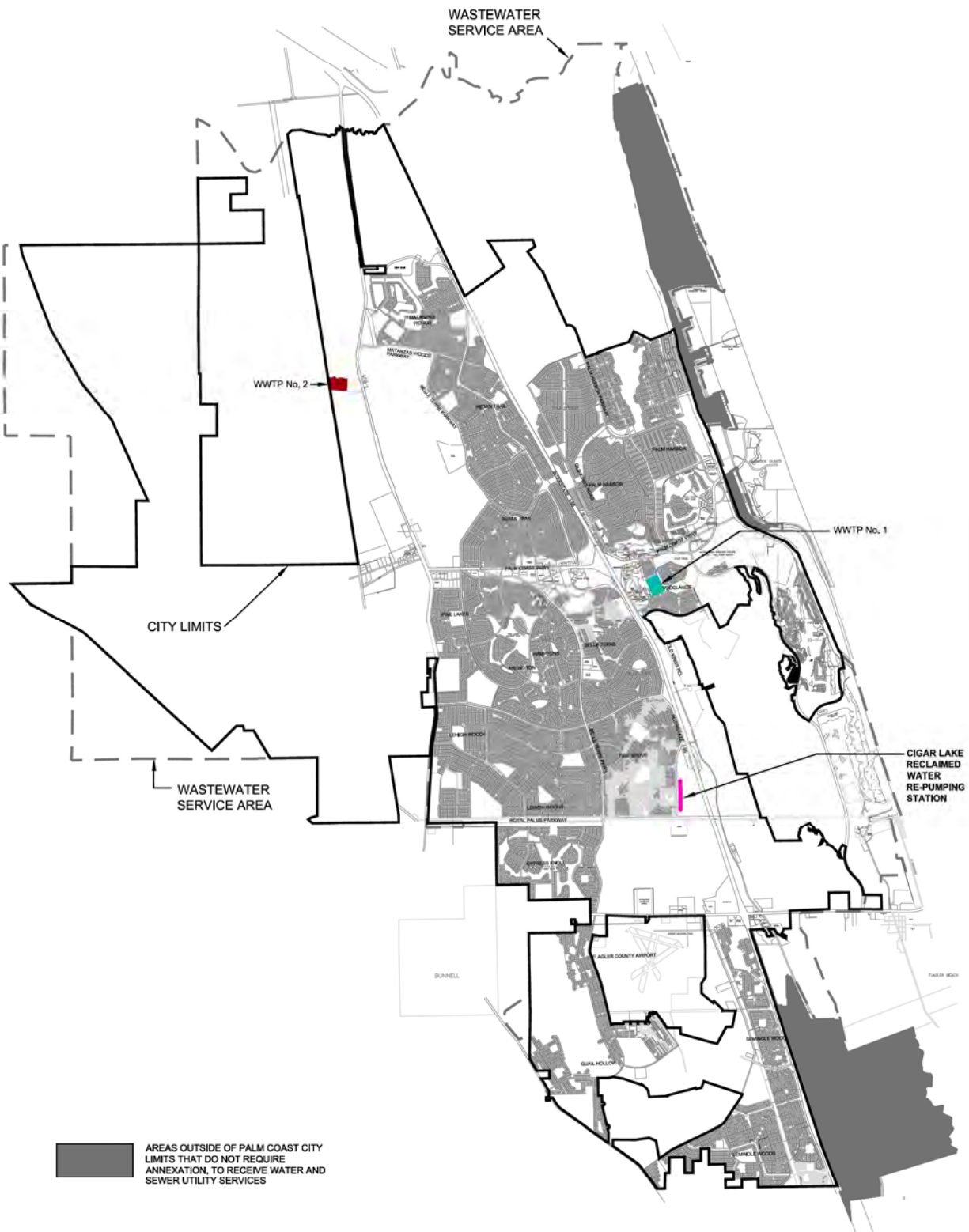
The City's WWTF No.2 was constructed and put into operation in June 2018. The construction was funded by the State Revolving Fund (SRF) #WW18042. The WWTF No.2 utilizes the membrane bioreactor (MBR) treatment process to treat the wastewater to meet advanced wastewater treatment (AWT) standards, with a rated capacity of 2.0 million gallons per day (MGD), expandable to 6.0 MGD. WWTP No.2 is currently treating a monthly average flow ranged from 0.7 MGD to 1.2 MGD.

This Wastewater System Facilities Plan has been prepared according to SRF Program requirements for the purpose of evaluating community requirements for wastewater treatment capacity, evaluating alternatives for providing the needed capacity, selecting the most feasible alternatives, and developing a plan for providing needed wastewater treatment facilities for the City.

1.2 RECOMMENDED PLAN

This Facilities Plan recommends expanding the WWTF No. 2 from 2.0 MGD to 4.0 MGD by early 2023. This expansion will meet the projected increased wastewater treatment demand and the need of the proposed new developments and the growth of the existing residential area in the northwestern portion of the Palm Coast community. The expanded WWTF No. 2 will still provide AWT, utilizing the MBR treatment process. Achieving AWT is required in accordance with the Apricot Rule to allow a backup reclaimed water discharge to a receiving wetland. The WWTF No.2 expansion will generally include the following components:

- a. On-site lift station
- b. Headworks – grit removal and screen equipment, and odor control (for the added grit chamber, drum screen, and the master pump station)
- c. Flow equalization tanks with aeration and mixing equipment and flow equalization pumping system
- d. Chlorine contact chambers
- e. Reclaimed water transfer pumps
- f. Reclaimed water high service pumps



AREAS OUTSIDE OF PALM COAST CITY LIMITS THAT DO NOT REQUIRE ANNEXATION TO RECEIVE WATER AND SEWER UTILITY SERVICES

*AS OF 03/22/10



Engineers (C.O.A. No. 3215)
 Architects (L.C. No. AA2600926)
 Surveyors (L.B. No. 7143)
 Landscape Arch. (L.C. No. LC0000288)
 Planners
 Environmental Scientists
 Construction Management
 Traffic / Transportation

520 Palm Coast Parkway SW
 Palm Coast, FL 32137
 Phone: 386.445.6569
 Fax: 386.447.8991

Designed by: JCS Date: July 2011
 Drawn by: JCS Job No. P61206
 Checked by: YCL Scale: 1" = 8000'
 Approved by: RP File: P61206 Fig1
 © 2011

WASTEWATER AND REUSE SERVICE AREA
 CITY OF PALM COAST
 PALM COAST, FLAGLER COUNTY, FLORIDA

FIGURE 1 88

- g. Sludge holding tanks and associated aeration and mixing system and pumping equipment
- h. Chemical feed systems including alum, Micro-C, sodium hypochlorite, and other chemical storage and feed systems.

Figure 2 shows the proposed WWTF No. 2 site layout and **Figure 3** shows the process schematic.

1.3 PROJECT COST SUMMARY

The Palm Coast WWTF No.2 expansion design and construction will be implemented within the next three to five years and will be funded with the FDEP SRF Loan. The construction of the WWTF No. 2 expansion is scheduled to begin in early 2021 and to be completed and in service by the end of 2022. It is estimated that the total capital cost is \$19.9 million, including \$17.38 million of construction, \$1.30 million of design and permitting, and \$1.22 million of technical service during construction.

1.4 PROJECT SCHEDULE

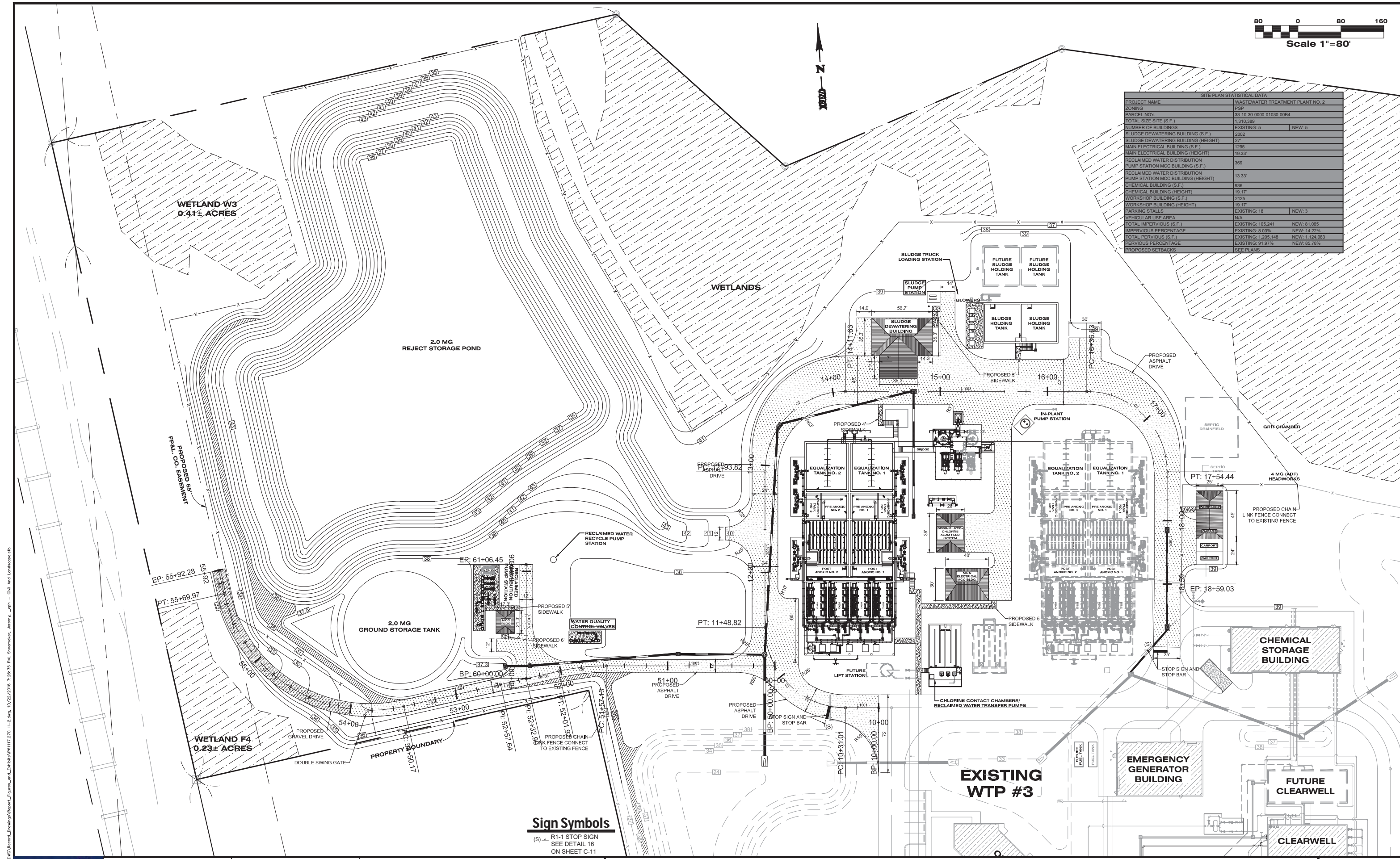
An expected schedule for implementation of the proposed WWTF No.2 expansion project and the SRF loan application is provided in **Table 1**.

Table 1: Palm Coast WWTP No.2 Expansion Project Schedule.

Activity Name	Start Date	Finish Date	2019				2020				2021				2022				2023																		
			J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A
1 Design Loan Application	6/21/19	11/1/19	[Bar]																																		
2 Request for Inclusion	6/21/19	6/21/19	[Diamond]																																		
3 Planning Documents (Facilities Plan, Capital Finance Plan, Resolutions)	6/18/19	7/31/19	[Bar]				[Text: Planning Documents must be submitted 45 days prior to the public meeting]																														
4 FDEP Priority List Public Meeting	8/14/19	8/14/19	[Diamond]																																		
5 Loan Agreement Approved and Signed	11/1/19	11/1/19	[Diamond]																																		
6 WWTP No.2 Expansion Design, Permitting, and Construction SRF Loan Application	7/1/19	8/27/20	[Bar]																																		
7 Design	7/1/19	8/27/20	[Bar]																																		
8 Permitting	3/2/20	6/1/20	[Bar]																																		
9 Request for Inclusion (RFI)	4/1/20	4/1/20	[Diamond]																																		
10 Readiness to Proceed Package (Plans, Specs, Permits, Capital Finance Plan, Resolutions)	7/1/20	7/1/20	[Diamond]																																		
11 FDEP Priority List Public Meeting	8/11/20	8/11/20	[Diamond]																																		
12 Loan Agreement Approved and Signed	11/2/20	11/2/20	[Diamond]																																		
13 Bidding and Awarding	10/1/20	12/31/20	[Bar]																																		
14 Construction	1/4/21	1/2/23	[Bar]																																		
15 2018 CAR Projected WWTP No.2 Expansion	6/30/23	6/30/23	[Diamond]																																		

Scale 1"=80'

SITE PLAN STATISTICAL DATA		
PROJECT NAME	WASTEWATER TREATMENT PLANT NO. 2	
ZONING	PSP	
PARCEL NO.	93-10-30-0000-01030-0054	
TOTAL SIZE SITE (S.F.)	1,310,389	
NUMBER OF BUILDINGS	EXISTING: 5	NEW: 5
SLUDGE DEWATERING BUILDING (S.F.)	2002	
SLUDGE DEWATERING BUILDING (HEIGHT)	27'	
MAIN ELECTRICAL BUILDING (S.F.)	1788	
MAIN ELECTRICAL BUILDING (HEIGHT)	19.33'	
RECLAIMED WATER DISTRIBUTION PUMP STATION MCC BUILDING (S.F.)	369	
RECLAIMED WATER DISTRIBUTION PUMP STATION MCC BUILDING (HEIGHT)	13.33'	
CHEMICAL BUILDING (S.F.)	936	
CHEMICAL BUILDING (HEIGHT)	19.17'	
WORKSHOP BUILDING (S.F.)	2135	
WORKSHOP BUILDING (HEIGHT)	19.17'	
PARKING STALLS	EXISTING: 18	NEW: 3
VEHICULAR USE AREA	N/A	
TOTAL IMPERVIOUS (S.F.)	EXISTING: 105,241	NEW: 81,065
IMPERVIOUS PERCENTAGE	EXISTING: 8.03%	NEW: 14.22%
TOTAL PERVIOUS (S.F.)	EXISTING: 1,205,148	NEW: 1,124,083
PERVIOUS PERCENTAGE	EXISTING: 91.97%	NEW: 85.78%
PROPOSED SETBACKS	SEE PLANS	



WETLAND W3
0.41± ACRES

2.0 MG
REJECT STORAGE POND

2.0 MG
GROUND STORAGE TANK

WETLAND F4
0.23± ACRES

EXISTING
WTP #3

Sign Symbols
(S) R1-1 STOP SIGN
SEE DETAIL 16
ON SHEET C-11

WWTP No.2 SITE PLAN
CITY OF PALM COAST
Wastewater Treatment Plant No. 2

FIGURE
90 **2**

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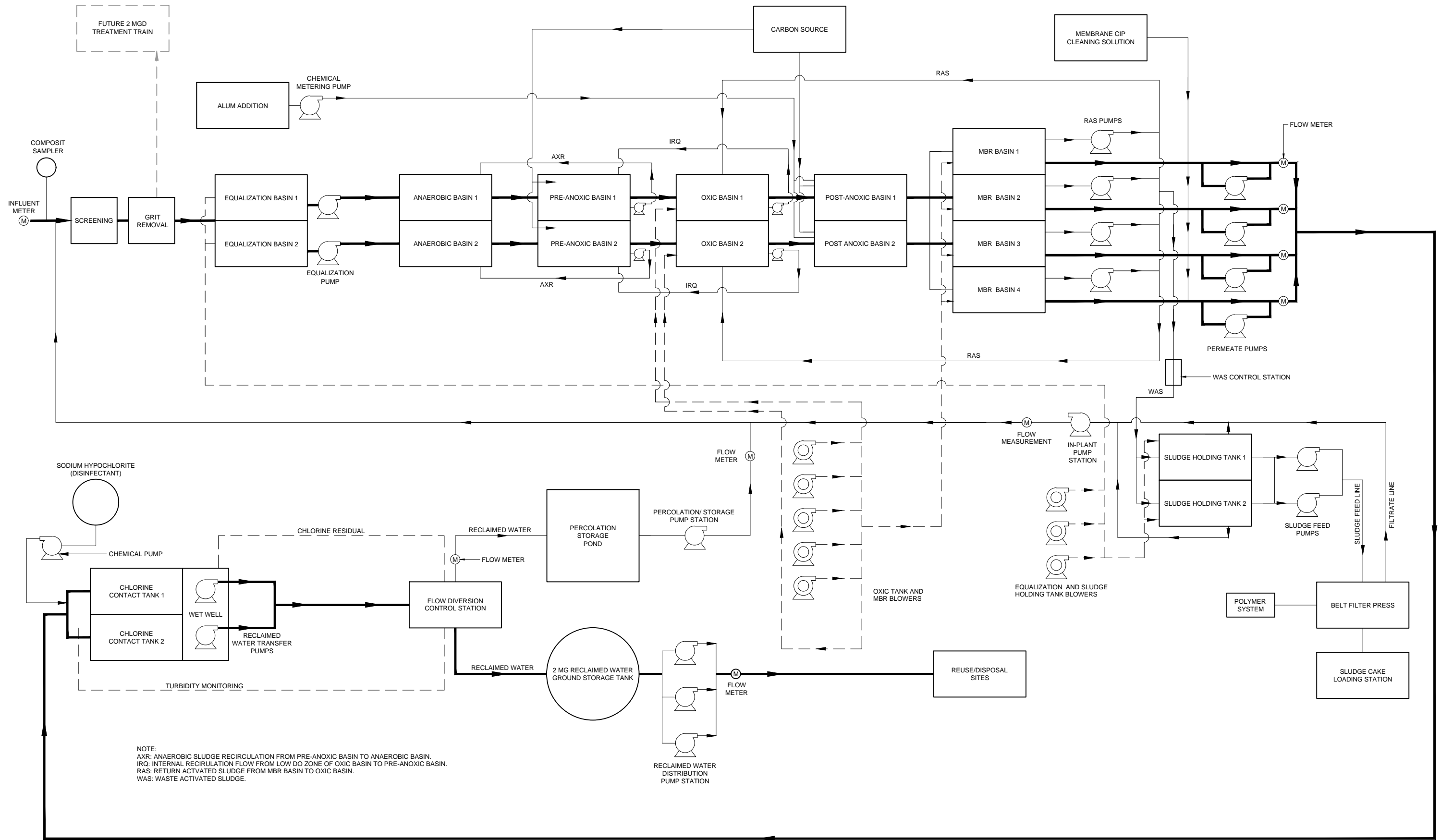


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Date: 10/22/2018
Job No. P61117.27C

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NOTE:
 AXR: ANAEROBIC SLUDGE RECIRCULATION FROM PRE-ANOXIC BASIN TO ANAEROBIC BASIN.
 IRQ: INTERNAL RECIRCULATION FLOW FROM LOW DO ZONE OF OXIC BASIN TO PRE-ANOXIC BASIN.
 RAS: RETURN ACTIVATED SLUDGE FROM MBR BASIN TO OXIC BASIN.
 WAS: WASTE ACTIVATED SLUDGE.

NOTE: FUTURE PLANT EXPANSION FACILITIES NOT SHOWN



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WWTP No.2 PROCESS FLOW SCHEMATIC
 CITY OF PALM COAST
Wastewater Treatment Plant No. 2

SECTION 2.0

EXISTING CONDITIONS

2.1 PERMITS AND LAND USE PLAN

The City of Palm Coast owns and operates the Palm Coast Wastewater Utility System which currently includes Wastewater Treatment Facility (WWTF) No. 1 and WWTF No. 2. WWTF No. 1 is an activated sludge domestic wastewater plant with a permitted annual average daily flow (AADF) capacity of 6.83 million gallons per day (MGD) and operates under the Florida Department of Environmental Protection (FDEP) Permit No. FL0116009. The permit was issued on February 17, 2017. The effective date of the permit is April 30, 2017 and will expire on April 29, 2022.

WWTF No.2 is an advanced wastewater treatment (AWT) facility, utilizing a flat sheet Membrane Bio-Reactor (MBR) process, which was constructed as a new facility in 2018, with a permitted capacity of 2.0 MGD annual average daily flow. WWTF No. 2 operates under FDEP permit number FL0710008, which will expire on May 15, 2021.

The City of Palm Coast has prepared a Comprehensive Land Use Plan. The Plan was adopted by the City on April 6, 2004 and was last amended on April 17, 2018.

2.2 WASTEWATER TREATMENT CAPACITY HISTORY

The current Palm Coast WWTF No.1 was constructed in 1983 with an initial 1.0 MGD AADF treatment capacity. The plant was expanded to 2.0 MGD treatment capacity in 1989. In 1995, the plant was expanded to 4.0 MGD. In 2004, the FDEP approved re-rating of the 4.0 MGD treatment capacity from 4.0 MGD to 4.55 MGD. In January of 2006, the FDEP approved re-rating of the facility permitted capacity from 4.55 MGD to 5.30 MGD. Upon completion of a major facility upgrading and expansion in 2006, the WWTPF No. 1 was permitted as a 6.83 MGD AADF advanced secondary treatment plant.

The WWTF No.2 was constructed in 2018 with an initial capacity of 2.0 MGD.

2.3 POPULATION AND LAND USE

2.3.1 Current Land Use within the Service Area

The City of Palm Coast was incorporated in December 31, 1999. In 2006, the US Census Bureau reported that Flagler County was the fastest growing county in the United States (percentage increase) for two consecutive twelve month reporting periods (July 2003 through July 2005). The Census Bureau also reported that Flagler County was the fastest growing county, with a population over 10,000, between 2000 and 2006. After a slow down from 2007 to 2012, the growth began to pick up again.

The basis of the population estimates are from Bureau of Economic Business Research (BEBR), at the University of Florida and the City of Palm Coast

Comprehensive Land Use Plan. BEBR provides Flagler County population projections and annual updates between the decennial census enumerations. The Comprehensive Plan provides the City’s projections of the percentage of the Flagler County population which is attributed to Palm Coast.

The Palm Coast Wastewater Service Area extends beyond the City limits. The inside and outside City limit population projections are adjusted to mid-year values. The population and number of wastewater Equivalent Residential Service Connections (ERC’s) from 2010 through 2018 are tabulated in **Table 2**. The ERC’s have been based on BEBR data and 2.4 persons per connection.

Table 2: Palm Coast Wastewater Service Area Historical Population and ERC (Mid-Year).

Year	Palm Coast Inside City Limits		Service Area Outside City Limits		Total Wastewater Service Area	
	ERC’s	Population	ERC’s	Population	ERC’s	Population
2010	31,357	75,258	67	162	31,424	75,420
2011	31,504	75,609	67	162	31,571	75,771
2012	31,766	76,240	67	164	31,833	76,404
2013	32,214	77,313	288	701	32,502	78,014
2014	32,734	78,561	293	712	33,027	79,273
2015	33,274	79,858	298	724	33,572	80,582
2016	33,549	81,523	404	982	33,953	82,505
2017	34,428	82,882	415	1,007	34,843	83,889
2018	35,821	87,044	425	1,033	36,246	88,077

2.3.2 Current Land Use within the Service Area

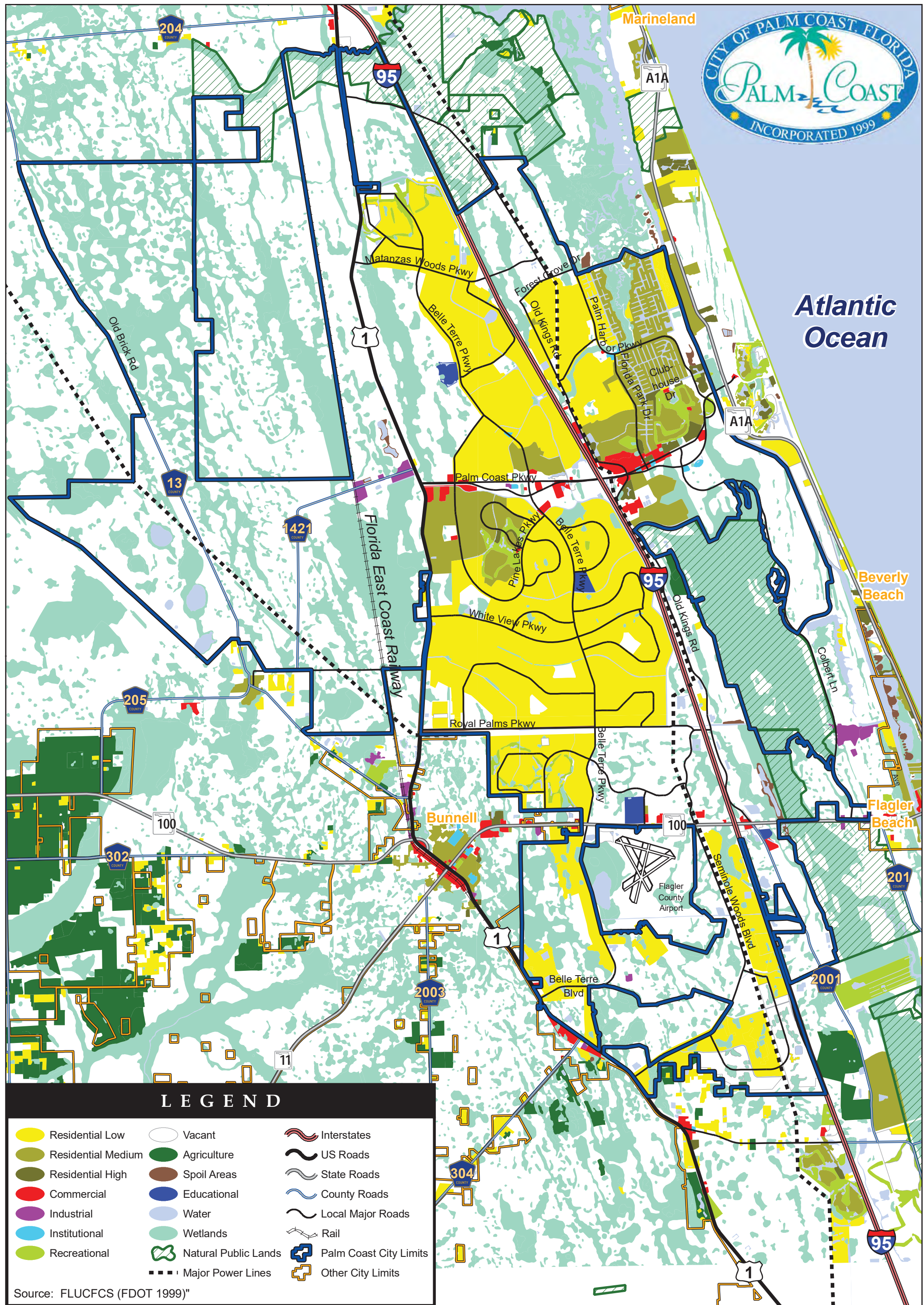
Palm Coast is a Master Planned Community, and has been designed as a series of suburban residential neighborhoods. The majority of the land use is residential. The majority of the residential uses are low-density, single-family units, with approximately two (2) units per acre. There are some Planned Unit Developments with densities of six (6) units per acre.

Other land uses are commercial, industrial, educational, institutional, and recreational. The Current Land Use Map from the 2018 updated Comprehensive Plan is presented in **Figure 4**. The Palm Coast Zoning Map, dated November 2008, is presented in **Figure 5**.

Commercial: Most of the commercial development is concentrated along Palm Coast Parkway (the City’s main street), US Highway No. 1, Old Kings Road, and SR 100.



Atlantic Ocean



LEGEND

- | | | |
|--------------------|----------------------|------------------------|
| Residential Low | Vacant | Interstates |
| Residential Medium | Agriculture | US Roads |
| Residential High | Spoil Areas | State Roads |
| Commercial | Educational | County Roads |
| Industrial | Water | Local Major Roads |
| Institutional | Wetlands | Rail |
| Recreational | Natural Public Lands | Palm Coast City Limits |
| | Major Power Lines | Other City Limits |

Source: FLUCFCS (FDOT 1999)"



City of Palm Coast Comprehensive Plan
Existing Land Use (CP-1.1)

Draft Date : March 01, 2010
Print Date : March 01, 2010

Figure 4

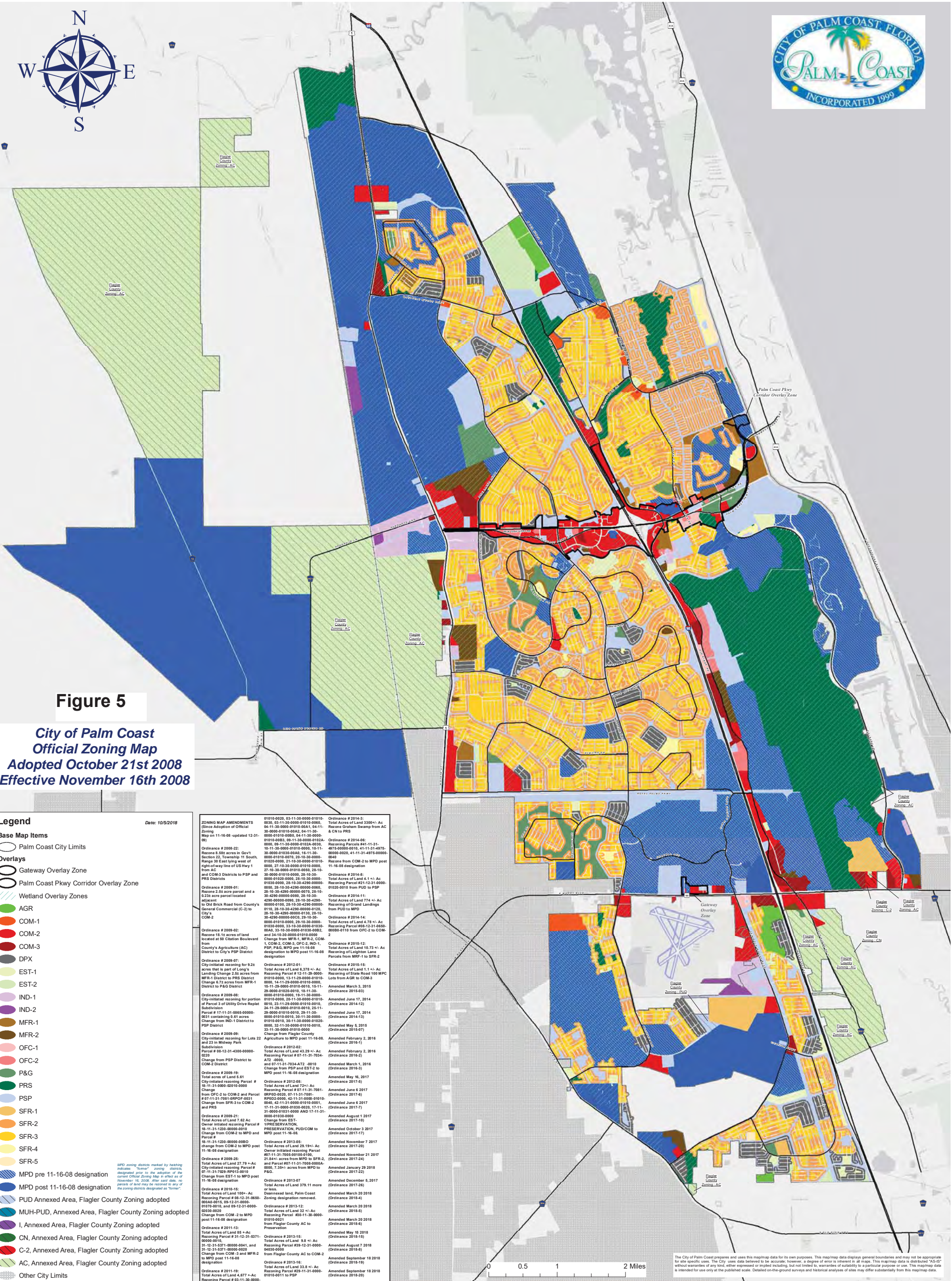


Figure 5

**City of Palm Coast
Official Zoning Map
Adopted October 21st 2008
Effective November 16th 2008**

Legend Date: 10/5/2018

Base Map Items

- Palm Coast City Limits

Overlays

- Gateway Overlay Zone
- Palm Coast Pkwy Corridor Overlay Zone
- Wetland Overlay Zones

AGR Overlay Zones

- AGR

COM Overlay Zones

- COM-1
- COM-2
- COM-3

DPX Overlay Zones

- DPX

EST Overlay Zones

- EST-1
- EST-2

IND Overlay Zones

- IND-1
- IND-2

MFR Overlay Zones

- MFR-1
- MFR-2

OFC Overlay Zones

- OFC-1
- OFC-2

P&G Overlay Zones

- P&G

PRS Overlay Zones

- PRS

PSP Overlay Zones

- PSP

SFR Overlay Zones

- SFR-1
- SFR-2
- SFR-3
- SFR-4
- SFR-5

MPD Overlay Zones

- MPD pre 11-16-08 designation
- MPD post 11-16-08 designation

PUD Annexed Area, Flagler County Zoning adopted

- PUD Annexed Area, Flagler County Zoning adopted

MUH-PUD, Annexed Area, Flagler County Zoning adopted

- MUH-PUD, Annexed Area, Flagler County Zoning adopted

I, Annexed Area, Flagler County Zoning adopted

- I, Annexed Area, Flagler County Zoning adopted

CN, Annexed Area, Flagler County Zoning adopted

- CN, Annexed Area, Flagler County Zoning adopted

C-2, Annexed Area, Flagler County Zoning adopted

- C-2, Annexed Area, Flagler County Zoning adopted

AC, Annexed Area, Flagler County Zoning adopted

- AC, Annexed Area, Flagler County Zoning adopted

Other City Limits

- Other City Limits

ZONING MAP AMENDMENTS
(Since Adoption of Official Zoning Map on 11-16-08 updated 12-31-09)

Ordinance # 2008-22: Rezone 5.92 acres in Gov't Section 27, Township 11 South, Range 30 East lying west of right-of-way line of US Hwy 1 from AC to MFR-2 and PRS Districts	Ordinance # 2014-3: Total Acres of Land 3300+/- Ac. Rezone Graham Swamp from AC & CN to PRS	Ordinance # 2014-6: Rezone Parcel #41-11-31-4975-0000-0020, 41-11-31-4975-0000-0040
Ordinance # 2009-01: Rezone 2.85 acre parcel and a 0.232 acre parcel located adjacent to 620 Brick Road from County's General Commercial (C-2) to City's COM-2	Ordinance # 2014-4: Total Acres of Land 4.1 +/- Ac. Rezone Parcel #21-12-31-0000-0120-0010 from PUD to PSP	Ordinance # 2014-11: Total Acres of Land 774 +/- Ac. Rezone of Grand Landings from PUD to MPD
Ordinance # 2009-02: Rezone 18.12 acres of land located at 50 Citation Boulevard from County's Agriculture (AC) District to City's PSP District	Ordinance # 2014-12: Total Acres of Land 4.78 +/- Ac. Rezone Parcel #28-12-31-0000-0110-0110 from OFC-2 to COM-2	Ordinance # 2015-12: Total Acres of Land 10.73 +/- Ac. Rezone of Lighthouse Lane Parcels from MFR-1 to SFR-2
Ordinance # 2009-07: City-initiated rezoning for 9.22 acres that is part of Long's Landing Change 2.82 acres from MFR-1 District to PRS District. Change 6.40 acres from MFR-1 District to P&G District	Ordinance # 2015-15: Total Acres of Land 1.1 +/- Ac. Rezone of State Road 160 MPC Lots from AGR to COM-3	Amended March 3, 2015 (Ordinance 2015-03)
Ordinance # 2009-08: City-initiated rezoning for portion of Parcel 3 of Utility Drive Replat Subdivision Parcel # 17-11-31-0000-0000-0031 containing 0.61 acres. Change from IND-1 District to PSP District	Amended June 17, 2014 (Ordinance 2014-12)	Amended June 17, 2014 (Ordinance 2014-13)
Ordinance # 2009-09: City-initiated rezoning for Lots 22 and 23 in Midway Park Subdivision Parcel # 08-12-31-0000-0000-0020. Change from PSP District to COM-2 District	Amended May 8, 2015 (Ordinance 2015-07)	Amended February 2, 2016 (Ordinance 2016-1)
Ordinance # 2009-19: Total acres of Land 5.61 City-initiated rezoning Parcel # 18-11-31-0000-0210-0000 Change from OFC-2 to COM-2 and PRS	Ordinance # 2012-02: Total Acres of Land 43.29 +/- Ac. Rezone Parcel # 07-11-31-7034-ATZ-0000 and 07-11-31-7034-ATZ-0010 from PSP and EST-2 to MPD post 11-16-08 designation	Amended February 2, 2016 (Ordinance 2016-2)
Ordinance # 2009-21: Total Acres of Land 7.82 Ac. Owner initiated rezoning Parcel # 18-11-31-1235-0000-0010 Change from COM-2 to MPD and Parcel #	Ordinance # 2012-08: Total Acres of Land 72+/- Ac. Rezone Parcel # 07-11-31-7081-RRPD-0020, 07-11-31-7081-RRPD-0000, 42-11-31-0000-0100-0040, 42-11-31-0000-0100-0051, 17-11-31-0000-0100-0020, 17-11-31-0000-0100-0020 AND 17-11-31-0000-0100-0020 Change from EST-1 PRESERVATION, PUD/COM to MPD post 11-16-08	Amended March 1, 2016 (Ordinance 2016-3)
Ordinance # 2009-25: Total Acres of Land 27.79 +/- Ac. City-initiated rezoning Parcel # 07-11-31-7028-RPD12-0010 Change from COM-2 to MPD post 11-16-08 designation	Ordinance # 2012-09: Total Acres of Land 23.19+/- Ac. Owner initiated rezoning Parcel # 07-11-31-7050-0000-0100, 21-84+/- acres from MPD to SFR-2, and Parcel #07-11-31-7000-0000A-0000, 7.29+/- acres from MPD to P&G.	Amended May 16, 2017 (Ordinance 2017-6)
Ordinance # 2010-15: Total Acres of Land 101+/- Ac. Rezone Parcel # 08-12-31-0000-0000-0015, 08-12-31-0000-0170-0010, and 08-12-31-0000-0230-0020 Change from COM-2 to MPD post 11-16-08 designation	Ordinance # 2013-07: Total Acres of Land 370.11 more or less. Discontinue land. Palm Coast Zoning designation removed.	Amended June 6 2017 (Ordinance 2017-6)
Ordinance # 2011-13: Total Acres of Land 85 +/- Ac. Rezone Parcel # 31-12-31-5371-0000-0010, 31-12-31-5371-0000-0041, and 31-12-31-5371-0000-0020 Change from COM-3 and MFR-2 to MPD post 11-16-08 designation	Ordinance # 2013-12: Total Acres of Land 32 +/- Ac. Rezone Parcel #20-11-31-0000-0100-0201 from Flagler County AC to Preservation	Amended August 1 2017 (Ordinance 2017-10)
Ordinance # 2011-16: Total Acres of Land 4.677 +/- Ac. Rezone Parcel # 03-11-30-0000-	Ordinance # 2013-16: Total Acres of Land 33.8 +/- Ac. Rezone Parcel #29-11-31-0000-0100-0110 to PSP	Amended October 3 2017 (Ordinance 2017-17)

The City of Palm Coast prepares and uses this map data for its own purposes. This map data displays general boundaries and may not be appropriate for site specific uses. The City uses data believed to be accurate; however, a degree of error is inherent in all maps. This map data is distributed "AS IS" without warranties of any kind, either expressed or implied including, but not limited to, warranties of suitability to a particular purpose or use. This map data is intended for use only at the published scale. Detailed on-ground surveys and historical analyses of sites may differ substantially from this map data.

Industrial: An Industrial Park Area (light manufacturing and warehousing) is located at the intersection of Palm Coast Parkway and US Highway 1. Over 80 businesses employing over 1,000 persons are located in the Palm Coast and Pine Lake Industrial Parks. An additional Industrial Park Area is located along Hargrove Grade.

Educational: There are ten existing K-12 public educational facilities, several private schools, and a community college.

Institutional: A hospital and library are the primary institutional uses.

Recreation: The City owns 890 acres of parks, recreation, and open space.

2.4 WASTEWATER FLOWS

The Palm Coast Wastewater Treatment Facility wastewater flow data for June 2010 through June 2019 is provided in **Table 3** as the monthly average daily flow (MADF), three-month average daily flow (TMADF) and annual average daily flow (AADF). The TMADF and AADF are calculated values using the MADF data.

For WWTF No. 1 the recorded MADF flows are based on the effluent meter readings (Monitoring Site No. EFA-1). A Parshall Flume measures the influent flow in the facility headworks. Effluent flows are measured with ultrasonic transducers and weirs at the outlet of the chlorine contact tank. These were calibrated in April of 2008. For WWTF No. 2, magnetic flow meters measure the influent and effluent flows prior to the facility headworks and after the reclaimed water distribution pump station respectively.

Figure 6 presents the graphical plots of the MADF, TMADF and AADF for June 2010 through June 2019, respectively.

Table 3: Palm Coast Wastewater Historical Flows.

