

June 29, 2021

Via E-mail at [dung.vo@FloridaDEP.gov](mailto:dung.vo@FloridaDEP.gov)

Mr. Vo Dung  
Florida Department of Environmental Protection  
8800 Baymeadows Way  
Jacksonville, FL 32256

**RE: Taylor Coastal Water Systems Improvements Project**

Dear Mr. Dung:

Please find enclosed the following:

- ***FDEP "Application for a Specific Permit to Construct PWS Components"***
- ***Preliminary Design Report***

The above attachments are preliminary documentation for the above referenced project. Final design plans and specifications are being developed.

If you have any questions, please give me a call at 813.770.9470

Sincerely,  
**DEWBERRY ENGINEERS, INC.**

  
Travis Covington, P.E.  
Project Engineer

Enclosures

cc: Mr. William Menadier, P.E., Senior Project Manager, PRI (via email at [wmenadier@dewberry.com](mailto:wmenadier@dewberry.com))  
Ms. Lynette Senter, District Manager, Taylor Coastal Water and Sewer District (via email at [tcwsd@fairpoint.net](mailto:tcwsd@fairpoint.net))



# APPLICATION FOR A SPECIFIC PERMIT TO CONSTRUCT PWS COMPONENTS

See page 4 for instructions.

## I. General Project Information

A. Name of Project: \_\_\_\_\_

B. Description of Project and Its Purpose: \_\_\_\_\_

C. Does project create a "new system" as described under subsection 62-555.525(1), F.A.C.? Yes, and a completed copy of Form 62-555.900(20), New Water System Capacity Development Financial and Managerial Operations Plan, is attached. No.

D. Location of Project

1. County Where Project Located: \_\_\_\_\_

2. Description of Project Location: \_\_\_\_\_

3. Latitude and Longitude of Each New Treatment Plant and Each New Raw Water Source (attach additional sheets if necessary):

Name of New Treatment Plant or Raw Water Source	Latitude	Longitude
	° ' "N	° ' "W
	° ' "N	° ' "W
	° ' "N	° ' "W
	° ' "N	° ' "W
	° ' N	° ' "W

E. Estimate of Cost to Construct Project: \_\_\_\_\_

F. Estimate of Dates for Starting and Completing Construction of Project: \_\_\_\_\_

G. Applicant

PWS/Company Name:		PWS Identification No.:	
PWS Type:*	Community	Non-Transient Non-Community	Transient Non-Community
Contact Person:		Contact Person's Title:	
Contact Person's Mailing Address:			
City:		State:	Zip Code:
Contact Person's Telephone Number:		Contact Person's Fax Number:	
Contact Person's E-Mail Address:			

\* This information is required only if the applicant is a public water system (PWS).

H. Public Water System (PWS) Supplying Water to Project

PWS Name:		PWS Identification No.:	
PWS Type:	Community	Non-Transient Non-Community	Transient Non-Community
PWS Owner:		Consecutive	
Contact Person:		Contact Person's Title:	
Contact Person's Mailing Address:			
City:		State:	Zip Code:
Contact Person's Telephone Number:		Contact Person's Fax Number:	
Contact Person's E-Mail Address:			

# APPLICATION FOR A SPECIFIC PERMIT TO CONSTRUCT PWS COMPONENTS

Project Name: Taylor Coastal Water Systems Improvements Project	Applicant: TCWSD
---	------------------

**I. Public Water System (PWS) that Will Own Project after It Is Placed into Permanent Operation**

PWS Name: TCWSD		PWS Identification No.: * 2624165	
PWS Type: * <input checked="" type="checkbox"/> Community <input type="checkbox"/> Non-Transient Non-Community <input type="checkbox"/> Transient Non-Community <input type="checkbox"/> Consecutive			
PWS Owner: TCWSD			
Contact Person: Lynette Senter		Contact Person's Title: District Manager	
Contact Person's Mailing Address: 18820 Beach Rd			
City: Perry		State: FL	Zip Code: 32348
Contact Person's Telephone Number: (850) 578-3043		Contact Person's Fax Number:	
Contact Person's E-Mail Address: tcwspd@fairpoint.net			

\* This information is required only if the owner/operator is an existing PWS.