Dates	WWTF No.1 (January 2008 - June 2019)			WWTF No.2 (July 2018 - June 2019)			Combined Flow (July 2018 - June 2019)		
	MADF (MGD)	TMADF (MGD)	AADF (MGD)	MADF (MGD)	TMADF (MGD)	AADF (MGD)	MADF (MGD)	TMADF (MGD)	AADF (MGD)
Jun-19	5.163	5.337	6.063	0.690	0.714	0.994	5.853	6.051	7.057
May-19	5.276	5.573	6.322	0.585	0.767		5.861	6.340	7.225
Apr-19	5.571	5.907	6.519	0.714	0.826		6.285	6.733	7.347
Mar-19	5.872	6.163	6.641	0.819	0.906		6.691	7.069	7.410
Feb-19	6.279	6.309	6.743	0.944	1.005		7.223	7.314	7.443
Jan-19	6.338	6.085	6.823	0.955	1.059		7.293	7.144	7.445
Dec-18	6.311	5.838	6.913	1.117	1.102		7.428	6.940	7.455
Nov-18	5.607	5.589	7.016	1.106	1.071		6.713	6.660	7.465
Oct-18	5.596	6.615	7.219	1.084	1.100		6.680	7.715	7.576
Sep-18	5.564	6.913	7.623	1.024	1.066		6.588	7.979	7.914

Dates	WWTF No.1 (January 2008 - June 2019)			WWTF No.2 (July 2018 - June 2019)			Combined Flow (July 2018 - June 2019)		
	MADF (MGD)	TMADF (MGD)	AADF (MGD)	MADF (MGD)	TMADF (MGD)	AADF (MGD)	MADF (MGD)	TMADF (MGD)	AADF (MGD)
Aug-18	8.686	7.816	7.869	1.192			9.878	8.541	8.086
Jul-18	6.490	7.468	7.758	0.982			7.472	7.795	7.867
Jun-18	8.273	7.650	7.777	WWTF No.2 was activated in June 2018.					
May-18	7.641	7.256	7.600						
Apr-18	7.035	7.122	7.439						
Mar-18	7.092	7.251	7.344						
Feb-18	7.238	7.402	7.245						
Jan-18	7.422	7.671	7.133						
Dec-17	7.545	8.679	7.001						
Nov-17	8.046	9.002	6.897						
Oct-17	10.445	8.773	6.721						
Sep-17	8.514	7.528	6.374						
Aug-17	7.361	6.743	6.158						
Jul-17	6.709	6.190	6.013						
Jun-17	6.158	5.917	5.929						
May-17	5.703	5.835	5.918						
Apr-17	5.891	5.896	5.948						
Mar-17	5.911	5.882	5.927						
Feb-17	5.886	6.009	5.921						
Jan-17	5.849	6.024	5.943						
Dec-16	6.293	6.170	5.936						
Nov-16	5.930	6.045	5.868						
Oct-16	6.287	5.942	5.836						
Sep-16	5.918	5.748	5.808						
Aug-16	5.621	5.782	5.857						
Jul-16	5.704	5.928	5.849						
Jun-16	6.022	5.909	5.834						
May-16	6.059	5.849	5.776						
Apr-16	5.647	5.876	5.727						
Mar-16	5.841	5.915	5.762						
Feb-16	6.141	5.794	5.758						
Jan-16	5.764	5.596	5.753						
Dec-15	5.476	5.660	5.805						
Nov-15	5.548	6.004	5.884						
Oct-15	5.955	5.994	5.938						
Sep-15	6.509	5.851	5.981						
Aug-15	5.519	5.455	5.979						
Jul-15	5.525	5.443	6.064						
Jun-15	5.322	5.622	6.136						
May-15	5.482	5.781	6.126						
Apr-15	6.062	5.980	6.153						

Dates	WWTF No.1 (January 2008 - June 2019)			WWTF No.2 (July 2018 - June 2019)			Combined Flow (July 2018 - June 2019)		
	MADF (MGD)	TMADF (MGD)	AADF (MGD)	MADF (MGD)	TMADF (MGD)	AADF (MGD)	MADF (MGD)	TMADF (MGD)	AADF (MGD)
Mar-15	5.798	6.086	6.110						
Feb-15	6.080	6.295	6.132						
Jan-15	6.380	6.334	6.154						
Dec-14	6.426	6.364	6.085						
Nov-14	6.197	6.384	5.998						
Oct-14	6.469	6.500	5.937						
Sep-14	6.487	6.474	5.886						
Aug-14	6.544	6.043	5.861						
Jul-14	6.390	5.796	5.847						
Jun-14	5.194	5.518	5.834						
May-14	5.805	5.804	5.882						
Apr-14	5.554	5.984	5.928						
Mar-14	6.052	5.986	5.892						
Feb-14	6.347	5.762	5.811						
Jan-14	5.560	5.467	5.707						
Dec-13	5.379	5.567	5.680						
Nov-13	5.463	5.834	5.680						
Oct-13	5.859	6.139	5.696						
Sep-13	6.179	6.162	5.742						
Aug-13	6.380	6.130	5.763						
Jul-13	6.230	6.121	5.808						
Jun-13	5.781	5.753	5.741						
May-13	6.352	5.518	5.771						
Apr-13	5.126	5.101	5.641						
Mar-13	5.075	5.136	5.620						
Feb-13	5.102	5.237	5.611						
Jan-13	5.231	5.423	5.598						
Dec-12	5.377	5.817	5.580						
Nov-12	5.661	6.166	5.575						
Oct-12	6.413	6.587	5.516						
Sep-12	6.425	6.259	5.400						
Aug-12	6.923	6.162	5.270						
Jul-12	5.430	5.454	5.084						
Jun-12	6.132	5.268	5.037						
May-12	4.800	4.878	4.904						
Apr-12	4.873	4.926	4.888						
Mar-12	4.962	4.977	4.886						
Feb-12	4.943	5.093	4.881						
Jan-12	5.026	5.096	4.895						
Dec-11	5.311	5.096	4.876						
Nov-11	4.952	4.947	4.825						

Dates	WWTF No.1 (January 2008 - June 2019)			WWTF No.2 (July 2018 - June 2019)			Combined Flow (July 2018 - June 2019)		
	MADF (MGD)	TMADF (MGD)	AADF (MGD)	MADF (MGD)	TMADF (MGD)	AADF (MGD)	MADF (MGD)	TMADF (MGD)	AADF (MGD)
Oct-11	5.025	4.861	4.809						
Sep-11	4.865	4.806	4.779						
Aug-11	4.693	4.699	4.772						
Jul-11	4.860	4.667	4.786						
Jun-11	4.543	4.663	4.785						
May-11	4.597	4.785	4.824						
Apr-11	4.849	4.957	4.857						
Mar-11	4.910	4.939	4.890						
Feb-11	5.113	4.869	4.974						
Jan-11	4.793	4.750	5.044						
Dec-10	4.701	4.707	5.097						
Nov-10	4.756	4.734	5.133						
Oct-10	4.663	4.772	5.159						
Sep-10	4.783	4.831	5.086						
Aug-10	4.869	4.907	5.151						
Jul-10	4.840	4.947	5.255						
Jun-10	5.011	5.084	5.268						

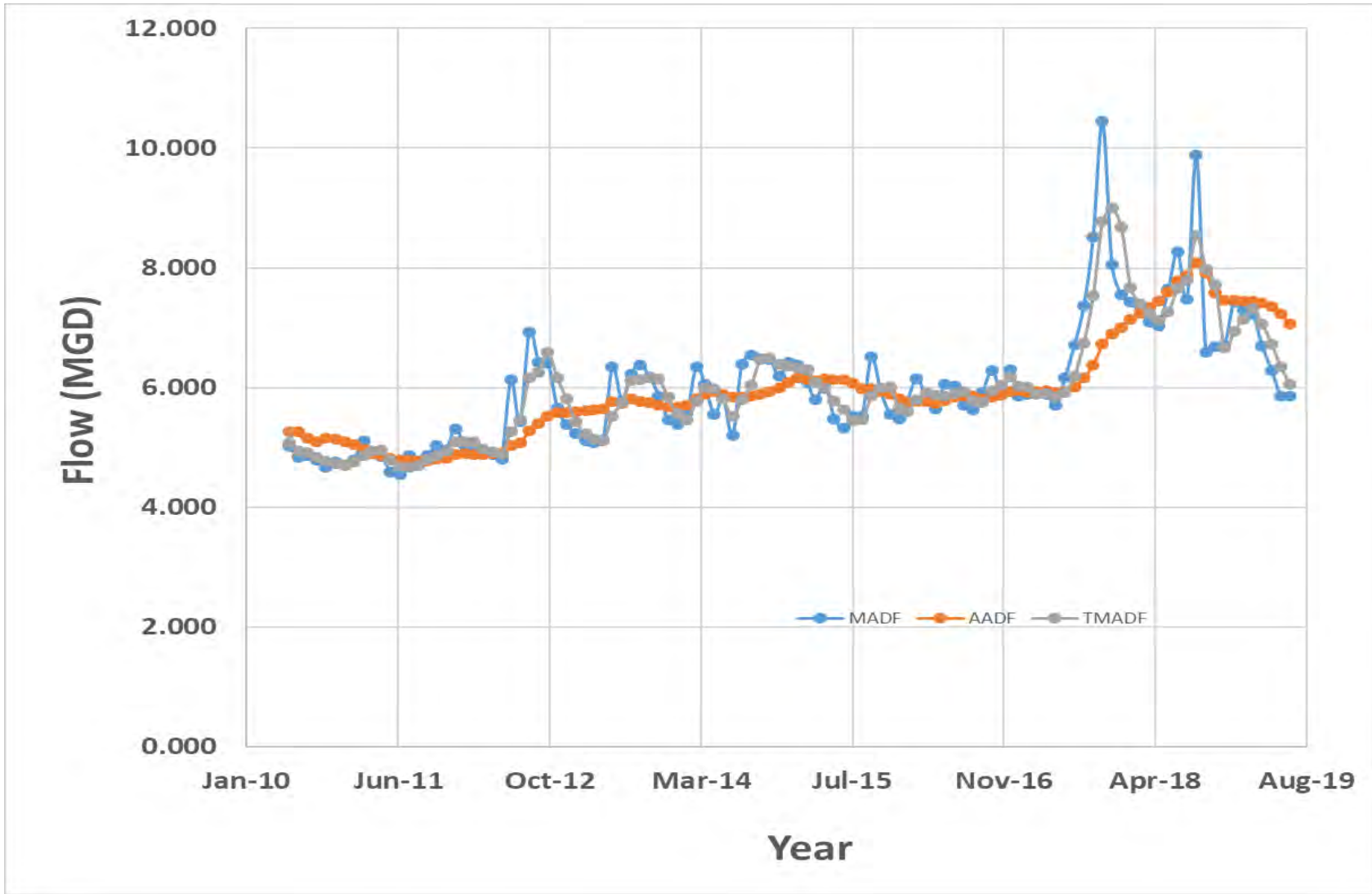


Figure 6: Palm Coast Historical Wastewater Flow.

2.5 EXISTING WASTEWATER SYSTEM

2.5.1 General

The City of Palm Coast owns and operates the wastewater collection system, the wastewater treatment facility, and the reclaimed water distribution system. **Figure 1** shows the Wastewater Service Area which also extends beyond the City limits.

2.5.2 Collection System

Wastewater from individual residences is conveyed to sewage lift stations by a combination of gravity sewers, sanitary, and pre-treatment effluent pumping (PEP) systems. Approximately 40% of Palm Coast is served by gravity sewer systems and 60% is served by PEP. The gravity sewer system is a combination of vitrified clay pipe, and plastic sewer pipe.

Most of the gravity sewer system, for the initial development, has been installed so that sanitary sewer service can be provided to new residences by extending a sanitary sewer service from the residence to the right-of-way. PEP storage tanks, PEP pumps, and pressure sewer will need to continue to be installed in areas served by the PEP systems. All new developments and sub-divisions are required to install gravity sewer systems.

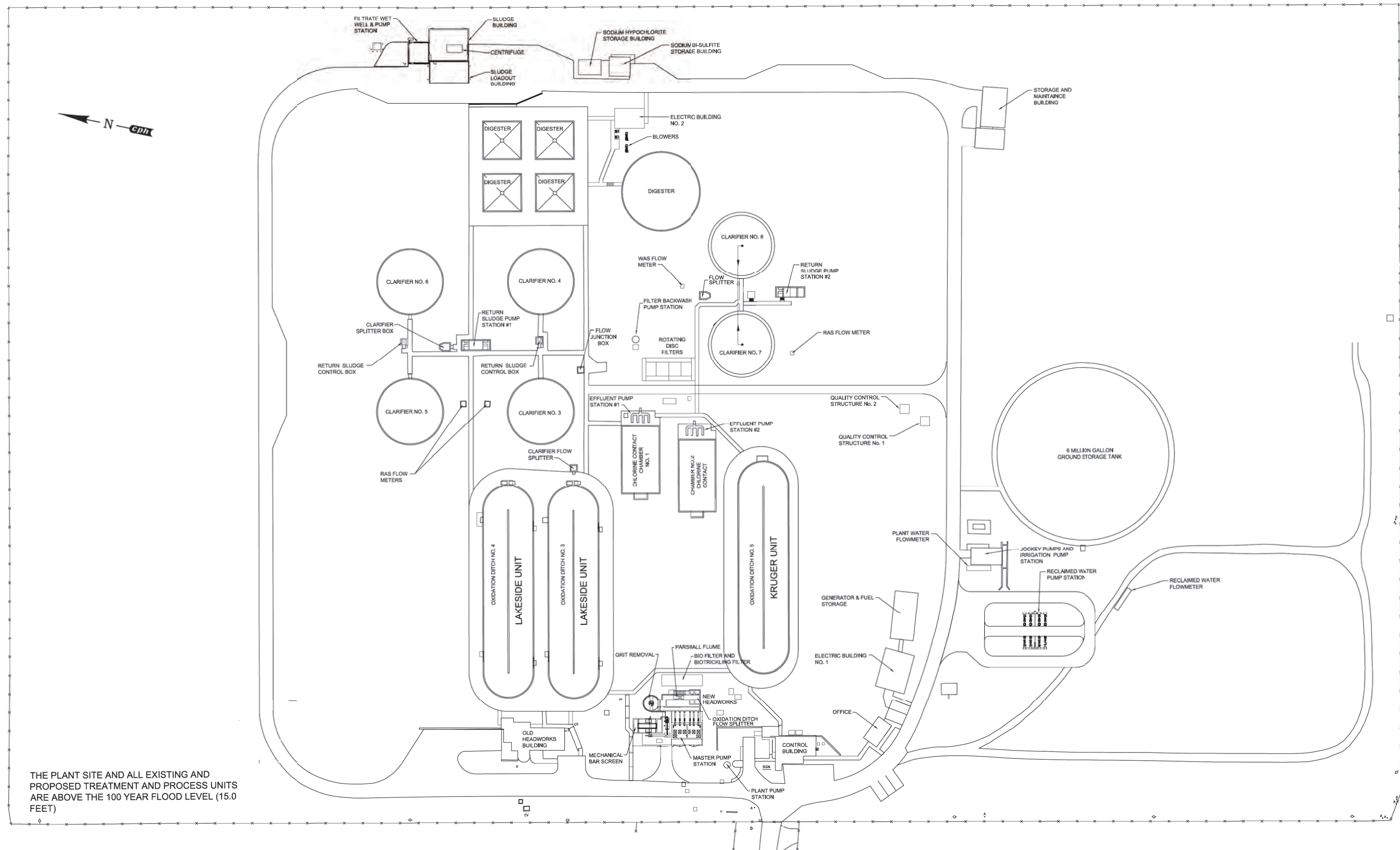
One hundred fifty-seven (157) sewage lift stations currently convey wastewater from individual service areas to the wastewater treatment facility, among which twenty two (22) delivers wastewater to WWTF No.2. The majority of the lift stations are City owned and operated, and the others are privately owned. Most of the lift stations have submersible sewage pumps. Many of the sewage lift stations pump to an adjacent gravity sewer, or to another lift station.

2.5.3 Wastewater Treatment Facilities

2.5.3.1 WWTF No.1

2.5.3.1.1 WWTF No.1 Treatment Process

The Palm Coast WWTF No. 1 is an oxidation ditch-type activated sludge wastewater treatment facility. Reclaimed water complies with advanced secondary standards and can be used for irrigation of areas with public access. Reclaimed water can also be disposed of in percolation ponds with controlled access. The location of the facility is presented on **Figure 1**. The facility Site Plan and Process Flow Schematic including the biosolids, reclaimed water and aerobic digestion facilities are presented in **Figure 7** and **Figure 8**, respectively.



THE PLANT SITE AND ALL EXISTING AND PROPOSED TREATMENT AND PROCESS UNITS ARE ABOVE THE 100 YEAR FLOOD LEVEL (15.0 FEET)

Designed by:	ARB	Date:	July 2011
Drawn by:	JCS	Job No.:	P61206
Checked by:	ARB	File:	P61206 Fig3
Approved by:	ARB		
Scale:	1" = 100'		© 2011



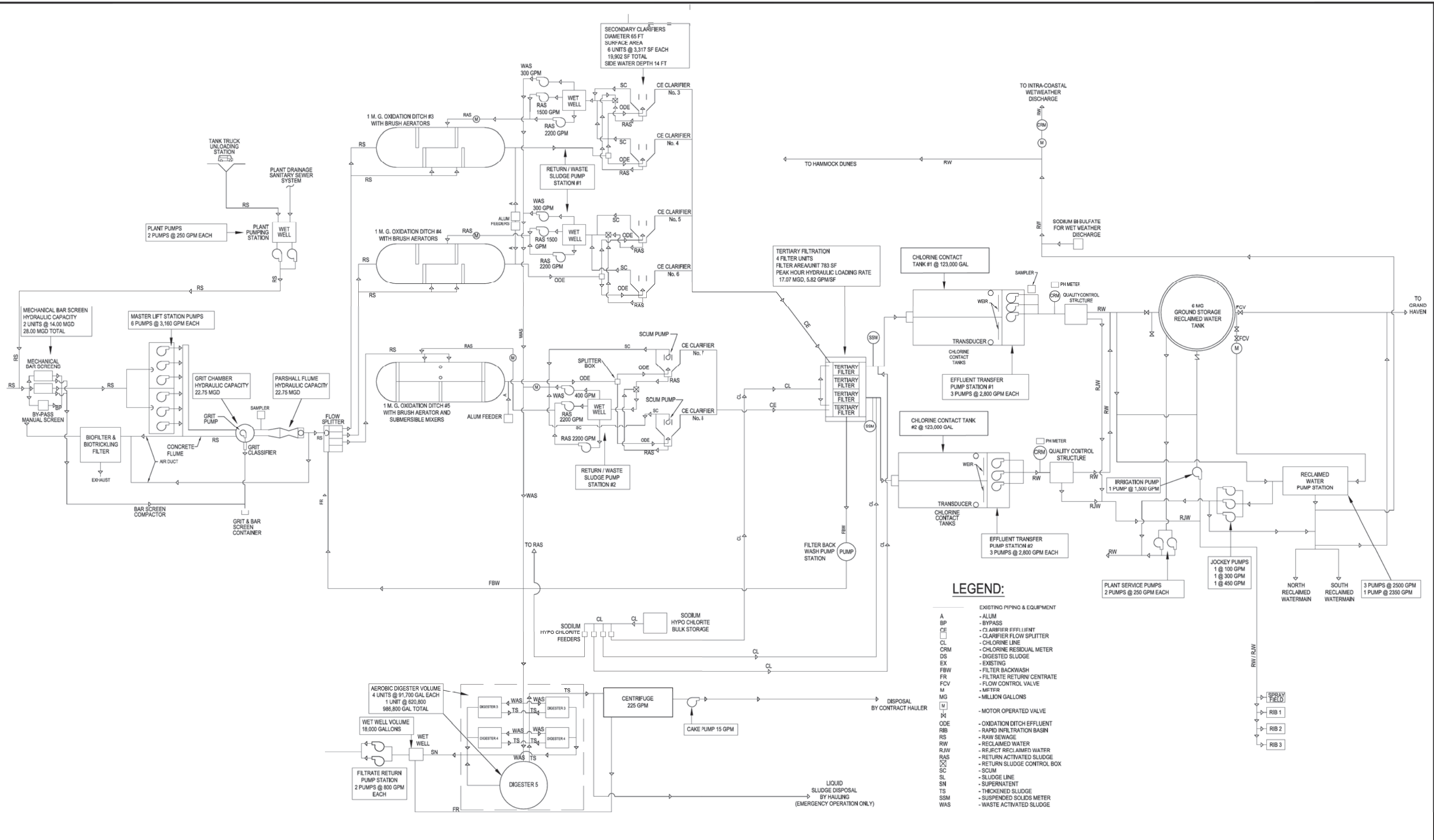
Engineers (C.O.A. No. 3215)
 Architects (Lic. No. AA2600926)
 Surveyors (L.B. No. 7143)
 Landscape Arch. (Lic. No. LC000298)
 Planners
 Environmental Scientists
 Construction Management
 Traffic / Transportation

520 Palm Coast Parkway SW
 Palm Coast, FL 32137
 Phone: 386.445.6569
 Fax: 386.447.8991

SITE PLAN

CITY OF PALM COAST WWTF NO. 1

FIGURE
7
 102



Designed by:	ARB	Date:	July 2011
Drawn by:	JCS	Job No.:	P61206
Checked by:	ARB	File:	P61206 Fig2
Approved by:	ARB	© 2011	
Scale:	N.T.S.		



Engineers
Architects
Surveyors
Landscape Arch. Planners
Environmental Scientists
Construction Management
Traffic/Transportation

(C.O.A. No. 3215)
(Lic. No. AA2600926)
(L.B. No. 7143)
(Lic. No. LC000298)

520 Palm Coast Parkway SW
Palm Coast, FL 32137
Phone: 386.445.6569
Fax: 386.447.8991

PROCESS FLOW DIAGRAM

CITY OF PALM COAST WWTF NO. 1

FIGURE
8
103

2.5.3.1.2 Plant Elevation / Flood Plain

The ground elevation at the WWTF No. 1 varies from elevation 33-feet to 17-feet. The plant is located on high ground and is above the 100-year flood level (15 feet M.L.S.). The plant and treatment units will remain operational during a 25-year flood event, in accordance with the FDEP and EPA Class I Reliability Criteria.

2.5.3.1.3 Wastewater Treatment Unit Processes and Major Equipment

Major Unit Process Volumes are given in **Table 4**. The Major Equipment Capacities are tabulated in **Table 5**.

Table 4: Palm Coast WWTF No.1 Major Process Units.

Unit Process	No. of Units	Capacity Per Unit		Total Capacity
Influent Master Pump Station	1	9.1	MGD, AADF	9.10
Headworks Structure	1	9.1	MGD, AADF	9.10
Oxidation Ditch	3	2.28	MGD	6.84
Clarifier	4	347,365	Gal	1,984,928
	2	297,734	Gal	
Discfilter (Submerged Filter Area)	4	509	Sq. Ft.	2,036
Chlorine Contact Tank	4	63,042	gal	252,166
Aerobic Digestion	4	91,700	gal	986,800
Aerobic Digestion	1	620,000	gal	
Reclaimed Water Storage	1	6.0	MG	6.0

2.5.3.1.4 Pumping and Preliminary Treatment

Wastewater is pumped from off-site pumping stations to the Wastewater Treatment Facility on-site lift station. The wastewater is pumped from the lift station to the headworks where preliminary treatment is performed. Preliminary treatment equipment includes mechanical screens, grit removal unit, flow measurement, bio-trickling filter and bio-filter odor control system.

2.5.3.1.5 Headworks

Two mechanic screens remove large solids (more than 3 mm diameter) from the influent flow. Six variable speed submersible sewage pumps pump the wastewater to the grit removal system. A Parshall flume measures the plant influent flow. A flow splitter equally divides the influent flow between the three existing process trains and a future process train. The screen structure, pumping station, and headworks are covered. The air above the water in these structures is routed through a bio-trickling filter and bio-filter for odor control.

Table 5: Palm Coast WWTF No.1 Major Equipment List.

Item	No. Units	Capacity Per Unit	Total Capacity
Mechanical Screens	2	14.0 MGD	28.0 MGD
Master Pump Station Pumps (30 HP)	6	1,500 - 3,160 gpm	9,000 - 18,960 gpm
Vortex Grit Chamber	1	22.75 MGD	22.75 MGD
Grit Pump	2	200 gpm	200 gpm
WasteTech Grit Washing System	1	22.75 MGD	22.75 MGD
Influent Parshall Flume	2	22.75 MGD	22.75 MGD
Biofilter	1	2,000 cfm	2,000 cfm
BioTrickling Filter	1	2,000 cfm	2,000 cfm
Flow Splitter	4	6.0 MGD	24.0 MGD
Oxidation Ditch Brush Aerators (50 HP)	8	90 lbs/hr	720 lbs/hr
Oxidation Ditch Brush Aerators (40 HP)	5	110 lbs/hr	550 lbs/hr
Alum Metering Pumps	3	2.0 gpm	6.0 gpm
Clarifiers	6	0.35 MG	2.10 MG
Return Variable Speed Sludge Pump (35 HP)	4	600 - 2,200 gpm	2,400 - 8,800 gpm
Return Variable Speed Sludge Pump (20 HP)	2	350 - 1,500 gpm	750 - 3,000 gpm
Waste Sludge Pump (5 HP)	2	300 gpm	600 gpm
Waste Sludge Pump (5 HP)	1	400 gpm	400 gpm
Discfilter	4	509 sq. ft.	2036 sq. ft.
Discfilter Pump Station	2	300 gpm	600 gpm
Chlorine Feeder	2	13.5 gal/hr	27.0 gal/hr
Chlorine Feeder	2	20.0 gal/hr	40.0 gal/hr
Effluent Flow Measurement (Weirs & Level Transducer)	4	6.0 MGD	24.0 MGD
Effluent Variable Speed Transfer Pump (60 HP)	6	1,600 - 2,800 gpm	9,600 - 16,800 gpm
Reclaimed Water Variable Speed Pump (150 HP)	1	2,350 gpm	2,350 gpm
Reclaimed Water Variable Speed Pumps (150 HP)	3	2,500 gpm	7,500 gpm
High Pressure Irrigation Pump (75 HP)	1	1,500 gpm	1,500 gpm
Plant Service Water Pump (10 HP)	1	100 gpm	100 gpm
Plant Service Water Pump (25 HP)	1	300 gpm	300 gpm
Plant Service Water Pump (40 HP)	1	450 gpm	450 gpm
Course Bubble Aeration Diffusers	80	31.18 scfm	2,494 scfm
Multistage Centrifugal Air Blowers (150 HP)	2	2,490 scfm	4,980 scfm
Sludge Centrifuge Feed Pumps (20 HP)	3	300 gpm	900 gpm
Inline Sludge Grinder / Macerator (3 HP)	1	300 gpm	300 gpm
Polymer Feed System (1/2 HP)	1	0.12 - 2.5 gpm	0.12 - 2.5 gpm
Solid Bowl Decanter Centrifuge (200 HP)	1	225 gpm	225 gpm
Progressive Cavity Cake Pump (15 HP)	1	5 - 15 gpm	5 - 15 gpm
Filtrate Return Pumps (20 HP)	2	800 gpm	1600 gpm
Plant Pumping Station (5 HP)	2	250 gpm	500 gpm
Sodium Bisulfite Feeder	1	12 gal/hr	12 gal/hr
Standby Electrical Generator	1	500 KW	500 KW
Standby Electrical Generator	1	1500 KW	1500 KW

2.5.3.1.6 Secondary Treatment

The Palm Coast WWTF No. 1 is an oxidation-ditch activated sludge wastewater treatment facility permitted for 6.83 MGD. Pretreated wastewater flows to three process trains, each of which includes a 2.28 MG oxidation ditch and two secondary clarifiers. The oxidation ditches provide biological treatment of the pre-treated wastewater. Two of the oxidation ditches have four surface brush aerators each. The third oxidation ditch has five surface brush aerators and two submersible mixers.

The aerated wastewater flow from each oxidation ditch is equally split between two clarifiers. There are a total of six clarifiers. Return sludge is pumped from the clarifiers back to the activated sludge treatment process, or wasted to aerobic sludge digesters.

2.5.3.1.7 Tertiary Filtration

Following the oxidation ditch process, the clarification process separates the solids from the liquid to produce clarified effluent. Clarified effluent is routed to a tertiary filter for additional treatment.

There are four tertiary disc filter units with 13 rotating discs per unit with a total submerged filter surface area of 2,036 square feet.

2.5.3.1.8 Disinfection

Effluent from the tertiary filter is routed to two separate chlorine contact tanks. Liquid sodium hypochlorite is used for disinfection. The two Chlorine Contact Tanks, each with two Chlorine Contact Chambers, provide the required chlorine contact time. Effluent from the chlorine contact chambers meets Advanced Secondary Treatment criteria with high-level disinfection treatment and can be used for public access reclaimed water irrigation, or disposed of in rapid infiltration basins, or a spray field. Reclaimed water is also permitted to discharge to the Intracoastal Waterway as the last disposal method.

2.5.3.1.9 Effluent Flow Measurement

Plant effluent flow is measured in each Chlorine Contact Chamber. An Ultrasonic Transducer prior to the Fiberglass weir located at the discharge of each Chlorine Contact Chamber records the flows. This point is defined in the FDEP wastewater permit as Monitoring Location Site No. EFA-1. The wastewater flows recorded at this site are the basis for effluent meter readings for the WWTF No. 1

The influent Parshall flume, effluent ultrasonic transducers, and weirs are regularly calibrated.

Effluent transfer pumps located adjacent to the Chlorine Contact Tanks convey the reclaimed water to a 6.0 MG Ground Storage Tank or to Rapid Infiltration Basins (percolation ponds), or to the Intracoastal Waterway.

2.5.3.1.10 Physical, Chemical, and Biological Characteristics of Wastewater

The key characteristics for measurement of the Removal Efficiency at WWTF No. 1 are Five-Day Carbonaceous Biochemical Oxygen Demand (CBOD₅) and Total Dissolved Solids (TSS). **Table 6** tabulates the concentrations of CBOD₅ and TSS data from June 2010 through June 2019.

Table 6: Palm Coast WWTF No.1 Influent and Effluent Water Quality.

Month	Year	MADF	CBOD ₅ (mg/L)*			TSS (mg/L)*		
		MGD	Influent	Effluent	% Removal	Influent	Effluent	% Removal
June	2019	5.163	99	2.0	98.0%	134	1.8	98.6%
May	2019	5.276	107	2.0	98.1%	132	1.8	98.6%
April	2019	5.571	217	4.0	98.2%	480	1.8	99.6%
March	2019	5.872	172	2.0	98.8%	199	1.8	99.1%
February	2019	6.279	119	2.9	97.6%	58	2.9	95.1%
January	2019	6.338	250	6.2	97.5%	297	1.6	99.5%
December	2018	6.311	112	5.6	95.0%	86	1.8	97.9%
November	2018	5.607	185	5.4	97.1%	292	1.2	99.6%
October	2018	5.596	99	3.8	96.2%	77	1.5	98.0%
September	2018	5.564	142	5.7	96.0%	146	1.6	98.9%
August	2018	8.686	65	6.2	90.5%	39	2.9	92.6%
July	2018	6.490	143	4.1	97.1%	88	2.2	97.5%
June	2018	8.273	143	6.9	95.2%	78	1.4	98.2%
May	2018	7.641	129	3.6	97.2%	56	1.4	97.5%
April	2018	7.035	150	3.6	97.6%	110	1.4	98.7%
March	2018	7.092	252	3.6	98.6%	105	1.4	98.7%
February	2018	7.238	225	3.6	98.4%	104	1.4	98.7%
January	2018	7.422	213	3.6	98.3%	145	1.4	99.0%
December	2017	7.545	200	2.8	98.6%	130	1.1	99.2%
November	2017	8.046	174	2.0	98.9%	132	1.2	99.1%
October	2017	10.445	95	2.0	97.9%	88	1.1	98.8%
September	2017	8.514	124	2.0	98.4%	90	1.0	98.9%
August	2017	7.361	170	2.1	98.8%	134	1.1	99.2%
July	2017	6.709	150	2.0	98.7%	123	1.5	98.8%
June	2017	6.158	166	2.9	98.3%	123	1.1	99.1%
May	2017	5.703	170	2.0	98.8%	121	1.0	99.2%
April	2017	5.891	250	2.7	98.9%	172	1.6	99.1%
March	2017	5.911	264	4.0	98.5%	164	1.2	99.3%
February	2017	5.886	282	2.0	99.3%	152	1.0	99.3%
January	2017	5.849	200	2.0	99.0%	210	1.4	99.3%

Month	Year	MADF	CBOD ₅ (mg/L)*			TSS (mg/L)*		
		MGD	Influent	Effluent	% Removal	Influent	Effluent	% Removal
December	2016	6.293	214	2.0	99.1%	158	1.2	99.2%
November	2016	5.930	210	2.0	99.0%	137	1.0	99.3%
October	2016	6.287	130	2.0	98.5%	114	1.0	99.1%
September	2016	5.918	150	2.0	98.7%	156	1.2	99.2%
August	2016	5.621	190	2.0	98.9%	163	1.4	99.1%
July	2016	5.704	140	2.0	98.6%	149	1.2	99.2%
June	2016	6.022	156	2.0	98.7%	112	1.0	99.1%
May	2016	6.059	188	2.0	98.9%	150	1.1	99.3%
April	2016	5.647	185	2.0	98.9%	160	1.5	99.1%
March	2016	5.841	206	3.1	98.5%	164	1.9	98.8%
February	2016	6.141	185	2.0	98.9%	170	1.0	99.4%
January	2016	5.764	187	2.0	98.9%	167	1.0	99.4%
December	2015	5.476	174	2.0	98.9%	124	1.0	99.2%
November	2015	5.548	158	2.0	98.7%	124	2.0	98.4%
October	2015	5.955	125	2.0	98.4%	120	1.1	99.1%
September	2015	6.509	99	2.0	98.0%	112	1.1	99.0%
August	2015	5.519	183	2.0	98.9%	123	1.1	99.1%
July	2015	5.525	178	2.0	98.9%	142	1.3	99.1%
June	2015	5.322	134	2.0	98.5%	150	1.2	99.2%
May	2015	5.482	170	7.3	95.7%	160	1.0	99.4%
April	2015	6.062	162	2.7	98.3%	150	1.4	99.1%
March	2015	5.798	190	2.0	98.9%	146	1.4	99.0%
February	2015	6.080	160	2.0	98.8%	145	1.0	99.3%
January	2015	6.380	170	2.0	98.8%	140	1.1	99.2%
December	2014	6.426	158	2.0	98.7%	129	1.0	99.2%
November	2014	6.197	133	2.0	98.5%	84	1.8	97.9%
October	2014	6.469	124	2.0	98.4%	88	1.0	98.9%
September	2014	6.487	145	2.0	98.6%	98	1.0	99.0%
August	2014	6.544	132	2.0	98.5%	105	1.0	99.0%
July	2014	6.390	120	2.0	98.3%	102	1.0	99.0%
June	2014	5.194	145	2.0	98.6%	153	1.0	99.3%
May	2014	5.805	103	2.0	98.1%	62	1.0	98.4%
April	2014	5.554	125	2.0	98.4%	83	1.0	98.8%
March	2014	6.052	109	2.0	98.2%	103	1.0	99.0%
February	2014	6.347	122	2.0	98.4%	110	1.0	99.1%
January	2014	5.560	170	2.0	98.8%	314	1.0	99.7%
December	2013	5.379	202	2.0	99.0%	220	1.0	99.5%

Month	Year	MADF	CBOD ₅ (mg/L)*			TSS (mg/L)*		
		MGD	Influent	Effluent	% Removal	Influent	Effluent	% Removal
November	2013	5.463	150	2.0	98.7%	165	1.0	99.4%
October	2013	5.859	158	2.0	98.7%	140	1.0	99.3%
September	2013	6.179	115	2.0	98.3%	143	1.0	99.3%
August	2013	6.380	160	2.0	98.8%	138	1.3	99.1%
July	2013	6.230	148	2.0	98.6%	150	1.5	99.0%
June	2013	5.781	148	2.0	98.6%	173	1.4	99.2%
May	2013	6.352	160	2.0	98.8%	176	1.4	99.2%
April	2013	5.126	168	2.0	98.8%	295	1.4	99.5%
March	2013	5.075	187	2.0	98.9%	187	1.4	99.3%
February	2013	5.102	187	2.0	98.9%	193	1.3	99.3%
January	2013	5.231	194	2.0	99.0%	216	1.3	99.4%
December	2012	5.377	170	2.0	98.8%	183	1.5	99.2%
November	2012	5.661	168	2.0	98.8%	136	1.5	98.9%
October	2012	6.413	125	2.0	98.4%	133	1.2	99.1%
September	2012	6.425	123	2.0	98.4%	143	1.4	99.0%
August	2012	6.923	152	2.2	98.6%	125	1.2	99.0%
July	2012	5.430	165	2.0	98.8%	135	1.3	99.0%
June	2012	6.132	133	2.0	98.5%	135	1.2	99.1%
May	2012	4.800	170	2.0	98.8%	176	1.4	99.2%
April	2012	4.873	166	2.0	98.8%	167	1.0	99.4%
March	2012	4.962	162	2.0	98.8%	170	1.2	99.3%
February	2012	4.943	171	2.0	98.8%	180	1.6	99.1%
January	2012	5.026	175	2.0	98.9%	188	1.6	99.1%
December	2011	5.311	134	2.0	98.5%	164	1.8	98.9%
November	2011	4.952	134	2.0	98.5%	145	1.0	99.3%
October	2011	5.025	132	2.0	98.5%	207	1.0	99.5%
September	2011	4.865	124	2.0	98.4%	158	1.4	99.1%
August	2011	4.693	142	2.0	98.6%	175	1.1	99.4%
July	2011	4.860	128	2.0	98.4%	155	1.1	99.3%
June	2011	4.543	152	2.1	98.6%	164	1.0	99.4%
May	2011	4.597	158	2.0	98.7%	190	1.1	99.4%
April	2011	4.849	172	2.0	98.8%	168	1.4	99.2%
March	2011	4.910	170	3.2	98.1%	182	1.8	99.0%
February	2011	5.113	184	2.0	98.9%	174	2.0	98.9%
January	2011	4.793	187	6.9	96.3%	187	7.0	96.3%
December	2010	4.701	184	15.0	91.8%	196	4.8	97.6%
November	2010	4.756	178	2.0	98.9%	173	2.0	98.8%

Month	Year	MADF	CBOD ₅ (mg/L)*			TSS (mg/L)*		
		MGD	Influent	Effluent	% Removal	Influent	Effluent	% Removal
October	2010	4.663	145	2.0	98.6%	150	2.0	98.7%
September	2010	4.783	150	2.0	98.7%	172	2.0	98.8%
August	2010	4.869	183	2.0	98.9%	183	2.0	98.9%
July	2010	4.840	166	2.0	98.8%	178	2.0	98.9%
June	2010	5.011	157	2.0	98.7%	177	2.1	98.8%
Max.		10.445	282	15.0	99.3%	480	7.0	99.7%
Average		5.788	160	2.6	98.3%	149	1.5	98.8%
Min		3.790	65	2.0	90.5%	39	1.0	92.6%

Note: * 2.0 mg/L is the detection limit

2.5.3.1.11 Sludge Processing

Sludge processing at Palm Coast WWTP No. 1 consists of aerobic digestion and dewatering. Waste sludge is pumped from the clarifiers to the aerobic digesters. There are four 91,700-gallon aerobic sludge digesters each with a floating aerator and one 620,000-gallon aerobic digester with coarse bubble diffusers.

The five aerobic digesters are used to partially stabilize waste sludge from the secondary clarifiers. After aerobic digestion and decanting, the solid content of the sludge pumped from the aerobic digesters is approximately 0.70 -1.5 percent.

Polymer is added to the partially stabilized sludge and the sludge is dewatered by a centrifuge to approximately 16-20 percent solids by weight. A screw pump conveys the dewatered sludge cake to truck loading station. The sludge cake is transported by truck to a contracted regional management facility for further treatment and disposal.

A Filtrate Pumping Station, with two 800-gpm pumps, conveys filtrate from the centrifuge and decant from the aerobic digesters to the plant headworks.

2.5.3.1.12 Sludge Disposal

The existing aerobic digesters do not provide sufficient treatment for the residual solids to be classified as Class B sludge.

The sludge cake is transported to a regional bio-solids management facility approved by FDEP for final treatment and disposal. The City pays a fee based on \$/wet ton of sludge cake to the contracted regional management operator for trucking, treatment and final disposal of the biosolids end product.

2.5.3.1.13 WASTEWATER TREATMENT SUPPORT FACILITIES

2.5.3.1.13.1 Plant Waste Pumping Station

A plant waste pumping station, with two 250-gpm pumps, conveys plant sanitary waste to the plant headworks.

2.5.3.1.13.2 Operations and Electrical Buildings

An operations building includes a laboratory, office, and facilities for the plant staff. A separate building houses the 500 KW standby generator, and electrical control room. The 1500 KW generator is housed in a sound attenuated enclosure.

Two electrical rooms and one office building were constructed with the 2006 plant upgrading and expansion.

2.5.3.1.13.3 Standby Power

A 500 KW and 1500 KW generator provide sufficient standby power to operate the entire existing wastewater treatment facility during times of a power failure.

2.5.3.2 WWTF No.2

2.5.3.2.1 WWTF No.2 Treatment Process

WWTF No.2 is an advanced wastewater treatment (AWT) facility, utilizing a flat sheet Membrane Bio-Reactor (MBR) process. The location of the facility is presented on **Figure 1**. The facility Site Plan and Process Flow Schematic are presented in **Figure 2** and **Figure 3**, respectively.

2.5.3.2.2 Plant Elevation / Flood Plain

The ground elevation at the WWTF No. 2 varies from elevation 43-feet to 36-feet. The plant is located on high ground and is above the 100-year flood level (15 feet M.L.S.). The plant and treatment units will remain operational during a 25-year flood event, in accordance with the FDEP and EPA Class I Reliability Criteria.

2.5.3.2.3 Wastewater Treatment Unit Processes and Major Equipment

WWTF No.2 consists of the following treatment process:

- Headworks
- Flow Equalization Basins
- Anaerobic Basins
- Pre-Anoxic Basins
- Aerobic Basins
- Post-Anoxic Basins
- MBR Basins
- Chlorine Contact Chambers
- Sludge Holding Tanks

- Sludge Dewatering Facility
- Chemical Storage and Feed System
- Reclaimed Water Storage and Distribution System

The major process equipment and capacities are tabulated in **Table 7**.

Table 7: WWTF No.2 Major Process Equipment and Capacities.

Pretreatment		
Screen	Unit	Description
Type of screen (fine)		Rotary Drum Screen
Number of screens		1 duty , 1 standby
Screen capacity, each	mgd	7.5
Motor horsepower of drum screen	HP	2
Number of screening conveyor		1
Motor horsepower of screen conveyor	HP	3
Number of wash press		1
Horsepower of wash press	HP	3
Grit Removal		
Type of grit removal		Vortex Type
Number of grit removal system		1
Number of PD blower		1
Motor horsepower of PD blower	HP	3
Number regenerative blower		1
Motor horsepower of regenerative blower	HP	3
Number of grit classifier		1
Motor horsepower of grit classifier	HP	0.5
Odor Control		
Type of odor control system		Vapex
Horsepower		
Number of Nozzles		5
Average influent H ₂ S concentration	ppm	110
Maximum influent H ₂ S concentration	ppm	300
Design removal efficiency	%	99
Equalization Tanks		
Number of tanks		2
Total volume	gals	505,230
Design volume per tank	gals	252,600
Effective volume per tank	gals	200,000
Max SWD	ft	19
Min SWD	ft	4
Tank Height	ft	20.5
Length/width per tank (inside)	ft x ft	45 x 39.5
Type of aeration equipment		Coarse bubble diffuser
Number of diffusers each tank		16

Required air in each tank	cfm	333
Number of EQ blower		1 (with a common standby with digesters)
EQ blower operation horsepower	HP	25
Blower Model		GM 025S-00
Number of EQ pumps		2 duty, 2 standby
Type of EQ pump drive		VFD
Type of EQ pump		Non-clog centrifugal type
Capacity of each EQ pump	gpm	1,085
EQ pump motor horsepower	HP	15
Number of mixer per tank		1
Type of mixer		Submersible propeller
Horsepower of each mixer	HP	10
Anaerobic Tanks		
Number of tanks		2
Maximum SWD	ft	18.63
Tank height	ft	20.5
Length/width per tank (inside)	ft x ft	24 x 13
Total anaerobic tank volume	gals	86,000
Volume of each tank	gals	43,000
Type of submersible mixer		Submersible Propeller
Number of mixer per tank		1
Motor horsepower of each mixer	HP	2.7
Pre-Anoxic Tanks		
Number of tanks	--	2
Maximum SWD	ft	18.63
Tank height	ft	20.5
Length/width per tank (inside)	ft x ft	24 x 25.5
Total volume	gals	170,554
Volume of each tank	gals	85,277
Type of mixer		Submersible Propeller
Number of mixers per tank		1
Motor horsepower of each mixer	HP	8
Type of anoxic-to-anaerobic recycle pumps (AXR pumps)		Non-clog centrifugal type
Capacity of each AXR pump	gpm	1,085
Number of AXR pumps		2 duty, 2 standby
Horsepower of each AXR pump	HP	25
Type of pump drive		Variable Frequency Drive (VFD)
Oxic Tanks		
Number of tanks		2
Maximum SWD	ft	17.79

Tank height	ft	20.5
Length/width per tank (inside)	ft x ft	41 x 39.5
Total tank volume (low DO zone included)	gals	431,000
Volume of each tank	gals	215,500
Type of air diffusers		Aerostrip Fine Bubble
Number of diffusers per tank		33
Type of aeration blower		Positive Displacement Blowers
Number of blowers		2 duty, 1 common standby with MBR
Motor horsepower of each blower	HP	100
Type of nitrification mixer		Submersible Propeller
Number of mixers		2 (1 per basin)
Horsepower of each mixer	HP	10
Low-DO Zone in Oxidic Tank		
Total design volume of low-DO zone	gals	25,000
Volume of each low DO zone	gals	12,500
Length/width per low DO zone	ft x ft	11 x 10
Maximum SWD in low DO zone	ft	17.2
Type of internal recycle pump		Non-clog centrifugal type
Recycle flow rate to pre-anoxic tanks	gpm	4,862 to 6,000
Number of internal recycle pumps		2 duty, 2 standby
Capacity of each IRQ pump	gpm	3,038
Motor horsepower of each IRQ pump	HP	50
Type of IRQ pump drive		VFD
Post-Anoxic Tanks		
Number of tanks		2
Maximum SWD	ft	16.72
Tank height	ft	20.5
Length/width per tank	ft x ft	13.25 x 39.5
Total design tank volume	gals	121,508
Volume of each tank	gals	60,754
Type Mixer		Submersible Propeller
Number of mixer per tank		1
Motor horsepower of each mixer		8
MBR Tanks		
Number of tanks		4
Total volume of MBR tank	gals	147,444
Volume of each tank	gals	51,323
Number of membrane cassettes per tank		10
Length/width per tank	ft x ft	32.9 x 19
Tank height	ft	11
Maximum SWD	ft	16
Design MLSS concentration	mg/L	10,485

Type and brand of membrane cassette		OV480	
Number of membrane cassettes		40 (10 cassettes per tank)	
Total membrane surface area	ft ²	206,667	
Type of blower		PD Blower	
Number of blowers		2 duty, 1 common standby with oxic tank	
Motor horsepower of blower	HP	100	
Returned activated sludge pumps		Non-clog centrifugal type	
Number of RAS Pumps		4 duty	
Capacity of each RAS pump	gpm	2,170	
Motor horsepower of each RAS pump		25	
Type of pump drive		VFD	
Type of permeate pump		Non-clog centrifugal type	
Number of permeate pumps		4	
Motor horsepower of each permeate pump	HP	20	
Capacity of each permeate pump	gpm	965	
Type of permeate pump drive		Constant Speed	
Type of permeate flow control valves		Modulating butterfly valve	
Type of permeate flow meters		Magnetic flow meter	
Chlorine Contact Tanks			
Chlorine doses	mg/L	5	
Contact time at peak flow	minutes	12.5	
Chlorine residual	mg/L	2	
Number of tanks		2	
Total effective tank volume	gal	44,318	
Effective volume of each tank	gal	22,159	
Maximum SWD	ft	6	
Tank height	ft	8	
Number of channels in each chamber		3	
Width of each channel	ft	4.22	
Length of each channel	ft	39	
Transfer Pumps			
Type of transfer pumps		Vertical Turbine	
Number of pumps		1 duty 1 standby	
Motor horsepower of transfer pump	HP	40	
Type of drive		VFD	
Capacity of each pump	gpm	2,100	
TDH	ft	45	
Reclaimed Water Distribution Pump Station			
Pump capacity, gpm	Number of pump	Motor horsepower, HP	Type
1,750	3 (2 duty, 1 standby)	125	Vertical turbine, VFD
500	1	50	Vertical turbine, VFD
200	1	30	Vertical turbine, VFD

Waste Sludge Holding Tanks		
Number of tanks		2
Total volume of tank	gals	245,000
Volume of each tank	gals	122,500
Length x width per tank	ft x ft	35 x 33
Maximum SWD	ft	14
Height of the tank	ft	16
Number of mixer per tank		1
Type of mixer		Submersible propeller
Horsepower of each mixer		6
Type of aeration equipment		Coarse bubble diffuser
Number of diffusers each tank		28
Air required in each tank	cfm	491
Number of blowers		1 duty, 1 standby with EQ
Type of blower		PD
Motor horsepower of each blower	HP	40
Chemical Feed Systems		
Alum Feed System		
Type of alum feed pump		Hydraulically Actuated Diaphragm Metering Pump
Design dosing rate	gph	6.0
Capacity per pump	gph	15
Motor horsepower of each pump	HP	1
Number of pumps		1 duty, 1 standby
Micro Cg Feed System		
Type of Micro Cg pump		Hydraulically Actuated Diaphragm Metering Pump
Design dosing rate	gph	22.7
Capacity per pump	gph	0.8-40
Motor horsepower of each pump	HP	1
Number of pumps		2 duty , 1 standby
Sodium Hypochlorite Feed System		
Type of sodium hypochlorite pump		Hydraulically Actuated Diaphragm Metering Pump
Design dosing rate	gph	3.48
Capacity per pump	gph	0.3-15
Motor horsepower of each pump	HP	1
Number of pumps		1 duty, 1 standby
Sludge Dewatering Facilities		
Number of sludge feed pumps	--	2 (1 duty, 1 standby)
Type of sludge feed pump		Progressive Cavity
Horsepower of each sludge feed pump	HP	13.2
Sludge feed pump control		VFD

Capacity each sludge pump	gpm	200
Number of belt filter press		1
Belt width	meter	2
Motor horsepower of BFP drive	HP	3
Dry solids handling capacity of BFP	lbs/hr	1,200
Type of sludge cake pump		Progressive Cavity
Capacity of sludge cake pump	gpm	12
Number of sludge cake pump		1
Horsepower of sludge cake pump	HP	20
Number of polymer feed pump		2
Capacity of polymer feed pump	gph	0.04~2.15
Motor horsepower of polymer feed pump	HP	1
Volume of polymer storage tank	gallons	1,000
Number of wash water booster pumps		1
Motor horsepower of each wash water booster pump	HP	5
Capacity of each wash water booster pump	gpm	120

2.5.3.2.4 Pretreat Treatment / Headworks

Wastewater is pumped from off-site pumping stations to the WWTF No.2. The pretreatment facilities include rotary drum screening, grit removal unit and an ozone odor control system.

Two rotary drum screens remove large solids (more than 2 mm diameter) from the influent flow. Following the screens, the flow goes through a grit removal system. A magnetic flow meter measures the plant influent flow. The drum screen and grit removal systems are covered. An ozone odor control system is used to oxidize the hydrogen sulfide and eliminate odor.

2.5.3.2.5 Flow Equalization Tanks

Flow equalization is provided following the headworks to equalize the flow rate and wastewater strength variations and to improve the performance of the biological treatment processes.

2.5.3.2.6 Biological Treatment Process

The biological treatment processes include the fermentation (anaerobic) tanks, pre-anoxic tanks, oxic tanks, post-anoxic tanks, and the Membrane Bioreactor (MBR) tanks. The fermentation tanks receive wastewater from the EQ tanks and the recycled mixed liquor (ML) from the pre-anoxic tanks.

The wastewater enters the pre-anoxic tanks from the fermentation tanks. The pre-anoxic tanks also receive recycled nitrified ML from the downstream low DO zone of the oxic tanks. Two (2) tanks are constructed, each having a volume of 85,277 gallons.

The oxic tanks are the aeration tanks designed for removal of BOD and nitrification. Two (2) oxic tanks are constructed with each having a volume of 217,000 gallons. Sufficient oxygen is supplied to the tanks to first satisfy the BOD removal and for subsequent nitrification process. The aerobic environment in the tanks is achieved by the use of fine bubble membrane diffusers and aeration blowers, which also serve to maintain the mixed liquor in a completely mixed regime.

The waste water with the remaining nitrate from the oxic tanks then enters the post-anoxic tanks. With the low DO condition in the post-anoxic tanks, denitrification occurs by converting the nitrate nitrogen to nitrogen gas. Supplemental carbon source Micro C is added to the post-anoxic tanks to enhance the removal of nitrate in the tanks. Two (2) tanks each having a volume of 60,754 gallons are constructed.

The wastewater from the post anoxic tanks enters the MBR tanks. The MBR system consists of activated sludge bioreactor, aeration equipment, and flat sheet membrane modules. Four (4) tanks are constructed so that 75% of the total design capacity is maintained with one unit out of service to provide Class I reliability. Each MBR tank has ten (10) membrane cassettes. Mixed liquor in the MBR tanks is filtered through the membrane modules and discharged as permeate. The residual nitrogen gas in the ML will be stripped out by aeration in the MBR tanks. The ML from the MBR tanks is returned to the oxic tanks at a recycle rate of 4 Q as the returned activated sludge (RAS).

2.5.3.2.7 Disinfection

The MBR permeate is routed to two chlorine contact tanks. Liquid sodium hypochlorite is used for disinfection. The two chlorine contact tanks provide the required chlorine contact time. An effluent transfer pump station conveys the reclaimed water to a 2.0 MG ground storage tank.

2.5.3.2.8 Effluent Flow Measurement

Plant effluent flow is measured using magnetic flow meters at the reclaimed water distribution pump station.

2.5.3.2.9 Physical, Chemical, and Biological Characteristics of Wastewater

The key characteristics for measurement of the Removal Efficiency at WWTF No. 2 are Five-Day Carbonaceous Biochemical Oxygen Demand (CBOD₅) and Total Dissolved Solids (TSS). **Table 8** tabulates the concentrations of CBOD₅ and TSS data from July 2018 through May 2019.

The average removal efficiency of CBOD₅ and TSS for the facility from July 2018 through May 2019 has been greater than 97%. All the averages expressed below are over this time period.

The average influent CBOD₅ concentration is 108 mg/L. The minimum and maximum influent CBOD₅ concentration is 75 mg/L and 152 mg/L.

The average influent TSS concentration is 96 mg/L. The minimum and maximum influent TSS concentration is 66 mg/L and 138 mg/L.

The average effluent CBOD₅ concentration of the effluent is 2.9 mg/L. The minimum and maximum effluent CBOD₅ concentration is 2.6 mg/L and 3.8 mg/L.

The average effluent TSS concentration is 2.2 mg/L. The minimum and maximum effluent TSS concentration is 1.0 mg/L and 4.7 mg/L.

Table 8: Palm Coast WWTF No.2 Influent and Effluent Water Quality.

Month	Year	MADF	CBOD ₅ (mg/L)*			TSS (mg/L)*		
		MGD	Influent	Effluent	% Removal	Influent	Effluent	% Removal
May	2019	0.585	75	2.7	96.4%	90	1.0	98.9%
April	2019	0.714	86	2.8	96.7%	78	1.0	98.7%
March	2019	0.819	96	2.8	97.1%	77	1.0	98.7%
February	2019	0.944	117	2.8	97.6%	105	4.2	96.0%
January	2019	0.955	127	2.9	97.8%	138	1.0	99.3%
December	2018	1.117	110	2.6	97.6%	120	3.4	97.2%
November	2018	1.106	98	2.8	97.2%	91	4.7	94.8%
October	2018	1.084	101	2.7	97.4%	93	3.4	96.3%
September	2018	1.024	129	2.7	97.9%	105	1.0	99.0%
August	2018	1.192	102	2.9	97.2%	66	3.0	95.5%
July	2018	0.982	152	3.8	97.5%	92	1.0	98.9%
Max.		1.192	152	3.8	97.9%	138	4.7	99.3%
Average		0.934	108	2.9	97.3%	96	2.2	97.6%
Min		0.585	75	2.6	96.4%	66	1.0	94.8%

Note: * 2.0 mg/L is the detection limit

2.5.3.2.10 Sludge Processing

Sludge processing at Palm Coast WWTP No. 2 consists of sludge holding tanks with aeration and dewatering. Waste sludge is wasted directly from the MBR tanks on a regular basis through the RAS lines to the sludge holding tanks. There are two 122,500 gallon sludge holding tanks with an aeration system to keep the digester contents mixed. Supernatant from the sludge holding tanks is periodically decanted to an on-site pumping station and returned to the headworks. The settled sludge is pumped by sludge feed pumps to a belt filter press (BFP) for dewatering. Polymer is added to the sludge and then it is dewatered by a BFP to approximately 16-20 percent solids by weight. A screw conveyor conveys the dewatered sludge cake to a truck loading station.

2.5.3.2.11 Wastewater Treatment Support Facilities

2.5.3.2.11.1 Plant Waste Pumping Station

A plant waste pumping station, with two 600-gpm pumps, conveys plant sanitary waste to the plant headworks.

2.5.3.2.11.2 Operations and Electrical Buildings

2.5.3.2.11.3 Standby Power

A 1500 KW generator provides sufficient standby power to operate the entire existing wastewater treatment facility during times of a power failure.

2.5.4 Reclaimed Water Reuse and Disposal

2.5.4.1 Reclaimed Water Quality Limitations

The WWTF No. 1 provides advanced secondary treatment with tertiary filtration and high-level disinfection. WWTF No.2 provides advanced wastewater treatment (AWT) and high-level disinfection.

Reclaimed water used for irrigation of public access areas must receive advanced secondary treatment with tertiary filtration and high-level disinfection (1 mg/L of chlorine residual). CBOD₅ are limited to not to exceed 20 mg/L (annual average), 30 mg/L (monthly average), 45 mg/L (weekly average), and 60 mg/L (single sample). Total Suspended Solids are limited not to exceed 5 mg/L for any single sample.

Reclaimed water disposed of in rapid infiltration basins and the spray field, with restricted access, must receive secondary treatment and basic disinfection (0.5 mg/L of chlorine residual). CBOD₅ and TSS are limited not to exceed 20 mg/L (annual average), 30 mg/L (monthly average), 45 mg/L (weekly average), and 60 mg/L (single sample). The nitrate [NO₃] shall not exceed 12 mg/L for any single sample).

2.5.4.2 Reclaimed Water Disposal Capacities

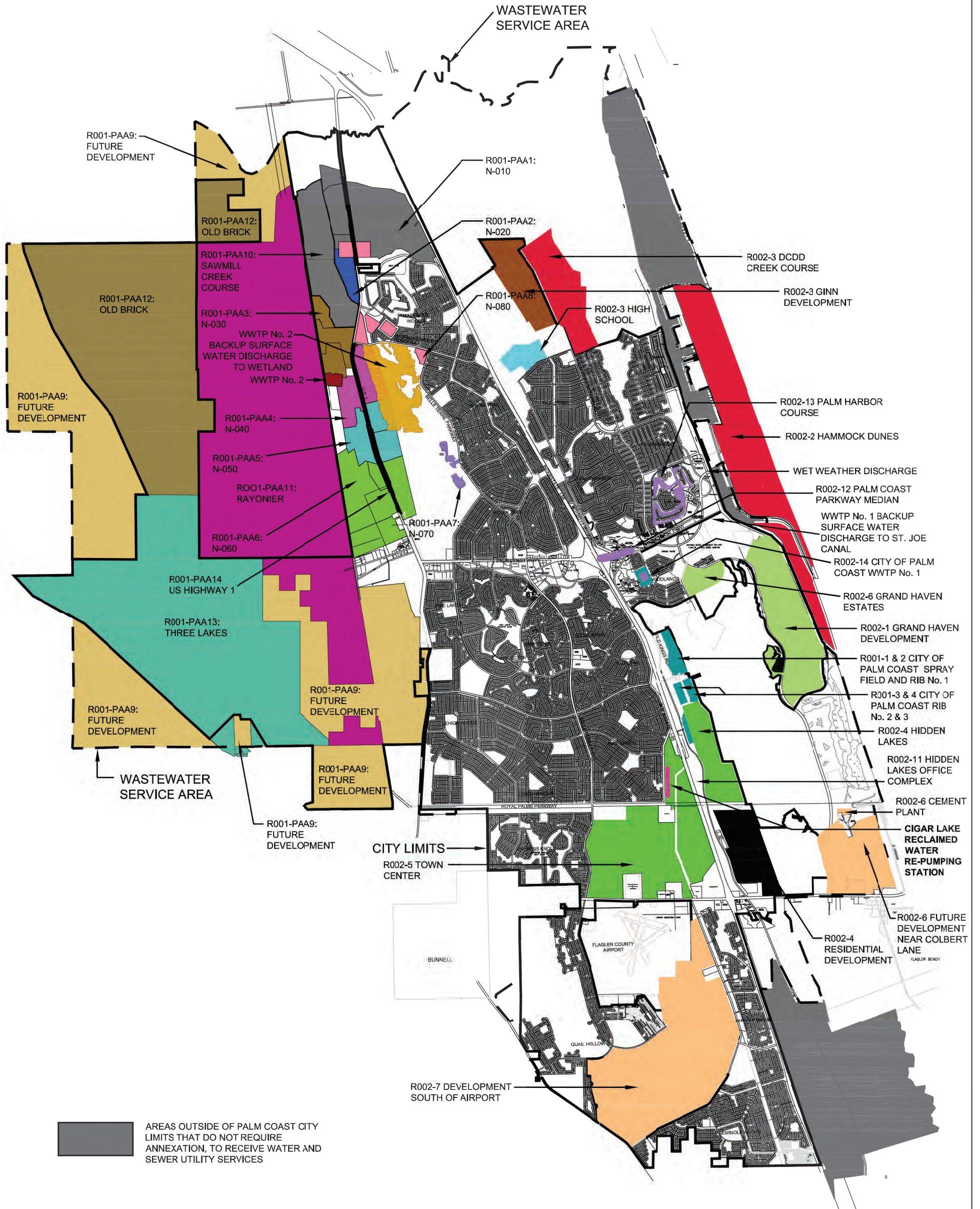
The reclaimed water reuse system capacities of WWTF No. 1 under the current permit are presented in **Table 9**. WWTF No.2 reuse sites and capacities are also listed in **Table 9**. The reuse service area for WWTF No. 1 and WWTF No. 2 has been combined into one Palm Coast Reuse Service Area. The Palm Coast Reuse Sites are presented in **Figure 9**.

In addition to the land application sites, WWTF No. 1 is permitted for a surface water discharge with an annual average of 1.6 MGD, AADF to the Intra-Coastal and a surface water discharge under the APRICOT Act with an annual average of 2.05 MGD, AADF to St. Joe Canal. WWTP No. 2 is permitted for surface water discharge of 0.6 MGD, AADF under the APRICOT Act.


Table 9: Palm Coast Reclaimed Water Disposal Capacity

Site No.	Site Location	Area Irrigated (Acres)	Capacity (MGD/AADF)
WWTF No. 1			
R-001	Restricted Public Access Irrigation Systems and Rapid Rate Infiltration Basins		
Site # 1	Palm Coast Spray Fields*	60.0	0.60
Site # 2	Palm Coast RIB No. 1 (North)*	8.0	1.00
Site # 3	Palm Coast RIB No. 2 (South)*	12.5	0.92
Site # 4	Palm Coast RIB No. 3 (West)*	17.0	0.55
	R-001 CAPACITY =		3.07
R-002	Public Access Irrigation Systems		
Site # 1	Grand Haven Golf Course*	127.0	0.726
	Grand Haven Common Areas*	45.0	0.274
	Total, Grand Haven	172.0	1.00
Site # 2	Hammock Dunes Golf Course*	96.0	0.35
	Dunes Residential Service Area*	254.0	1.00
	Ocean Hammock Golf Course*	96.0	0.35
	Ocean Hammock Residential*	100.0	0.90
	Total, Hammock Dunes	546.0	2.60
Site # 3	DCDD Creek Course*	128.9	0.35
	Conservatory Development*	179.0	0.49
	New High School landscape Area*	18.4	0.05
	FPL Row Residential	92.1	0.25
	Total	418.4	1.14
Site # 4	Hidden Lakes Residential Area*	102.4	0.28
	Residential Developments*	147.3	0.40
	Total, Old Kings Road South	249.7	0.68
Site # 5	Town Center Landscape Area*	405.1	1.40
Site # 6	Cement Plant Landscape Area	4.0	0.01
	Grand Haven Estates Residential Area	44.2	0.12
	Future Development near Colbert Residential Area	209.9	0.57
	Total, Colbert Lane	258.1	0.70
	Sawmill Golf Course**	157.7	0.70
Site # 7	South of Airport (Residential Areas)	869.2	2.36
Site # 8	Old Kings Road Median / ROW South of WWTP No. 1	28.5	0.08
Site # 9	Old Kings Road Median / ROW North of WWTP No. 1	23.3	0.06
Site # 10	FPL ROW South of WWTF No. 1	128.6	0.35
Site # 11	Hidden Lakes Office Complex (Landscape Areas)	60.0	0.19
Site # 12	Palm Coast Parkway Median (Landscape Areas)	2.8	0.011
	Palm Harbor (Golf Course)	120.0	0.470
	WWTP No. 1 (Landscaped Areas)*	8.4	0.02
	Total, Palm Harbor	131.2	0.50
	R-002 CAPACITY =		11.065
WWTF No. 2			

Site No.	Site Location	Area Irrigated (Acres)	Capacity (MGD/AADF)
R-001	Public Access Irrigation Systems		
PAA-1	Palm Coast West N-010 (Residential and Office/Commercial)	118.0	0.41
PAA-2	Palm Coast West N-020 (Residential)	4.0	0.01
PAA-3	Palm Coast West N-030 (Industrial and Mixed Use)	18.1	0.06
PAA-4	Palm Coast West N-040 (Commercial and Office)	9.2	0.03
PAA-5	Palm Coast West N-050 (Residential, Commercial/Industrial, Institutional)	8.8	0.03
PAA-6	Palm Coast West N-060 (Residential and Commercial/Industrial)	27.7	0.10
PAA-7	Palm Coast West N-070 (School, Parks)	28.8	0.10
PAA-8	Palm Coast West N-080 (Mixed Use)	56.7	0.15
PAA-9	Future Development West of the Railroad	424.0	1.15
PAA-10	Palm Coast West N-Sawmill Creek Course (Golf Course) Avg Use	110.7	0.34
PAA-11	Rayonier Property (Mixed Use)	787.0	2.14
PAA-12	Old Brick (Residential and Commercial)	527.0	1.43
PAA-13	Three Lakes (Residential and Commercial)	580.0	1.58
PAA-14	US Hwy1 Multiuse Path Reuse Irrigation	62.9	1.20
	R-001 CAPACITY =		7.99



* AS OF 04/2010

	Engineers (C.O.A. No. 3215) Architects (Lic. No. AA2600926) Surveyors (L.B. No. 7143) Landscape Arch. (Lic. No. LC0000298) Planners Environmental Scientists Construction Management Traffic/Transportation	520 Palm Coast Parkway SW Palm Coast, FL 32137 Phone: 386.445.6569 Fax: 386.447.8991	Designed by: JCS Drawn by: JCS Checked by: YCL Approved by: RP	Date: July 2011 Job No. P61206 Scale: 1" = 8000' File: P61206 FIG.5	PALM COAST RECLAIMED WATER SITES	FIGURE 9
	CITY OF PALM COAST PALM COAST, FLAGLER COUNTY, FLORIDA			Certificate of Authorization No. 3215		125 © 2011

SECTION 3.0 FUTURE CONDITIONS

3.1 SERVICE AREA POPULATION AND FLOW PROJECTIONS

3.1.1 Population Projections

The City of Palm Coast's Comprehensive Land Use Plan includes population projections for the City. The Comprehensive Plan provides the City's projections of the percentage of the Flagler County population which is attributed to Palm Coast. The Palm Coast Wastewater Service Area includes all of the City of Palm Coast and extends beyond the City limits. The City limits and the Wastewater Service Area are presented in **Figure 1** in **Section 1** of this Facility Plan.

Table 10 provides projections of population and Equivalent Residential Service Connections (ERC's) from 2019 through 2040. **Table 10** identifies populations inside the City Limits, outside of the City Limits and the total for the Wastewater Service Area.

To provide a consistent basis for annual averages, projections for population and ERC's, wastewater flows are adjusted to mid-year. Not all of the areas outside of the City Limits and within the designated Wastewater Service Area are connected to the Wastewater System. The ERC projections for inside the City Limits are calculated from the population estimate divided by the BEBR provided and Comprehensive Plan Level of Service ratio of 2.4 persons per ERC. The ERC projections for outside the city limits are based on known development plans (service agreements/residential lot counts) and a growth rate equal to population rate of change for the corresponding period. **Figure 10** provides graphical description of historical and future population growth projections within the Wastewater Service Area.

The population projections for outside the city limits are calculated from the ERC estimate multiplied by the 2.4 (person/ERC) ratio. It is expected that additional developments that are currently outside of the City limits will request current or future voluntary annexation along with wastewater and/or reclaimed water service.

Table 10: Palm Coast Wastewater Service Area Population and ERC Projections.

Year	Inside City Limits		Outside City Limits		Total Service Area	
	ERC's	Population	ERC's	Population	ERC's	Population
2019	37,656	91,505	436	1,059	38,092	92,564
2020	39,615	96,265	447	1,085	40,062	97,350
2021	40,312	97,957	467	1,134	40,778	99,091
2022	41,008	99,649	487	1,184	41,495	100,833
2023	41,704	101,341	507	1,233	42,212	102,574
2024	42,401	103,033	528	1,283	42,929	104,316
2025	43,097	104,725	548	1,332	43,645	106,057
2026	43,433	105,543	567	1,377	44,000	106,920
2027	43,770	106,361	585	1,421	44,355	107,782
2028	44,106	107,179	603	1,465	44,709	108,644
2029	44,443	107,996	621	1,510	45,064	109,506
2030	44,779	108,814	640	1,554	45,419	110,368
2031	45,393	110,304	657	1,597	46,050	111,901
2032	46,006	111,794	675	1,640	46,680	113,434
2033	46,619	113,283	693	1,684	47,312	114,967
2034	47,232	114,773	711	1,727	47,942	116,500
2035	47,845	116,263	728	1,770	48,573	118,033
2036	48,378	117,558	740	1,798	49,118	119,356
2037	48,911	118,854	751	1,826	49,662	120,680
2038	49,444	120,149	763	1,854	50,207	122,003
2039	49,977	121,444	774	1,882	50,752	123,326
2040	50,510	122,740	786	1,910	51,296	124,650

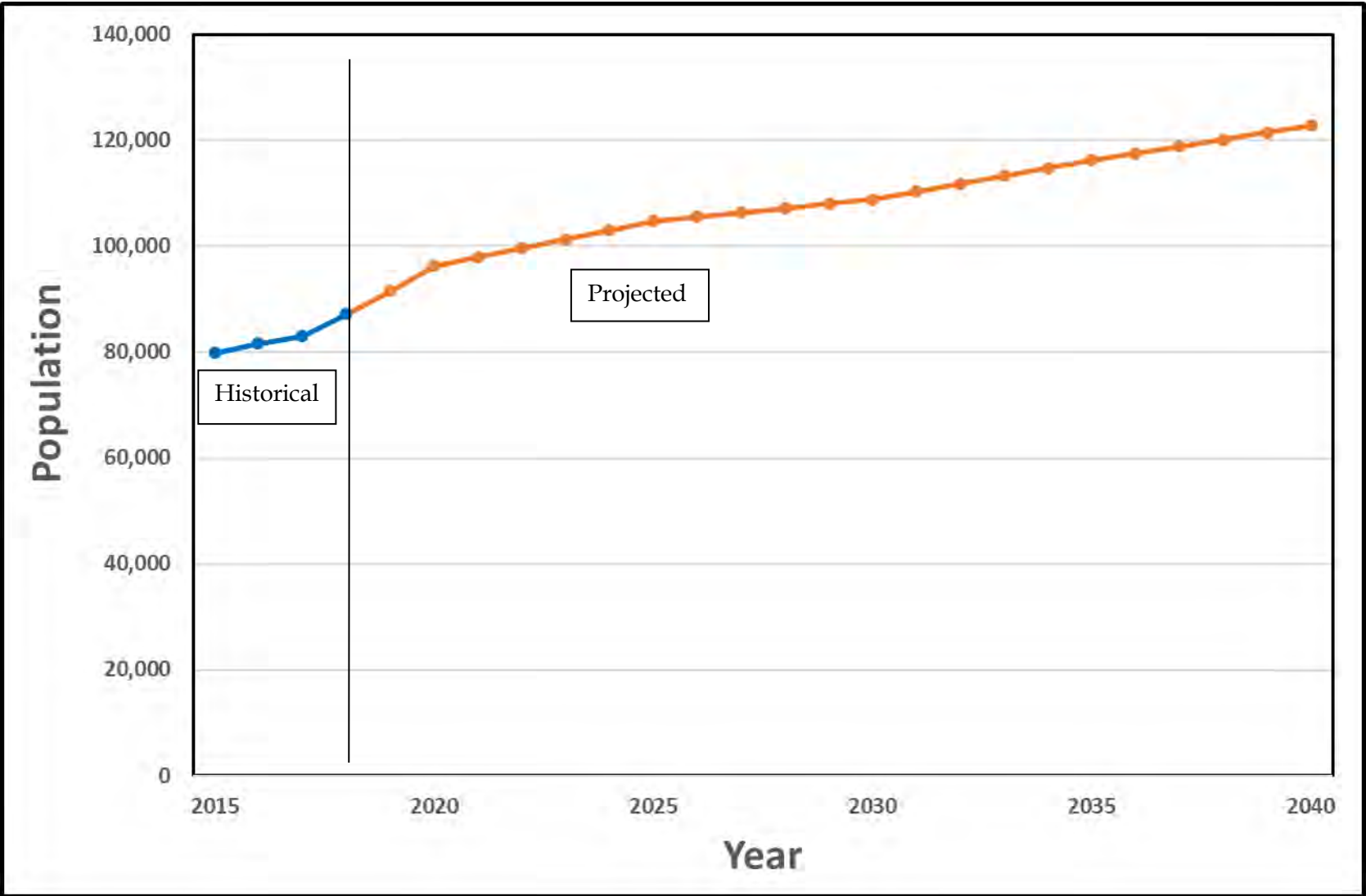


Figure 10: Palm Coast Wastewater Service Area Historical and Projected Population.

3.1.2

Wastewater Flow Projections

Wastewater flow projections are calculated by multiplying the projections of ERCs by the historical Average Flow per ERC to obtain the Annual Average Daily Flow.

Table 11 tabulates the Average Flow per Equivalent Residential Connection using data from 2010 through 2018. The ERC values were obtained from **Table 2** in **Section 2** and the corresponding Annual Average Daily Flow (AADF) and Three Month Average Daily Flow (TMADF) to the existing Wastewater Treatment Facility were obtained from **Table 3** in **Section 2**.

Table 11: Palm Coast Wastewater Average Flow per ERC.

Year	Yearly Average ERC	AADF (MGD)	Average Flow per ERC (gpd)	Max TMADF, MGD	TMADF/AADF
2010	31,424	5.268	168	5.767	1.095
2011	31,571	4.785	152	4.957	1.036
2012	31,833	5.037	158	5.268	1.046
2013	32,502	5.741	177	6.587	1.147
2014	33,027	5.834	177	6.162	1.056
2015	33,572	6.136	183	6.500	1.059
2016	33,953	5.834	169	6.004	1.029
2017	34,843	6.897	173	9.002	1.305
2018	36,246	7.575	209	8.541	1.128

The Ratio of the Maximum Three-Month Average Daily Flow (TMADF) to the Annual Average Daily Flow (AADF) represents the seasonal variation in the wastewater influent flows compared to the yearly average.

Projected Wastewater Flows are presented in **Table 12**. The flow projections are based on Projected ERC's from **Table 11** and Average Flow per ERC from **Table 11**. These wastewater flow projections are mid-year (July 1) projections.

Projected Wastewater Flows are plotted in **Figure 11** along with the existing wastewater treatment capacity and the projected future wastewater treatment plant construction and /or expansions. **Figure 11** assumes the following wastewater treatment facility construction completion:

- Wastewater Treatment Facility No. 2 expansion to 4.0 MGD – 2023
- Wastewater Treatment Facility No. 1 expansion to 9.1 MGD – 2031

Table 12: Palm Coast Wastewater Flow Projections.

Year	Total Service Area		AADF / ERU	AADF	TMAADF / AADF	TMADF
	ERC	Population	(gal/ERU)	(MGD)		(MGD)
2019	38,092	92,564	185	7.321	1.147	8.396
2020	40,062	97,350	185	7.424	1.147	8.514
2021	40,778	99,091	185	7.557	1.147	8.667
2022	41,495	100,833	185	7.690	1.147	8.819
2023	42,212	102,574	185	7.823	1.147	8.971
2024	42,929	104,316	185	7.956	1.147	9.124
2025	43,645	106,057	185	8.088	1.147	9.276
2026	44,000	106,920	185	8.154	1.147	9.351
2027	44,355	107,782	185	8.220	1.147	9.427
2028	44,709	108,644	185	8.286	1.147	9.502
2029	45,064	109,506	185	8.351	1.147	9.578
2030	45,419	110,368	185	8.417	1.147	9.653
2031	46,050	111,901	185	8.534	1.147	9.787
2032	46,680	113,434	185	8.651	1.147	9.921
2033	47,312	114,967	185	8.768	1.147	10.055
2034	47,942	116,500	185	8.885	1.147	10.189
2035	48,573	118,033	185	9.002	1.147	10.323
2036	49,118	119,356	185	9.103	1.147	10.439
2037	49,662	120,680	185	9.203	1.147	10.555
2038	50,207	122,003	185	9.304	1.147	10.671
2039	50,752	123,326	185	9.405	1.147	10.786
2040	51,296	124,650	185	9.506	1.147	10.902

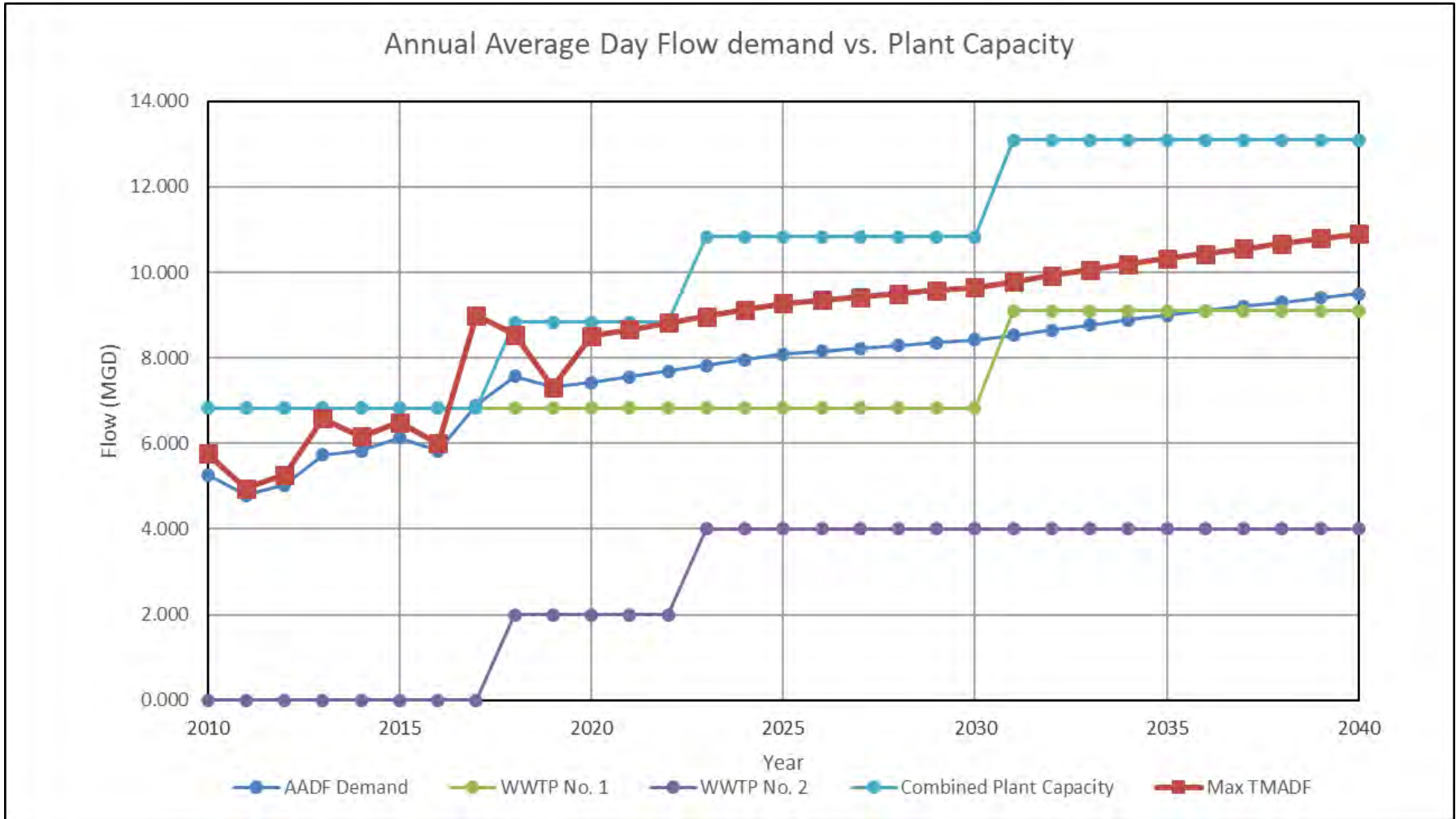


Figure 11: Projected Palm Coast Wastewater Flow and Plant Capacity.

3.2 PROPOSED WWTF NO. 2 EXPANSION

3.2.1 General

The WWTP No.2 expansion will be utilizing the membrane bioreactor (MBR) treatment process to treat the wastewater to the advanced wastewater treatment (AWT) standards. The expansion will include the following treatment processes:

- i. Onsite lift station
- ii. Headworks – to add one grit removal, one screen, odor control (for the added grit chamber, drum screen, and the master pump station)
- iii. Two EQ tanks with mixers and coarse bubble diffusers
- iv. Biological treatment process from fermentation tanks to MBR tanks and associated aeration, mixing, and recycling equipment
- v. Chlorine contact chambers and transfer pump
- vi. Sludge holding tanks and associated mixers and coarse bubble diffusers
- vii. Chemical feed systems
- viii. Reclaimed water transfer pumps
- ix. Reclaimed water high service pumps

3.2.2 Need for Advanced Wastewater Treatment for the WWTF No. 2 Expansion

The existing WWTP No.2 provides advanced wastewater treatment and has been successfully achieving the treatment goals since it was put into operation in June 2018.

Although a significant amount of the reclaimed water produced at WWTF No. 2 is utilized for irrigation, it is expected that a portion of the plant's reclaimed water reuse will need to utilize surface water "backup discharge" to a nearby waterway. It is expected that during wet weather periods that part or all of the plant's reclaimed water will also have to be discharged to a nearby waterway. The initial operation of WWTF No. 2 will need to provide for this "backup discharge" capacity for the reclaimed water.

If WWTF No. 2 continues to produce reclaimed water that complies with Advanced Wastewater Treatment criteria, surface water discharges under the Apricot Rule can be permitted for the expansion. Reclaimed water reuse options are discussed later in this section. Wastewater treatment criteria, including Advanced Wastewater Treatment criteria, are discussed in more details in **Section 4**.

3.2.3 WWTF No. 2 Expansion Treatment Process Consideration

When the initial phase of the WWTP No.2 was designed and constructed, the biological process alternatives under consideration included Membrane Bioreactor, 5-Stage Bardenpho Process and Conventional Activated Sludge processes. The membrane bioreactor (MBR) option was selected as the most feasible option and it has been working great since the plant startup. Even though it makes logical sense that the WWTP No.2 expansion utilizes the same treatment process and technology, the biological process alternatives are evaluated in **Section 4**.

WWTF No. 2 expansion will require construction of the following process components:

3.2.3.1 On-site Pump Station

An onsite pump station will be designed and constructed to deliver the influent to the headworks for the current flow and projected future flows.

3.2.3.2 Headworks

The headworks structure constructed with the initial phase of WWTF No. 2 has a capacity of 6.0 MGD AADF and 15.0 MGD PHF. The existing 2.0 MGD headworks includes the following treatment units:

- Two (2) Parkson model RDS60120DVT Hycor Rotoshear mechanical rotary drum-screens with 2 mm round openings screens the wastewater influent. Each screen is rated to have 7.5 MGD capacity of peak hourly flow. A Hycor Helicon Conveyor Unit (Model HCN260PSBDA) receives materials from the two screens and conveys them to the Aqua Wash Press Screenings Washer/Compactor Model AWP10. The compactor compacts the screenings and deposits the screenings in a dumpster.
- One (1) Fluidyne Hydrogrit grit removal unit with a bypass rated for 7.5 MGD peak hourly flow capacity removes the grits. An airlift pump pumps the grit to a dewatering screw to separate the grit from the organic material. The grit is discharged to a dumpster.
- One (1) Vapex unit Model Mili with 5 nozzles is used for odor control. Two nozzles go to each of the drum screens and one nozzle goes to the grit removal chamber. The Vapex unit uses hydroxyl fog consisting of air, ozone and < 5 micron sized water particles to destroy odorous compounds within the headworks.

For the expansion, one screen and grit removal unit need to be added to provide redundancy. The existing structure provides sufficient space and support for the addition of these units. One odor control unit shall be installed to provide odor treatment for the screen and grit chamber to be installed.

3.2.3.3 Flow Equalization Tanks

Influent flow equalization shall be provided following the pretreatment to equalize the flow rate and wastewater strength variations and to improve the performance of the biological treatment processes. It is also provided to reduce the size and cost of the downstream treatment facilities. The proposed equalization tanks are designed to achieve a fairly constant influent flow rate of approximately 2.0 MGD to the biological treatment processes. Coarse bubble diffusers and submersible mixers will be installed to provide aeration and mixing of the content of the tanks.