**J. Professional Engineer(s) or Other Person(s) in Responsible Charge of Designing Project\***

Company Name: Dewberry Engineers, Inc.			
Designer(s): Travis Covington		Title(s) of Designer(s): P. E.	
Qualifications of Designer(s):			
<input checked="" type="checkbox"/> Professional Engineer(s) Licensed in Florida – License Number(s): 89637			
<input type="checkbox"/> Public Officer(s) Employed by State, County, Municipal, or Other Governmental Unit of State†			
<input type="checkbox"/> Plumbing Contractor(s) Licensed in Florida – License Number(s): ^			
Mailing Address of Designer(s): 654 SE Baya Drive			
City: Lake		State: City	Zip Code: 32025
Telephone Number of Designer(s): 813-770-9470		Fax Number of Designer(s):	
E-Mail Address(es) of Designer(s): tcovington@dewberry.com			

\* Except as noted in paragraphs 62-555.520(3)(a) and (b), F.A.C., projects shall be designed under the responsible charge of one or more professional engineers licensed in Florida.

† Attach a detailed construction cost estimate showing that the cost to construct this project is \$10,000 or less.

^ Attach documentation showing that this project will be installed by the plumbing contractor(s) designing this project, documentation showing that this project involves a public water system serving a single property and fewer than 250 fixture units, and a detailed construction cost estimate showing that the cost to construct this project is \$50,000 or less.

## II Certifications

**A. Certification by Applicant**

I am duly authorized to sign this application on behalf of the applicant identified in Part I.G of this application. I certify that, to the best of my knowledge and belief, this project complies with Chapter 62-555, F.A.C., and provides assurance of compliance with Chapter 62-550, F.A.C. I also certify that construction of this project has not begun yet.

	06/29/2021	Travis Covington	Project Engineer
Signature and Date		Printed or Typed Name	Title

**B. Certification by PWS Supplying Water to Project**

I am duly authorized to sign this application on behalf of the PWS identified in Part I.H of this application. I certify that said PWS will supply the water necessary to meet the design water demands for this project. I certify that, to the best of my knowledge and belief, said PWS's connection to this project will not cause said PWS to be, or contribute to said PWS being, in noncompliance with Chapter 62-550 or 62-555, F.A.C. I also certify that said PWS has reviewed the preliminary design report or drawings, specifications, and design data for this project and that said PWS considers the connection(s) between this project and said PWS acceptable as designed.

- Name(s) of Water Treatment Plant(s) to Which this Project Will Be Connected: TCWSD
- Total Permitted Maximum Day Operating Capacity of Plant(s), gpd: 120,000
- Total Maximum Day Flow at Plant(s) as Recorded on Monthly Operating Reports During Past 12 Months, gpd: 81,900

	06/17/2021	Lynette Senter	District Manager
Signature and Date		Printed or Typed Name	Title

# APPLICATION FOR A SPECIFIC PERMIT TO CONSTRUCT PWS COMPONENTS

Project Name: Taylor Coastal Water Systems Improvements Project	Applicant: TCWSD
---	------------------

**C. Certification by PWS that Will Own Project after It Is Placed into Permanent Operation**

I am duly authorized to sign this application on behalf of the PWS identified in Part I.I of this application. I certify that said PWS will own this project after it is placed into permanent operation. I also certify that said PWS has reviewed the preliminary design report or drawings, specifications, and design data for this project and that said PWS considers this project acceptable as designed.

<i>Lynette Senter</i>	06/17/2021	Lynette Senter	District Manager
Signature and Date		Printed or Typed Name	Title

**D. Certification by Professional Engineer(s) in Responsible Charge of Designing Project\***

I, the undersigned professional engineer licensed in Florida, am in responsible charge of preparing the preliminary design report or drawings, specifications, and design data for this project. I certify that, to the best of my knowledge and belief, the design of this project complies with Chapter 62-555, F.A.C., and provides assurance of compliance with Chapter 62-550, F.A.C.