3.2.3.4 Biological Treatment Process

The existing WWTP No.2 biological treatment process includes fermentation tanks, pre-anoxic tanks, oxic tanks, post-anoxic tanks, and MBR tanks and associated aeration, mixing, and recycling equipment. It is expected that the WWTP No.2 expansion will use the similar treatment process. The development of the treatment alternatives is discussed in more details in **Section 4.0**.

3.2.3.5 Chlorination and Effluent Transfer Pumping

Sodium hypo-chlorite is used for disinfection of treated effluent. The Chlorine Contact Tanks will have two separate baffled chambers for the addition of the 2.0 MGD. One chamber can be off line while the other remains in service. Baffle walls will prevent short-circuiting of the chlorine contact chamber. Chlorine residual analyzers will monitor the chlorine residual. The plant effluent flow will be measured by ultra-sonic transducers and weirs. There are two variable speed vertical turbine pumps (each sized for 1200 gpm maximum pumping rate) installed to convey the chlorinated plant effluent to a quality control structure. An additional transferring pump of the same size will be installed for the expansion.

3.2.3.6 Reclaimed Water Storage and Distribution Pumping Station

A 2.0 MG ground storage tank is onsite store the reclaimed water. A reclaimed water pumping station conveys reclaimed water from the ground storage tank to provide reclaimed water to the reclaimed water distribution system and to provide the plant service water for the facility. The pumps installed with the first 2.0 MGD and using a 2.5 peaking factor are listed below:

- Two 2,000 gpm pumps
- One 1,000 gpm pump
- One 500 gpm pump
- One 200 gpm pump

The reclaimed water distribution pumping station design provides for installation of additional reclaimed water pumps for future plant expansion. Two 2,000 gpm pumps will be installed during the expansion.

3.2.3.7

Aerobic Digestion

Aerobic sludge holding/digesters are provided for partial treatment of the sludge. Sludge will be periodically pumped to two additional 0.25 MG holding/digesters that are to be provided for the 4.0.0 MGD plant capacity.

Aeration, mixing and decanting equipment will keep the digester contents mixed and also provide dissolved oxygen. Sludge will be periodically pumped from the holding/digesters to a belt filter press for dewatering.

Supernatant is periodically decanted from the digester to an on-site pumping station. The digested sludge will be transferred to the existing belt filter press.

SECTION 4.0 DEVELOPMENT OF ALTERNATIVES

4.1 GENERAL

This Section develops and evaluates alternatives for wastewater system in Service Area #2. The following three primary wastewater system components are evaluated:

- Wastewater Treatment Biological Treatment Process
- Reclaimed Water Reuse and Disposal
- Residual Solids Treatment and Disposal

4.2 WASTEWATER TREATMENT

The existing WWTP No.2 with the initial capacity of 2.0 MGD was designed and constructed to provide advanced wastewater treatment (AWT). Achieving AWT provides the City flexibility of reclaimed water disposal. It has been operating well since it was put into operation in June 2018. Although it is logically reasonable to provide AWT using the similar treatment process for the expansion, this section compares a few treatment alternatives for the expansion.

4.2.1 Levels of Wastewater Treatment

4.2.1.1 Secondary Treatment

Secondary Treatment is defined as the removal of carbonaceous biological oxygen demand (CBOD5), total suspended solids (TSS), and basic disinfection prior to discharge. Secondary Treatment does not include nutrient removal.

Secondary Treatment can be characterized as:

- CBOD5: ≤ 20 mg/L
- TSS: ≤ 20 mg/L
- Chlorine Residual: ≥ 0.5 mg/L

Secondary Treatment will not produce an effluent that can be used as a commodity (reclaimed water), surface water disposal, wetlands, or for other reuse disposal options. This option is not proposed for the City of Palm Coast.

4.2.1.2 Advanced Secondary Treatment

Advanced Secondary Treatment is secondary treatment with tertiary filtration, high-level disinfection, and limited nutrient removal. Advanced Secondary Treatment can be characterized as:

- CBOD5: ≤ 20 mg/L
- TSS: ≤ 5 mg/L
- NH3-N: ≤ 12 mg/L

- Chlorine Residual: ≥ 1.0 mg/L

Advanced Secondary Treatment produces an effluent that can be used as a commodity (reclaimed water) for urban and agricultural reuse applications.

The existing Palm Coast Wastewater Treatment Facility No. 1 currently processes wastewater to Advanced Secondary Standards.

4.2.1.3 Advanced Wastewater Treatment

Advanced Wastewater Treatment is a step beyond Advanced Secondary Treatment. Nutrients (nitrogen and phosphorous) are removed from the wastewater prior to final disposal. Section 403.086(4) of Florida Statutes defines Advanced Wastewater Treatment as a reclaimed water product having annual average limits for the following contaminants as follows:

- CBOD5: ≤ 5 mg/L
- TSS: ≤ 5 mg/L
- Total Nitrogen: ≤ 3 mg/L
- Total Phosphorous: ≤ 1 mg/L
- Chlorine Residual ≥ 1 mg/L

Advanced Wastewater Treatment and High Level Disinfection are required if the final disposal method incorporating a wetlands treatment or surface discharge as a backup disposal to the public accessible irrigation reuse system.

4.3 RECLAIMED WATER EFFLUENT DISPOSAL

4.3.1 Methods of Disposal

The following six (6) methods of reclaimed water reuse and disposal are commonly used in Florida:

- Deep Well Injection
- Natural Wetlands Disposal
- Percolation Ponds
- Surface Discharge
- Urban Reuse
- Agricultural Reuse

The level of treatment required for each of the above listed reclaimed water reuse and disposal methods are tabulated in **Table 13**.

Table 13: Palm Coast Wastewater Service Area Effluent Disposal Methods.

Effluent Disposal Method	Required Form of Wastewater Treatment
Deep Well Injection, Percolation Ponds, Limited Wet Weather Discharge to a Receiving Stream	Secondary Treatment
Urban and Agricultural Reuse	Advanced Secondary Treatment
Wetlands Disposal, Surface Water Discharge to a receiving waterway in accordance with the Apricot Rule	Tertiary (Advanced) Treatment

4.3.2 Reclaimed Water Reuse and Disposal in Palm Coast

The Palm Coast Sewer Ordinance requires that all new developments install dry reuse lines and use reclaimed water for irrigation when reclaimed water becomes available.

All new developments and subdivisions within Palm Coast Service Area # 2 will be required to install a reclaimed water distribution system and to use reclaimed water for irrigation of residential and common areas.

Reclaimed water will be provided for irrigation of areas of public beautification such as roadway medians and rights-of-way. Rights-of-way areas include both publicly owned property such as areas adjacent to roadways and privately owned properties such as utility corridors.

The current reclaimed water reuse and disposal in the Palm Coast Service Area are urban reuse, Rapid Infiltration Basin (RIB's), surface water discharge to the Intracoastal Waterway, and a back-up surface water discharge in accordance with the Apricot Rule for WWTP No.1, as discussed in **Section 2.0**.

The reclaimed water reuse and disposal methods for WWTP No.2 includes public access irrigation and a backup discharge to wetlands during the period when demand is reduced and there is excess reclaimed water that needs to be disposed of. Irrigation with reclaimed water will reduce the amount of fresh water pumped from the aquifer and used directly for irrigation.

4.4 SLUDGE TREATMENT AND DISPOSAL

As the Palm Coast wastewater treatment capacity increases, the quantities of sludge byproduct generated also increases. The current WWTF No.2 bio-solids management includes aerobic sludge digestion and dewatering of sludge approximately 16-20% sludge cake by a belt filter press. It is expected that the WWTF No.2 expansion will use the same sludge treatment and disposal process.

The dewatered sludge will then be transported to a regional bio-solids management facility for further treatment and final disposal. The sludge is treated

to Class “AA” standards at the regional management facility which can be made available for use as fertilizer in areas with public access and possibility to the public.

4.5 WWTF NO.2 EXPANSION TREATMENT ALTERNATIVES

4.5.1 General

The historical wastewater flows have been tabulated in **Table 3-3** and the expected wastewater flows have been projected for a 20-year period. A wastewater flow of 9.506 MGD, AADF and 10.902 MGD, TMADF has been projected for the year 2040.

The WWTF No. 1 has a current treatment capacity of 6.83 MGD, and there is only sufficient space available to expand to 9.1 MGD which the City plans on doing in 2031. Expanding WWTF No. 2 from 2.0 MGD to 4.0 MGD will accommodate the growth in the northwest portion of the service area better.

4.5.2 No-Action Alternative

The No-Action Alternative is not a viable alternative. Growth in the City of Palm Coast and the Palm Coast Wastewater Service Area has been considerable and is expected to continue, although at a lower rate of growth. The US Census Bureau reported that Flagler County (of which Palm Coast is the largest city) was the fastest growing (percentage) county in the United States for 2003 to 2005. Due to the downturn of the economy, the growth of the Palm Coast area has decreased significantly during the past several years. However, the City has recently experienced the return of growth in the City.

Wastewater flows presented in **Table 12** project that the wastewater average annual daily flow will require WWTF No. 2 to be expanded to 4.0 MGD by 2023 and that WWTF No. 1 will need to be expanded to 9.1 MGD in 2030.

4.5.3 WWTF No. 2 Expansion

As discussed in **Section 3.0**, flows to the Palm Coast Wastewater Treatment system are increasing and additional wastewater treatment capacity is required. The continued development of existing subdivisions in the northwest portion of the City along with the new Palm Coast Park Development will require additional wastewater treatment capacity in this portion of the City. WWTF No.2 was put into operation in June 2018 and the projected flow increase indicates that the plant needs to be expanded to 4.0 MGD by 2013. The WWTF No. 2 initial construction has a 2.0 MGD process module. The site layout can accommodate the expansion to 4.0 or the future 6.0 MGD.

The WWTF No. 2 expansion will provide treatment to Advanced Wastewater Treatment Standards which are defined on annual average daily basis as:

- $BOD_5 \leq 5 \text{ mg/L}$
- Total Suspended Solids $\leq 5 \text{ mg/L}$
- Total Nitrogen $\leq 3 \text{ mg/L}$

- Total Phosphorous ≤ 1 mg/L.

The biological process options being evaluated are Membrane Bioreactor, Oxidation Ditch and Activated Sludge processes as discussed in the following sections.

4.5.3.1 Membrane Bioreactor Wastewater Treatment Option

The proposed Membrane Bioreactor (MBR) option will be constructed with two identical 1.0 MGD modular treatment units (2.0 MGD total) which share a common wall, as what is for the existing 2.0 MGD. Each MBR modular treatment unit could have two separate process basins (each sized for 0.5 MGD and also separated by a common wall). In this way, the initial 2.0 MGD module will comply with the Class 1 Reliability Requirements of treating 75% of the average daily flow with one MBR basin out of service. The proposed MBR layout with the associated biological process units is presented in **Figure 2**.

The biological treatment process will include the following:

- Fermentation Basins
- Pre-Anoxic Basins
- Pre-Aeration Basins
- Post-Anoxic Basins
- MBR Basins

This treatment process is a modified 5-stage Bardenpho process in which the MBR basins replace the post aeration basins and the conventional secondary clarifiers. The MBR basins also replace the conventional tertiary filtration system. The space required for this process is significantly smaller than the space required for the 5-Stage Bardenpho process for the same treatment capacity. This treatment system will reliably achieve the AWT standards of reclaimed water through nitrification and de-nitrification processes.

4.5.3.2 5-Stage Bardenpho Wastewater Treatment Option

Carrousel Oxidation Ditch in conjunction with other biological processes will provide Advanced Wastewater Treatment. Typically, a Fermentation Basin followed by a Pre-Anoxic Basin precedes the Oxidation Ditch. A Post-Anoxic Basin immediately follows the Oxidation Ditch. The last process is a Post-Aeration Basin prior to the secondary clarification of the mixed liquor. This is the popular 5-Stage Bardenpho Process which has been widely used in the past 30 years. The process will also reliably treat the wastewater to AWT standards.

Two separate Carrousel Oxidation Ditches (each sized for 1.0 MGD treatment capacity) will be needed for the 2.0 MGD capacity to comply with Class 1 Reliability Requirements. The clarifiers will need to be oversized so each clarifier will comply with the Class 1 Reliability Requirements of treating 75% of the average daily flow with one clarifier out of service.

4.5.3.3 Conventional Activated Sludge Wastewater Treatment Option

The Activated Sludge Option will provide secondary biological treatment, but additional treatment will be required to provide Advanced Wastewater Treatment.

Three separate aerobic activated sludge tanks will be needed for the 2.0 MGD module. The clarifiers will be oversized so each clarifier will comply with the Class 1 Reliability Requirements of treating 75% of the ADF with one clarifier out of service.

The initial 2.0 MGD Oxidation Ditch option will include the following:

- Two Anaerobic Treatment Units
- Two 1st Anoxic Treatment Units
- Three Aerobic Activated Sludge Basins
- Recirculation Pumps
- Two 2nd Anoxic Treatment
- Two Reaeration Treatment Units
- Clarifier Flow Splitter
- Two Clarifiers
- Tertiary Disc Filter Unit

The conventional activated sludge wastewater treatment option would require a larger space. There is no sufficient area on the site for future expansion to 6.0 MGD.

4.5.3.4 Comparison of Wastewater Biological Treatment Process Options

The comparison of the three biological treatment process options is listed below:

- The Membrane Bioreactor option is compatible to the existing WWTF No.2 and provides the staff flexibility for operating and maintain the same treatment process. It also indicates that the sites is suitable for up to three 2.0 MGD Membrane Bioreactor Modules for a total of 6.0 MGD to be located on upland areas at WWTF No. 2 site.
- The 5-Stage Bardenpho Process option and the Activated Sludge option will take up much more space than the existing 2.0 MGD MBR plant. It also brings more challenges to operation and maintenance.
- The cost comparison for the the three biological processes for the original 2.0 MGD is presented in **Table 14**.

Table 14: Preliminary Cost Comparison of the Three Biological Processes.*

Process Description	Cost Estimation
Membrane Bioreactor (MBR)	\$21,460,800

5-Stage Bardenpho	\$22,580,000
Activated Sludge	\$21,800,000

*This cost comparison was included in the Facility Plan dated Feb. 2015.

The 5-Stage Bardenpho process and the Activated Sludge treatment options each require significantly more area than the Membrane Bioreactor option. Since the upland area at WWTF No. 2 is limited and only a 2.0 MGD 5-Stage Bardenpho process or Activated Sludge Module can be constructed on the uplands, these two options have been screened from further consideration during the initial 2.0 MGD of WWTF No.2. The Membrane Bioreactor option is the recommended biological treatment process option for the WWTF No.2 expansion.

No-Action is not a viable alternative to expanding WWTF No. 2. The Palm Coast Wastewater Service Area Population Projections are presented in **Figure 10**. As shown in **Table 12** and **Figure 11**, the Projected Maximum Wastewater Flow into the Palm Coast Wastewater Treatment System requires that the City provide more treatment capacity to meet the increasing flow.

The only viable alternative for increasing the Palm Coast Wastewater Treatment System’s treatment capacity in the 20 year period is to expand the 2.0 MGD WWTF No. 2 to 4.0 MGD by 2023, and expand the WWTF No. 1 to 9.1 MGD by 2031.

4.5.3.4 Cost Analysis of the Selected Alternative

As discussed above, expanding the existing WWTF No.2 from 2.0 to 4.0 MGD using the MBR treatment process is the only viable option to meet the flow increase by 2023. The estimated cost for the expansion is summarized in **Table 15**. It is estimated that the total capital cost is \$19.9 million, including \$17.38 million of construction, \$1.30 million of design and permitting, and \$1.22 million of technical service during construction.

Table 15: Preliminary Cost Estimation Breakdowns of WWTF No.2 Expansion.

ITEM	DESCRIPTION OF WORK	ESTIMATED COST
1	General Requirements	\$ 288,500
2	Master Pump Station	\$ 167,800
3	Headworks	\$ 721,434
4	Biological Process Tanks	\$ 8,221,090
5	Chlorine Contact Tanks	\$ 491,060
6	Sludge Holding Tanks	\$ 692,340
7	Electrical	\$ 3,500,000
8	Process Instrumentation and Controls	\$ 400,000
TOTAL CONSTRUCTION ESTIMATE		\$ 14,482,224
Contingency		20%
TOTAL CONSTRUCTION INCLUDING		\$ 17,378,669

CONTINGENCY	
Design and Permitting	\$ 1,307,615
Technical Service after Bid Opening	\$ 1,216,506.84
TOTAL CAPITAL COST	
	\$ 19,902,790.50

The present worth analysis is summarized in **Table 16**. Assuming a life time of 50 years and the cost recovery period 20 years, the present worth is calculated to be \$25.9 million.

Table 16: Present Worth Analysis of WWTF No.2 Expansion.

Total Capital Cost	\$ 19,902,790.50
Life Expectancy (Lexp) - Years	50
Cost Recovery Period - Years (n)	20
Interest Rate (i)	6%
Constant Yearly Depreciation (Dx) (Straight Line Depreciation)	\$398,056
Value Remaining after 20 Years (Vn)	\$11,941,674
Present Worth Factor of Remaining Value: $PWfr = (1 + i)^{-n}$	0.3118
Present Worth of Salvage Value: $PWsv = Vn * PWfr$	\$ 3,723,470
Annual Operation and Maintenance Cost (O&M)	\$850,000
Present Worth Factor for Uniform Series of Payments: $PWfs = \frac{(1 + i)^n - 1}{i(1 + i)^n}$	11.47
Present Worth for O&M Cost: $PWom = O\&M * PWfs$	\$ 9,749,433
Total Present Worth (TPW)=Total Capital Cost+PWom-PWsv	\$ 25,928,753

SECTION 5.0 ENVIRONMENTAL ASSESSMENT

The Florida Finding of No Significant Impact (FFONSI) was originally issued on May 1, 2015. The WWTF No.2 expansion will be constructed on the same site of the existing WWTF No.2. The site has been cleaned and prepared for the construction of the WWTF No.2 expansion during the construction of the first phase of 2.0 MGD. For the environmental assessment purpose for the WWTF No.2 expansion, an updated environmental assessment report along with an updated protected species review was prepared (**Appendix A**).

Appendix A

Environmental Assessment Document for SRF Planning, September 2019

**CITY OF PALM COAST
WASTEWATER TREATMENT PLANT # 2**

**ENVIRONMENTAL ASSESSMENT
DOCUMENT FOR SRF
PLANNING**

SEPTEMBER 2019



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Architects
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**CITY OF PALM COAST
 WWTP#2 ENVIRONMENTAL ASSESSMENT
 DOCUMENT FOR SRF PLANNING**

September 2019

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1.0 INTRODUCTION

The City of Palm Coast constructed Waste Water Treatment Plant (WWTP) No. 2 to serve the citizens of Palm Coast. WWTP No. 2 has a capacity of treating 2.0 MGD. The City of Palm Coast is proposing an expansion project to increase capacity to 4.0 MGD at WWTP No. 2. The WWTP No.2 project is located north of Peavey Grade Road, west of U.S. Highway 1, adjacent to the Florida East Coast Rail Road tracks (**Figure 1, Appendix A**). The City's WWTP No. 2 project also includes a pipeline to convey the advanced wastewater treatment (AWT) effluent to Hulett Swamp when the AWT effluent cannot be used as reclaimed water.

The City of Palm Coast owns and operates the Palm Coast wastewater system, which includes Wastewater Treatment Plant (WWTP) No. 1 and WWTP No. 2. WWTP No. 2 primarily treats wastewater from the areas west of I-95 and north of Palm Coast Parkway, Linear Park, and future development areas in the western part of the City. The City has received a permit (#FL0710008-001) from FDEP authorizing the discharge of advanced treated wastewater to Hulett Swamp and for land application as reclaimed water.

During the permitting of WWTP No. 2 in 2014, the FDEP approved the City of Palm Coast's selected effluent disposal program for AWT into Hulett Swamp as the most efficient and technically feasible option.

1.1 Effluent Discharge System

At a design capacity of 2.0 MGD, the Palm Coast WWTP No. 2 can discharge up to 219 MG Per Year of advanced treated effluent (30% of the total annual reclaimed water volume). Advanced Wastewater Treatment (AWT) produces effluent water that contains no more, on an annual average basis, of the following concentrations:

Parameter	Limit
Biochemical Oxygen Demand (CBOD5)	5 mg/L
Suspended Solids	5 mg/L
Total Nitrogen, as N	3 mg/L
Total Phosphorus, as P	1 mg/L

The primary disposal option for WWTP No. 2 AWT is the Palm Coast reclaimed water system. However, a backup disposal method was needed for AWT disposal during wet weather or low reclaimed water demand periods. The Florida Administrative Code (FAC) permits a Backup Wetland Discharge for AWT of 30% of the permitted annual effluent disposal in accordance with the APRICOT Rule. WWTP No. 2 provides AWT so a backup wetland discharge in accordance with the APRICOT Rule. The WWTP No. 2 effluent is de-chlorinated in accordance with the APRICOT Rule before being discharged.

WWTP No. 2 provides AWT so that the wetland can be utilized as a backup surface water discharge in accordance with the APRICOT Rule. There are no existing commercial or recreational uses of the wetland (Hulett Swamp). The backup surface water discharge to the wetland has minimal effect on flows and water quality, and the increase in nutrient loadings will be immeasurable. As such FDEP issued Permit# FL0710008-001, thus demonstrating the discharge to a wetland will not adversely affect Hulett Swamp and that the project is in the public interest.

2.0 PROJECT DESCRIPTION

The City's WWTP No. 2 expansion project will include an increase in capacity at WWTP No. 2 from 2.0 MGD to 4.0 MGD. This increase will result in an increase of the AWT discharge from 0.6 MGD to 1.2 MGD. of effluent to Hulett Swamp when the AWT effluent cannot be used as reclaimed water. Treated effluent from WWTP No. 2 is primarily used for irrigation of areas in the vicinity of WWTP No. 2. The infrastructure in place for the AWT discharge is capable to handle the proposed increased flow and no improvements are proposed.

2.1 Existing Infrastructure

A 16-inch reclaimed water main is located on the south side of Peavey Grade Road. The reclaimed water main interconnects with a 10-inch reclaimed water main on the west side of U.S. Highway 1. The reclaimed water main continues easterly until it reaches a 20-foot wide utility easement. The reclaimed water main is routed within the existing utility easement before running parallel within an existing dirt road (historical logging road). The reclaimed water main continues within the existing dirt road to just east of the Indian Trails Sports Complex and Belle Terre Elementary and Indian Trails Middle School for future reclaimed water demands. The reclaimed water main heads northeast into Hulett Swamp for the AWT discharge into the wetland from a diffuser. The project limits are provided on an aerial photograph (**Figure 2**). During the times of low irrigation demands, the excess plant effluent flow can be discharged to the wetland as a backup surface water discharge in accordance with the APRICOT Rule.

A wetland area east of U.S. Highway 1, west of Belle Terre Parkway and south of Matanzas Woods Parkway was permitted through FDEP for use as a backup wetland discharge option for AWT in accordance with the APRICOT Rule. The location of Hulett Swamp in relation to its surroundings is depicted on **Figure 3**. The wetland property is owned by Palm Coast Forest LLC (Palm Coast Holdings). Palm Coast Holdings and the City entered a long-term agreement to use the wetland as a backup wetland discharge for the WWTP No. 2 AWT in accordance with the APRICOT Rule.

The WWTP No. 2 effluent is de-chlorinated before being discharged to the wetland. The de-chlorination facility is located along US Highway 1 at existing Well Site SW-38. The location of the de-chlorination facility and well site SW-38 are depicted on **Figure 4**.

An 18-inch High Density Polyethylene Pipe (HDPE) conveys the de-chlorinated AWT from the discharge facility to the wetland for a backup surface water discharge. Erosion protection is provided at the points where the diffusers discharge to the wetland. The existing facilities have been designed to accommodate for the proposed capacity.

3.0 ENVIRONMENTAL SETTING

The proposed receiving wetland (Hulett Swamp) will be used as a backup wetland discharge for AWT in accordance with the APRICOT Rule is located east of US Highway 1, west of Belle Terre Parkway and south of Matanzas Woods Parkway in Palm Coast, Florida. The wetland drainage basin is approximately 624 acres, which discharges under Matanzas Woods Parkway through a pair of 72-inch CMP culverts into Ashwood Canal and then flows north into the Hulett Branch and eventually discharges to Pellicer Creek and the Intracoastal Waterway.

3.1 Regional Setting

The proposed project is located within the Northern Coastal Basin (NCB) along the northern Atlantic Coast of Florida. The NCB extends nearly 100 miles from lower Duval County, just south of the urban center of Jacksonville, Florida, south through the coastal watersheds of St. Johns, Flagler, and Volusia Counties to Ponce de Leon Inlet, near the City of New Smyrna Beach. The project is located within the Pellicer Creek Planning Unit located south of St. Augustine and includes southern St. Johns County and northern Flagler County. Pellicer Creek, which forms the boundary between St. Johns and Flagler Counties, is the only natural watershed drainage feature in this planning unit. Hulett Swamp flows into Hulett Branch which flows into Pellicer Creek (**Figure 5**). Pellicer Creek has been designated by the state of Florida as an Outstanding Florida Water (OFW). The Pellicer Creek Planning Unit consists of vast wetlands, many miles of which were drained for pine plantations, real estate development (mostly in the Palm Coast area) and to reduce mosquito breeding sites.

There are no USGS stream gauging stations on Hulett Swamp, but there is one USGS stream gauging station on Pellicer Creek between Hulett Swamp and the Intracoastal Waterway. Available data from the USGS gauging indicates that the discharge and water elevation at the Pellicer Creek stream gauging station are tidal influenced. The gauge height varied one to two feet and the measured discharge varied by as much as minus 750 cubic feet per second (CFS) to plus 600 CFS. Because of the tidal influence, the water quality of Pellicer Creek in the vicinity of the USGS stream gauging station is not anticipated to vary from the water quality conditions in the

Intracoastal Waterway. Pellicer Creek is classified as a Class II Stream and an Outstanding Florida Water, but because of the tidal influence from the Intracoastal Waterway, the water quality of Pellicer Creek at the point where Hulett Branch discharges into Pellicer Creek does not comply with the Class II Stream and Outstanding Florida Water quality criteria.

Use of Hulett Swamp as a backup wetland discharge in accordance with the APRICOT Rule will not degrade the water quality of Pellicer Creek at the point where Hulett Branch discharges to Pellicer Creek.

3.2 Description of Existing Uses & Conditions

The Hulett Swamp property is owned by Palm Coast Forest LLC (Palm Coast Holdings). Use of this wetland as a backup wetland discharge option has been discussed with Palm Coast Holdings and it is expected that they will agree to a long-term agreement or easement with the City to use the wetland as a backup surface water discharge for the WWTP No. 2 AWT in accordance with the APRICOT Rule.

There are no existing commercial or recreational uses of the wetland. The backup surface water discharge to the wetland will have minimal effect on flows and water quality, and the increase in nutrient loadings will be immeasurable.

3.2.1 Biological Communities

Changes to the biological communities of Hulett Swamp are not expected as a result of the proposed discharge. The habitats present within the Hulett Swamp vary but are predominantly late successional wetland forests surrounded by silviculture altered ecotone and upland habitats. A low velocity flowway is centrally located flowing northward and under Matanzas Woods Parkway via a pair of 72-inch CMP culverts and then channeled into the Ashwood Canal eventually emptying into Hulett Branch, Pellicer Creek and the Intracoastal Waterway. The wetland system (Hulett Swamp) from Palm Coast Parkway, to Matanzas Woods Parkway, the northern extent of the system displays a distinct change in

ecotone due to the historical land use activities. The eastern extent of the Hulett Swamp system is less obvious with wide areas of mesic uplands interspersed throughout the wetland. The wetland periphery was converted into a pine plantation resulting in areas of uniform pine rows interspersed with very dense forested wetlands.

Hulett Swamp is dominated by various hardwood trees and cypress (*Taxodium* sp.). The forested wetland is dominated by cypress interspersed with sweet bay (*Magnolia virginiana*), red maple (*Acer rubrum*), willow (*Salix* sp.), dahoon holly (*Ilex cassine*) and swamp tupelo (*Nyssa sylvatica* var. *biflora*). Sub-canopy species include red maple, loblolly bay (*Gordonia lasianthus*), slash pine (*Pinus elliotii*) and cabbage palm (*Sabal palmetto*).

The east and west wetland periphery habitat type is a narrow strand of late successional wetland scrub. This is an ecotone typically maintained as low growing shrubby and herbaceous vegetation through frequent fire occurrences. Fire suppression has resulted in this ecotone approaching the transitional stage from wetland scrub to mixed forested wetland. Dominant vegetation occurring within this portion of the system includes: wax myrtle (*Myrica cerifera*), cabbage palm and blackberry (*Rubus* sp.).

The wetland scrub ecotone transitions into hydric pine plantation toward the outward extent of the system. This portion of the system has been manipulated due to extensive silvicultural activities. The dominant canopy species occurring in this ecotype is slash pine. Trees are planted in rows throughout this portion of the site along raised planting beds with shallow furrows between, as is typical of most pine plantations. The age and height of trees varies. This habitat type supports minimal sub-canopy vegetation. Vegetation that has become established in the ground strata includes: blue maidencane (*Amphicarpum muhlenbergianum*), broomsedge (*Andropogon* sp.), gallberry (*Ilex glabra*) and Virginia chain fern (*Woodwardia virginica*).

3.2.2 Fish

Fish communities will not be adversely affected by the proposed discharge. There will be little change to water quality even during peak discharges. The common type of fishes in the Hulett Swamp system is comprised of mosquito fish (*Gambusia* sp.). These fish are common within the large tracts of wetland forests in the area and have been observed in the flowway on several occasions though no sampling was conducted to determine density or population. Due to the lack of a defined channel and seasonal flow volume and lack of a major upstream headwater source (lake/stream), the fish population is estimated to be relatively low when compared to other fish populations of similar systems. The discharge into the wetland is predicted to occur during periods of wet weather where the fish population will be dispersed throughout the system and a detrimental affect is not expected.

3.2.3 Habitat for Benthic Organisms

A benthic organism assessment was not conducted within Hulett Swamp to determine populations' size or density. Due to the nature of the proposed discharge during periods of wet weather, reclaimed water surplus outfall is anticipated when the system will have a higher water table and larger areas of inundation. Treated discharge will be mixed with the present swamp hydrology to the greatest extent practical given the site conditions resulting in a dispersal of any concentrated pollutants that may adversely affect any organisms. The diversity of species present within the system should not be affected by the additional discharge during these times. The discharge will not result in a lowering of water quality that would result in the transition of the on-site population to skew in the favor of a particular species as common in cases of declining water quality.

3.2.4 Protected Species Review

Prior to initiation of field work, a review of the records for documented wildlife observations maintained by the Florida Fish and Wildlife Conservation Commission and the Florida

Natural Areas Inventory (FNAI) was conducted. The Florida Atlas of Breeding Sites for Herons and their Allies (FFWCC Technical Report No. 10) indicates there are no known breeding or nesting sites in the vicinity of the project site. During field investigations and water quality sampling events, protected species and their signs were not observed.

CPH biologists conducted field investigations of the subject corridor in 2009 through September 2019. General reconnaissance of the site was conducted focusing on the occurrence of federal or state-listed flora and fauna as well as general wildlife utilization.

Methodology and Site Conditions

Prior to initiation of field work, the existing uplands and wetlands within the subject project corridor were mapped and classified in accordance with the *Florida Land Use, Cover and Forms Classification System* (FLUCFCS) (FDOT 1999). A records review of documented wildlife observations (Wildlife Occurrence Database System) maintained by the Florida Fish and Wildlife Conservation Commission (FFWCC) was conducted. Other resources used as aids included the following: aerials, *Soil Survey of Flagler County, Florida*; Florida National Areas Inventory (FNAI); and Official Lists of Endangered and Potentially Endangered Fauna and Flora in Florida (FFWCC and USFWS); and *Closing the Gaps in Florida's Wildlife Habitat Conservation System* (FFWCC). The records review did not indicate recorded observations or occurrences of protected species on the subject project area.

Sufficient transects were conducted to provide coverage of the subject project area. The upland area consists of right-of-way, maintained vegetation and dirt roads and driveways. The wetland areas are adjacent to U.S. Highway 1 and within the City limits and confines of urban development.

Regulatory Review

Regulatory oversight for protected fauna and flora is the responsibility of the U.S. Fish and Wildlife Service (USFWS), FFWCC and the Florida Department of Agriculture and

Consumer Services (DACS). The USFWS is the federal agency responsible for protecting the nation's fish and wildlife resources through implementation of the Endangered Species Act (ESA) of 1973, as amended. ("ESA," 16 U.S.C. 1513-1543). **Species protected under the ESA were not observed within or adjacent to the subject project area during the on-site field investigations.**

The FFWCC regulates the taking of species listed as Endangered (E), Threatened (T) or a Species of Special Concern (SSC) and their habitat impacts through Rules 68A-27.003, 68A-27.004 and 68A-27.005, Florida Administrative Code. The FFWCC also provides technical assistance to other agencies that have regulatory authority over activities, which may affect fish and wildlife and their habitat. **State listed protected species were not observed within, or adjacent to, the subject project area during the field investigations.**

Section 581.185, Florida Statutes and Chapter 5B-40, F.A.C., delegates authority to the Florida Department of Agriculture and Consumer Services (DACS) to designate and regulate plants listed as "endangered," "commercially exploited" and "threatened." It is unlawful for an individual to harvest endangered or commercially exploited plants from the private land of another or any public land without first obtaining written permission of the landowner and a permit from DACS. It is unlawful for an individual to harvest a threatened plant from private land or public land without first obtaining written permission of the landowner. **DACS protected plants were not observed within the subject project area during the on-site field investigations.**

Wildlife Survey Results

Wildlife utilization is a measure of direct observations or evidence of animals' presence (e.g. scat, tracks, dens, etc.). Potential wildlife utilization was evaluated on the basis of food sources, nesting areas, roosting areas, den areas and protective covering. The potential for wildlife utilization of the subject project area is considered low to moderate due to its location adjacent to a heavily trafficked roadway, proximity to urban development and the lack of vegetative cover along the majority of proposed project area. During the

field investigations, direct observations or signs of wildlife on the subject project area did not occur.

Based upon the regulatory review and field observations, the project as proposed demonstrates compliance with the Endangered Species Act, 16 U.S.C. 1531, et seq., which requires that projects avoid disrupting threatened or endangered species and their habitats, the Fish and Wildlife Coordination Act, PL 85-624, as amended, which requires that actions to control natural streams or other water bodies be undertaken to protect fish and wildlife resources and their habitats and Chapter 372, F.S., the Florida Endangered and Threatened Species Act which prohibits the killing or wounding of an endangered, threatened, or special concern species or intentionally destroying their eggs or nest.

According to regulatory data bases, the FNAI data review and site investigation observations for species listed as endangered, threatened, or of special concern by state or federal agencies, protected species are not recorded nor have they been documented or observed as occurring in Hulett Swamp. A list of protected species occurrences in the area, compiled from the Florida Natural Areas Inventory, FFWCC and USFWS is included in **Appendix B**. Also located in Appendix B is a Wildlife Species Map (Exhibit B-1). Exhibit B-1 depicts the location of bald eagle nests as recorded by FFWCC, scrub jay sightings as recorded by USFWS and one wood stork colony approximately eight (8) miles north of the project site according to USFWS records in relation to the project site.

3.3 Archaeological and Historical Resources

The Florida Department of State, Division of Historical Resources (DHR) was contacted regarding the Palm Coast Waste Water Treatment Plant #2 project to review the proposed project in accordance with Section 106 of the National Historic Preservation Act of 1966 (Public Law 89-665) as amended in 1992; implementing regulations 36 Code of Federal Regulation Part 800 (revised January 2001), Chapters 267 and 373, Florida Statutes as well as Chapter 1A-46, Florida Administrative Code (revised August 21, 2002). The State of Florida, Division of Historical Resources (DHR) reviewed the Florida Master Site File which indicated no historical properties or

archaeological sites recorded within the project area. The letter received from DHR is located in **Appendix C**. The documentation provided in Appendix C demonstrates compliance with the Archaeological and Historic Preservation Act of 1974, PL 93-291, and the National Historic Preservation Act of 1966, PL 89-665, as amended, regarding identification and protection of historic properties, Executive Order 11593, Protection and Enhancement of the Cultural Environment, regarding preservation, restoration and maintenance of the historic and cultural environment, Chapter 267, F.S., the "Florida Historical Resources Act" which requires identification, protection, and preservation of historic properties, archaeological and anthropological sites and Chapter 253, F.S., "Emergency Archaeological Property Acquisition Act of 1988".

4.0 ENVIRONMENTAL DATA

Environmental data has been documented as a baseline condition to aid with monitoring the health of Hulett Swamp.

4.1 Wetland Seasonal High Pool Elevations

The seasonal high pool elevations were located at six separate locations as depicted on **Figure 6**. The coordinates (State Plane Coordinates Florida East) and elevations (North American Vertical Datum 1988) of the six locations are tabulated in **Table 1**. Due to a significant storm event in September 2014 the water level in the wetland was higher than normal due to the high water levels, the location of normal pool levels using biological indicators could not be determined.

Hulett Swamp Seasonal High Water Elevation Coordinates				
Table No. 1				
Location ID #	Coordinates		Normal Elevation (ft)	Seasonal High Elevation (ft)
	Northing	Easting		
502	1915095.7600	568012.5300	UTD	25.6
504	1915109.7040	567998.9440	UTD	25.7
505	1915105.9700	567975.8430	UTD	25.8
543	1908208.5360	570903.8410	UTD	27.1
545	1908210.2930	570910.9340	UTD	26.9
546	1908219.9480	570940.5670	UTD	27.1

UTD = Unable to determine due to high water levels

5.0 DEMONSTRATION OF PUBLIC INTEREST

Effluent from WWTP No. 2 is primarily used for irrigation of areas in the vicinity of WWTP No. 2. A reclaimed water pipeline has been installed along Matanzas Woods Parkway easterly from US Highway 1 to Old Kings Road so whenever the irrigation demands in the vicinity of WWTP No. 2 are less than the effluent discharged from WWTP No. 2, the excess flow can be routed to the WWTP No. 1 reclaimed water system and be used for irrigation. However, during the times of low irrigation demands, a backup wetland discharge in accordance with the APRICOT Rule is needed for the excess WWTP No. 2 effluent.

The most economically and technically feasible option is to use Hulett Swamp as a backup wetland discharge in accordance with the APRICOT Rule. Wetland discharge also has the greatest opportunity to minimize environmental effects. The anti-degradation permitting requirements (62-4.242, FAC) state that FDEP should consider the benefit to public health, safety and welfare; conservation of fish and wildlife; recreational values and marine productivity; and consistency with an applicable Surface Water Improvement (SWIM) Plan.

Treatment of domestic wastewater is a necessary and essential public health service. Palm Coast WWTP No. 2 will be providing advanced wastewater treatment and the quality and quantity of the discharge will have minimal effect on the wetland.

There is a low probability the proposed discharge will have an adverse affect on water quality or hydrological conditions in the wetland, it should not adversely affect any flora or fauna or their habitat. There are no recreational or commercial uses of the wetland, so none will be affected.

The wetland is located within the Northern Coastal Basin Surface Water Improvement and Management Plan. The wetland discharges into Hulett Branch which eventually discharges into Pellicer Creek. As part of SWIM, Pellicer Creek has been documented to exceed limits including lead, nutrients, coliform bacteria, dissolved oxygen and iron. Since WWTP No. 2 will be providing advanced wastewater treatment and the quality and quantity of water has a minimal effect on the wetland, these parameters at Pellicer Creek will not be affected. The assessments used to issue FDEP Permit# FL0710008-001 document the amount and quality of water being discharged to the wetland will have a minimal effect on the total wetland flow. The basin's surface water quality will be protected, and the natural systems within the basin's surface waters will be minimally affected. Advanced wastewater treatment with disposal to the Hulett Swamp wetland system provides the highest environmental protection that can reasonably be provided.

5.1 Anti-degradation Rule Requirements

Anti-degradation requirements for surface waters can be found in 62-4.242, FAC and 62-302.300, FAC. The rules require that the following issues be addressed: 1) whether water quality standards will be violated; 2) whether existing uses are being maintained; and 3) whether the proposed discharge is necessary or desirable under State and Federal standards and under circumstances that are clearly in the public interest. Palm Coast has demonstrated the project is compliant with anti-degradation rule requirements by issuance of FDEP Permit# FL0710008-001 authorizing the discharge of AWT effluent to Hulett Swamp. The proposed backup wetland discharge for the WWTP No. 2 AWT effluent meets anti-degradation criteria and will have a minimal effect on the wetland water quality and flow.

5.2 Coastal Resources

Florida's coastal zone is the entire State. Florida's seaward boundary in the Gulf of Mexico is 3 marine leagues (9 nautical miles) and is 3 nautical miles in the Atlantic. Geographically, Florida has low land elevation, a generally high water table, and an extensive coastline with many rivers emptying into coastal waters. Few places in Florida are more than seventy miles from either the Atlantic Ocean or the Gulf of Mexico. The result is an interrelationship between the land and coastal waters, which makes it difficult to establish a boundary that would exclude inland areas. Because of this interrelationship, the state boundaries include the entire area encompassed by the state's 67 counties and its territorial seas. The only exceptions are lands the federal government owns, leases, holds in trust, or whose use is otherwise by law subject to the sole discretion of the federal government, its officers, or agents. Lands held by the Seminole and Miccosukee Indian Tribes are also exempted.

The project as proposed is compliant with the Coastal Zone Management Act of 1972, PL 92-583, as amended, which requires assurance of project consistency with the approved State management program developed under this Act, The Coastal Barrier Resources Act, 16 U.S.C. 3501 et seq., regarding protection and conservation of the coastal barrier resources and Chapter 161, Part I, F.S., "Beach and Shore Preservation Act" and Part III, "Coastal Zone Protection Act of 1985" which regulate coastal zone construction and all activities likely to affect the condition of the beaches or shore. The proposed project has a low probability to adversely affect flora and fauna typically found along the beach, dunes and estuarine environment. The proposed project is approximately 6 miles upstream from estuarine and marine environments. The project has a low probability to adversely affect estuarine and marine physical environments as well.

5.3 Wetland Avoidance & Minimization

The project as proposed will not require any additional infrastructure that will result to direct or indirect impacts to wetland resources.

5.4 Additional Environmental Compliance Review

The project as proposed is compliant with the Wild and Scenic Rivers Act, PL 90-542, as amended, related to protecting components or potential components of the national wild and scenic rivers system. There are only two rivers in Florida which are designated national wild and scenic rivers systems – the Wekiva River and the Loxahatchee River. These rivers are not located within, or in the vicinity of, the project area.