Signature, Seal, and Date: 
Affix Seal 
Printed/Typed Name: Travis Covington
License Number: 89637
Portion of Engineering Document(s) for Which Responsible: All Design

Signature, Seal, and Date:
Affix Seal
Printed/Typed Name:
License Number:
Portion of Engineering Document(s) for Which Responsible:

Signature, Seal, and Date:
Affix Seal
Printed/Typed Name:
License Number:
Portion of Engineering Document(s) for Which Responsible:

Signature, Seal, and Date:
Affix Seal
Printed/Typed Name:
License Number:
Portion of Engineering Document(s) for Which Responsible:

*\* Except as noted in paragraphs 62-555.520(3) (a) and (b), F.A.C., projects shall be designed under the responsible charge of one or more professional engineers (PEs) licensed in Florida. If this project is being designed under the responsible charge of one or more PEs licensed in Florida, Part II.D of this application shall be completed by the PE(s) in responsible charge. If this project is not being designed under the responsible charge of one or more PEs licensed in Florida, Part II.D does not have to be completed.*

## APPLICATION FOR A SPECIFIC PERMIT TO CONSTRUCT PWS COMPONENTS

INSTRUCTIONS: This application shall be completed and submitted by persons proposing to construct or alter public water system components unless such proposed construction or alteration is permitted under the Department of Environmental Protection's (DEP's) "General Permit for Construction of Water Main Extensions for Public Water Systems," in which case Form 62-555.900(7) is to be completed and submitted, or under the DEP's "General Permit for Construction of Lead or Copper Corrosion Control, or Iron or Manganese Sequestration, Treatment Facilities for Small or Medium Public Water Systems," in which case Form 62-555.900(18) is to be completed and submitted. Complete and submit one copy of this application to the appropriate DEP District Office or Approved County Health Department (ACHD) along with payment of the proper application processing fee and one copy of the following information:

- either a preliminary design report or drawings, specifications, and design data (the preliminary design report or drawings, specifications, and design data shall contain all pertinent information required under subsection 62-555.520(4), F.A.C.); and
- the Florida Public Service Commission (FPSC) certificate of authorization to provide water service if the project involves construction of a new public water system subject to the jurisdiction of the FPSC.

All information provided on this application shall be typed or printed in ink. Application processing fees are listed in paragraph 62-4.050(4) (n), F.A.C. Checks for application processing fees shall be made payable to the Department of Environmental Protection or to the appropriate ACHD. Preliminary design reports, drawings, specifications, and design data prepared under the responsible charge of one or more professional engineers licensed in Florida shall be signed, sealed, and dated by the professional engineer(s) in responsible charge. **NOTE THAT A SEPARATE APPLICATION AND A SEPARATE APPLICATION PROCESSING FEE ARE REQUIRED FOR EACH NON-CONTIGUOUS PROJECT.\***

*\* Non-contiguous projects are projects that are neither interconnected nor located nearby one another (i.e., on the same site, on adjacent streets, or in the same neighborhood).*

# **PRELIMINARY DESIGN REPORT**

for the

# **WATER SYSTEMS IMPROVEMENTS PROJECT**

Prepared for:

**Taylor Coastal Water and Sewer District  
Taylor County, Florida**

Project No.: 50083283

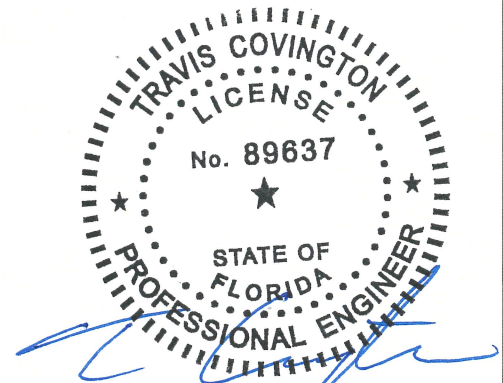
June 2021

Prepared by:



# **Dewberry<sup>®</sup>**

654 SE BAYA DRIVE  
LAKE CITY, FL 32025  
PHONE: 386.361.2136



Travis Covington, P.E.  
FL Registration No.: 89637

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## **1.0 PROJECT DETAILS**

### **1.1 LOCATION**

Taylor Coastal Water and Sewer District (TCWSD), is located in coastal southwest Taylor County, Florida. TCWSD is located at 29°51'4"N and 83°35'36"W. TCWSD is a rural community located approximately 20 miles south of the City of Perry and 20 miles northwest of the City of Steinhatchee. TCWSD encompasses approximately 6.2 miles of the Taylor County coastline. This area extends from Dekle Beach on the north end to Fish Island on the south end and is bounded on the west by the Gulf of Mexico and on the east approximately by Beach Road with some services along the Cedar Island East community. The project area is inhabited by approximately 1,330 residents, the majority of which are seasonal. TCWSD is located within Township 07 South, Range 07 East, Sections 22, 23, 26, 27, 31, 35, and 36, as well as Township 08 South, Range 07 East, Sections 01, 06, 07, 12, 13, and 18.

### **1.2 PROPOSED ENHANCEMENTS**

TCWSD is proposing to construct new water treatment components to replace the existing system currently used. The major components of the new facility will address storage capacity, failing infrastructure, and water production. These components include a new 60,000-gallon ground storage tank, new booster pumps, a new 10,000-gallon hydropneumatic tank, new chemical feed systems, new generators, and associated buildings. The project also proposes to drill a new 8" well to accompany the existing 8" well. This new system will tie into the existing distribution lines that service TCWSD. Construction cost for the project is estimated at \$3,294,243.00.

## **2.0 EXISTING FACILITIES**

### **2.1 EXISTING WATER SOURCES**

TCWSD's current system consists of three wells: one 4" diameter, one 6" diameter, and one 8" diameter. The capacities of the wells are 90gpm, 180gpm, and 240gpm respectively. The 4" well is no longer in use and the 6" well is rarely used due to the presence of iron bacteria. The 8" well serves as the primary water source.

### **2.2 EXISTING WATER TREATMENT PLANT**

The current water treatment plant consists of a disinfection system, hydro-pneumatic tanks, a booster pump station, and a pressurized water distribution system. Groundwater is treated with polymer for iron sequestration (3gpd capacity) and is then chlorinated with hypochlorite (30gpd capacity pump). The treated water enters a 10,000-gallon hydropneumatic tank before entering the distribution system. The on/off pressure for the hydropneumatic tank is 42/62 psi. The existing water system also has a booster pump station located at another site separate of the treatment plant. This site consists of a

5,000-gallon storage tank and a 5,000-gallon hydropneumatic tank. The on/off pressure for this tank is also 42/62 psi. Currently, the booster station does not work properly. The pump will not keep prime and the hydropneumatic tank does not maintain system pressures.

## **3.0 WATER USAGE DATA**

### **3.1 SERVICE AREA**

TCWSD encompasses approximately 6.2 miles of coastline in Taylor County. This area extends from Dekle Beach on the north end to Fish Island on the south end and is bounded on the west by the Gulf of Mexico and on the east approximately by Beach Road with some services along the Cedar Island East community. Refer to Figure A (TCWSD Service Area Map). The area experiences high seasonal increases in usage and data was used from the peak months of April – September. As of the year 2020, TCWSD services approximately 1,330 residents, and the average number of residential connections was 532. Currently there are no commercial or industrial connections. Projections out to the year 2041 put the number of residential connections at 669 and the number of commercial/industrial connections at 4. No fire protection is being provided with the system upgrades and there are no proposed connections to neighboring public water systems.

### **3.2 HISTORICAL TRENDS**

TCWSD's usage is seasonal and is highest during the spring and summer months of April – September. Data trends and historical averages were based on this 6-month period. From the period of 2016 thru 2020, the average number of residential connections increased from 481 in 2016, to 532 in 2020. During this period, the residential water use average day ranged from .0342 mgd to .0395 mgd. The uniform residential per capita use average during this period was 28.8 gpcd. The area has seen some growth over the years, albeit somewhat slow due to its being located within a high hazard coastal zone.

### **3.3 WATER DEMAND & SYSTEM PRESSURES**

Presently, Average Daily Flow (ADF) is 53,000 gpd and the Max Daily Flow (MDF) is 82,600 gpd. Peak Hourly Flow (PHF) is 148 gpm and was calculated conservatively using a peaking factor of 4.0. Projected design flows were based on population growth estimates. A 1.1 % yearly projected growth was used conservatively to ensure future system capacity is available, and a per capita use of 55 gpcd was used conservatively to account for potential high seasonal uses. Using this projected growth, Design Average Daily Flow (DADF) is 120,736 gpd, Design Max Daily Flow (DMDF) is 198,007 gpd, and Design Peak Hourly Flow is 336 gpm. See Appendix A for system calculations.

Currently the water service pressure range is between 42psi - 60psi and the design water service pressure range will be between 50psi – 60psi.

## **4.0 NEW SOURCE FACILITIES**

### **4.1 LOCATION**

The new well is proposed to be drilled within an existing Wellhead Protection Area owned by TCWSD that is adjacent to the parcel where existing well are located. The parcel ID where the new well is to be located is 06642-510. Refer to figure B (Well Location Map). This location is not within a flood zone and would be economically feasible to construct and connect to the new proposed plant.

### **4.2 DESIGN & CONSTRUCTION REQUIREMENTS**

The new well will be designed & constructed to meet or exceed requirements set forth in Chapter 62-532, F.A.C.

### **4.3 SANITARY HAZARDS**

There are no moderate risk sanitary hazards located within 50 feet of the new well site, nor are there any high risk sanitary hazards located within 100 feet of the new well site. The new well will meet all the provisions of Chapter 62-555.312 F.AC.

### **4.4 DESIGN CAPACITIES**

Per Chapter 62-555.315 F.A.C., total well capacity shall equal the system's maximum-day water demand and shall equal at least the design average daily water demand with the largest producing well out of service. The DMDF for the new system is 138 gpm and the DADF is 84 gpm. The new well will be designed with a capacity of 240 gpm, which matches the capacity of the existing well. Total system capacity with both wells in operation will equal 480 gpm. The new well will serve as a primary well and the existing well will serve as secondary (stand-by).

## **5.0 NEW TREATMENT FACILITIES**

### **5.1 DESCRIPTION**

Water treatment for the new system is proposed by way of chlorine injection. Taylor Coastal maintains a chlorine residual of approximately 0.85 mg/L at the plant and remote values of 0.66 mg/L. The plant is planned to operate between 168 gpm and 336 gpm.

$$\text{lbs/day chlorine} = (0.012^*) \times (168 \text{ gpm}) \times (2.0 \text{ ppm}) = 4.032 \text{ lbs/day}$$

$$\text{lbs/day chlorine} = (0.012^*) \times (336 \text{ gpm}) \times (2.0 \text{ ppm}) = 8.064 \text{ lbs/day}$$

The chlorination system will operate between the range of 4 - 9 lb/day. Since this rate is very low, tablet chlorination is recommended.

## 5.2 DESIGN & CONSTRUCTION REQUIREMENTS

The chlorination system will be designed & constructed to meet or exceed any and all requirements set forth in Rule 62-555.320(13), F.A.C. Final construction plans and specifications will document specific manufacturer and model to be used.

## 6.0 NEW PUMPING FACILITIES

### 6.1 DESCRIPTION

Based on FDEP guidelines, the pumps must be able to meet PHF plus fire demand, and according to the Ten State Standards, also meet PHF with the largest pump out of service. Since no fire flow is being provided, a PHF of 336 gpm was used for pump sizing. Based on these values, the system will include (3) minimum 168 gpm high service pumps.

### 6.2 DESIGN & CONSTRUCTION REQUIREMENTS

High service pumps will be selected which meet or exceed any and all requirements set forth in Rule 62-555.330, F.A.C. Final construction plans and specifications will document specific pump models to be used.