Chapter 258, Part III, F.S., requires protection of components or potential components of the national wild and scenic rivers system. Specially, Chapter 258.501 the Myakka River, a portion thereof has been designated as a Wild and Scenic Designation and Preservation Act. The Myakka River in Manatee, Sarasota, and Charlotte Counties possesses outstandingly remarkable ecological, fish and wildlife, and recreational values which are unique in the State of Florida. This river is not located within the project area. Therefore, the project is compliant with Chapter 258, Part III, F.S.

Chapter 582, F.S., Soil and Water Conservation Act which requires conformance with Water Management District's regulations governing the use of land and water resources. The project as proposed shall be designed and constructed using of Best Management Practices (BMP). BMP during construction will help eliminate and/or reduce the loss of valuable wetland functions as a result of sedimentation. Sedimentation causes loss of soil properties and vegetation that are characteristic of wetlands, thus resulting in the loss of wildlife habitat. The temporary erosion and turbidity control measures will be implemented as the first step of construction. During construction, the contractor is required to take all reasonable measures to insure against polluting, silting or disturbing to such an extent as to cause an increase in turbidity to the remaining water resources. Such measures shall be approved by the project engineer and may include, but not be limited to, construction of temporary erosion control structures such as sediment basins, sediment checks and/or silt barriers and hay bales. Therefore, the project is compliant with Chapter 582, F.S.

6.0 REGULATORY AUTHORIZATIONS

The City of Palm Coast has obtained, or is in the process of obtaining, appropriate State, Federal and local governmental approval for the project. The City has obtained Permit # FL0710008-001 and Permit # 18-257347-003-ES from FDEP authorizing the discharge of AWT effluent into Hulett Swamp according to the APRICOT Rule and the construction of WWTP No.2, respectively. The City is seeking authorization for the construction of the pipeline and discharge structure from FDEP. Receipt of the FDEP permits shall demonstrate compliance with Chapter 373, Part IV, F.S., Florida Water Resources Act of 1972, which requires that activities on surface waters or wetlands avoid adversely affecting: public health, safety, welfare, or property; conservation of fish and wildlife, including endangered or threatened species or their habitats; navigation or the flow of water; the fishing or recreational values or marine productivity; and significant historical and archaeological resources.

The Federal government through the U.S. Army Corps of Engineers (ACOE) regulates wetlands connected to "Waters of the United States" and "Adjacent Waters" pursuant to Section 404 of the Clean Water Act. The process to determine whether the ACOE will claim jurisdiction over wetland or surface water is entitled a Jurisdictional Determination (JD). Dredge and fill activities within "Waters of the United States" and "Adjacent Waters" will require either a Section 404 Individual Permit or verification to use permits issued through the General or Nationwide Permit Program. The City is in the process of obtaining either a "No Permit Required" Letter or a Nationwide Permit from the ACOE.

7.0 SUMMARY

The City's WWTP No. 2 project includes facilities to treat up to 2.0 MGD of effluent a day and a pipeline to convey the advanced wastewater treatment (AWT) effluent to Hulett Swamp when the AWT effluent cannot be used as reclaimed water from the WWPT No. 2. The City of Palm Coast is proposing an expansion project to increase capacity to 4.0 MGD at WWTP No. 2. The resulting AWT discharge may increase from 0.6 MGD to 1.2 MGD as a result of the capacity increase. There

are no existing commercial or recreational uses of the Hulett Swamp. The backup surface water discharge to the wetland will have minimal effect on flows and water quality, and the increase in nutrient loadings will be immeasurable. As such FDEP issued Permit# FL0710008-001, thus demonstrating the discharge will not adversely affect Hulett Swamp and that the project is in the public interest.

All jurisdictional systems in the vicinity of the project were identified during planning efforts in 2009 and re-assessed in 2019. All wetlands on, and adjacent to, the project corridor were inspected to ascertain current functions and values. No additional infrastructure is required to accommodate the increased capacity and no impacts to natural resources are anticipated for the WWTP #2 expansion project.

This assessment reviewed the environmental effects/benefits associated with the City of Palm Coast's WWTP No. 2 backup surface water discharge to Hulett Swamp. The results of the assessment revealed the project is consistent with the State's anti-degradation rules and is in compliance with relevant regulatory compliance issues.



500 West Fulton Street
Sanford, Florida 32771

Appendix A

Figures

**WWTP#2 Environmental Assessment
Document for SRF Planning
City of Palm Coast, Flagler County**



Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013

Path: M:\PROJECTS\P61117_27\2014\10SRFL\LOCATION.mxd



Scale: 1" = 10,000'
 Date: 11/4/2014
 Photo Date:
 Project No. P61117.27A
 Biologist: GIS: RCO



LOCATION MAP

PALM COAST WWTP #2 RECLAIMED

SECTION 33, TOWNSHIP 10 SOUTH, RANGE 30 EAST
 SECTIONS 3 & 4, TOWNSHIP 11 SOUTH, RANGE 30 EAST
 FLAGLER COUNTY, FLORIDA

FIGURE 1



Wastewater Treatment Plant #2

N US HIGHWAY 1

Hullet Swamp

Approximate Project Limits

Discharge Site

LONDON DR

MATANZAS WOODS PKWY

BELLE TERRE PKWY

Path: M:\PROJECTS\P61117_27020-4\USRP-AERIAL.mxd



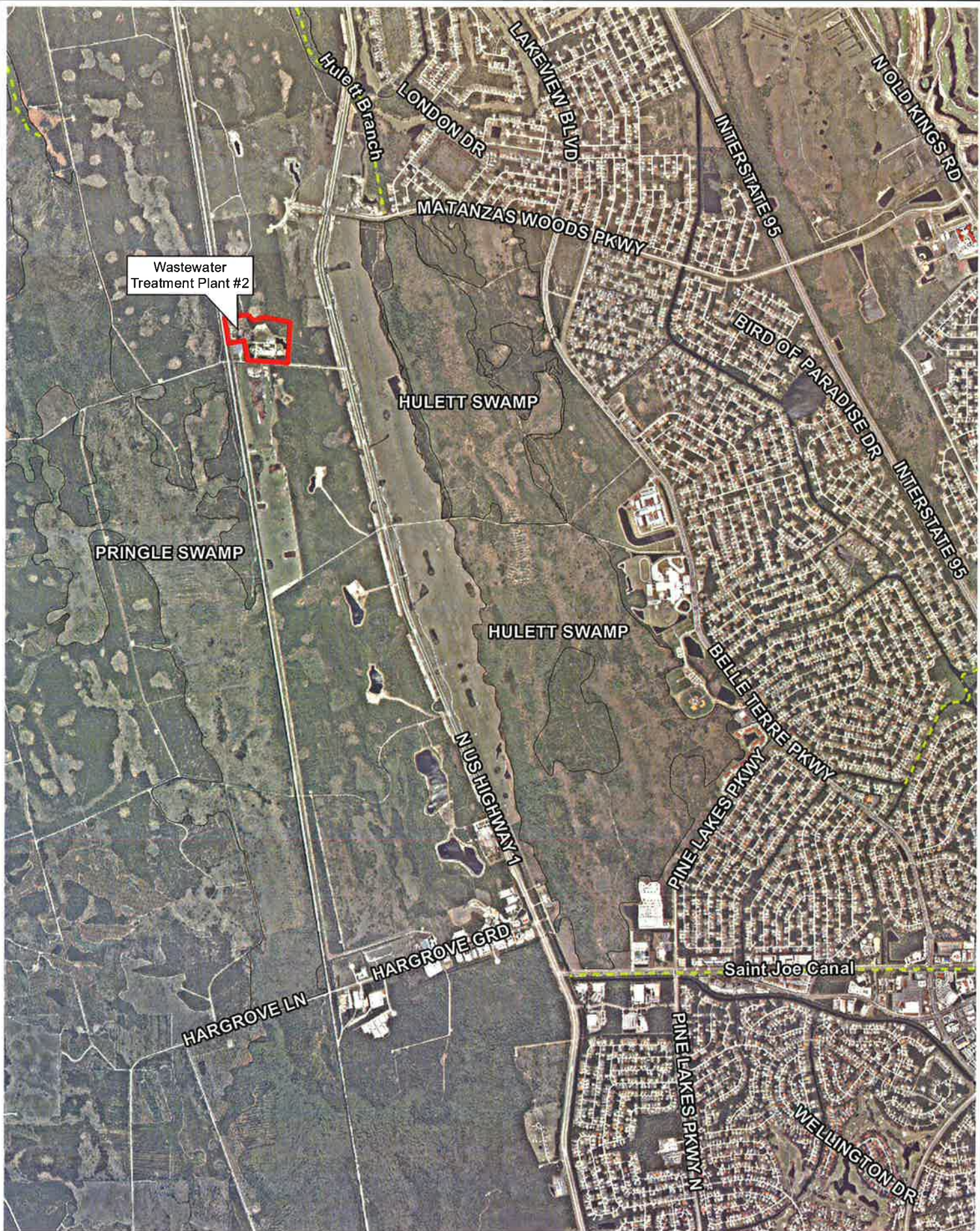
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 Date: 10/30/2014
 Photo Date: 2011
 Project No. P61117.27A
 Biologist: AED GIS: RCO



PROJECT LIMITS AERIAL MAP

PALM COAST WWTP #2 RECLAIMED
 SECTION 33, TOWNSHIP 10 SOUTH, RANGE 30 EAST
 SECTIONS 3 & 4, TOWNSHIP 11 SOUTH, RANGE 30 EAST
 FLAGLER COUNTY, FLORIDA

FIGURE 2



Wastewater
Treatment Plant #2

PRINGLE SWAMP

HULETT SWAMP

HULETT SWAMP

HARGROVE GRD

HARGROVE LN

BELLE TERRE PKWY
PINE LAKES PKWY

Saint Joe Canal

PINE LAKES PKWY N

WELLINGTON DR

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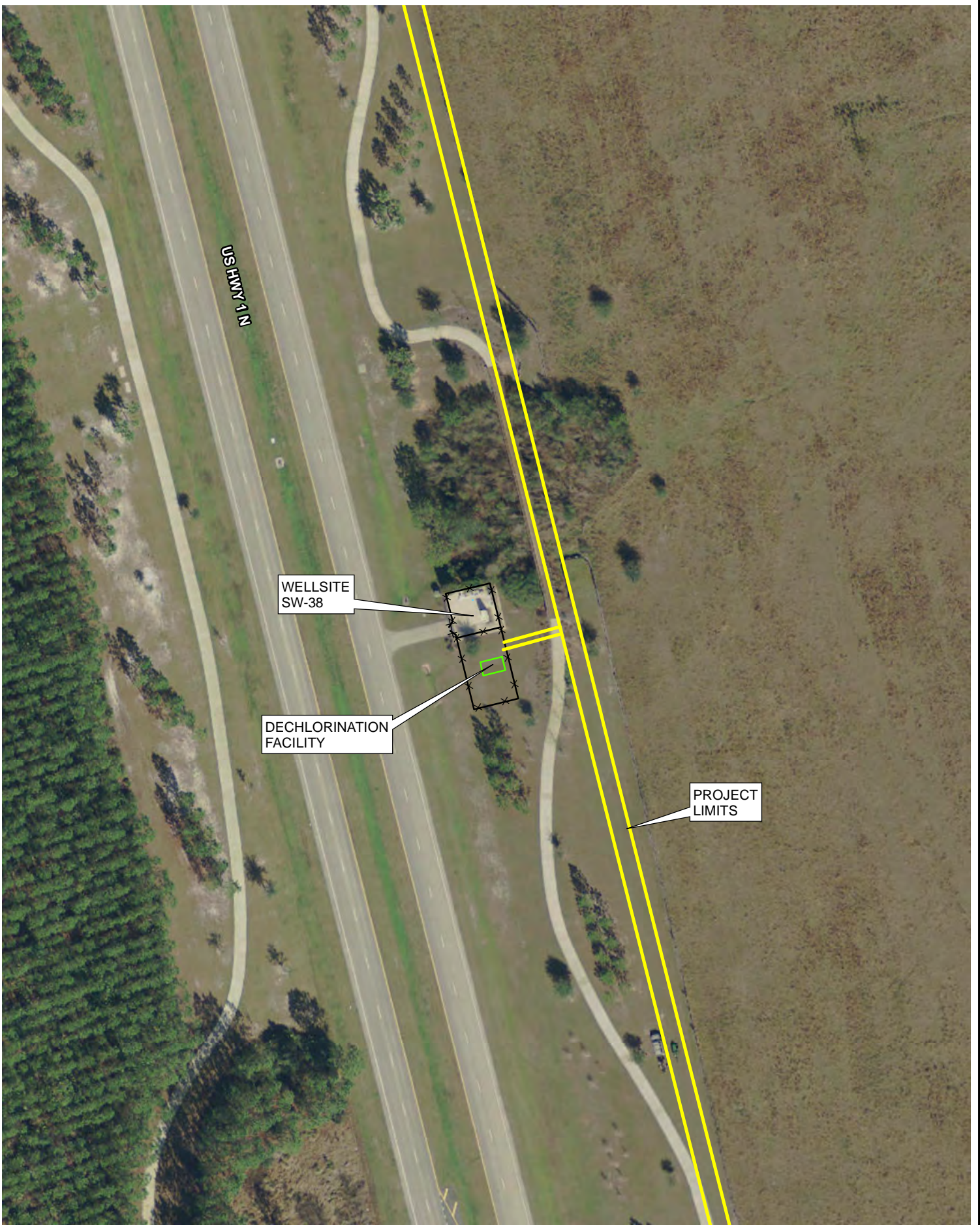


Scale: 1" = 3,000'
Date: 10/31/2014
Photo Date: 2011
Project No. P61117.27A
Biologist: AED GIS: RCO



HULETT SWAMP MAP
PALM COAST WWTP #2 RECLAIMED
SECTION 33, TOWNSHIP 10 SOUTH, RANGE 30 EAST
SECTIONS 3 & 4, TOWNSHIP 11 SOUTH, RANGE 30 EAST
FLAGLER COUNTY, FLORIDA

FIGURE 3



WELLSITE
SW-38

DECHLORINATION
FACILITY

PROJECT
LIMITS

US HWY 1 N

Path: P:\PIP\61255\DECHLORINATION.mxd



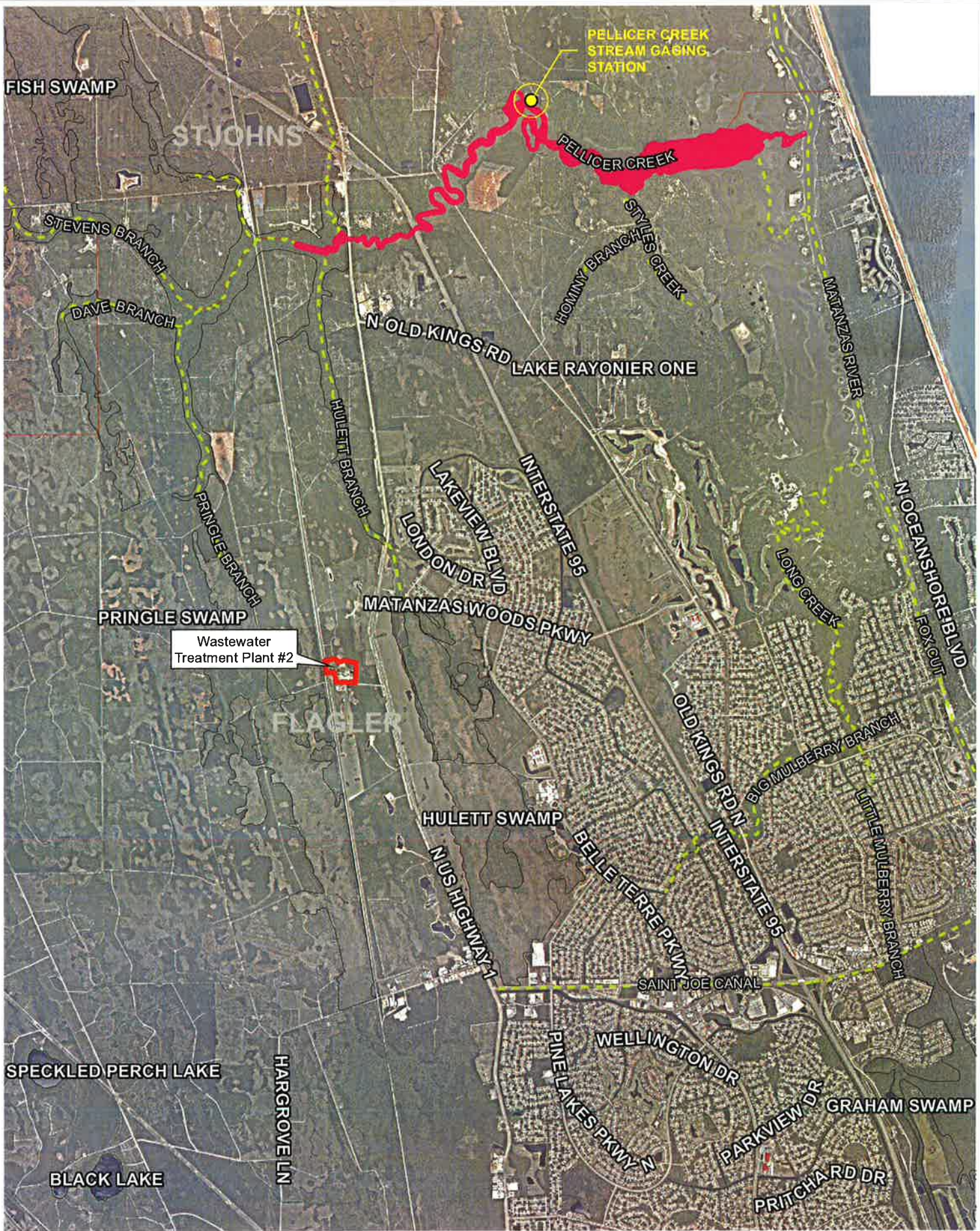
Scale: 1" = 100'
 Date: 9/13/2019
 Photo Date: 2017
 Project No. P61255
 Biologist: APM GIS: MGO



DECHLORINATION FACILITY LOCATION MAP

PALM COAST WWTP #2 RECLAIMED
 SECTION 33, TOWNSHIP 10 SOUTH, RANGE 30 EAST
 SECTIONS 3 & 4, TOWNSHIP 11 SOUTH, RANGE 30 EAST 167
 FLAGLER COUNTY, FLORIDA

**FIGURE
4**



Path: M:\PROJECTS\IS\P61117_27\2014\05SRF\regional.mxd

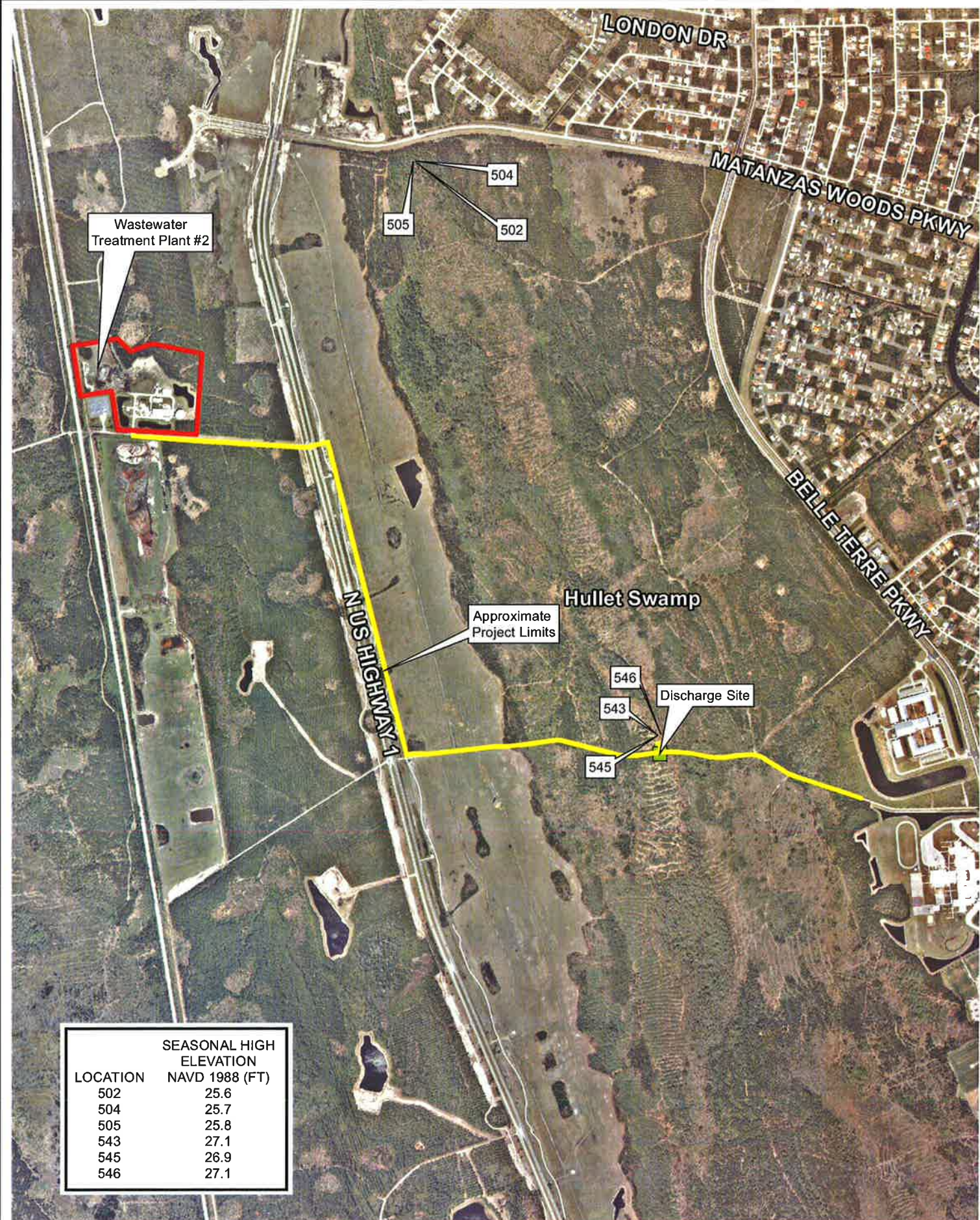


Scale: 1" = 6,000'
 Date: 10/31/2014
 Photo Date: 2011
 Project No. P61117.27A
 Biologist: AED GIS: RCO



REGIONAL AERIAL MAP
PALM COAST WWTP #2 RECLAIMED
 SECTION 33, TOWNSHIP 10 SOUTH, RANGE 30 EAST
 SECTIONS 3 & 4, TOWNSHIP 11 SOUTH, RANGE 30 EAST T68
 FLAGLER COUNTY, FLORIDA

FIGURE
5

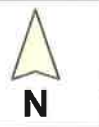


LOCATION	SEASONAL HIGH ELEVATION NAVD 1988 (FT)
502	25.6
504	25.7
505	25.8
543	27.1
545	26.9
546	27.1

Path: M:\PROJECTS\117.27\2014\USRF\SHW.mxd



Scale: 1" = 1,500'
 Date: 11/4/2014
 Photo Date: 2011
 Project No. P61117.27A
 Biologist: AED GIS: RCO



SEASONAL HIGH WATER LOCATION MAP
PALM COAST WWTP #2 RECLAIMED
 SECTION 33, TOWNSHIP 10 SOUTH, RANGE 30 EAST
 SECTIONS 3 & 4, TOWNSHIP 11 SOUTH, RANGE 30 EAST
 FLAGLER COUNTY, FLORIDA

FIGURE 6
6



Path: M:\PROJECTS\P61117_27\201410SRFWater_quality.mxd



Scale: 1" = 1,500'
 Date: 11/4/2014
 Photo Date: 2011
 Project No. P61117.27A
 Biologist: AED GIS: RCO



WATER QUALITY SAMPLING STATIONS MAP
PALM COAST WWTP #2 RECLAIMED
 SECTION 33, TOWNSHIP 10 SOUTH, RANGE 30 EAST
 SECTIONS 3 & 4, TOWNSHIP 11 SOUTH, RANGE 30 EAST
 FLAGLER COUNTY, FLORIDA

FIGURE 7

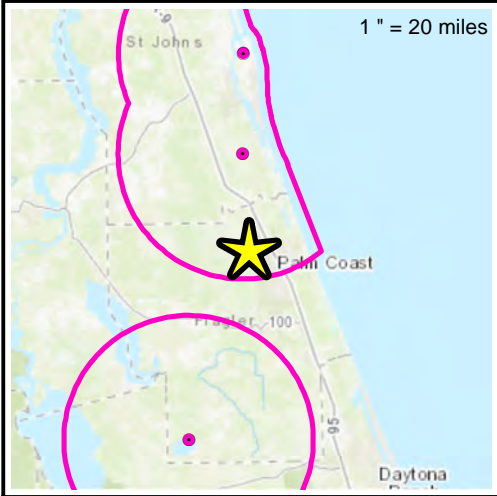


500 West Fulton Street
Sanford, Florida 32771

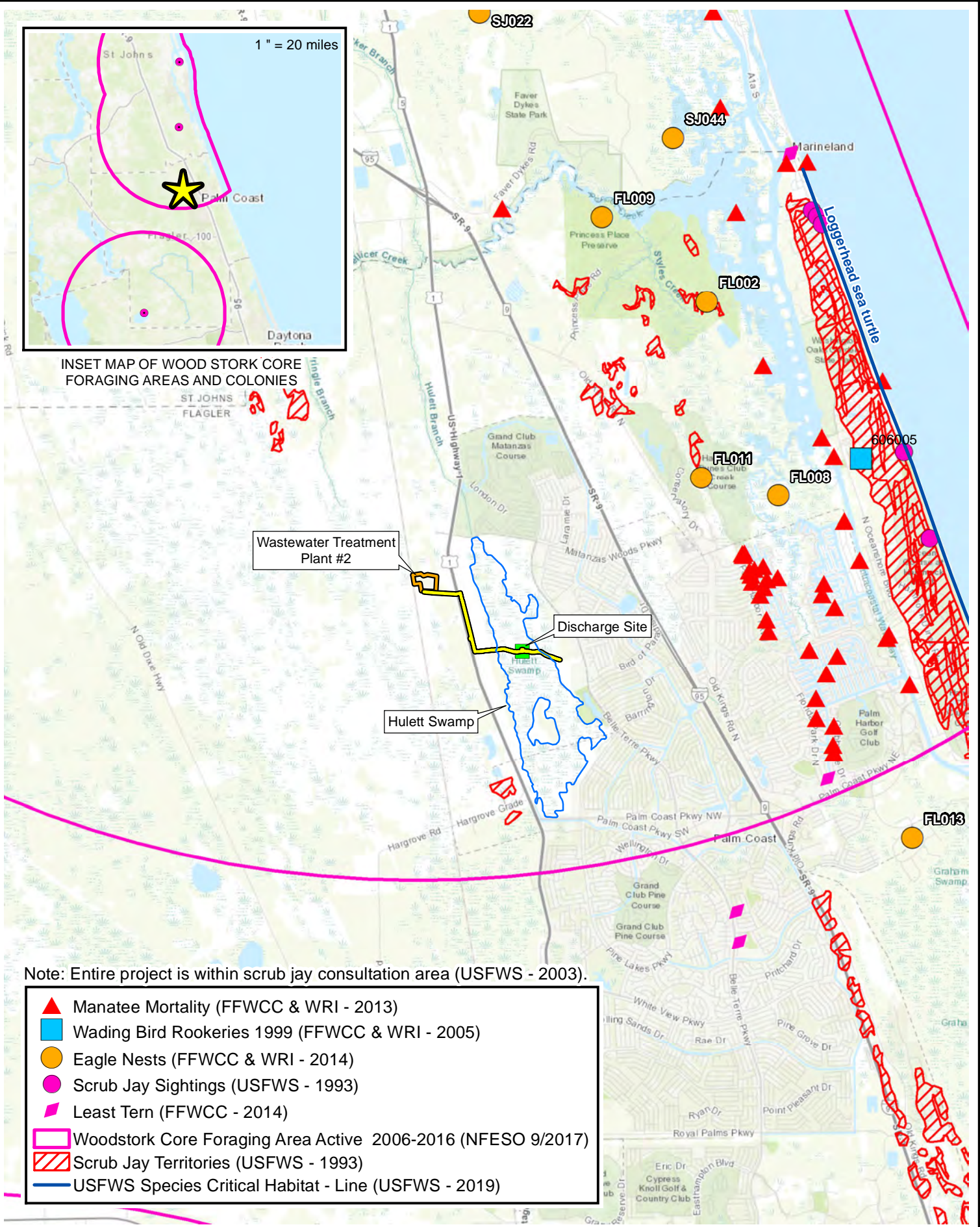
Appendix B

Wildlife Assessment Documents

**WWTP#2 Environmental Assessment
Document for SRF Planning
City of Palm Coast, Flagler Count**



INSET MAP OF WOOD STORK CORE FORAGING AREAS AND COLONIES



Note: Entire project is within scrub jay consultation area (USFWS - 2003).

- ▲ Manatee Mortality (FFWCC & WRI - 2013)
- Wading Bird Rookeries 1999 (FFWCC & WRI - 2005)
- Eagle Nests (FFWCC & WRI - 2014)
- Scrub Jay Sightings (USFWS - 1993)
- ◆ Least Tern (FFWCC - 2014)
- ▭ Woodstork Core Foraging Area Active 2006-2016 (NFESO 9/2017)
- ▨ Scrub Jay Territories (USFWS - 1993)
- USFWS Species Critical Habitat - Line (USFWS - 2019)

Path: P:\P61255\Species.mxd



Scale: 1" = 8,000'
 Date: 8/28/2019
 Photo Date: NA
 Project No. P61255
 BIOLOGIST: APM GIS: MGO



SPECIES MAP

PALM COAST WWTP #2 RECLAIMED
 SECTION 33, TOWNSHIP 10 SOUTH, RANGE 30 EAST
 SECTIONS 3 & 4, TOWNSHIP 11 SOUTH, RANGE 30 EAST
 FLAGLER COUNTY, FLORIDA

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EXHIBIT B-1

CITY OF PALM COAST
WASTE WATER TREATMENT PLANT #2
THREATENED, ENDANGERED,
AND OTHER SPECIES OF CONCERN LIKELY TO OCCUR IN
FLAGLER COUNTY, FLORIDA
Species Compiled from FNAI, FFWCC USFWS

Table No. 1

Common Name	Scientific Name	State Status *	FWS Status *	Natural Communities	On-Site Habitat	Likelihood of Occurrence
FISH:						
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	E	E CH	ESTUARINE: various MARINE: various habitats RIVERINE: alluvial and blackwater streams	No	None
AMPHIBIANS & REPTILES:						
Loggerhead turtle	<i>Caretta caretta</i>	T	T	TERRESTRIAL: sandy beaches; nesting	No	None
Green turtle	<i>Chelonia mydas</i>	T	T	TERRESTRIAL: sandy beaches; nesting	No	None
Leatherback turtle	<i>Dermodochelys coriacea</i>	E	E	TERRESTRIAL: sandy beaches; nesting	No	None
Eastern indigo snake	<i>Drymarchon couperi</i>	T	T	ESTUARINE: tidal swamp PALUSTRINE: hydric hammock, wet flatwoods TERRESTRIAL: mesic flatwoods, upland pine forest, sandhills, scrub, scrubby flatwoods, rockland hammock, ruderal	Yes	Suitable habitat, not observed
Gopher tortoise	<i>Gopherus polyphemus</i>	T	C	TERRESTRIAL: sandhills, scrub, scrubby flatwoods, xeric hammocks, coastal strand, ruderal	Yes	Tortoise burrows observed
American Alligator	<i>Alligator Mississippiensis</i>	SAT	FT(S/A)	ESTUARINE: tidal marsh LACUSTRINE: river floodplain lake, swamp lake RIVERINE: alluvial stream, blackwater stream	Yes	None observed
BIRDS:						
Florida scrub jay	<i>Aphelocoma coerulescens</i>	T	T	TERRESTRIAL: dunes, sandy beaches, and inlet areas, xeric oak.	No	Low probability, not observed
Piping plover	<i>Charadrius melodus</i>	T	T	ESTUARINE: exposed unconsolidated substrate MARINE: exposed unconsolidated substrate TERRESTRIAL: dunes, sandy beaches, and inlet areas. Mostly wintering and migrants.	No	Low probability, not observed
Bald eagle	<i>Haliaeetus leucocephalus</i>	N	BGEPA (Bald & Golden Eagle Protection Act)	ESTUARINE: marsh edges, tidal swamp, open water LACUSTRINE: swamp lakes, edges PALUSTRINE: swamp, floodplain RIVERINE: shoreline, open water TERRESTRIAL: pine and hardwood forests, clearings	Possible	Marginal habitat, not observed
Wood stork	<i>Mycteria americana</i>	T	T	ESTUARINE: marshes LACUSTRINE: floodplain lakes, marshes (feeding), various PALUSTRINE: marshes, swamps, various	No	Low probability, not observed
Limpkin	<i>Aramus guarana</i>	SSC		ESTUARINE: exposed unconsolidated substrate MARINE: exposed unconsolidated substrate TERRESTRIAL: dunes, sandy beaches, and inlet areas	No	Low probability, not observed
Little blue heron	<i>Egretta caerulea</i>	SSC		ESTUARINE: marshes, shoreline PALUSTRINE: floodplains, swamps RIVERINE: shoreline	Possible	Low probability, not observed

*E=endangered, T=threatened, C=candidate, FT(S/A) =Federally threatened for similarity of appearance, SAT=treated as threatened for similar appearance, SSC=species of special concern, ce=consideration encouraged, CH=Critical Habitat

CITY OF PALM COAST
WASTE WATER TREATMENT PLANT #2
THREATENED, ENDANGERED,
AND OTHER SPECIES OF CONCERN LIKELY TO OCCUR IN
FLAGLER COUNTY, FLORIDA
Species Compiled from FNAI, FFWCC USFWS

Table No. 1

Common Name	Scientific Name	State Status *	FWS Status *	Natural Communities	On-Site Habitat	Likelihood of Occurrence
Snowy egret	<i>Egretta thula</i>	SSC		ESTUARINE: marshes, tidal swamps, shoreline LACUSTRINE: lake edges PALUSTRINE: swamp, floodplain, ruderal RIVERINE: shoreline	Possible	Low probability, not observed
White Ibis	<i>Eudocimus albus</i>	SSC		ESTUARINE: marshes, tidal swamps, shoreline LACUSTRINE: lake edges PALUSTRINE: swamp, floodplain, ruderal RIVERINE: shoreline	Possible	Low probability, not observed
Tricolored heron	<i>Egretta tricolor</i>	SSC		ESTUARINE: marshes, tidal swamps, shoreline LACUSTRINE: lake edges PALUSTRINE: swamp, floodplain, ruderal RIVERINE: shoreline	Possible	Low probability, not observed
Florida Sandhill Crane	<i>Crus canadensis pratensis</i>	T		PALUSTRINE: hydric pine flatwoods	Possible	Low probability, not observed
Southeastern American kestrel	<i>Falco sparverius paulus</i>	T		ESTUARINE: various habitats PALUSTRINE: various habitats TERRESTRIAL: open pine forests, clearings, ruderal, various	No	Low probability, not observed
American oystercatcher	<i>Haematopus palliatus</i>	SSC		ESTUARINE: exposed unconsolidated substrate, exposed mullock reef MARINE: exposed unconsolidated substrate, exposed mullock reef TERRESTRIAL: beaches, ruderal areas	No	Low probability, not observed
Brown pelican	<i>Pelecanus occidentalis</i>	SSC		ESTUARINE: islands for nesting, open water MARINE: open water	No	None
Black skimmer	<i>Rynchops niger</i>	SSC		ESTUARINE: various LACUSTRINE: various RIVERINE: various TERRESTRIAL: ocean beaches, beach dune, ruderal.	No	None
Least tern	<i>Sterna antillarum</i>	T		ESTUARINE: various LACUSTRINE: various RIVERINE: various TERRESTRIAL: beach dune, ruderal. Nests common on rooftops.	No	None
MAMMALS:						
West Indian manatee	<i>Trichechus manatus latirostris</i>	E	E	ESTUARINE: submerged vegetation, open water MARINE: open water, submerged vegetation RIVERINE: alluvial stream, blackwater stream, spring-run stream	No	None
North Atlantic Right Whale	<i>Eubalaena glacialis</i>	E	E	MARINE: open water	No	None
Florida black bear	<i>Ursus americanus floridanus</i>	T	ce	PALUSTRINE: titi swamps, floodplains TERRESTRIAL: pine and hardwood forests	Yes	Marginal habitat, not observed

*E=endangered, T=threatened, C=candidate, FT(S/A) =Federally threatened for similarity of appearance, SAT=treated as threatened for similar appearance, SSC=species of special concern, ce=consideration encouraged, CH=Critical Habitat

CITY OF PALM COAST
WASTE WATER TREATMENT PLANT #2
THREATENED, ENDANGERED,
AND OTHER SPECIES OF CONCERN LIKELY TO OCCUR IN
FLAGLER COUNTY, FLORIDA
Species Compiled from FNAI, FFWCC USFWS

Table No. 1

Common Name	Scientific Name	State Status *	FWS Status *	Natural Communities	On-Site Habitat	Likelihood of Occurrence
PLANTS:						
Coastal vervain	<i>Glandularia maritima</i>	E		TERRESTRIAL: beach dunes, dunes, wales and coastal hammocks	No	None
Lake-side sunflower	<i>Helianthus carnosus</i>	E		PALUSTRINE: wet prairie and wet flatwoods	Yes	Marginal habitat, not observed
Atlantic Coast Florida lantana	<i>Lantana depressa</i> var. <i>Floridana</i>	T	E	TERRESTRIAL: beach dunes, pine flatwoods, coastal grasslands	No	None
Nodding Pinweed	<i>Lechea cernua</i>	T		TERRESTRIAL: upland hardwood forest, slope forest, bluffs PALUSTRINE: bottomland forest, stream banks, floodplains	No	None
Celestial Lily	<i>Nemastylis floridana</i>	E		TERRESTRIAL: slope forest, moist sandy loam; moist sandy loam	No	None
Terrestrial Peperomia	<i>Peperomia humilis</i>	E		TERRESTRIAL: coastal dunes, coastal strand, coastal grassland; openings and blowouts	No	None
Florida Mountain-mint	<i>Pycnanthemum floridanum</i>	T		PALUSTRINE: creek swamps TERRESTRIAL: slope forest, upland hardwood forest, bluffs	No	None

*E=endangered, T=threatened, C=candidate, FT(S/A) =Federally threatened for similarity of appearance, SAT=treated as threatened for similar appearance, SSC=species of special concern, ce=consideration encouraged, CH=Critical Habitat



500 West Fulton Street
Sanford, Florida 32771

Appendix B

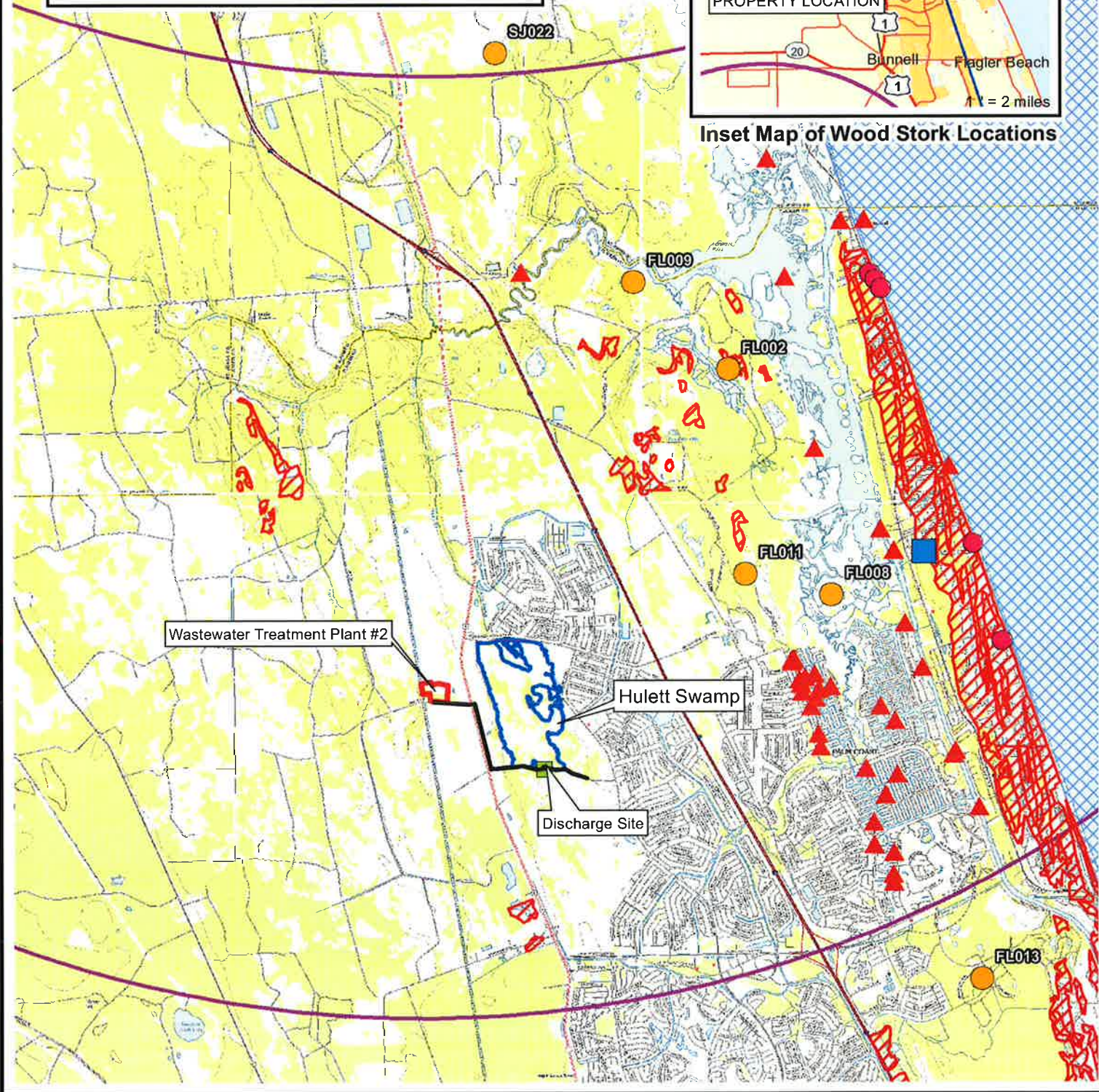
Wildlife Assessment Documents

**WWTP#2 Environmental Assessment
Document for SRF Planning
City of Palm Coast, Flagler County**

- ▲ Manatee Mortality 2011, FWC
- Wading Bird Rookeries 1999 (FFWCC Status Unknown)
- Eagle Nests (FFWCC - 2011)
- Scrub Jay Sightings (USFWS - 1993)
- Wood Stork Colonies (USFWS - 2010)
- Scrub Jay Territories (USFWS - 1993)
- Critical Wildlife Areas
- Wood Stork CFA (USFWS - 2010)
- USFWS Species Critical Habitat Feb. 2012



Inset Map of Wood Stork Locations



Path: M:\PROJECTS\IP61117_27\2014\OSRF\species.mxd



Scale: 1" = 8,000'
 Date: 11/4/2014
 Photo Date: NA
 Project No. P61117.27A
 Biologist: AED GIS: RCO



SPECIES MAP
PALM COAST WWTP #2 RECLAIMED
 SECTION 33, TOWNSHIP 10 SOUTH, RANGE 30 EAST
 SECTIONS 3 & 4, TOWNSHIP 11 SOUTH, RANGE 30 EAST¹⁷⁷
 FLAGLER COUNTY, FLORIDA

**EXHIBIT
 B-1**



500 West Fulton Street
Sanford, Florida 32771

Appendix C

State Historical Preservation Office Review

**WWTP#2 Environmental Assessment
Document for SRF Planning
City of Palm Coast, Flagler County**



FLORIDA DEPARTMENT OF STATE
Kurt S. Browning
Secretary of State
DIVISION OF HISTORICAL RESOURCES

Ms. Amy Daly
CPH Engineers, Inc.
500 W. Fulton Street
Sanford, Florida 32771

October 27, 2009

Re: DHR No.: 2009-06015/ Received by DHR: July 6, 2009
Applicant: City of Palm Coast
Project: City of Palm Coast Back-up Disposal Outfall Construction
County: Flagler

Dear Ms. Daly:

Our office received and reviewed the referenced project in accordance with Chapters 253, 267 and 373, *Florida Statutes*, Florida's Coastal Management Program, and implementing state regulations, for possible impact to historic properties listed, or eligible for listing, in the *National Register of Historic Places*, or otherwise of historical, architectural or archaeological value. The State Historic Preservation Officer is to advise and assist state and federal agencies when identifying historic properties, assessing effects upon them, and considering alternatives to avoid or minimize adverse effects.