## 7.0 NEW STORAGE FACILITIES

### 7.1 DESCRIPTION & LOCATION

The proposed project will include one 10,000-gallon hydropneumatic tank to maintain system pressures and one 60,000-gallon ground storage tank. Storage capacity for the ground storage tank was calculated based off Section 62-555.320, F.A.C. as follows:

$$\begin{aligned} \text{Method 1: Storage} &= (25\% \times \text{DMDF}) + \text{Fire Flow} \\ &= (0.25 \times 198,007 \text{ gallons}) + (0 \text{ gallons}) \\ &= 49,502 \text{ gallons} \end{aligned}$$

$$\begin{aligned} \text{Method 2: Storage} &= (\text{PHF} - \text{Total Production Capacity}) \times 4 \text{ hours} \\ &= (336 \text{ gpm} - 240 \text{ gpm}) \times 4 \text{ hours} \times 60 \text{ mins/hr} \\ &= 23,040 \text{ gallons} \end{aligned}$$

The storage facilities will be located on either Parcel ID: 06643-150 or 06643-125

### 7.2 DESIGN & CONSTRUCTION REQUIREMENTS

The storage tanks will be designed & constructed to meet or exceed any and all requirements set forth in Rule 62-555.330, F.A.C. Final construction plans and specifications will document specific tank type and style to be used.

## **8.0 PROJECT INFORMATION**

### **8.1 SITE PLAN**

See Figure C (Preliminary Site Plan).

### **8.2 FLOOD RISK/CONTAMINATION MITIGATION**

The parcels where construction is to occur lie within Zone X Floodplains. The majority of the area is classified as “area of minimal flood hazard”, and the other portion are classified as “0.2 pct annual chance flood hazard”. Efforts will be made to construct all enhancements within the areas with minimal flood hazard.

### **8.3 SECURITY MEASURES**

The new treatment plant and pumping facilities will be enclosed with security fencing and all equipment will be housed in lockable buildings or enclosures. The facility will adhere to requirements set forth in Rule 62-555.320 (5), F.AC..

### **8.4 MATERIALS AND COMPONENTS**

All materials used for the new facilities will conform to all applicable standards, regulations, and requirements of the FDEP. Final construction plans and specifications will document specific material and components to be used.

All new or altered aboveground piping will be color coded and labeled as recommended in Section 2.14 of *Recommended Standards for Water Works* as incorporated into Rule 62-555.330, F.A.C.

### **8.5 ELECTRICAL & CONTROL SYSTEMS**

The systems will be powered thru the existing power at the site. Emergency standby power will be supplied via an on-site generator, which conforms to requirements set forth in Rule 62-555.320 (14), F.A.C..

Control systems will be designed to requirements set for in subparagraphs, subsection, sub-subparagraph, and paragraph 62-555.320(8)(a)3., 62-555.320(11), 62-555.320(13)(a)9., 62-555.320(13)(a)10.c., 62-555.320(13)(b)12., and 62-555.320(14)(f), F.A.C.

### **8.6 METERING & SAMPLING**

The new water treatment facility will provide a finished-drinking water meter and a sampling tap per subsection 62-55.320(16) and (17), F.A.C.

## 8.7 OPERATION OF EXISTING FACILITIES DURING CONSTRUCTION

The existing water plant will operate uninterrupted during construction of the new water treatment plant facilities. Only when the new plant is operational, will the existing treatment plant be shut down and equipment/facilities removed.