Our review of the Florida Master Site File indicates that no significant archaeological or historical resources are recorded within the project area. Furthermore, because of the location and/or nature of the project it is unlikely that any such site will be affected.

For any questions concerning our comments, please contact Michael Hart, Historic Sites Specialist, by electronic mail at mrhart@dos.state.fl.us, or by phone at (850) 245-6333. We appreciate your continued interest in protecting Florida's historic properties.

Sincerely,

A handwritten signature in cursive script that reads "Laura A. Kammerer".

Laura A. Kammerer
Historic Preservationist Supervisor
Compliance Review Section
Bureau of Historic Preservation

500 S. Bronough Street • Tallahassee, FL 32399-0250 • <http://www.flheritage.com>

☐ Director's Office
(850) 245-6300 • FAX: 245-6436

☐ Archaeological Research
(850) 245-6444 • FAX: 245-6452

✓ Historic Preservation
(850) 245-6333 • FAX: 245-6437

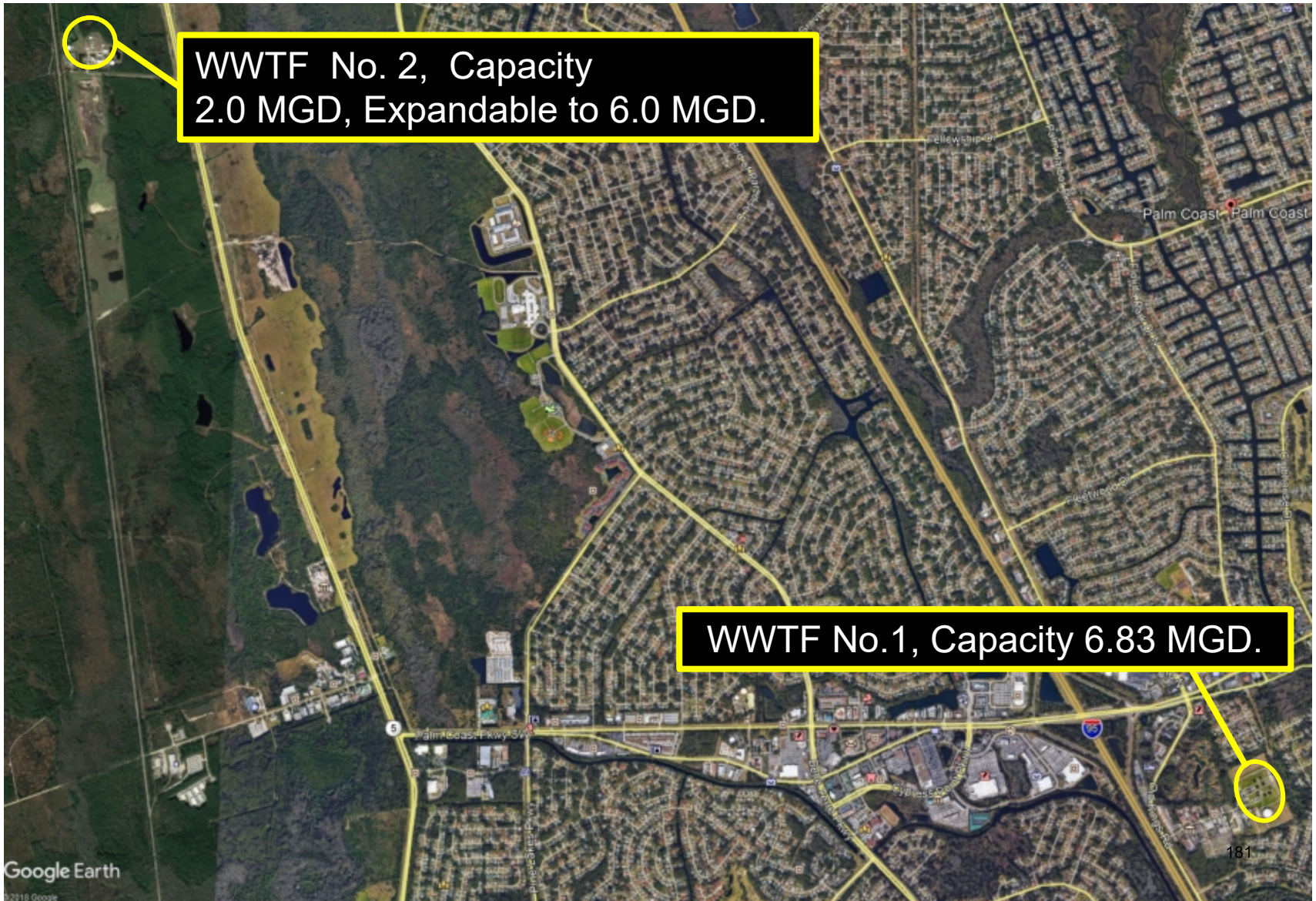


Wastewater Treatment Capacity Expansion

Council Workshop, January 14, 2020



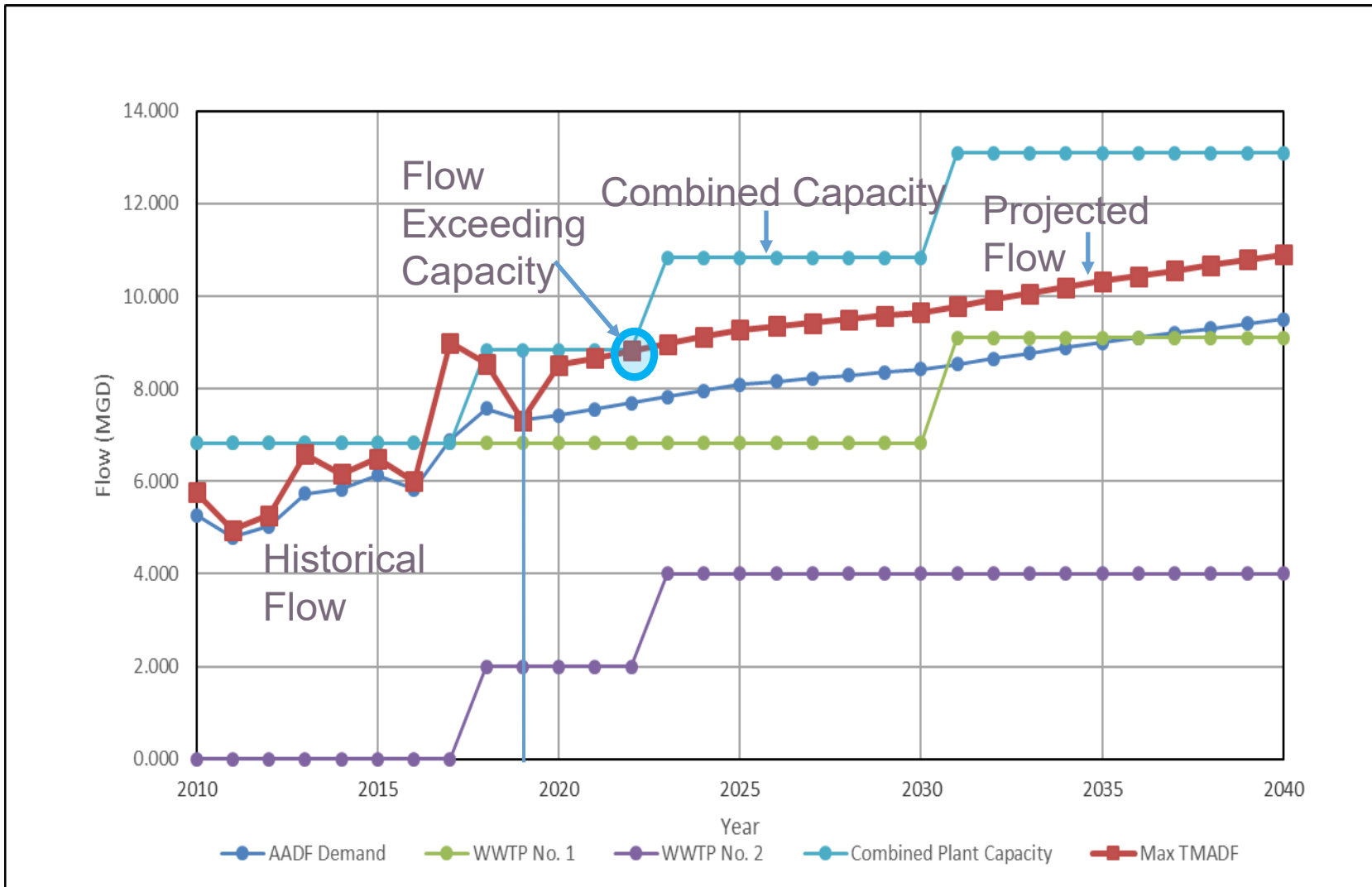
WWTF Expansion



WWTF No. 2, Capacity
2.0 MGD, Expandable to 6.0 MGD.

WWTF No. 1, Capacity 6.83 MGD.

Flow vs Capacity



FDEP Requirements



62-600.405 Planning for Wastewater Facilities Expansion.

- **Fours Years Planning Period**
 - (7)(b) If the permitted capacity will be equal or exceeded within the next four years, design for the necessary expansion must be underway.
- **Permit Application**
 - (7)(c) If the permitted capacity will be equal or exceeded within the next three years, a complete permit application for the necessary expansion shall be submitted.

City 2014 Strategic Action Plan

- **Strategy 1.2.2: Coordinate facility capacity upgrades to meet the City's growth needs appropriately**

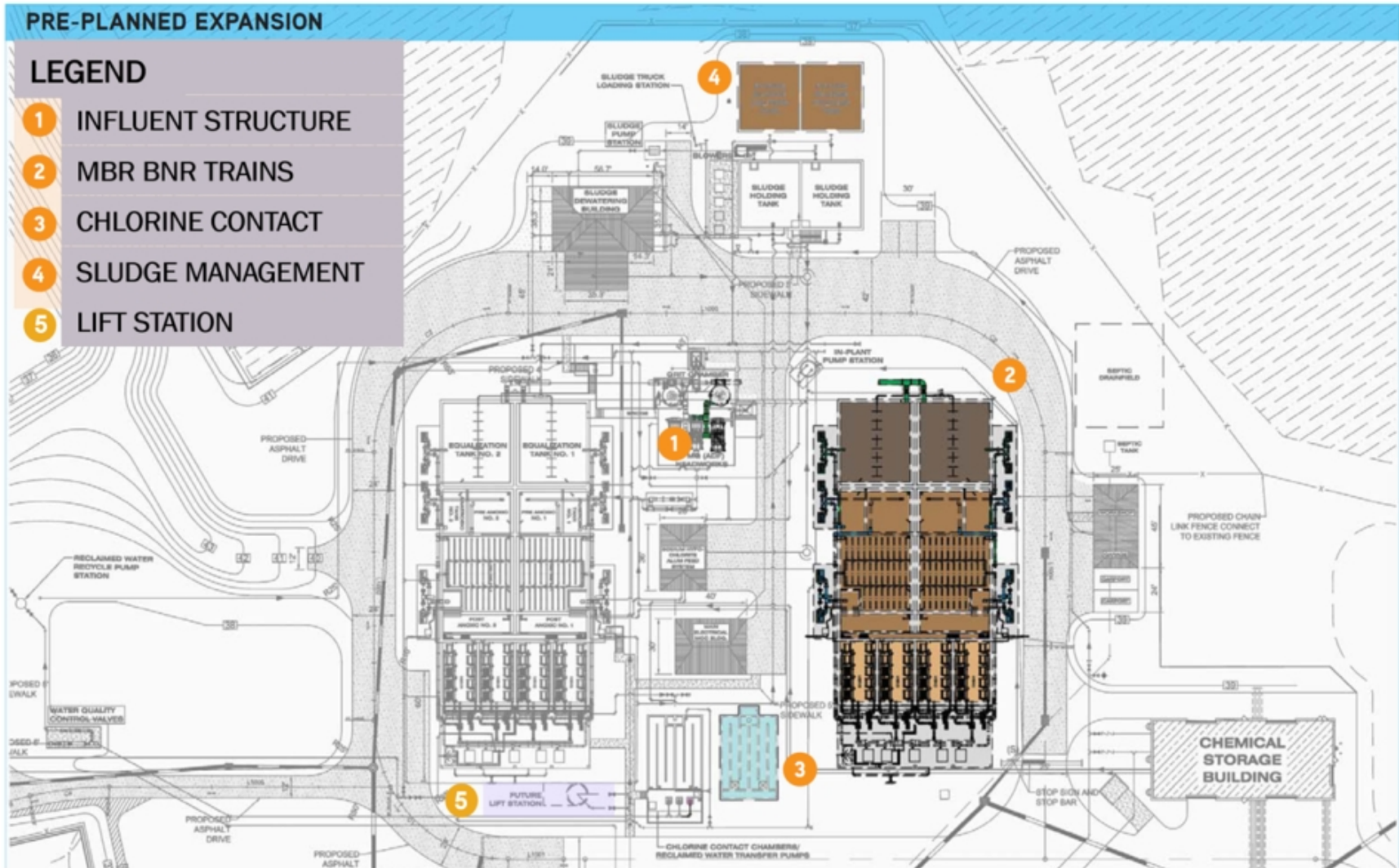
Proposed Improvements



PRE-PLANNED EXPANSION

LEGEND

- 1 INFLUENT STRUCTURE
- 2 MBR BNR TRAINS
- 3 CHLORINE CONTACT
- 4 SLUDGE MANAGEMENT
- 5 LIFT STATION

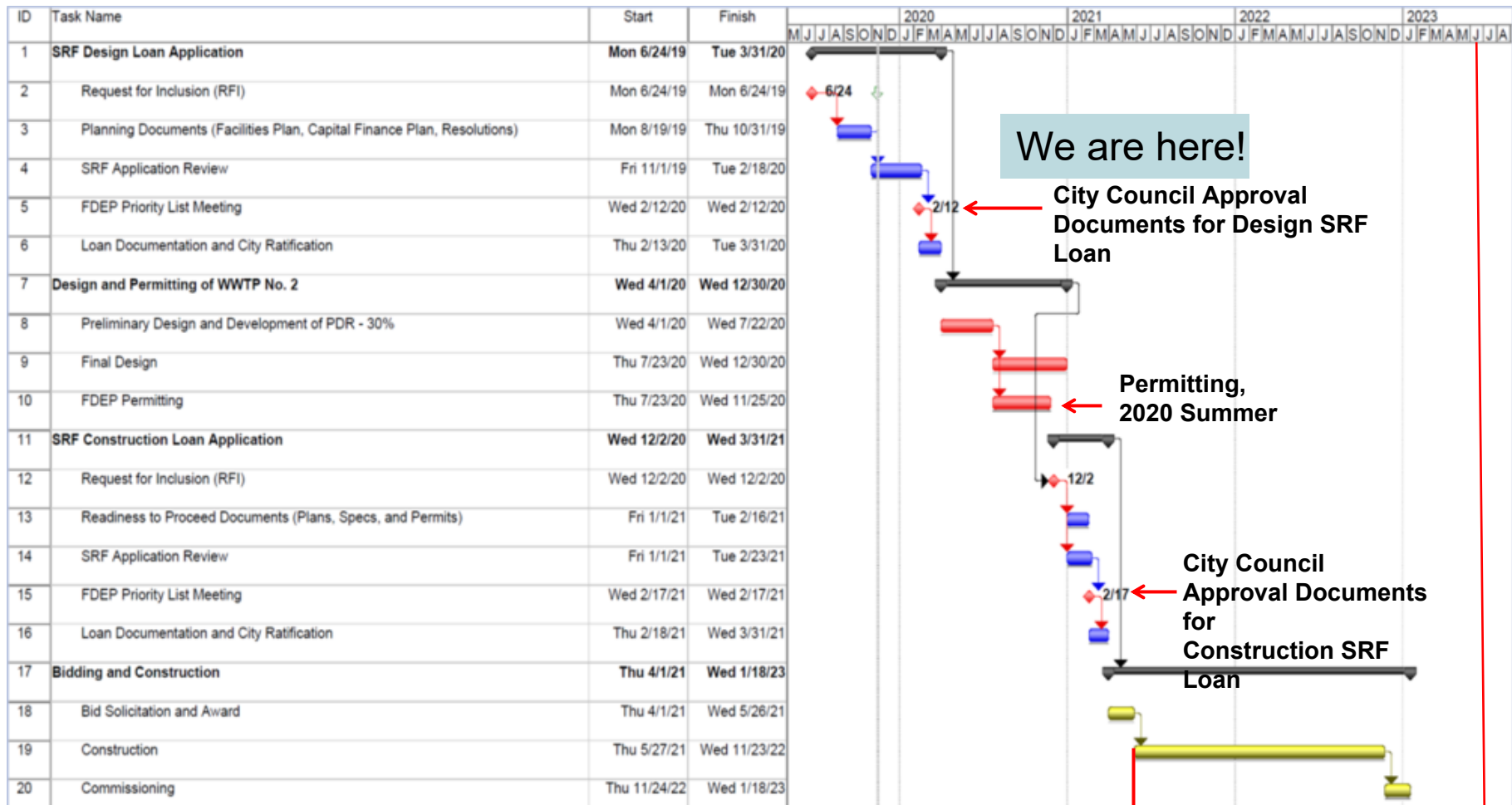


WWTF No.2 Expansion Critical Tasks



1. Request for Inclusion (RFI) – SRF Loan for Design June 24, 2019
2. Facilities Plan and Capital Finance Plan (CFP, Design Loan) Completion December, 2019
3. City Council Adoption of Facilities Plan and Capital Finance Plan January, 2020
4. Engineering Design Contract approval February, 2020
5. FDEP SRF Public Meeting for Design Loan February 12, 2020
6. Design Loan Application and Council Approval March, 2020
7. Design Loan Agreement Executed April, 2020
8. Preliminary Design and PDR Completion July, 2020
9. Request for Inclusion (RFI) – SRF Loan for Construction October, 2020
10. FDEP Permitting Completion November, 2020
11. Final Design, Construction Plans and Specs Completion December, 2020
12. Capital Finance Plan (CFR, Construction Loan) Completion December, 2020
13. City Council Approval and Adoption of the CFP December, 2020
14. Readiness to Proceed Package to FDEP January, 2020
15. FDEP SRF Public Meeting for Construction Loan February 17, 2021
16. Construction Loan Application and Council Approval March, 2021
17. Construction Loan Approval April, 2021
18. Bidding and Awarding Completion May, 2021
19. Construction Completion November, 2022
20. Testing and Commissioning January, 2023

Implementation Schedule



We are here!

City Council Approval Documents for Design SRF Loan

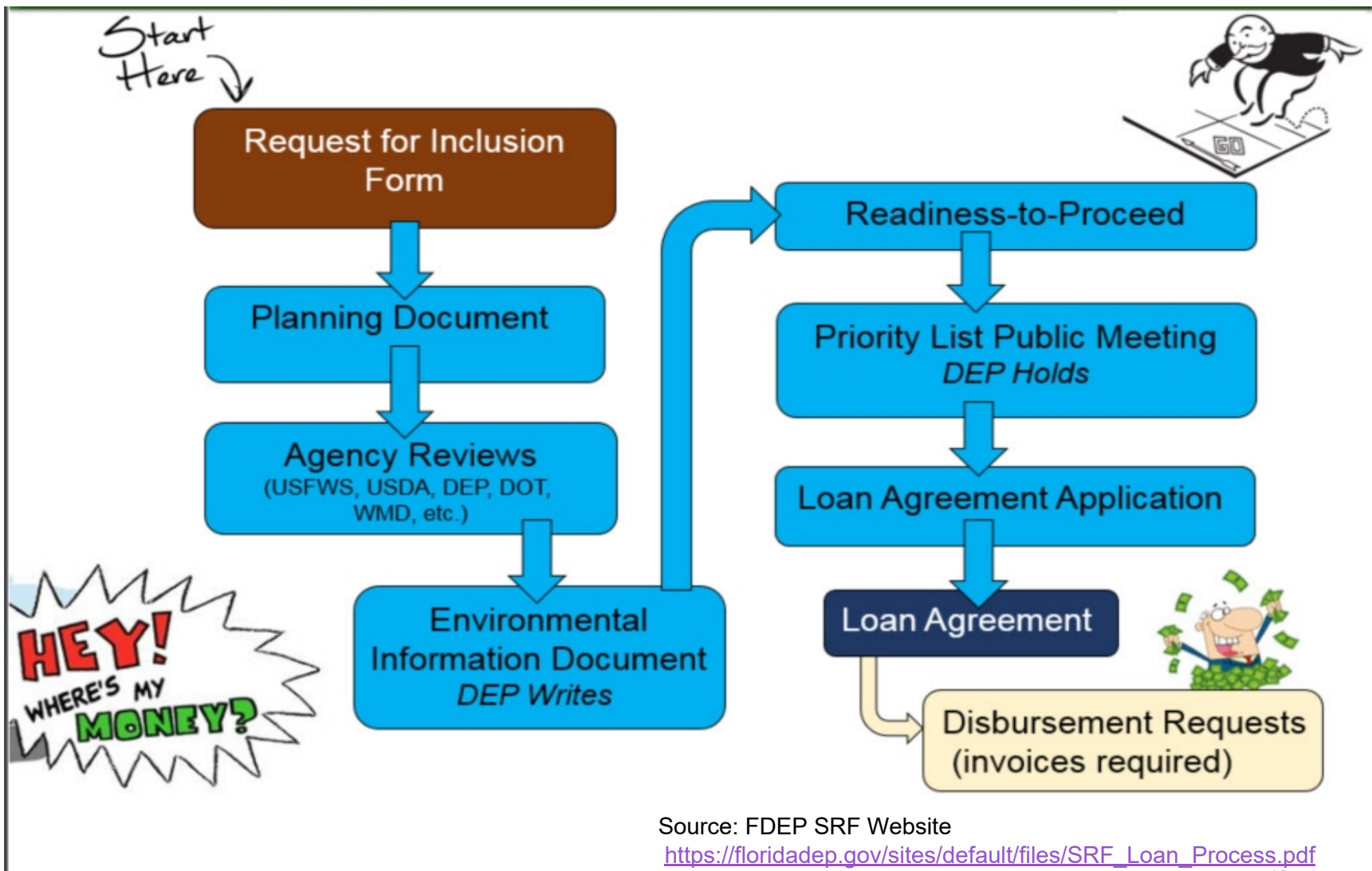
Permitting, 2020 Summer

City Council Approval Documents for Construction SRF Loan

Start Construction of WWTF#2 Expansion, May 2021

Flow Exceeding Current Capacity

SRF Loan Process



Management System Facilities



Plan

- **FDEP SRF Requirements for Loan Application**
- **Improvements Identification**
 - WWTF No.2 Expansion
- **Cost Estimation** - Approximately \$20,000,000.00
 - Design Engineering Services - Current SRF Loan
 - Construction - Future SRF Loan
- **Approval and Authorization by the City Council for the Design Loan**
 - Wastewater Management System Facilities Plan
 - Capital Financing Plan

Capital Finance Plan Agenda



- **Purpose**
- **Recent Rate History**
- **SRF Assumptions**
- **Assumptions and Highlights**
- **Observations and Conclusions**

Purpose



- **Development of Capital Finance Plan**
 - Required by FDEP to Secure SRF Loan
- **Purpose is to Identify the City's Future Ability to Repay SRF Loan Obligation**
 - Provides A Commitment to Meet Loan Agreement Covenants
 - Prepared a Five-Year Financial Forecast and Funding Analysis For Fiscal Years 2020-2024
 - Objective is to Ensure Rates/Revenues Meet Expenditure Requirements

Recent Rate History



- **Last Formal Rate Review was Conducted at the Beginning of FY 2019**
- **The Identified and Adopted Rate Adjustments from the Last Study**

<u>Fiscal Year</u>	<u>Adopted Percent Adjustment [1]</u>	<u>Status</u>
2019	6.00%	Implemented
2020	6.00%	Implemented
2021 - 2023	Index Only	To be Reviewed

[1] Rates Adopted by City Council.

Changes Since 2019 Financial Forecast



■ **Benefits**

- Improved Economic Conditions – Increased Customer Growth
- Favorable Interest Rates – Reduces Cost to Borrow
- Matches Cost Recovery to Future Customers Benefiting From the New Capacity
- Ability to Defer Debt Payment Until Construction Complete

■ **Immediate Risks**

- Construction Costs Increasing (Competition)
- WWTF Capacity Can No Longer Be Deferred

SRF Loan Assumptions



- **SRF Design Loan Recommended to Fund Design Portion of Wastewater Treatment Facility No. 2 Expansion (SRF Construction Loan Estimated For FY 2021)**
 - Additional 2.0 MGD Expansion
- **Design Costs = \$1,401,339.50**
- **Total Estimated Loan Principal = \$1,431,038**
 - Reflects Loan Service Fee (to FDEP) of 2%
 - Capitalized Interest Cost During Construction
 - No Payments Made on Draws Until Completion

SRF Loan Assumptions (cont'd)



- **Semi-annual Payments Assumed to Begin FY2021**
 - Payments Begin After Construction Completed
 - Annualized Estimated Payments = \$72,434/yr
 - Assumes 0.117% Annual Interest Rate
 - Requires that Net Revenues > 1.15x Annual Debt Service
 - After Payments of Senior Lien Bonds

Primary Forecast Assumptions



- **Updated Financial Projections from Last Rate Study**
- **Customer Growth Increase Projected to be Approximately 1.4% Per Year (Approximately 700 Accounts)**
- **Operating Expenses Projected to Increase Approximately 3.5% Per Year**
 - Personnel / Power / Chemicals / Sludge = 70% of Total Operating Expenses
- **Forecast Assumes Continued Annual Capital Reinvestment From Rates**
 - Continued Programmed Deposits to R&R Fund at 10% of Prior Year Gross Revenue (\$4.7 Million Per Year)

Primary Forecast (cont'd)



■ Highlights

- Maintain Strong All-In Debt Coverage = 1.50x
- Maintain 90 Days Working Capital
- Promotes Credit Rating – A+ by Fitch / S&P (Positive Outlook)

Assumed System Rate Adjustments



- **Forecasted Rate Adjustments:**

- No Additional Rate Adjustments Above Annual Indexing are Projected Over the Forecast Period

Fiscal Year	Water and Sewer Revenue Adjustments	
	Annual Price Index [1]	Estimated Additional Rate Adjustment
2020 - 2024	CPI	0.00%

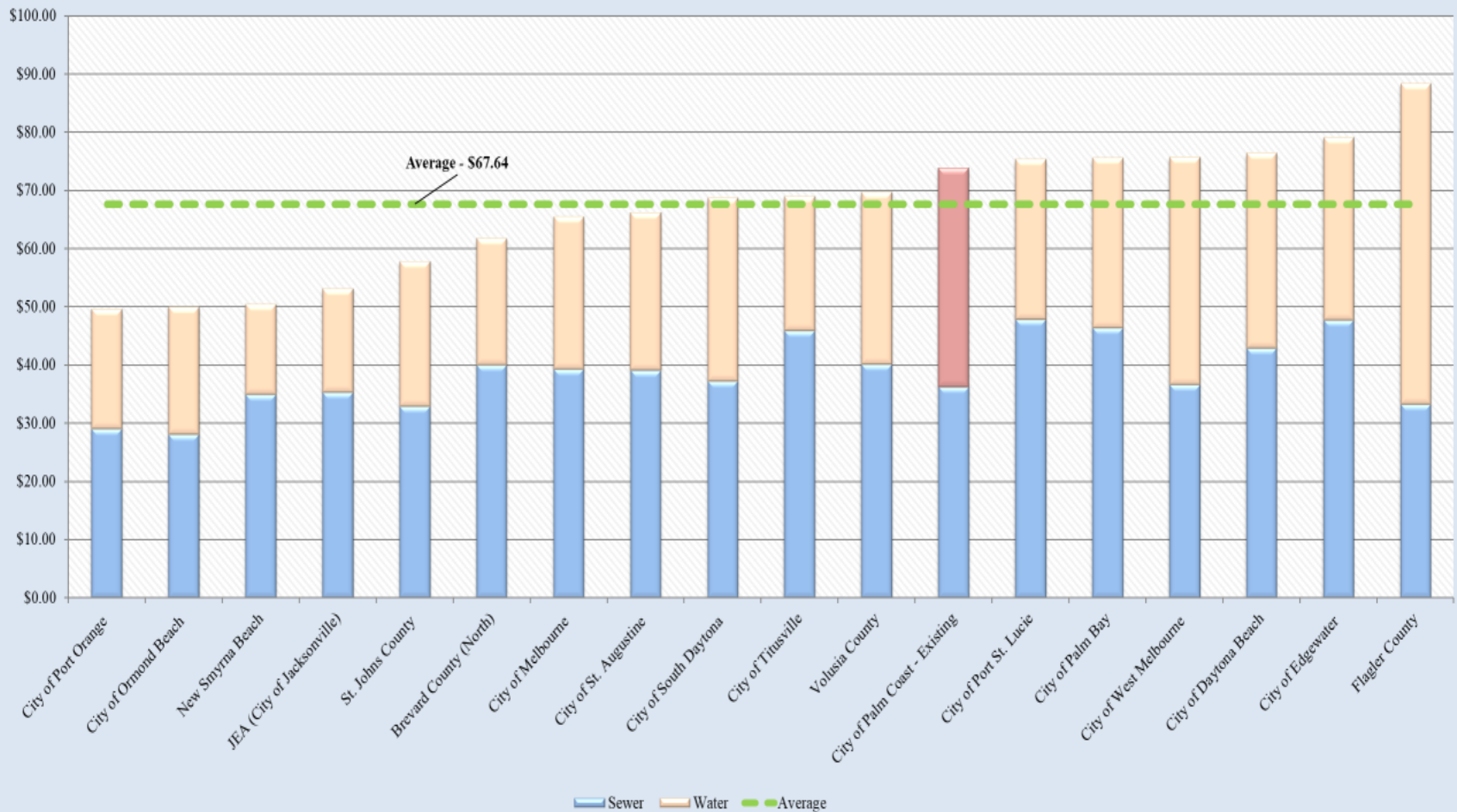
[1] Assumed to be effective October 1st of each Fiscal Year.

Water and Wastewater Typical Residential Monthly Bill Comparison



- **Average Monthly Residential Use = 4,000 gallons**

Comparison of Residential Water and Wastewater Bills at 4,000 Gallons



Conclusions and Observations



- **Issuance of 2021 SRF Design Loan is a Cost Effective Basis to Finance WWTF**
 - Low Issue Cost to Secure Loan
 - Extremely Low Interest Rates 0.117% vs. 3.75% (Revenue Bonds)
 - Ability to Defer Payment Until Project Completion
- **Existing Rates Along with Rate Indexing Adjustments are Projected to be Adequate to Meet the Financial Plan – Not Requesting Adoption of Additional Rate Increases**
- **City has the Financial Capability to Repay the 2021 SRF Design Loan and Maintain Overall Creditworthiness of System**

Discussion and Questions



City of Palm Coast, Florida

Agenda Item

Agenda Date: 01/14/2020

Department Item Key	Utility	Amount \$ Account #																						
Subject RESOLUTION 2020-XX APPROVING THE CAPITAL FINANCING PLAN FOR THE EXPANSION OF WASTEWATER TREATMENT PLANT #2.																								
Background :																								
<p>The City of Palm has been back in a growth mode now for several years. This growth has seen a year over year increase in residential construction every year for over five years. This city controlled growth is good for our community but it does create the need to increase our city wastewater capabilities when our wastewater flows hit certain daily average permitted flows.</p>																								
<p>The City Utility Five Year Capital Improvement Plan currently has plan monies for expansion of the plant in Fiscal Years 2020 through 2023 for the Wastewater Treatment Facility #2. The Utility also has a Wastewater Capacity Analysis Report, which is completed roughly every two years or so depending on flows and growth. This report is the overall planning document for tracking wastewater plant flows, outstanding committed capacity to developers/customers and ultimately providing the data to determine the timing for beginning the process of Wastewater Facility Expansion needs for our community.</p>																								
<p>Our Design consultants, CPH Engineers, have worked with staff to start the process to expand our current Wastewater Treatment Facility No. 2 from its current permitted capacity of 2.0 million gallons a day (MGD) to 4.0 MGD. This process from the beginning of application for State Revolving Funds and Facilities Plan and Capital Financing Plan to the activation of the new facilities is a rather lengthy one. Some of the highlighted steps and estimated time frames would be:</p>																								
<table><tbody><tr><td>City Council Adoption of Facilities Plan and Capital Finance Plan (CFP)</td><td>January 2020</td></tr><tr><td>City approval of Engineering Design Contract</td><td>January 2020</td></tr><tr><td>Design Loan Application and Council Approval</td><td>March 2020</td></tr><tr><td>Request for Inclusion (RFI) – SRF Loan for Construction</td><td>October 2020</td></tr><tr><td>Final Design, Permitting, and Specification Completion</td><td>December 2020</td></tr><tr><td>City Council Approval of and Adoption of the CFP</td><td>December 2020</td></tr><tr><td>FDEP SRF Public meeting for Construction Loan</td><td>February 2021</td></tr><tr><td>Construction Loan Approval</td><td>April 2021</td></tr><tr><td>Bidding and Awarding of the Construction Contract</td><td>May 2021</td></tr><tr><td>Construction Completion</td><td>November 2022</td></tr><tr><td>Facility Testing and Commissioning</td><td>January 2023</td></tr></tbody></table>			City Council Adoption of Facilities Plan and Capital Finance Plan (CFP)	January 2020	City approval of Engineering Design Contract	January 2020	Design Loan Application and Council Approval	March 2020	Request for Inclusion (RFI) – SRF Loan for Construction	October 2020	Final Design, Permitting, and Specification Completion	December 2020	City Council Approval of and Adoption of the CFP	December 2020	FDEP SRF Public meeting for Construction Loan	February 2021	Construction Loan Approval	April 2021	Bidding and Awarding of the Construction Contract	May 2021	Construction Completion	November 2022	Facility Testing and Commissioning	January 2023
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Construction Completion	November 2022																							
Facility Testing and Commissioning	January 2023																							
<p>In today's packet is a request for two resolutions that will be needed to advance this lengthy process of continuing to be good stewards of the environment while growing our community in a controlled method that shows good planning practices. This item is for a proposed resolution to AUTHORIZE THE CITY'S FINANCE DIRECTOR TO CERTIFY AND EXECUTE THE PROPOSED CAPITAL FINANCING PLAN FOR THE WASTEWATER MANAGEMENT SYSTEM FACILITIES PLAN, DATED OCTOBER, 2019.</p>																								
<p>The City began the original construction of WWTP#2 back in early 2016 and completed the activation in the summer of 2018. The initial permitted capacity of the facility was 2.0 MGD. This facility site was laid out, designed and constructed to be expanded in 2.0 MGD segments for an ultimate site capacity of 6.0 MGD of permitted wastewater treatment capability. This would be the first of two probable site expansions.</p>																								
Recommended Action : ADOPT RESOLUTION 2020-XX APPROVING THE CAPITAL FINANCING PLAN FOR THE EXPANSION OF WASTEWATER TREATMENT PLANT #2																								

RESOLUTION 2020 - _____
CAPITAL FINANCING PLAN
WASTEWATER MANAGEMENT SYSTEM
FACILITIES PLAN

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PALM COAST, FLORIDA, AUTHORIZING THE CITY'S FINANCE DIRECTOR TO CERTIFY AND EXECUTE THE PROPOSED CAPITAL FINANCING PLAN FOR THE WASTEWATER MANAGEMENT SYSTEM FACILITIES PLAN; AUTHORIZING THE CITY MANAGER, OR DESIGNEE, TO EXECUTE SAID AGREEMENT; PROVIDING FOR SEVERABILITY; PROVIDING FOR CONFLICTS; PROVIDING FOR IMPLEMENTING ACTIONS AND PROVIDING FOR AN EFFECTIVE DATE

WHEREAS, The City of Palm Coast currently owns and operates the City of Palm Coast Water and Wastewater Utility; and

WHEREAS, The City Council of the City of Palm Coast has consistently recognized the need to diligently protect the natural resources of the City of Palm Coast and the State of Florida, as well as the need to ensure that the environment is carefully and adequately protected; and

WHEREAS, The City of Palm Coast wishes to apply to the State Revolving Fund for funding this project; and

WHEREAS, the City of Palm Coast recognizes the need to proceed with the improvements identified in the Wastewater Management System Facilities Plan; and

WHEREAS, the City Council of the City of Palm Coast has been presented with a Capital Financing Plan and Dedicated Revenue Information and a Public Hearing has been held to present the information for public input; and

WHEREAS, the Florida Department of Environmental Protection requires that a resolution be adopted by the City Council of the City of Palm Coast authorizing the City's Finance Director to certify and execute the proposed Capital Financing Plan for the City of Palm Coast Wastewater Management System Facilities Plan dated October, 2019.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF PALM COAST, FLORIDA AS FOLLOWS:

SECTION 1. APPROVAL OF PLAN. The City Council of the City of Palm Coast hereby authorizes the City's Finance Director to certify and execute the proposed Capital

Financing Plan for the City of Palm Coast Wastewater Management System Facilities Plan, dated October, 2019.

SECTION 2. DELEGATION OF AUTHORITY. The City Manager is hereby delegated authority to take any and all actions otherwise necessary and desirable pertaining to the implementation of the City of Palm Coast Wastewater Management System Facilities Plan and interactions with the Florida Department of Environmental Protection pertaining to obtaining of funding from the State Revolving Fund.

SECTION 3. AUTHORIZATION TO EXECUTE. The City Manager, or designee, is hereby authorized to execute the necessary documents.

SECTION 4. SEVERABILITY. If any section or portion of a section of this Resolution proves to be invalid, unlawful, or unconstitutional, it shall not be held to invalidate or impair the validity, force, or effect of any other section or part of this Resolution.

SECTION 4. CONFLICTS. All resolutions or parts of resolutions in conflict with any of the provisions of this Resolution are hereby repealed.

SECTION 5. IMPLEMENTING ACTIONS. The City Manager is hereby authorized to take any actions necessary to implement the action taken in this Resolution.

SECTION 6. EFFECTIVE DATE. This Resolution shall take effect immediately upon adoption by the City Council.

DULY PASSED AND ADOPTED by the City Council of the City of Palm Coast, Florida, on this 21st day of January 2020.

CITY OF PALM COAST, FLORIDA

MILISSA HOLLAND, MAYOR

ATTEST:

VIRGINIA SMITH, CITY CLERK

Approved as to form and legality

William E. Reischmann, Jr., Esq. City Attorney

Resolution 2020-____
Page 2 of 2

CAPITAL FINANCING PLAN

CITY OF PALM COAST

(Project Sponsor)

MATTHEW MORTON, CITY MANAGER

(Authorized Representative and Title)

CITY OF PALM COAST, FL 32164

(City, State, and Zip Code)

HELENA P. ALVES, FINANCE DIRECTOR, 386-986-2360

(Capital Financing Plan Contact, Title and Telephone Number)

160 LAKE AVENUE

(Mailing Address)

PALM COAST, FL, 32164

(City, State, and Zip Code)

The Department needs to know about the financial capabilities of potential State Revolving Fund (SRF) loan applicants. Therefore, a financial capability demonstration (and certification is required well before the evaluation of the actual loan application.

The sources of revenues being dedicated to repayment of the SRF loan are **WATER AND WASTEWATER UTILITIES REVENUES**

(Note: Projects pledging utility operating revenues should attach a copy of the existing/proposed rate ordinance)

Estimate of Proposed SRF Loan Debt Service

Capital Cost*	\$	1,300,000.00
Loan Service Fee (2% of capital cost)	\$	26,000.00
Subtotal	\$	1,326,000.00
Capitalized Interest**	\$	21,666
Total Cost to be Amortized	\$	1,347,666
Interest Rate***		1.67%
Annual Debt Service	\$	79,514
Annual Debt Service Including Coverage Factor****	\$	91,441

* Capital Cost = Allowances + Construction Cost (including a 10% contingency) + Technical Services after Bid Opening.

** Estimated Capitalized Interest = Subtotal times Interest Rate times construction time in years divided by two.

***20 GO Bond Rate times Affordability Index divided by 200.

*** Coverage Factor is generally 15%. However, it may be higher if other than utility operating revenues are pledged.

SCHEDULE OF EXISTING PRIOR AND PARITY LIENS

List annual debt service beginning two years before the anticipated loan agreement date and continuing at least fifteen fiscal years. Use additional pages as necessary.