# **FIGURE A**

TCWSD Service Area Map



Spring Warrior Camp

Dekle Beach

Ezell Beach


Keaton Beach

Cedar Island

Dark Island

Fish Creek

# TAYLOR COASTAL WATER & SEWER DISTRICT

 Water and Sewer District Service Area



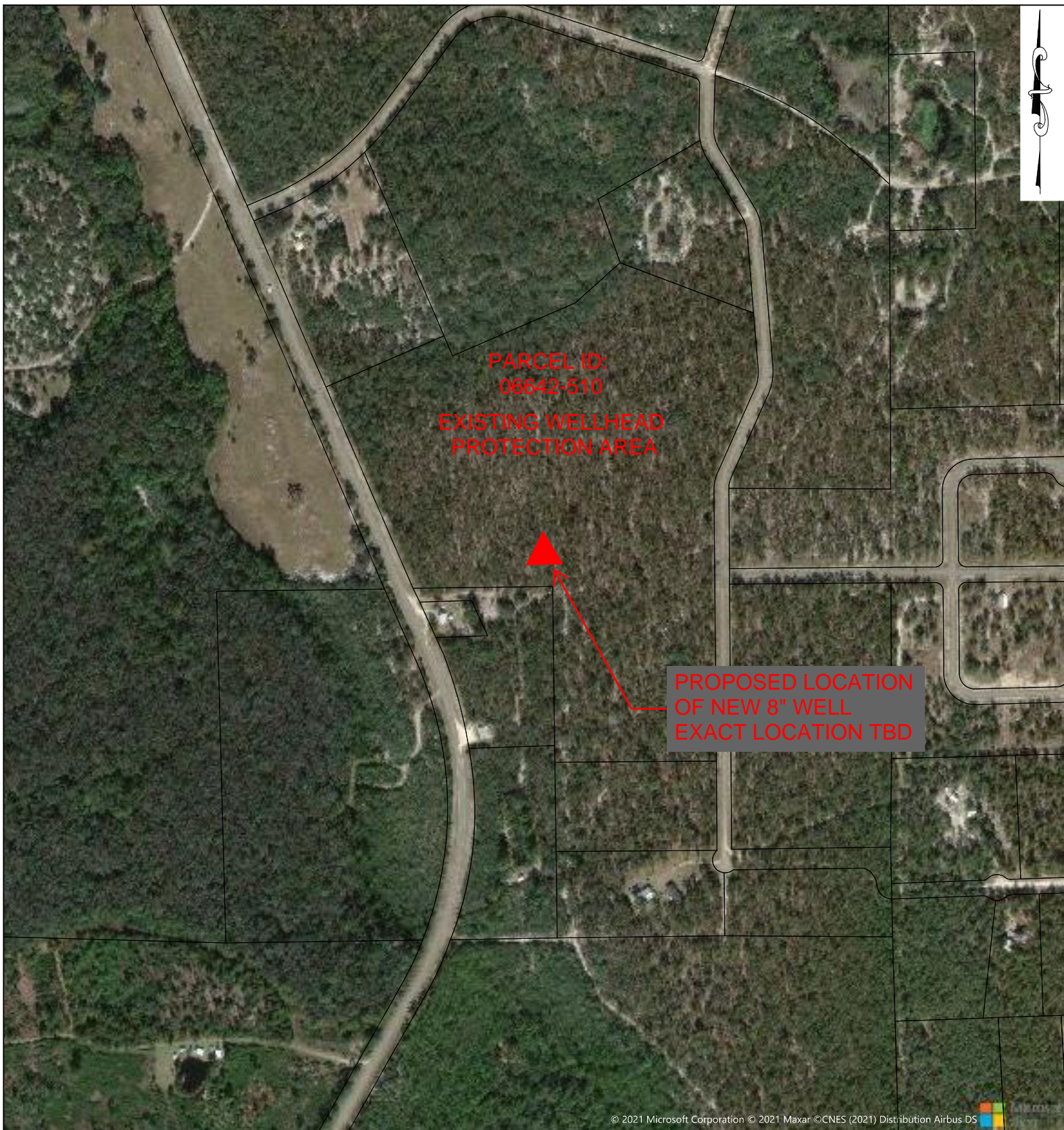
NOTE: This map was prepared by the Suwannee River Water Management District for informational purposes only and does not conform to National Map Accuracy Standards. More information regarding the data portrayed on this map can be found by contacting the Administration and Operations Department.





# **FIGURE B**

Well Location Map



© 2021 Microsoft Corporation © 2021 Maxar ©CNES (2021) Distribution Airbus DS

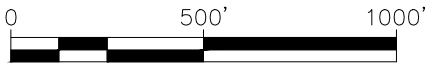


FIGURE B - WELL LOCATION MAP

TAYLOR COASTAL WATER SYSTEMS  
IMPROVMENT PROJECT  
TAYLOR COUNTY, FLORIDA

Project No.:  
Sheet No.:

# **FIGURE C**

Preliminary Site Plan

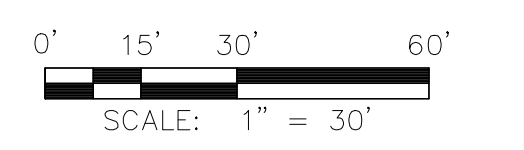
TAYLOR COASTAL WATER  
SYSTEMS IMPROVEMENTS  
PROJECT  
TAYLOR COUNTY, FLORIDA

SEAL

PRELIMINARY DOCUMENTS  
NOT FOR CONSTRUCTION

TRAVIS L. COVINGTON  
89637  
EB # 8794

SCALE



REVISIONS

NO.	DESCRIPTION	DATE

DRAWN BY \_\_\_\_\_ TLC  
APPROVED BY \_\_\_\_\_  
CHECKED BY \_\_\_\_\_  
DATE \_\_\_\_\_ 06/17/2021  
TITLE

**PRELIMINARY  
SITE PLAN**

PROJECT NO. 50083283

SHEET NO. **1** OF



**NOTES:**  
ALL EQUIPMENT AND STRUCTURE LOCATIONS ARE APPROXIMATE. FINAL DESIGN & CONSTRUCTION PLANS WILL SHOW ULTIMATE LOCATIONS.  
DRAWING IS SCALED TO 1" = 30FT, BUT STRUCTURES AND BUILDINGS ARE NOT DRAWN TO SCALE  
SUBJECT TO CHANGE PENDING REVIEW

April 17, 2020 (06/09/20, 10/17/20)  
S:\05202003 - Taylor Coastal Water Systems Improvements\DWG\05202003 - Preliminary Site Plan.dwg

# **APPENDIX A**

## System Calculations

# TAYLOR COASTAL WATER AND SEWER DISTRICT SYSTEM IMPROVEMENTS SYSTEM CALCULATIONS

## WATER DEMAND

### Population Based Estimates

Existing Estimated Population (2020) = 1,330  
Assuming a 1.1% increase through the year 2041,  
 $(1.011)^{21} (1,330) = 1,674$

(Residential Users) **Average Daily Flow** = Population x 55 gpcd = gpd  
ADF residential =  $1,674 \times 55$  gpcd = **92,070 gpd**

(Commercial Users) **Average Daily Flow** = No. of Commercial users x 1,250 gal/user = gpd  
ADF commercial =  $(4.25) \times 1,250 =$  **5,313 gpd**.

(Recreation & Irrigation Users) **Average Daily Flow** = estimated at 500 gal/day  
ADF rec & irrigation = **500 gpd**.

(Fire Hydrants) **Average Daily Flow** = estimated at 1000 gal/day  
ADF hydrants = **1000 gpd**

(Water Utility) **Average Daily Flow** = 10% of total ADF residential, ADF commercial, and ADF hydrants  
ADF utility =  $(.10)(92,070 \text{ gpd} + 5,313 \text{ gpd} + 500 \text{ gpd} + 1000 \text{ gpd}) =$  **9888 gpd**

(Water Losses) **Average Daily Flow** = 11% of total ADF residential, ADF commercial, ADF hydrants, and ADF utility  
ADF losses =  $(.11)(92,070 \text{ gpd} + 5,313 \text{ gpd} + 500 \text{ gpd} + 1000 \text{ gpd} + 9888 \text{ gpd}) =$  **11965 gpd**

**Average Daily Flow** = ADF residential + ADF commercial + ADF rec & irrigation + ADF hydrants + ADF utility + ADF losses  
**ADF** =  $92,070 \text{ gpd} + 5,313 \text{ gpd} + 500 \text{ gpd} + 1000 \text{ gpd} + 9888 \text{ gpd} =$  **120,736 gpd or 84 gpm**

**Maximum Daily Flow** = ADF x PF  
where PF = Max Monthly Flow/5 Year Average Flow =  $2,457,000 \text{ gal} / 1,498,850 \text{ gal} = 1.64$   
MDF =  $120,736 \text{ gpd} \times 1.64 =$  **198,007 gpd or 138 gpm**

**Peak Hourly Flow** = ADF X peak factor of 4.0 (conservative)  
**PHF** =  $84 \text{ gpm} \times 4.0 =$  **336 gpm**