IDENTIFY EACH OBLIGATION

#1 City of Palm Coast Utility System Revenue Refunding Bonds, Series 2013 Coverage % 110% Insured (Yes/No) Yes	#2 City of Palm Coast Utility System Revenue Refunding Bonds, Series 2017 Coverage % 110% Insured (Yes/No) Yes	#3 City of Palm Coast Utility System Revenue Refunding Note, Series 2017 Coverage % 110% Insured (Yes/No) Yes
#4 SRF WWTP #2 WW180420 Coverage % 115% Insured (Yes/No) Yes	#5 Coverage % Insured (Yes/No)	#6 Coverage % Insured (Yes/No)

Fiscal Year	Annual Debt Service (Principal + Interest) (1)						Total Non-SRF Debt Service w/coverage	Total SRF Debt Service w/ coverage
	#1	#2	#3	#4	#5	#6		
2017	\$ 6,796,750	\$ 2,519,806	\$ 1,461,994	\$ -			\$ 11,856,405	\$ -
2018	\$ 6,796,250	\$ 2,518,514	\$ 1,876,544	\$ 759,472			\$ 12,310,439	\$ 873,393
2019	\$ 6,798,250	\$ 2,518,306	\$ 1,874,321	\$ 1,657,235			\$ 12,309,965	\$ 1,905,820
2020	\$ 6,797,250	\$ 2,521,130	\$ 1,875,587	\$ 1,650,386			\$ 12,313,364	\$ 1,897,944
2021	\$ 6,798,000	\$ 2,521,887	\$ 1,876,382	\$ 1,650,387			\$ 12,315,896	\$ 1,897,945
2022	\$ 6,805,000	\$ 2,519,603	\$ 1,875,354	\$ 1,650,386			\$ 12,319,953	\$ 1,897,944
2023	\$ 6,802,500	\$ 2,518,327	\$ 1,874,201	\$ 1,650,387			\$ 12,314,531	\$ 1,897,945
2024	\$ 6,800,500	\$ 2,519,010	\$ 1,874,432	\$ 1,650,386			\$ 12,313,336	\$ 1,897,944
2025	\$ 6,798,500	\$ 2,519,576	\$ 1,874,238	\$ 1,650,386			\$ 12,311,545	\$ 1,897,944
2026	\$ 6,801,000	\$ 2,520,002	\$ 1,490,357	\$ 1,650,386			\$ 11,892,495	\$ 1,897,944
2027	\$ 6,797,250	\$ 2,517,262	\$ 857,935	\$ 1,650,386			\$ 11,189,692	\$ 1,897,944
2028	\$ 6,802,000	\$ 2,521,406	\$ 606,503	\$ 1,650,387			\$ 10,922,900	\$ 1,897,945
2029	\$ 6,799,250	\$ 2,521,235	\$ -	\$ 1,650,386			\$ 10,252,534	\$ 1,897,944
2030	\$ 6,797,850	\$ 2,516,825	\$ -	\$ 1,650,387			\$ 10,246,143	\$ 1,897,945
2031	\$ 6,800,819	\$ 2,518,255	\$ -	\$ 1,650,386			\$ 10,250,981	\$ 1,897,944
2032	\$ 6,799,094	\$ 2,519,334	\$ -	\$ 1,650,386			\$ 10,250,271	\$ 1,897,944
2033	\$ 6,802,894	\$ 2,521,048	\$ -	\$ 1,650,387			\$ 10,256,336	\$ 1,897,945
2034	\$ 1,432,594	\$ 2,517,362	\$ -	\$ 1,650,387			\$ 4,344,951	\$ 1,897,945
2035	\$ 1,432,469	\$ 2,517,354	\$ -	\$ 1,650,386			\$ 4,344,805	\$ 1,897,944
2036	\$ 1,429,938	\$ 2,516,909	\$ -	\$ 1,650,386			\$ 4,341,531	\$ 1,897,944
2037	\$ -	\$ -	\$ -	\$ 1,650,386			\$ -	\$ 1,897,944
2038	\$ -	\$ -	\$ -	\$ 893,959			\$ -	\$ 1,028,053
2039	\$ -	\$ -	\$ -				\$ -	\$ -
2040	\$ -	\$ -	\$ -				\$ -	\$ -
2041	\$ -	\$ -	\$ -				\$ -	\$ -
2042	\$ -	\$ -	\$ -				\$ -	\$ -
2043	\$ -	\$ -	\$ -				\$ -	\$ -
2044	\$ -	\$ -	\$ -				\$ -	\$ -

Notes:

(1) Reflects debt service schedules for the City's existing outstanding bonds and SRF Loans. The future proposed debt service is shown on page 2 of 2.

SCHEDULE OF PROPOSED FUTURE PARITY LIENS

List annual debt service beginning two years before the anticipated loan agreement date and continuing at least fifteen fiscal years. Use additional pages as necessary.

IDENTIFY EACH OBLIGATION

#1 City of Palm Coast Proposed Future System Revenue Bonds, Series 2020 Coverage % 110% Insured (Yes/No) Yes	#2 City of Palm Coast Proposed Future System Revenue Bonds, Series 2022 Coverage % 110% Insured (Yes/No) Yes	#3 City of Palm Coast Proposed SRF - WWTP #2 Expansion Design Fiscal Year 2020 Coverage % 115% Insured (Yes/No) Yes
#4 City of Palm Coast Proposed SRF - WWTP #2 Expansion Construction Fiscal Year 2021 Coverage % 115% Insured (Yes/No) Yes	#5 Coverage % Insured (Yes/No)	#6 Coverage % Insured (Yes/No)

Fiscal Year	Annual Debt Service (Principal + Interest) (1)						Total Non-SRF Debt Service w/coverage	Total SRF Debt Service w/ coverage
	#1	#2	#3	#4	#5	#6		
2017	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2018	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2019	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2020	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2021	\$ 344,138	\$ -	\$ 79,514	\$ -	\$ -	\$ -	\$ 378,552	\$ 91,441
2022	\$ 938,984	\$ -	\$ 79,514	\$ -	\$ -	\$ -	\$ 1,032,882	\$ 91,441
2023	\$ 938,984	\$ 755,116	\$ 79,514	\$ -	\$ -	\$ -	\$ 1,863,510	\$ 91,441
2024	\$ 938,984	\$ 755,116	\$ 79,514	\$ 1,286,594	\$ -	\$ -	\$ 1,863,510	\$ 1,571,024
2025	\$ 938,983	\$ 755,116	\$ 79,514	\$ 1,286,594	\$ -	\$ -	\$ 1,863,509	\$ 1,571,024
2026	\$ 938,984	\$ 755,116	\$ 79,514	\$ 1,286,594	\$ -	\$ -	\$ 1,863,510	\$ 1,571,024
2027	\$ 938,984	\$ 755,116	\$ 79,514	\$ 1,286,594	\$ -	\$ -	\$ 1,863,510	\$ 1,571,024
2028	\$ 938,984	\$ 755,116	\$ 79,514	\$ 1,286,594	\$ -	\$ -	\$ 1,863,510	\$ 1,571,024
2029	\$ 938,984	\$ 755,116	\$ 79,514	\$ 1,286,594	\$ -	\$ -	\$ 1,863,510	\$ 1,571,024
2030	\$ 938,984	\$ 755,115	\$ 79,514	\$ 1,286,594	\$ -	\$ -	\$ 1,863,509	\$ 1,571,024
2031	\$ 938,984	\$ 755,116	\$ 79,514	\$ 1,286,594	\$ -	\$ -	\$ 1,863,510	\$ 1,571,024
2032	\$ 938,984	\$ 755,116	\$ 79,514	\$ 1,286,594	\$ -	\$ -	\$ 1,863,510	\$ 1,571,024
2033	\$ 938,983	\$ 755,116	\$ 79,514	\$ 1,286,594	\$ -	\$ -	\$ 1,863,509	\$ 1,571,024
2034	\$ 938,984	\$ 755,116	\$ 79,514	\$ 1,286,594	\$ -	\$ -	\$ 1,863,510	\$ 1,571,024
2035	\$ 938,984	\$ 755,116	\$ 79,514	\$ 1,286,594	\$ -	\$ -	\$ 1,863,510	\$ 1,571,024
2036	\$ 938,984	\$ 755,116	\$ 79,514	\$ 1,286,594	\$ -	\$ -	\$ 1,863,510	\$ 1,571,024
2037	\$ 938,984	\$ 755,116	\$ 79,514	\$ 1,286,594	\$ -	\$ -	\$ 1,863,510	\$ 1,571,024
2038	\$ 938,984	\$ 755,116	\$ 79,514	\$ 1,286,594	\$ -	\$ -	\$ 1,863,510	\$ 1,571,024
2039	\$ 938,984	\$ 755,116	\$ 79,514	\$ 1,286,594	\$ -	\$ -	\$ 1,863,510	\$ 1,571,024
2040	\$ 938,984	\$ 755,116	\$ 79,514	\$ 1,286,594	\$ -	\$ -	\$ 1,863,510	\$ 1,571,024
2041	\$ 938,984	\$ 755,116	\$ -	\$ 1,286,594	\$ -	\$ -	\$ 1,863,510	\$ 1,479,583
2042	\$ 938,984	\$ 755,116	\$ -	\$ 1,286,594	\$ -	\$ -	\$ 1,863,510	\$ 1,479,583
2043	\$ 938,983	\$ 755,116	\$ -	\$ 1,286,594	\$ -	\$ -	\$ 1,863,509	\$ 1,479,583
2044	\$ 938,983	\$ 755,116	\$ -	\$ -	\$ -	\$ -	\$ 1,863,509	\$ -

Notes:

- (1) Reflects estimated debt service for the City's future proposed debt service. Amounts shown reflect estimates and are subject to change based on completion of actual project cost and timing of completion.
- (1) Reflects estimated future debt estimated to partially fund the City's six-year capital improvement program.

Future Debt	Annual Payment	Annual Payment With Coverage	Payment Start Date
#1 - Series 2021 Revenue Bonds	\$ 15,295,000	\$ 938,984	4/1/2021
#2 - Series 2023 Revenue Bonds	12,300,000	755,116	10/1/2022
#3 - SFR - WWTP #2 Design	1,347,666	79,514	10/1/2020
#4 - SFR - WWTP #2 Construction	21,122,449	1,286,594	10/1/2023
Total Future Debt	\$ 50,065,115	\$ 3,060,207	\$ 3,434,533

**SCHEDULE OF ACTUAL REVENUES AND DEBT COVERAGE
FOR PLEDGED REVENUE**

(Provide information for the two fiscal years preceding the anticipated date of the SRF loan agreement) [1]

	<u>FY 2017</u>	<u>FY 2018</u>
(a) Operating Revenues (Identify)		
Water and Wastewater Sales	\$ 36,937,453	\$ 37,229,302
(b) Interest Income	<u>\$ 381,431</u>	<u>\$ 542,669</u>
(c) Other Incomes or Revenue (Identify)		
Other / Miscellaneous	\$ 1,147,717	\$ 1,152,552
Connection Fees [2]	\$ 800,508	\$ 1,015,527
Transfers to Rate Stabilization Fund	<u>\$ -</u>	<u>\$ -</u>
(d) Total Revenues	<u>\$ 39,267,109</u>	<u>\$ 39,940,050</u>
(e) Operating Expenses (excluding interest on debt, depreciation, and other non-cash items)	<u>\$ 18,384,360</u>	<u>\$ 22,097,569</u>
(f) Net Revenues (f = d - e)	<u>\$ 20,882,749</u>	<u>\$ 17,842,481</u>
(g) Debt Service (including coverage) Excluding SRF Loans	<u>\$ 11,856,405</u>	<u>\$ 12,310,439</u>
(h) Debt Service (including coverage) for Outstanding SRF Loans	<u>\$ -</u>	<u>\$ 873,393</u>
(I) Net Revenues After Debt Service (I = f - g - h)	<u>\$ 9,026,344</u>	<u>\$ 4,658,649</u>

Source: [1] Unless otherwise noted, amounts shown are derived from the City's historical financial statements.

[2] Amounts represent charges for meter installation fees on other connection fees but do not include impact fees. For Fiscal Years 2017 and 2018 the City collected on average \$3.6 million in annual impact fees not included above.

**SCHEDULE OF PROJECTED REVENUES AND DEBT COVERAGE
FOR PLEDGED REVENUE**

(Begin with fiscal year preceding first anticipated semiannual loan payment)

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
(a) Operating Revenues (Identify)					
Water and Wastewater Sales (1)	\$ 43,272,394	\$ 45,040,220	\$ 46,862,016	\$ 48,775,926	\$ 50,622,404
(b) Interest Income	266,836	183,173	187,520	197,472	135,560
(c) Other Incomes or Revenue (Identify)					
Other / Miscellaneous	1,333,199	1,333,199	1,333,199	1,333,199	1,333,199
Connection Fees	815,714	805,939	777,698	777,698	774,440
(d) Total Revenues	\$ 45,688,144	\$ 47,362,530	\$ 49,160,433	\$ 51,084,295	\$ 52,865,602
(e) Operating Expenses (2)	\$ 26,117,743	\$ 27,149,184	\$ 28,096,148	\$ 29,229,127	\$ 30,092,841
(f) Net Revenues (f = d - e)	\$ 19,570,401	\$ 20,213,347	\$ 21,064,285	\$ 21,855,168	\$ 22,772,762
(g) Existing Debt Service on Non-SRF Projects (including coverage)	\$ 12,313,364	\$ 12,315,896	\$ 12,319,953	\$ 12,314,531	\$ 12,313,336
(h) Existing SRF Loan Debt Service (including coverage) (3)	\$ 1,897,944	\$ 1,897,945	\$ 1,897,944	\$ 1,897,945	\$ 1,897,944
(i) Total Existing Debt Service (i = g + h)	\$ 14,211,308	\$ 14,213,841	\$ 14,217,897	\$ 14,212,476	\$ 14,211,280
(j) Projected Debt Service on Non-SRF Future Projects (including coverage) (4)	\$ -	\$ 378,552	\$ 1,032,882	\$ 1,863,510	\$ 1,863,510
(k) Projected SRF Loan Debt Service (including coverage) (5)	\$ -	\$ 91,441	\$ 91,441	\$ 91,441	\$ 1,571,024
(l) Total Debt Service (Existing and Projected) (l = i + j + k)	\$ 14,211,308	\$ 14,683,834	\$ 15,342,220	\$ 16,167,427	\$ 17,645,814
(m) Net Revenues After Debt Service (m = f - l)	\$ 5,359,093	\$ 5,529,513	\$ 5,722,065	\$ 5,687,741	\$ 5,126,948

Source: Revised financial operating prepared for the Capital Finance Plan associated with the issuance of the State Revolving Fund ("SRF") loan agreement. Projections prepared by Raftelis Financial Consultants, Inc..

Notes: (i.e. rate increases, explanations, etc.)

- The City's monthly water and wastewater sales revenues were assumed to be adjusted by the following factors for Fiscal Years 2020 through 2024. The increases are projected to be effective October 1, of each respective year in order to offset the future debt service requirements associated with the City's anticipated future SRF Loan and other inflationary factors.

Water and Sewer Revenue Adjustments

Fiscal Year	Annual Price	Additional Rate	Combined
	Index Adjustment	Adjustment	Rate Adjustment
2020 (a)	2.40%	3.60%	6.00%
2021	2.50%	0.00%	2.50%
2022	2.50%	0.00%	2.50%
2023	2.50%	0.00%	2.50%
2024	2.50%	0.00%	2.50%

(a) Previously adopted by City Council with rates effective 10/1/2019.

- Reflects estimated operating expenses for existing and proposed facilities, excluding interest on debt, depreciation, and other non-cash items.
- Reflects existing debt service including coverage associated with the City's existing SRF Loan No. WW180420.
- Represents debt service associated with anticipated future tax-exempt utility system revenue bonds (the "Future Additional Bonds") used to fund a portion of the City's Capital Improvement Program. Specifically, the forecast recognizes debt service associated with the issuance of the following Future Additional Bonds:

	Principal Amount	Annual Payment	Annual Payment	Payment Start
			With Coverage	Date
#1 - Series 2021 Revenue Bonds	\$ 15,295,000	\$ 938,984	\$ 1,032,882	4/1/2021
#2 - Series 2023 Revenue Bonds	\$ 12,300,000	\$ 755,116	\$ 830,628	10/1/2022

- Amounts shown reflect future SRF debt service associated with the expansion of the City's wastewater treatment plant #2.

	Principal Amount	Annual Payment	Annual Payment	Payment Start
			With Coverage	Date
#3 - SFR - WWTP #2 Design	\$ 1,347,666	\$ 79,514	\$ 91,441	10/1/2020
#4 - SFR - WWTP #2 Construction	\$ 21,122,449	\$ 1,286,594	\$ 1,479,583	10/1/2023

CERTIFICATION

I, _____, certify that I have reviewed the information
Chief Financial Officer (please print)

included in the preceding capital financing plan worksheets, and to the best of my knowledge, this

information accurately reflects the financial capability of the City of Palm Coast,
Project Sponsor

I further certify that the City of Palm Coast has the financial capability to ensure
Project Sponsor

adequate construction, operation, and maintenance of the system, including this SRF project.

Signature

Date

City of Palm Coast, Florida

Agenda Item

Agenda Date: 01/14/2020

Department	Stormwater & Engineering	Amount	\$1,401,339.50
Item Key		Account	54029083-063000-82007
Subject	RESOLUTION 2020-XX APPROVING A WORK ORDER WITH CPH, INC., FOR ENGINEERING DESIGN SERVICES FOR THE EXPANSION OF WASTEWATER TREATMENT PLANT #2		
Background :			
<p>Wastewater Treatment Plant #2 is rated to treat a maximum of 2 Million Gallons per Day (MGD) to advanced wastewater treatment standards and is expandable to 6.0 MGD in 2 MGD increments. Based on the latest Wastewater Capacity Analysis Report prepared by utility staff and on the Florida Department of Environmental Protection (FDEP) regulations, the City needed to begin the process to design additional wastewater treatment capacity to meet future demands. For this reason, the City tasked CPH, Inc. to begin preliminary design and planning activities for the WWTP #2 expansion.</p> <p>The City issued RFSQ-CD-20-10 for the final design of the WWTP 2 Expansion on October 23, 2019. CPH, Inc., submitted their qualifications. CPH, Inc., had previously worked on the Clean Water State Revolving Fund (CWSRF) loan to assist in financing the design of the WWTP 2 Expansion.</p> <p>City staff recommends retaining CPH, Inc., to perform the preliminary design, permitting, final design and SRF loan application as required to secure a State Revolving Fund loan to fund the construction WWTP 2 Expansion. Work will be performed on an hourly rate basis under the existing continuing services contract for a fee not-to-exceed \$1,401,339.50. Funds for the engineering design services are budgeted in the Utility 5-Year Capital Plan.</p>			
SOURCE OF FUNDS WORKSHEET FY 2020			
	Waste Water Treatment Plant #2 54029083-063000-82007	\$	700,000.00
	Total Expended/Encumbered to Date.....	\$	000,000.00
	Pending Work Orders/Contracts.....	\$	000,000.00
	Current (WO/Contract).....	\$	400,000.00
	Balance	\$	300,000.00
SOURCE OF FUNDS WORKSHEET FY 2021			
	Waste Water Treatment Plant #2 54029083-063000-82007	\$	2,350,000.00
	Total Expended/Encumbered to Date.....	\$	000,000.00
	Pending Work Orders/Contracts.....	\$	000,000.00
	Current (WO/Contract).....	\$	1,101,339.50
	Balance	\$	1,248,660.50
Recommended Action :			
ADOPT RESOLUTION 2020-XX APPROVING A WORK ORDER WITH CPH, INC., IN THE AMOUNT NOT-TO-EXCEED \$1,401,339.50, FOR ENGINEERING DESIGN SERVICES FOR THE EXPANSION OF WASTEWATER TREATMENT PLANT #2			

RESOLUTION 2020-____
WASTEWATER TREATMENT PLANT NO. 2 EXPANSION

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PALM COAST, FLORIDA, APPROVING A WORK ORDER WITH CPH INC., FOR THE PRELIMINARY DESIGN, PERMITTING, FINAL DESIGN AND SRF LOAN APPLICATIONS SERVICES FOR THE WASTEWATER TREATMENT PLANT NO. 2 EXPANSION, IN AMOUNT NOT TO EXCEED \$1,401,339.50; AUTHORIZING THE CITY MANAGER, OR DESIGNEE, TO EXECUTE SAID CONTRACT; PROVIDING FOR SEVERABILITY; PROVIDING FOR CONFLICTS; PROVIDING FOR IMPLEMENTING ACTIONS AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, CPH, Inc., has expressed a desire to perform engineering design services for the Expansion of Wastewater Treatment Plant No. 2; and

WHEREAS, the City Council of the City of Palm Coast desires for CPH, Inc., to provide for the engineering design services for the Wastewater Treatment Plant No. 2 Expansion,

NOW, THEREFORE, IT IS HEREBY RESOLVED BY THE CITY OF PALM COAST, FLORIDA:

SECTION 1. APPROVAL OF WORK ORDER. The City Council of the City of Palm Coast hereby approves the terms and conditions of the work order with CPH, Inc., for the engineering design services for the Wastewater Treatment Plant No. 2 Expansion,

SECTION 2. AUTHORIZATION TO EXECUTE. The City Manager, or designee, is hereby authorized to execute any necessary documents.

SECTION 3. SEVERABILITY. It is hereby declared to be the intention of the City Council that the sections, paragraphs, sentences, clauses and phrases of this Resolution are severable, and if any phrase, clause, sentence, paragraph or section of this Resolution shall be declared unconstitutional by the valid judgment or decree of a court of competent jurisdiction, such unconstitutionality shall not affect any of the remaining phrases, clauses, sentences, paragraphs and sections of this Resolution.

SECTION 4. CONFLICTS. All resolutions or parts of resolutions in conflict with this Resolution are hereby repealed.

SECTION 5. IMPLEMENTING ACTIONS. The City Manager is hereby authorized to take any actions necessary to implement the action taken in this Resolution.

SECTION 6. EFFECTIVE DATE. This Resolution shall become effective immediately upon its passage and adoption.

DULY PASSED AND ADOPTED by the City Council of the City of Palm Coast, Florida, on this 21st day of January 2020.

CITY OF PALM COAST, FLORIDA

ATTEST:

MILISSA HOLLAND, MAYOR

VIRGINIA A. SMITH, CITY CLERK

Approved as to form and legality

William E. Reischmann, Jr., Esq.
City Attorney



SCOPE OF SERVICES

City of Palm Coast Wastewater Treatment Facility No.2 Expansion

Preliminary Design, Permitting, Final Design and SRF Loan Applications

December 16, 2019

BACKGROUND

The City of Palm Coast (CITY)'s Wastewater Treatment Facility (WWTF) No.2 was constructed and put into operation in June 2018. The treatment process of the WWTF No. 2 consists of screening and grit removal systems with odor control, in-line equalization tanks, anaerobic tanks, pre-anoxic tanks, oxic (nitrification) tanks, post-anoxic tanks, flat sheet membrane bioreactors (MBRs), chlorine contact tanks, various process pumping systems, chemical feed systems, reclaimed water storage and pumping facilities, and bio-solids management facilities, etc. The WWTF No.2 is rated at 2.0 million gallons per day (MGD), expandable to 6.0 MGD. The WWTF No. 2 treats the wastewater to the Advanced Wastewater Treatment (AWT) standards and the highly treated reclaimed water is used for irrigation of residential areas, golf courses and other public accessible areas. During wet weather or low irrigation demand periods, the excess reclaimed water is discharged to the nearby wetland permitted under the APRICOT Rule.

The City's latest Wastewater Treatment Facility Capacity Analysis Report dated September 2018 projects that the WWTF No.2 shall be expanded to 4.0 MGD by 2023 to meet the future growth and flow increase. The CITY shall start planning on expanding the WWTF No.2 to 4.0 MGD to meet the future treatment demands.

SCOPE OF SERVICES

CPH, Inc. (SUPPLIER) prepared this scope of services for the WWTF No.2 expansion, including membrane equipment manufacturer selection, preliminary and final design of the WWTF No.2 expansion, permitting, and State Revolving Fund (SRF) loan application for construction.

Task 1: MBR Equipment Manufacturer (MBREM) Selection

The flat sheet membranes in the MBR tank of the existing WWTF No.2 were furnished by Ovivo, Inc. which was selected through a MBREM selection process. Ovivo supplied all the equipment and the associated control systems in the anaerobic tanks, pre-anoxic tanks, oxic tanks, post anoxic tanks and the MBR tanks of the existing WWTF No.2. The City desires to select the



MBREM for the WWTF No.2 expansion through the MBREM selection process again. The SUPPLIER shall assist the CITY in this process by the following tasks:

1.1 Meet with the Potential MBREMs and the CITY

Upon the request of a potential MBREM, the SUPPLIER will coordinate with the CITY to meet with them, to learn about their membranes and discuss the specifications of the scope and equipment requirements.

1.2 Prepare the Technical and Cost Request For Proposal (RFP)

The SUPPLIER shall prepare the RFP package for the technical and cost proposals. The RFP shall include the introduction, design basis, scope of supply, equipment design criteria, selection process, evaluation criteria, and instructions for the RFP submittal.

1.3 Review the RFP with the CITY

The SUPPLIER shall send the draft RFP to the CITY's review and incorporate the CITY's comments before the CITY advertises it.

1.4 Answer Questions and Prepare Addendums

The SUPPLIER shall answer questions during the RFP solicitation process and prepare addendums for the CITY to post on the website.

1.5 Evaluate the Bids with the CITY

The SUPPLIER shall evaluate the bids and provide evaluation result to the CITY. The SUPPLIER shall meet with the CITY to discuss the bids and evaluation results.

1.6 Make Recommendations to the CITY

The SUPPLIER shall make recommendations to the CITY on the MBREM selection.

Task 2: WWTF No.2 Expansion Preliminary Design

2.1 Geotechnical Report Updates

The original Geotechnical Report, dated January 29, 2009, was prepared by Universal Engineering Sciences (UES), the sub-consultant to the SUPPLIER. During the construction of the first phase of the WWTF No.2, unsuitable materials were identified in many of the areas, which indicate that the site may have been changed over the past ten years. It is desirable to conduct additional borings to update the existing Geotechnical Report. The details of the additional borings to be provided by UES are presented in **Appendix A**.

2.2 Preliminary Design of the On-Site Lift Station



The SUPPLIER shall coordinate with the CITY to develop the design criteria of the proposed on-site pump station, taking into account the current flow and projected future flows. The SUPPLIER shall preliminarily size and select the pumps based on the developed criteria. The CITY staff's input shall be obtained on the pump selection and sizing. A preliminary site layout of the pump station shall be developed.

2.3 Preliminary Wastewater Treatment Process Design Calculations

The SUPPLIER shall collect the latest wastewater characteristic and the existing treatment information and develop the design calculations for the expansion with the following treatment processes:

- a. Headworks – to add one grit removal chamber and one screen
- b. Odor control system
- c. EQ tanks with mixers and coarse bubble diffusers
- d. Biological treatment process from fermentation tanks to MBR tanks and associated aeration, mixing, and recycling equipment
- e. Chlorine contact chambers
- f. Sludge holding tanks and associated mixers and coarse bubble diffusers
- g. Chemical feed systems

2.4 Preliminary Hydraulic Analysis

The SUPPLIER shall perform preliminary hydraulic calculations for the entire treatment plant from the on-site pump station to the plant effluent including internal process pumping and piping. The existing hydraulic profiles will be updated.

2.5 Preliminary Process Equipment and Building Layout

The SUPPLIER shall prepare a preliminary layout for all process equipment, buildings and structures for the expansion including the on-site influent pump station, grit removal equipment, screen equipment, odor control equipment, EQ tanks, biological treatment process, sludge holding tanks, disinfection system, chemical feed system, process recycle pumping system, and process mixing and aeration system, etc.

2.6 Preliminary Yard Piping Plan

The SUPPLIER shall prepare a preliminary yard piping plan for the proposed WWTF No.2 expansion to show major wastewater piping, process piping, reclaimed water piping, and process sludge piping, etc. Major process and flow control structures and valves will be shown. The SUPPLIER shall obtain inputs from the CITY staff in developing the preliminary yard piping plan.

2.7 Preliminary Structural Design

The SUPPLIER shall perform the preliminary structural design for the proposed WWTF No.2 expansion to show major treatment process tanks and equipment slabs.

2.8 Preliminary Electrical, Instrumentation and Control System Design

Preliminary design on the electrical, instrumentation and control system will be provided by the SUPPLIER's sub-consultant, Bailey Consultant Engineering, Inc. The SUPPLIER shall coordinate with Bailey Engineering and the CITY staff in performing the preliminary design of the electrical, power, instrumentation and control system for the WWTF No.2 expansion. The detailed services to be provided by Bailey Engineering are presented in **Appendix B**.

2.9 Opinion of Probable Construction Cost

The SUPPLIER shall prepare a preliminary estimation of probable construction cost for the proposed expansion. This information will be provided to the CITY for review and budgeting purposes.

2.10 Preliminary Design Report (PDR) and other Deliverables

The SUPPLIER shall prepare the following deliverables for the preliminary design phase:

- Preliminary Design Report (PDR) that is prepared in compliance with the requirements of Chapter 62-600 and Chapter 62-620, F.A.C. Two (2) hard copies of the PDR and an electronic version in PDF will be delivered to the CITY for review.
- Preliminary Design Plan Set (30% design) that will include the preliminary Civil, Mechanical, Structural, Electrical and Instrumentation Design. One (1) set of 24" x 34" and two (2) sets of 11" x 17" hard copies of the plan and an electronic version in PDF will be delivered to the CITY for review.
- The SUPPLIER shall meet with the CITY and address the CITY's comments on the preliminary design and PDR to complete the preliminary design phase.

Task 3: Permit Application

It is expected that only the FDEP Domestic Wastewater Facility Permit application is needed. The SUPPLIER shall prepare the permit modification application of the existing permit (No. FL0710008-006) for:

- Expansion of the facility from 2.0 MGD to 4.0 MGD, and
- Increase the surface water discharge – APRICOT from 0.6 MGD to 1.2 MGD

The Preliminary Design Report (PDR) will be submitted to the FDEP in support of a Wastewater Facility Permit modification application for construction and operation of WWTF No. 2 with a capacity of 4.0 MGD.

It is anticipated that an Anti-Degradation Report will be required for the application of increasing the surface water discharge from 0.6 MGD to 1.2 MGD. The SUPPLIER shall prepare the report and any other supporting documents for this modification. Details of this task to be provided by the SUPPLIER's environmental scientist are attached in **Appendix C**.

The SUPPLIER shall prepare the permit modification package that will include the following:

1. Cover Letter
2. Permit Application Forms 62-620.910 (1) and 62-620.910 (18)
3. All supporting document for the permit application including maps, Preliminary Design Report, Anti-Degradation Report, and any other information FDEP requests.

The SUPPLIER shall provide all the efforts related to the wastewater facility permit modification including meetings with FDEP and responding to FDEP request for additional information.

The permit application will be submitted based on the PDR and 30% design plans to expedite the project. This will allow final design to proceed during the FDEP permitting process since SRF construction loan cannot be obtained until FDEP permit is obtained plus final plans and specifications.

The CITY shall provide all the influent and effluent water quality data. This proposal doesn't include water sampling and testing, if required. The permit application fee is not included in this proposal and shall be paid by the CITY.

Task 4: WWTF No.2 Expansion Final Design

4.1 Design of the On-Site Influent Pump Station

The SUPPLIER shall finalize the pump sizing and selection and perform detailed designs of the on-site pump station.

4.2 Design of Non-Biological Treatment Process

The SUPPLIER shall perform the detailed design for the following non-biological wastewater treatment process and the supporting facilities:

- a. Headworks – grit removal and screen equipment
- b. Odor control system
- c. Flow equalization tanks with aeration and mixing equipment and flow equalization pumping system
- d. Chlorine contact chambers
- e. Reclaimed water transfer pumps
- f. Sludge holding tanks and the associated aeration and mixing system and pumping equipment
- g. Chemical feed systems including alum, Micro-C, sodium hypochlorite, polymer and other chemical storage and feed systems

4.3 Design of the MBR and Associated Biological Treatment Processes

The SUPPLIER shall coordinate with the MBREM and perform the detailed design of the following MBR and the associated biological treatment processes:

- a. Anaerobic Process
- b. Pre-Anoxic Process
- c. Oxic Process
- d. Post-Anoxic Process
- e. MBR process

The SUPPLIER shall perform the detailed design and layout of the above process structures, process mixing and aeration equipment, process recycle pumping systems, the activated sludge wasting system, and all other miscellaneous designs associated with the biological processes.

4.4 Structural Design

The SUPPLIER shall perform final structural design calculations for all building, concrete structures, and tanks. Detailed structural design drawings shall be prepared to allow for bidding and construction of the project. All concrete or steel structures or buildings shall be designed to meet all latest Federal, State and local requirements.

4.5 Electrical and Instrumentation & Control System Design

Bailey Engineering, the sub-consultant to the SUPPLIER, shall perform the detailed design of the electrical, instrumentation and control including the MCC system, power feed to the various processes and pumping equipment, instrumentation and control system, SCADA system for the expansion, and incorporation of the new system to the existing SCADA system. The SUPPLIER shall coordinate with the MBR manufacturer to incorporate their instrumentation and control system design associated with the MBR and other biological processes with the entire plant instrumentation and control system. The SUPPLIER shall coordinate with the sub-consultant and the CITY staff to include the input from the CITY staff.

4.6 Administrative Building Modification

The SUPPLIER shall provide the following services for the modification/upgrade of the administrative building shared by the water and wastewater staff:

- HVAC system redesign and modification for better cooling capacity
- Kitchen remodeling with a new residential grade stove and refrigerator

4.7 Preparation of Plans and Specifications

The SUPPLIER shall prepare construction plan sheets for the WWTF No.2 expansion consisting of general civil drawings, site plans, yard piping plan, mechanical drawings, structural drawings, electrical drawings, instrumentation and control drawings, etc. Sufficient details shall be provided in the plan sheets to allow for bid solicitation and for construction of the expansion.

The SUPPLIER shall prepare project specifications to include front-end documents, SRF specific conditions, bidding documents, general requirements, and technical specifications for all construction materials, piping materials, chemical storage and feed equipment, process and mechanical equipment, structures, electrical, instrumentation and control systems, etc. The



specifications shall be prepared with sufficient details to allow for bid solicitation and for construction of the plant expansion.

4.8 Deliverables and Progress Review Meetings with the CITY Staff

The SUPPLIER shall deliver one (1) set of 24" x 34" and two (2) sets of 11" x 17" plans for the 60%, 90%, and 100% design. Electronic version of the plans in PDF shall also be sent to the CITY. The SUPPLIER shall prepare project specifications at 90% and 100% design. Electronic version of the specs in PDF will be provided to the CITY for review. Hard copies of up to two (2) sets can be provided to the CITY upon request.

The SUPPLIER shall meet with the CITY staff at 60%, 90%, and 100% design stages. Comments and input from the CITY staff shall be addressed and incorporated.

4.9 Construction Cost Estimate

The SUPPLIER shall prepare an estimation of probable construction cost for the proposed WWTF No.2 expansion. The cost estimation shall be presented to the CITY prior to bidding for review and budgeting purpose.

Task 5: SRF Construction Loan Application

The SUPPLIER shall assist the CITY in preparing and submitting the documents for the SRF Construction Loan application, including:

5.1 Request for Inclusion (RFI) (FDEP Form 62-503_200(30)_RFI

The SUPPLIER shall assist in filling out the RFI Form and submitting to FDEP, and shall assist the CITY in coordinating with FDEP to ensure that the proposed construction of the WWTF No.2 expansion is eligible for funding. The SUPPLIER shall prepare all the supporting documents required by the RFI submission.

5.2 SRF Construction Loan Planning Documents

The SUPPLIER shall assist the CITY in preparing all the planning documents required by the construction loan application. The adopted Palm Coast Wastewater Management System Facilities Plan prepared and adopted during the design SRF loan application shall meet the requirements for the construction loan application, according to FDEP. No new or updated Wastewater Facilities Plan is needed. The following sub-tasks list all the planning documents listed:

5.2.1 Financial Feasibility and Capital Financing Plan

Raftelis Inc. (RAFTELIS, previous PRMG), the sub-consultant to the SUPPLIER shall prepare the Financial Feasibility and Capital Financing Plan to address the issues of funding the construction of the WWTF No.2 expansion. The Capital Financing Plan shall identify revenues to be dedicated to repaying the SRF loan for construction. The detailed scope of services to be performed by RAFTELIS is attached as **Appendix D**. The SUPPLIER shall assist the CITY in



preparing the Resolution of the “Legal Opinion on Pledged Revenue”. The SUPPLIER shall attend the City Council Workshops and Meetings related to the adoption of the Resolution.

5.2.2 Implementation Schedule

The SUPPLIER shall update the schedule for the SRF construction loan application.

5.3 SRF Construction Loan Application

The SUPPLIER shall prepare, assemble and submit the Readiness-to-Proceed and loan application package to FDEP. The package shall include all required documents, including RFI, all Planning Documents, Resolution adoptions, biddable plans and specifications, all permits and site certification.

The SUPPLIER shall review the draft loan agreement and provide comments to the CITY. The SUPPLIER shall attend the CITY Council Workshops and Meetings related to the adoption of the Loan Agreement Resolutions.

FEE AND COMPENSATIONS

The SUPPLIER proposes to provide the engineering services described above for a not-to-exceed fee of \$1,401,339.50. The proposed fee includes reimbursable expenses and sub-consultant fees. The SUPPLIER will bill the CITY based on the actual hours and expenses incurred and the total amount billed will not exceed the above not-to-exceed amount unless authorized by the CITY. The detailed break downs of the fee estimation are presented in **Appendix E**. The proposed fee of each task is summarized as follows:

Task #	Description	Cost
Task 1	MBR Equipment Manufacturer Selection	\$43,030.00
Task 2	WWTF No.2 Expansion Preliminary Design	\$236,460.00
Task 3	Permit Application	\$54,999.50
Task 4	WWTF No.2 Expansion Final Design	\$981,030.00
Task 5	SRF Construction Loan Application	\$85,820.00
Total		\$1,401,339.50



**Appendix A Universal Engineering Sciences, Inc.
Proposal for Geotechnical Engineering Services**



UNIVERSAL ENGINEERING SCIENCES

Consultants In: Geotechnical Engineering • Environmental Sciences
Geophysical Services • Construction Materials Testing • Threshold Inspection
Building Inspection • Plan Review • Building Code Administration

LOCATIONS:

- Atlanta
- Daytona Beach
- Fort Myers
- Fort Pierce
- Gainesville
- Jacksonville
- Kissimmee
- Leesburg
- Miami
- Ocala
- Orlando (Headquarters)
- Palm Coast
- Panama City
- Pensacola
- Rockledge
- Sarasota
- Tampa
- West Palm Beach

January 29, 2019
Revised: February 18, 2019

Ms. Yinhui Xu, Ph.D., P.E.
CPH, Inc.
500 West Fulton Street
Sanford, Florida 32771

Reference: **PROPOSAL FOR GEOTECHNICAL ENGINEERING SERVICES**
Wastewater Treatment Plant Expansion
Palm Coast, Flagler County, Florida
UES Opportunity No.: 0430.0119.00028
UES Proposal No. 2019D-090R

Dear Ms. Xu:

Universal Engineering Sciences (UES) appreciates the opportunity to submit a proposal for geotechnical engineering services for the above referenced project in Palm Coast, Florida.

PROJECT INFORMATION

Project information has been provided to us by you. We understand that construction will comprise of development of eight (8) new structures. We understand this project consists of construction of the following: sludge holding tanks, equalization tanks, pre anoxic tanks, anaerobic tanks, post anoxic tanks, oxic tanks, MBR tanks and chlorine contact chambers. UES previously performed a subsurface evaluation for this project, Report No. 75700. We have fifteen (15) borings as an allowance with respect to the prior proposal.

SCOPE OF SERVICES

We will propose fourteen (14) Standard Penetration Test (SPT) borings to a depth of 30 feet each below existing grade within the proposed structure areas. The SPT borings will be performed in accordance with ASTM D-1586 and the data obtained from our field and laboratory investigation will be evaluated to provide the following information and recommendations:

- General soil stratigraphy;
- Encountered groundwater level;
- Presence or lack of unsuitable soils;
- General Foundation Design Recommendations; and
- Site preparation recommendations.

AUTHORIZATION AND FEES

Barring any unforeseen circumstances, we would be able to begin field work within two weeks of authorization and a final report would be complete within two to three weeks of authorization.

We will perform the proposed work for a lump sum fee of \$8,400.00. To initiate our services, please sign and return one copy of the attached Proposal Acceptance/Work Authorization form.

We appreciate the opportunity to offer our services and look forward to working with you on this project. Please feel free to call us with any questions at your convenience at (386) 756-1105.

Respectfully submitted,

UNIVERSAL ENGINEERING SCIENCES

A handwritten signature in blue ink, appearing to read "Patrick Clark".

Patrick Clark
Project Engineer

A handwritten signature in blue ink, appearing to read "Brian Pohl".

Brian Pohl, P.E.
Branch Manager

Attachments

PC/BCP/cme

UNIVERSAL ENGINEERING SCIENCES, INC.
Work Authorization / Proposal Acceptance Form

PLEASE SIGN AND RETURN ONE COPY

Universal Engineering Sciences, Inc. (Universal) is pleased to provide the services described below. The purpose of this document is to describe the terms under which the services will be provided and to obtain formal authorization.

Project Name: Wastewater Treatment Plant – Additional Borings **Date:** February 18, 2019
Project Location: Palm Coast, Flagler County, Florida
Client Name: CPH, Inc. **Contact:** Ms. Yinhui Xu, Ph.D., P.E.
Contact Business Address: 500 West Fulton Street, Sanford, Florida 32771
Contact Email: lxu@cphcorp.com **Contact Phone:** 407-322-6841 ext. 1044 **Contact Cell:** _____

I. Scope of Services & Understanding of Project (See attached proposal or as indicated below).

UES Opportunity No.: 0430.0119.00028
UES Proposal No. 2019D-090R

Lump Sum: \$8,400.00

II. Contract Documents. The following documents form part of the Agreement and are incorporated herein by referral:

A. Universal General Conditions.

In the event of any inconsistency or conflicting among the Contract Documents, the provision in that Contract Documents first listed above shall govern.

III. Authority to proceed and for payment. (To be completed by Client)

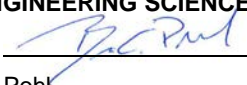
A. For payment of Services, invoice to the account of:

Firm: _____ **Social Security Number or Federal Identification No.:** _____
Address: _____ **City:** _____ **Zip Code:** _____
Attention: _____ **Title:** _____
Phone: _____ **Fax:** _____

B. If the invoice is to be mailed for approval to someone other than the account charged, please indicate where, below:

Firm: _____
Address: _____ **City:** _____ **Zip Code:** _____
Attention: _____ **Title:** _____
Phone: _____ **Fax:** _____

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their duty authorized representatives this _____ day of _____ 2019.

CLIENT: _____ **UNIVERSAL ENGINEERING SCIENCES, INC.**
BY (signature): _____ **BY (signature):** 
NAME: _____ **NAME:** Brian C. Pohl
TITLE: _____ **TITLE:** Branch Manager

Return Executed Copies to:
Universal Engineering Sciences, Inc.
Attention: Daytona Beach GEO
911 Beville Road, South Daytona, Florida 32119
Phone: 386-756-1105 / Fax: 386-760-4067



Universal Engineering Sciences, Inc.
GENERAL CONDITIONS

SECTION 1: RESPONSIBILITIES

- 1.1 *Universal Engineering Sciences, Inc.*, ("UES"), has the responsibility for providing the services described under the Scope of Services section. The work is to be performed according to accepted standards of care and is to be completed in a timely manner. The term "UES" as used herein includes all of *Universal Engineering Sciences, Inc.*'s agents, employees, professional staff, and subcontractors.
- 1.2 The Client or a duly authorized representative is responsible for providing UES with a clear understanding of the project nature and scope. The Client shall supply UES with sufficient and adequate information, including, but not limited to, maps, site plans, reports, surveys and designs, to allow UES to properly complete the specified services. The Client shall also communicate changes in the nature and scope of the project as soon as possible during performance of the work so that the changes can be incorporated into the work product.
- 1.3 The Client acknowledges that UES's responsibilities in providing the services described under the Scope of Services section is limited to those services described therein, and the Client hereby assumes any collateral or affiliated duties necessitated by or for those services. Such duties may include, but are not limited to, reporting requirements imposed by any third party such as federal, state, or local entities, the provision of any required notices to any third party, or the securing of necessary permits or permissions from any third parties required for UES's provision of the services so described, unless otherwise agreed upon by both parties.
- 1.4 Universal will not be responsible for scheduling our services and will not be responsible for tests or inspections that are not performed due to a failure to schedule our services on the project or any resulting damages.

1.5 **PURSUANT TO FLORIDA STATUTES §558.0035, ANY INDIVIDUAL EMPLOYEE OR AGENT OF UES MAY NOT BE HELD INDIVIDUALLY LIABLE FOR NEGLIGENCE.**

SECTION 2: STANDARD OF CARE

- 2.1 Services performed by UES under this Agreement will be conducted in a manner consistent with the level of care and skill ordinarily exercised by members of UES's profession practicing contemporaneously under similar conditions in the locality of the project. No other warranty, express or implied, is made.
- 2.2 The Client recognizes that subsurface conditions may vary from those observed at locations where borings, surveys, or other explorations are made, and that site conditions may change with time. Data, interpretations, and recommendations by UES will be based solely on information available to UES at the time of service. UES is responsible for those data, interpretations, and recommendations, but will not be responsible for other parties' interpretations or use of the information developed.
- 2.3 Execution of this document by UES is not a representation that UES has visited the site, become generally familiar with local conditions under which the services are to be performed, or correlated personal observations with the requirements of the Scope of Services. It is the Client's responsibility to provide UES with all information necessary for UES to provide the services described under the Scope of Services, and the Client assumes all liability for information not provided to UES that may affect the quality or sufficiency of the services so described.
- 2.4 Should UES be retained to provide threshold inspection services under Florida Statutes §553.79, Client acknowledges that UES's services thereunder do not constitute a guarantee that the construction in question has been properly designed or constructed, and UES's services do not replace any of the obligations or liabilities associated with any architect, contractor, or structural engineer. Therefore it is explicitly agreed that the Client will not hold UES responsible for the proper performance of service by any architect, contractor, structural engineer or any other entity associated with the project.

SECTION 3: SITE ACCESS AND SITE CONDITIONS

- 3.1 Client will grant or obtain free access to the site for all equipment and personnel necessary for UES to perform the work set forth in this Agreement. The Client will notify any and all possessors of the project site that Client has granted UES free access to the site. UES will take reasonable precautions to minimize damage to the site, but it is understood by Client that, in the normal course of work, some damage may occur, and the correction of such damage is not part of this Agreement unless so specified in the Proposal.
- 3.2 The Client is responsible for the accuracy of locations for all subterranean structures and utilities. UES will take reasonable precautions to avoid known subterranean structures, and the Client waives any claim against UES, and agrees to defend, indemnify, and hold UES harmless from any claim or liability for injury or loss, including costs of defense, arising from damage done to subterranean structures and utilities not identified or accurately located. In addition, Client agrees to compensate UES for any time spent or expenses incurred by UES in defense of any such claim with compensation to be based upon UES's prevailing fee schedule and expense reimbursement policy.

SECTION 4: SAMPLE OWNERSHIP AND DISPOSAL

- 4.1 Soil or water samples obtained from the project during performance of the work shall remain the property of the Client.
- 4.2 UES will dispose of or return to Client all remaining soils and rock samples 60 days after submission of report covering those samples. Further storage or transfer of samples can be made at Client's expense upon Client's prior written request.
- 4.3 Samples which are contaminated by petroleum products or other chemical waste will be returned to Client for treatment or disposal, consistent with all appropriate federal, state, or local regulations.

SECTION 5: BILLING AND PAYMENT

- 5.1 UES will submit invoices to Client monthly or upon completion of services. Invoices will show charges for different personnel and expense classifications.
- 5.2 Payment is due 30 days after presentation of invoice and is past due 31 days from invoice date. Client agrees to pay a finance charge of one and one-half percent (1 ½ %) per month, or the maximum rate allowed by law, on past due accounts.
- 5.3 If UES incurs any expenses to collect overdue billings on invoices, the sums paid by UES for reasonable attorneys' fees, court costs, UES's time, UES's expenses, and interest will be due and owing by the Client.

SECTION 6: OWNERSHIP AND USE OF DOCUMENTS

- 6.1 All reports, boring logs, field data, field notes, laboratory test data, calculations, estimates, and other documents prepared by UES, as instruments of service, shall remain the property of UES.
- 6.2 Client agrees that all reports and other work furnished to the Client or his agents, which are not paid for, will be returned upon demand and will not be used by the Client for any purpose.
- 6.3 UES will retain all pertinent records relating to the services performed for a period of five years following submission of the report, during which period the records will be made available to the Client at all reasonable times.
- 6.4 All reports, boring logs, field data, field notes, laboratory test data, calculations, estimates, and other documents prepared by UES, are prepared for the sole and exclusive use of Client, and may not be given to any other party or used or relied upon by any such party without the express written consent of UES.

SECTION 7: DISCOVERY OF UNANTICIPATED HAZARDOUS MATERIALS

- 7.1 Client warrants that a reasonable effort has been made to inform UES of known or suspected hazardous materials on or near the project site.
- 7.2 Under this agreement, the term hazardous materials include hazardous materials (40 CFR 172.01), hazardous wastes (40 CFR 261.2), hazardous substances (40 CFR 300.6), petroleum products, polychlorinated biphenyls, and asbestos.
- 7.3 Hazardous materials may exist at a site where there is no reason to believe they could or should be present. UES and Client agree that the discovery of unanticipated hazardous materials constitutes a changed condition mandating a renegotiation of the scope of work. UES and Client also agree that the discovery of unanticipated hazardous materials may make it necessary for UES to take immediate measures to protect health and safety. Client agrees to compensate UES for any equipment decontamination or other costs incident to the discovery of unanticipated hazardous waste.
- 7.4 UES agrees to notify Client when unanticipated hazardous materials or suspected hazardous materials are encountered. Client agrees to make any disclosures required by law to the appropriate governing agencies. Client also agrees to hold UES harmless for any and all consequences of disclosures made by UES which are required by governing law. In the event the project site is not owned by Client, Client recognizes that it is the Client's responsibility to inform the property owner of the discovery of unanticipated hazardous materials or suspected hazardous materials.
- 7.5 Notwithstanding any other provision of the Agreement, Client waives any claim against UES, and to the maximum extent permitted by law, agrees to defend, indemnify, and save UES harmless from any claim, liability, and/or defense costs for injury or loss arising from UES's discovery of unanticipated hazardous materials or suspected hazardous materials including any costs created by delay of the project and any cost associated with possible reduction of the property's value. Client will be responsible for ultimate disposal of any samples secured by UES which are found to be contaminated.

SECTION 8: RISK ALLOCATION

- 8.1 Client agrees that UES's liability for any damage on account of any breach of contract, error, omission or other professional negligence will be limited to a sum not to exceed \$50,000 or UES's fee, whichever is greater. If Client prefers to have higher limits on contractual or professional liability, UES agrees to increase the limits up to a maximum of \$1,000,000.00 upon Client's written request at the time of accepting our proposal provided that Client agrees to pay an additional consideration of four percent of the total fee, or \$400.00, whichever is greater. The additional charge for the higher liability limits is because of the greater risk assumed and is not strictly a charge for additional professional liability insurance.

SECTION 9: INSURANCE

- 9.1 UES represents and warrants that it and its agents, staff and consultants employed by it, is and are protected by worker's compensation insurance and that UES has such coverage under public liability and property damage insurance policies which UES deems to be adequate. Certificates for all such policies of insurance shall be provided to Client upon request in writing. Within the limits and conditions of such insurance, UES agrees to indemnify and save Client harmless from and against loss, damage, or liability arising from negligent acts by UES, its agents, staff, and consultants employed by it. UES shall not be responsible for any loss, damage or liability beyond the amounts, limits, and conditions of such insurance or the limits described in Section 8, whichever is less. The Client agrees to defend, indemnify and save UES harmless for loss, damage or liability arising from acts by Client, Client's agent, staff, and other UESs employed by Client.

SECTION 10: DISPUTE RESOLUTION

- 10.1 All claims, disputes, and other matters in controversy between UES and Client arising out of or in any way related to this Agreement will be submitted to alternative dispute resolution (ADR) such as mediation or arbitration, before and as a condition precedent to other remedies provided by law, including the commencement of litigation.
- 10.2 If a dispute arises related to the services provided under this Agreement and that dispute requires litigation instead of ADR as provided above, then:
- (a) the claim will be brought and tried in judicial jurisdiction of the court of the county where UES's principal place of business is located and Client waives the right to remove the action to any other county or judicial jurisdiction, and
 - (b) The prevailing party will be entitled to recovery of all reasonable costs incurred, including staff time, court costs, attorneys' fees, and other claim related expenses.

SECTION 11: TERMINATION

- 11.1 This agreement may be terminated by either party upon seven (7) days written notice in the event of substantial failure by the other party to perform in accordance with the terms hereof. Such termination shall not be effective if that substantial failure has been remedied before expiration of the period specified in the written notice. In the event of termination, UES shall be paid for services performed to the termination notice date plus reasonable termination expenses.
- 11.2 In the event of termination, or suspension for more than three (3) months, prior to completion of all reports contemplated by the Agreement, UES may complete such analyses and records as are necessary to complete its files and may also complete a report on the services performed to the date of notice of termination or suspension. The expense of termination or suspension shall include all direct costs of UES in completing such analyses, records and reports.

SECTION 12: ASSIGNS

- 12.1 Neither the Client nor UES may delegate, assign, sublet or transfer their duties or interest in this Agreement without the written consent of the other party.

SECTION 13. GOVERNING LAW AND SURVIVAL

- 13.1 The laws of the State of Florida will govern the validity of these Terms, their interpretation and performance.
- 13.2 If any of the provisions contained in this Agreement are held illegal, invalid, or unenforceable, the enforceability of the remaining provisions will not be impaired. Limitations of liability and indemnities will survive termination of this Agreement for any cause.

SECTION 14. INTEGRATION CLAUSE

- 14.1 This Agreement represents and contains the entire and only agreement and understanding among the parties with respect to the subject matter of this Agreement, and supersedes any and all prior and contemporaneous oral and written agreements, understandings, representations, inducements, promises, warranties, and conditions among the parties. No agreement, understanding, representation, inducement, promise, warranty, or condition of any kind with respect to the subject matter of this Agreement shall be relied upon by the parties unless expressly incorporated herein.
- 14.2 This Agreement may not be amended or modified except by an agreement in writing signed by the party against whom the enforcement of any modification or amendment is sought.



**Appendix B Bailey Engineering Consultants, Inc.
Proposal for Electrical and Instrumental & Control Services**



February 12th, 2019

Ms. Lucida Xu, P.E
CPH Inc.
500 West Fulton Street
Sanford, Florida 32771

Re: Palm Coast WWTP No. 2 Expansion
Palm Coast, Florida

Dear Ms. Xu:

We are pleased to submit our proposal for electrical and control system engineering services for the above project. The following serves to provide an overview of the engineering services Bailey Engineering Consultants, Inc. (BEC) intends to furnish on the above referenced project and provides the agreed upon lump sum fee proposal. Your signature on this agreement will serve as your letter of intent and official notice to proceed with the referenced work.

Scope of Work:

Electrical and instrumentation design to expand the WWTP facility to 4.0 MGD, as follows:

1. Electrical design associated with Headworks – to add one grit removal, one screen, odor control (for the added grit chamber, drum screen, and the master pump station)
2. Electrical design associated with an on-site master pump station.
3. Electrical design associated with two (2) EQ tanks with mixers and coarse bubble diffusers.
4. Electrical design associated with Biological treatment process from fermentation tanks to MBR tanks and associated aeration, mixing, and recycling equipment
5. Electrical design associated with CCCs transfer pumps and sampling of quality control
6. Electrical design associated with Sludge holding tanks and associated mixers and coarse bubble diffusers.

Task 1 – Meetings, Project Management and Quality Control

1. Project Kick-Off and Progress Meetings

- BEC shall attend a kick-off meeting for the project to discuss the detailed project approach, the project schedule, and the budget.

10620 GRIFFIN ROAD, SUITE 202 • COOPER CITY, FL • 33328
PHONE: 954-448-7930 • FAX: 954-713-9959

2. Project Quality Control Technical Review

- BEC will attend Technical Review Committee (TRC) meeting as required.

Task 2 – Technical Memorandum Development

1. Data Collection, Review, and Conceptual Design

- BEC will perform the following:
 - i. Review electrical site plans and as-built drawings provided by others for the WWTP.
 - ii. Conduct site visits as required to identify site-conditions for the associated electrical and instrumentation improvements.
 - iii. Provide a conceptual site plan, Electrical Single Line Diagram and Process and Instrumentation Diagrams (P&IDs). P&IDs will include proposed improvements indicating new and existing (same process) equipment.
 - iv. Confirmation of spacing requirements for electrical and instrumentation improvements associated with the process upgrades.
 - v. Engineer's Opinion of Probable Construction Costs.
 - vi. Meeting with CITY to present and review the findings and results of the 30% submittal. The draft will be revised to reflect discussions at the meeting.

Task 3 – Preparation of Contract Documents

1. Subtask 3.1 – Final Engineering Design

- Prepare final design documents suitable for bidding and construction of the improvements included in the CITY approved 30% submittal.
- The plans will be submitted to the CITY for review at 60% and 90% levels of completion, in 22" x 34" size. The CITY's comments on the 60% and 90% submittals will be incorporated into the construction documents as warranted. Prepare Technical Specifications at the 60%, 90% and 100% submittals.
- Attend review meetings for the draft 60% and 90% submittals with the CITY staff to collect comments to be incorporated into either the 90% or in the 100% submittal package.
- Prepare final Contract Documents (drawings and specifications). BEC will provide one (1) hard copy of the electrical and instrumentation documents and one (1) electronic copy in PDF and AutoCAD format. All additional reproduction will be by others.

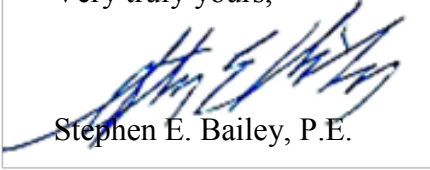
2. Subtask 3.2 – Engineer’s Opinion of Probable Construction Cost

- Provide an Engineer’s Opinion of the Probable Construction Cost for the project at the 60%, 90% and 100% completion milestones.

Compensation for all services, materials, supplies, and any other items or requirements necessary to complete the work defined in this Task Assignment will be based upon a Not to Exceed amount of \$48,790.00. This not to exceed amount includes all tasks described above (i.e. Tasks 1 through 3). At no time shall work fees exceed said amount of compensation without a written and executed amendment. Our scope of work shall be as outlined above and as indicated on the attached estimate of work effort. Services not specifically outlined above are excluded. Our fee for this work shall be payable as follows:

Task 1 - Meetings, Project Management and Quality Control	\$ 13,720.00
Task 2 - Preliminary Engineering Design	\$ 60,320.00
<u>Task 3 - Preparation of Contract Documents</u>	<u>\$126,045.00</u>
Total:	\$200,085.00

Very truly yours,



Stephen E. Bailey, P.E.

ACCEPTED _____ DATE _____



**Appendix C Waste Water Treatment Plant #2 Expansion Permitting
Scope of Services – Environmental**

CITY OF PALM COAST

WASTE WATER TREATMENT PLANT #2 EXPANSION PERMITTING SCOPE OF SERVICES

1. INTRODUCTION

CPH, Inc., hereafter referred to as “CONSULTANT” is submitting this proposal to permit the expansion of WWTP#2 from 2.0 MGD (million gallons per day) to 4.0 MGD. CONSULTANT shall submit for a permit modification for the surface water discharge to be increased from 0.6 MGD to 1.2 MGD. CONSULTANT prepare a permit application to the Florida Department of Environmental Protection (FDEP) and process the application.

2. OBJECTIVE

Process the conduct necessary data collection, modeling and report preparation to submit and process the FDEP permit application for a 5 year permit.

3. SCOPE OF SERVICES

CONSULTANT shall provide, or obtain from others, all labor, material and equipment to perform the following services:

Task A Modeling & Water Quality Sampling

CONSULTANT will prepare a Technical Memorandum providing values and calculations of the discharge, volume, mixing, and dilution and receiving water quality in support of the permit application. CONSULTANT will incorporate existing data from the City as well as limited ambient sampling to provide data for the modeling. Field sampling shall be limited to the sampling protocol approved by FDEP in the original permit effort in three locations (at the diffuser discharge, 200 feet north of the diffuser, 200 feet south of the diffuser). This includes collection of available background data from the City and other public sources. CONSULTANT shall use the known data on the current design of the diffuser and discharge volumes to model for the “worst” case scenario per FDEP and EPA requirements. CONSULTANT shall update the 2014 Environmental Assessment for SRF Funding.

Task B FDEP Permit Application Preparation and Submittal

CONSULTANT anticipates conducting two (2) meetings with the City and one (1) meeting with FDEP prior to the FDEP application submittal. CONSULTANT shall assist with permit application preparation.

Task C FDEP Request for Additional Information

CONSULTANT shall respond to up to two (2) Requests for Additional Information (RAI) from FDEP.

4. RESPONSIBILITIES OF OTHERS

The City shall guarantee access to and make provisions for CONSULTANT to enter public or private lands as required by CONSULTANT to perform their work under this Agreement.

The CONSULTANT shall perform services under the sole direction of the City or his designated representative. In the performance of these services, CONSULTANT will coordinate its efforts with those of other project team members and consultants as required. The City shall provide CONSULTANT with all project related information available including permits. CONSULTANT will rely upon the accuracy and completeness of all City furnished information in connection with the performance of services under this agreement.

The City shall be responsible for all permit application fees associated with the submittal of applications to regulatory agencies.

The City shall be responsible for all Chronic Toxicity testing. The City shall provide all laboratory results to CONSULTANT routinely performed at WWTP#2.

5. ADDITIONAL SERVICES

Provide other professional and technical services not specifically identified in Section 3 above.

- Requests for Additional Information by the FDEP does not include the performance of any additional field studies/surveys, site analysis or similar investigations nor does it include design revisions or modifications resulting from plan changes by the City.
- Additional field surveys, management plans and permitting for impacts to State and Federally listed protected species is not included in the Scope of Services but can be provided as an additional service.
- Additional field surveys, sampling or requirements identified by FDEP that are not outlined in the Plan of Study shall be considered out of scope and additional services will be required.

6. FEES AND BILLING

CONSULTANT proposes to provide the above described services for a Not-to-Exceed fee of \$44,609.50. The proposed Not-to-Exceed fee has been calculated utilizing rates

as approved in the base contract between CONSULTANT and the City of Palm Coast. Expenses for Sub-consultants, printing, travel, telephone and all other related charges have been included in the above Not-to-Exceed fee. CONSULTANT will invoice the City based on actual time and expenses and the total amount invoiced to the City will not exceed \$44,609.50.

The attached table shows the estimated hours and the rates for this scope of work is attached for your review.

Hourly rates shall be in accordance with the previously approved rate schedule with the Continuing Engineering Service Contract between the City and the CONSULTANT.



**Appendix D Raftelis, Inc.
Letter Agreement to Provide Financial Services - State Revolving
Fund Loan Applications**

December 17, 2019

Mr. David A. Gierach, P.E.
President
CPH, Inc.
P.O. Box 2808
Sanford, FL 32772-2808

Subject: Letter Agreement to Provide Financial Services - State Revolving Fund Loan Applications

Dear Mr. Gierach:

Raftelis Financial Consultants, Inc. (Raftelis) is pleased to submit this letter proposal to CPH, Inc. (CPH) to provide subconsulting services on behalf of the City of Palm Coast (the "City") associated with assisting in the preparation of two State Revolving Fund (SRF) loan applications on behalf of the City's water and wastewater utility system (the "System"). Based on our understanding of the City's needs, Raftelis proposes to update the most recently completed financial forecast (the "Water and Wastewater Revenue Sufficiency and Capital Facilities Fees Study") dated August 15, 2018, to reflect current and changed conditions in order to prepare the capital financial plan component of an SRF loan application and preparing for and attending the presentation to the City Council of the findings of the capital finance plan as required by the Florida Department of Environmental Protection (FDEP).

PROJECT TEAM AND BILLING RATES

With respect to the performance of this engagement, Robert J. Ori will be the principal-in-charge and will be the primary contact with the City and CPH. Other analysts and administrative personnel will be utilized during the course of the engagement as needed. Attachment A summarizes the direct labor hourly billing rates relative to this engagement which is made part of this proposal.

SCOPE OF SERVICES

The scope of services to be performed by Raftelis relative the Project is included herein as Attachment B which is made part of this proposal.

COMPENSATION AND BILLING

Initial budget consists of the preparation of the capital finance plan component of the SRF Loan application for the construction of the City's proposed wastewater facilities expansion. The contract budget for the project is a budget not to exceed \$27,200; reference Attachment B for billing rates.

This contract budget amount includes the direct cost of personnel anticipated to be assigned to conduct the various tasks of the Project by Raftelis as well as an allowance for other direct costs such as travel, telephone, delivery charges and subconsulting expenses, if any. The costs incurred by Raftelis for such other direct costs, if any, would be billed to CPH based on the standard rate for the recovery of such costs as identified in Attachment A. It is proposed that Raftelis would bill monthly for services relative to this engagement based on the sum of: i) the hourly amount of time spent by the Project team members; ii) the other direct costs incurred to provide the financial consulting services; and iii) the subconsulting expenses required to assist in Project completion, as adjusted for administrative costs per Attachment A. It is not anticipated that any subconsultants would be required to assist Raftelis in the completion of the Project. To the extent that Raftelis determines that a portion of the Project would need to be performed by a subconsultant, Raftelis would notify CPH in writing for approval prior to the assignment of any Project responsibilities to such subconsultant by Raftelis.

It should be noted that the proposed contract budget would be billed on an hourly basis predicated on the actual work effort performed by Raftelis and not on a lump-sum basis. To the extent that the Project were completed at a cost less than the contract budget, Raftelis would not invoice CPH for any amounts remaining (unbilled) on such contract except for the provision of any additional services which CPH may request from Raftelis, as mutually agreed between the two parties.

PROJECT SCHEDULE

Upon notification to proceed as provided by CPH, Raftelis would complete the Project within a reasonable time frame (e.g., 180 days) for presentation to the City Council at a public hearing, the date of which has yet to be determined. The completion of the analysis would be subject to the availability of information provided to Raftelis from the City that would be necessary to conduct our rate study update analysis.

FINANCIAL ADVISOR QUALIFICATION

As a registered Municipal Advisor under the Dodd-Frank Act, Raftelis is required to inform our clients of any existing or potential conflicts of interest that may be relevant to any proposed scope of services that may include providing “advice” as that term is defined in the Dodd-Frank Act. As of the date of this engagement letter, no conflicts of interest are known to exist.

Under the Dodd-Frank Act the definition of “advice” includes providing any opinion, information or assumptions related to the size, timing and terms of possible future debt issues or borrowing. This type of information may be integrated into the capital and financial planning components of a SRF Capital Finance Plan. This definition is applicable regardless of whether this information is developed and used solely for planning and decision making purposes. For the services addressed in the scope of work identified for this engagement, any information that is developed by Raftelis that falls under this definition of municipal advice is not intended to represent a recommendation that the City should issue debt based on the terms and assumptions used to develop the financial plan or forecast, or that the City will, in fact, be able to issue debt under the exact terms and conditions assumed and used to develop the financial plan or forecast.

Mr. David A. Gierach, P.E.
CPH, Inc.
December 17, 2019
Page 3

The information developed as part of this SRF Capital Finance Plan, including any related municipal advice, is intended only to provide information useful in evaluating the potential impact on the utility and future rate adjustments of one potential course of action for the City. If the City decides at some future date to issue debt, then at that time the City will need to engage an independent, registered Financial Advisor to assist in evaluating the availability of different types of debt, and the specific terms and conditions for issuing debt, which will be affected by market conditions and the City's credit rating at the time of issuance. At that time, as a registered Municipal Advisor, Raftelis can also provide additional assistance related to a specific bond or debt issue, such as preparing a bond feasibility report or financial forecast for inclusion in bond documents, without requiring additional oversight or supervision by the Financial Advisor.

By signing this engagement letter indicating its approval and acceptance of the of the proposed scope of work and fees, the City is also explicitly acknowledging that Raftelis has provided the necessary disclosures addressing conflicts of interest and any limitations on the scope of Municipal Advisory services to be provided by Raftelis' part of this engagement.

The Municipal Securities Rulemaking Board (MSRB) provides significant protections for municipal entities and obligated persons that are clients of a municipal advisor. To understand the protections provided and how to file a complaint with an appropriate regulatory authority, visit the MSRB web site at www.msrb.org.

If this proposal is acceptable to both the City and CPH, please prepare a subconsultant agreement or necessary contract documents between our two firms that incorporates the scope of work and other components of this proposal. Once we receive the executed documents, we will consider this as our notice to proceed on the project. We appreciate the opportunity to provide the utility consulting services to CPH on behalf of the City and look forward to working with both CPH and the City on this Project in the near future.

Very truly yours,

Raftelis Financial Consultants, Inc.



Robert J. Ori
Executive Vice President

Attachments

ATTACHMENT A

**CITY OF PALM COAST, FLORIDA
STATE REVOLVING FUND LOAN APPLICATION - FINANCIAL SERVICES**

**RAFTELIS FINANCIAL CONSULTANTS, INC.
SCHEDULE OF DIRECT LABOR HOURLY RATES AND COST RATES**

DIRECT LABOR HOURLY RATES

Project Team Title	Direct Labor Hourly Rates [*]
Principal	\$225.00
Associate	\$200.00
Managing Consultant	\$175.00
Supervising Consultant	\$150.00
Senior Consultant	\$130.00
Rate Consultant	\$125.00
Consultant	\$110.00
Senior Rate Analyst	\$100.00
Rate Analyst	\$ 90.00
Analyst	\$ 80.00
Assistant Analyst	\$ 70.00
Administrative Support Staff	\$ 60.00

[*] Direct labor hourly rates effective twelve months after the date of execution of the Agreement; rates will be adjusted by not more than the net percentage change (but not less than 0%) in the Consumer Price Index – Urban Consumers per annum (rounded to the nearest dollar) or as mutually agreed between parties for invoices rendered after each anniversary date of each year thereafter until project completion or termination of the Agreement between the parties.

STANDARD COST RATES

Expense Description	Standard Rates [*]
Mileage Allowance – Personal Car Use Only	IRS Standard Mileage Rate
Reproduction (Black and White) (In-House)	\$0.05 per Page
Reproduction (Color) (In-House)	\$0.25 per Page
Reproduction (Contracted)	Actual Cost
Computer Time	\$0.00 per Hour
Telephone Charges	Actual Cost
Delivery Charges	Actual Cost
Lodging/Other Travel Costs	Actual Cost
Meals	Not-to-Exceed per Raftelis Employee: \$8.00 – Breakfast \$12.00 – Lunch \$25.00 – Dinner
Subconsultant Services	Actual Cost plus 5.0%

[*] Standard cost rates effective twelve months after the date of execution of the Agreement; where applicable, rates will be adjusted by not more than the net percentage change (but not less than 0%) in the Consumer Price Index – Urban Consumers per annum (rounded to the nearest dollar) or as mutually agreed between parties for invoices rendered after each anniversary date of each year thereafter until project completion or termination of the Agreement between the parties. Any Standard Rate adopted by policy by Client will supersede rates shown above

ATTACHMENT B

CITY OF PALM COAST, FLORIDA STATE REVOLVING FUND LOAN APPLICATION - FINANCIAL SERVICES

SCOPE OF SERVICES

The following represents the scope of services to be performed by Public Resources Management Group, Inc. (Raftelis) as it relates to providing financial services associated with the preparation of the capital finance plan associated with the preparation of the State Revolving Loan Fund (SRF) application on behalf of the City of Palm Coast, Florida (the "City"). The preparation of the capital finance plan will include the update of the financial forecast recently prepared for the City (the "Water and Wastewater Revenue Sufficiency Study") dated August 15, 2018, to encompass the planning phase required by the FDEP SRF Loan application and the preparation of all of the forms and corresponding analytical work papers / calculation considered necessary to support the financial forecast contained in the application.

Task 1 - Data Acquisition and Review: Raftelis will prepare a data request to assimilate updated statistical and financial information from the City. Data that will be requested includes: i) financial data such as adopted and proposed budgets, recent historical operating results, and updated customer statistics; and ii) other information as deemed necessary by Raftelis to adequately complete the loan application.

Task 2 – Development of Historical Presentation: Working with the City, Raftelis will prepare the historical operating results section of the Capital Finance Plans which will include the Fiscal Year 2019 as the most recent fiscal year. The basis for the historical financial presentation will also be recognized in the development of the projected financial forecast presented in the Capital Finance Plans.

Task 3 – Development of Financial Projections: Raftelis will update the customer and financial operating projections originally prepared for inclusion in the Water and Wastewater Revenue Sufficiency Study. The updated customer and financial projections since the last study will focus on: i) any significant change in customer growth and water use / sewer flow patterns; ii) material changes to operations and maintenance expenses; and iii) changes to the City's Capital Improvement Program (both timing and amount) since Raftelis last performed the analysis. Raftelis will prepare a five-year projection of the revenue requirements of the utility system in accordance with the requirements of the SRF loan application using current budgetary information as the basis for projections. The net effect of this task is to develop target expenditure requirements sufficient to meet the rate covenants requirements as outlined by the Florida Department of Environmental Protection (FDEP) as a prerequisite of SRF loan approval.

Task 4 – Preparation of SRF Capital Finance Plans: Raftelis will prepare the necessary documentation as required by the FDEP in support of developing the SRF Capital Finance Plans. Information to be prepared for inclusion in the Capital Finance Plans will include: i) recent historical operating results for the utility system; ii) disclosure of existing and proposed

indebtedness where utility revenues are the pledged repayment source; iii) preparation of five-year financial projections; and iv) other required information. Such information will be provided to the City's consulting engineers for inclusion in the comprehensive SRF loan submittal.

Task 5 – Attendance of Public Hearings

Raftelis will attend one (1) public hearing to present the results of the Capital Finance Plan to the City Council.

Two specific deliverables will be provided:

Deliverable 1 – At the conclusion of Task 3, the financial component of the capital finance plan related to the SRF Loan Application.

Deliverable 2 – Concurrent with Task 4, a presentation document to present the capital finance plan related to the SRF Loan Application to the City Council.

MEETINGS

During the course of this engagement, it is anticipated that Raftelis will attend a total of four (4) meetings, have been assumed which consist of the following:

- One (1) kickoff and data collection meeting with City staff;
- One (1) meeting to review the results with City staff; and
- One (1) workshop and One (1) formal meeting to present the plans to the City Council.

Attendance of those meetings will be by not more than two (2) employees of Raftelis; the attendance of any additional meetings will be considered as an additional service.

ADDITIONAL SERVICES

During the course of the study, the City may request additional services from Raftelis. Such services will not be conducted until authorized by the City or CPH as mutually agreed between the City, CPH, and Raftelis. Billing for such additional services based on the hourly rate schedule of Raftelis members as shown in this Letter of Agreement or some other basis as mutually agreed between the City, CPH, and Raftelis. Although no additional services are anticipated for this engagement, examples of additional services may include the following:

1. Attendance of meetings in addition to what is contemplated in the scope of services.
2. Delays in the project schedule which are at no fault of Raftelis, which may have impacts on analyses performed and which would affect the budget for the scope of services reflected herein.

ATTACHMENT C

City of Palm Coast, Florida

Cost Estimate Associated With SRF Capital Finance Plan for Wastewater Treatment Facilities

Line No.	Task Ref.	Principal	Managing Consultant	Senior Rate Analyst	Clerical and Administration	Totals
1	Direct Labor Rates	\$ 225.00	\$ 175.00	\$ 100.00	\$ 60.00	
	Preparation of Capital Finance Plan					
2	Data Acquisition and Review	1	2	2	2	7
3	Development of Historical Presentation	2	4	12		
4	Development of Financial Projections	3	30	48	-	82
5	Preparation of SRF Capital Finance Plan	4	6	12	8	30
6	Attendance of Public Hearing - Presentation Document	5	4	-	2	8
7	Meetings (three on-site meetings)					
8	Kickoff and Data Collection meeting with City Staff (one meeting)		6	6	-	12
9	Meeting with City Staff to Review Results (one meeting)		6	6	-	12
10	City Council Workshop and Public Hearing (one meeting)		6	6	-	12
11	Project Management	All	2	-	2	4
12	Total Hours	33	64	74	14	167
13	Direct Labor Cost	\$ 7,425	\$ 11,200	\$ 7,400	\$ 840	\$ 26,865
14	Average Hourly Rate					\$ 160.87
	Other Direct Costs					
15	Mileage @ \$0.58 Per Mile - 140 Miles Roundtrip; 2 Trips					\$ 162
16	Other (e.g., Telephone, Other Miscellaneous Travel Costs, Delivery Charges)					100
17	Miscellaneous Allowance and Fee Rounding					73
18	Total Other Direct Costs					\$ 335
19	Total Estimated Total Project Cost					\$ 27,200



Appendix E Palm Coast WWTF No.2 Expansion Fee Breakdowns



Palm Coast WWTF No.2 Expansion - Design, Permitting, and Loan Application
Scope of Services & Fee Schedule
Date: December 2019

TASK ITEM	DESCRIPTION	Principal	Sr. Project Manager	Project Manager	Project Engineer	Senior Design Technician	Clerical	Structural Design	Environmental Services	MEP HVAC	Sub-Consultant	Estimated Expenses	Cost by Task
Hourly Rates		\$190.00	\$180.00	\$160.00	\$120.00	\$105.00	\$60.00						
Task 1	MBR Equipment Manufacturer Selection												
	1.1 Meet with the Potential MBREMs and the CITY	4	20	10	20							\$300.00	\$8,660.00
	1.2 Prepare the Technical and Cost Request For Proposal (RFP)	2	40	20	15	20							
	1.3 Review the RFP with the CITY		10	8	10								\$4,280.00
	1.4 Answer Questions and Prepare Addendums		20	20							\$13,850.00		\$20,650.00
	1.5 Evaluate the Bids with the CITY	2	25		20		4						\$7,520.00
	1.6 Make Recommendations to the CITY	1	8				4					\$50.00	\$1,920.00
	Sub-total Task 1	9	123	58	65	20	8					\$350.00	\$43,030.00
Task 2	WWTF No.2 Expansion Preliminary Design												
	2.1 Geotechnical Report Updates										\$8,400.00		\$8,400.00
	2.2 Preliminary Design of the On-Site Pump Station	8	20	40	20	80							\$22,320.00
	2.3 Preliminary Wastewater Treatment Process Design Calculations		20	20	40								\$11,600.00
	2.4 Preliminary Hydraulic Analysis		20	20	20								\$9,200.00
	2.5 Preliminary Process Equipment and Building Layouts		20	40	80	120							\$32,200.00
	2.6 Preliminary Yard Piping Plan		20	20	40	40							\$15,800.00
	2.7 Preliminary Structural Design							\$15,000.00					\$15,000.00
	2.8 Preliminary Electrical, Instrumentation and Control System Design	2	8	4		8					\$74,040.00		\$77,340.00
	2.9 Opinion of Probable Construction Cost	2	12	4	40								\$7,980.00
	2.10 Preliminary Design Deliverables and Review Meeting	8	80	40	80	40						\$500.00	\$36,620.00
	Sub-total Task 2	20	200	188	320	288	0	\$15,000.00			\$82,440.00	\$500.00	\$236,460.00
Task 3	Permit Application	4	30		20	10	8		\$44,609.50			\$300.00	\$54,999.50
	Sub-total Task 3	4	30		20	10	8		\$44,609.50			\$300.00	\$54,999.50
Task 4	WWTF No.2 Expansion Final Design (60%, 90% and 100%)												
	4.1 Design of the On-Site Influent Pump Station	4	60	80	200	240							\$73,560.00
	4.2 Design of Non-Biological Treatment Process	4	480	480	312	480							\$251,800.00

TASK ITEM	DESCRIPTION	Principal	Sr. Project Manager	Project Manager	Project Engineer	Senior Design Technician	Clerical	Structural Design	Environmental Services	MEP HVAC	Sub-Consultant	Estimated Expenses	Cost by Task
	4.3 Design of the MBR and Associated Biological Treatment Processes	4	640	640	400	600							\$329,360.00
	4.4 Structural Design							\$40,000.00					\$40,000.00
	4.5 Electrical and Instrumentation & Control System Design	4	20	20		30					\$126,045.00		\$136,755.00
	4.6 Administrative Building Modification	1	2	10	30	20				\$14,805.00			\$22,655.00
	4.7 Preparation of Specifications	8	100	120	240	80							\$75,920.00
	4.8 Deliverables and Progress Review Meetings	4	40	40	40	120	20					\$2,500.00	\$35,460.00
	4.9 Construction Cost Estimate	8	20	20	60								\$15,520.00
	Sub-total Task 4	37	1362	1410	1282	1570	20	\$40,000.00		\$14,805.00	\$126,045.00	\$2,500.00	\$981,030.00
Task 5	SRF Construction Loan Application												
	5.1 Request for Inclusion (RFI) (FDEP Form 62-503_200(30)_RFI	2	8	8	4	4	2						\$4,120.00
	5.2 SRF Construction Loan Planning Documents	10	80	40	40	120	4				\$27,200.00	\$400.00	\$67,940.00
	5.3 SRF Construction Loan Application	8	40		40		4						\$13,760.00
	Sub-total Task 5	20	128	48	84	124	10		\$0.00		\$27,200.00	\$400.00	\$85,820.00
Total (Task 1- Task 5)		99	1966	1762	1836	2032	54	\$55,000.00	\$44,609.50	\$14,805.00	\$235,685.00	\$4,400.00	\$1,401,339.50



City of PALM COAST

Finance Department
Budget & Procurement Office

160 Lake Avenue
Palm Coast, FL 32164
386-986-3730

NOTICE OF INTENT TO AWARD

Project: Wastewater Treatment Plant No. 2 Expansion - RFSQ-CD-20-10

Date: 11/18/2019

Appeal Deadline: Appeals must be Filed by 5:00 PM on 11/21/2019

Firm	Points
CPH, Inc.	95

The intent of the City of Palm Coast is to award Wastewater Treatment Plant No. 2 Expansion to CPH, Inc.

For questions regarding the NOIT please contact project coordinator @palmcoastgov.com.

Bid protests arising under City Bidding Documents or Procedures shall be resolved under the City of Palm Coast Central Service Division's Bid Protest procedures.

A proposer may protest matters involving the award of this Bid within three (3) business days from the posting of this recommendation to award. Failure to protest to the City's Administrative Services and Economic Development Director, Beau Falgout (bfalgout@palmcoastgov.com) shall constitute a waiver of the protest proceedings.





RFSQ-CD-20-10 - Wastewater Treatment Plant No. 2 Expansion

Project Overview

Project Details	
Reference ID	RFSQ-CD-20-10
Project Name	Wastewater Treatment Plant No. 2 Expansion
Project Owner	Kelly Downey
Project Type	RFSQ
Department	Procurement
Budget	\$0.00 - \$0.00
Project Description	City of Palm Coast 160 Lake Avenue Palm Coast, FL 32164 This Request for Statement of Qualifications is issued for the purpose of evaluating and selecting professional engineering consultant services for the design of the expansion of the City's Wastewater Treatment Facility No. 2 from its current



	capacity of 2.0 MGD to a capacity of 4.0 MGD.
Open Date	Oct 23, 2019 8:00 AM EDT
Intent to Bid Due	Nov 14, 2019 2:00 PM EST
Close Date	Nov 14, 2019 2:00 PM EST

Awarded Suppliers	Reason	Score
CPH, Inc.		95 pts

Seal status

Requested Information	Unsealed on	Unsealed by
Proposal	Nov 14, 2019 2:01 PM EST	Kelly Downey
Forms 1 -4	Nov 14, 2019 2:01 PM EST	Kelly Downey



Submissions

Supplier	Date Submitted	Name	Email	Confirmation Code
CPH, Inc.	Nov 14, 2019 11:27 AM EST	Nik Jindal	info@cphcorp.com	NjMyOTc=

Project Criteria

Criteria	Points	Description
Required Forms	Pass/Fail	Forms 1 - 4
Proposal - Admin Review	Pass/Fail	completed as requested
Experience with Similar Projects	50 pts	Below Average 10 Points Average 20 Points Above Average 30 Points Well Above Average 40 Points Outstanding 50 Points
Experience Providing Engineering Consultant Services to the City of Palm Coast	10 pts	Below Average 2 Points Average 4 Points Above Average 6 Points Well Above Average 8 Points Outstanding 10 Points
Location of responding firm office	10 pts	Outside of the state of Florida 0 Points Within the state of Florida 2 Points Within 60 Miles of Palm Coast 7 Points Within Flagler County, FL



		10 Points
Project Team Qualifications	20 pts	Below Average 4 Points Average 8 Points Above Average 12 Points Well Above Average 16 Points Outstanding 20 Points
Company Resources and Availability	10 pts	Below Average 2 Points Average 4 Points Above Average 6 Points Well Above Average 8 Points Outstanding 10 Points
Total	100 pts	



Scoring Summary

Active Submissions

	Total	Required Forms	Proposal - Admin Review	Experience with Similar Projects	Experience Providing Engineering Consultant Services to the City of Palm Coast
Supplier	/ 100 pts	Pass/Fail	Pass/Fail	/ 50 pts	/ 10 pts
CPH, Inc.	95 pts	Pass	Pass	50 pts	10 pts

	Location of responding firm office	Project Team Qualifications	Company Resources and Availability
Supplier	/ 10 pts	/ 20 pts	/ 10 pts
PH, Inc.	10 pts	18 pts	7 pts

