

Englewood Water District

REUSE SYSTEM ANALYSIS
AND MASTER PLAN UPDATE



Prepared by:

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July 2022
Fort Myers, Florida
148896004

Prepared for:

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Englewood, Florida 34223**

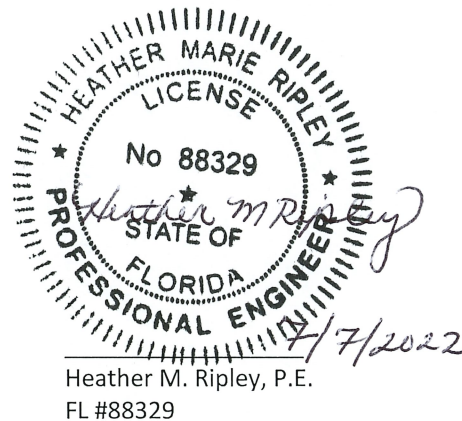
Englewood Water District Reuse System Analysis and Master Plan Update

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1. INTRODUCTION

The Englewood Water District (EWD) Utility Master Plan was completed in 2017 by HDR (2017 Utility Master Plan). The 2017 Utility Master Plan is a combined potable water, wastewater, and reuse/reclaimed plan that evaluated pre-2015 populations, flows and EWD water, wastewater, and reclaimed systems. The 2017 Utility Master Plan identified critical improvement projects and needs for the next 20 years through 2036. The EWD is in the process of updating the 2017 Utility Master Plan by addressing each system (water, wastewater, and reclaimed water systems) as separate master plans. Kimley-Horn and Associates, Inc. (Kimley-Horn) recently completed an update to the wastewater section of the 2017 Utility Master Plan in July 2021. As recommended in the updated wastewater master plan, a new north water reclamation facility (North WRF) is being planned for and is anticipated to be constructed within five years. The focus of this study is on the reclaimed water system and provides an update to the 2017 Utility Master Plan.

In accordance with Task Order No. 22-002 under Agreement No. 2017-001 dated February 8, 2017 (Reuse Master Plan Update), Kimley-Horn has been authorized by the EWD to evaluate the reuse (reclaimed) water system, irrigation pumps at the reclaimed pond, and the effluent pumping station at the South Water Reclamation Facility (South WRF). This analysis will assess reclaimed water availability and the ability to supply customer demands. It will also assess how to reduce pressure at the effluent pump station with the addition of the North WRF and how to enhance reclaimed storage capacity.

The Analysis includes five tasks, (1) Update Populations and Flows, (2) Site Evaluations, (3) Hydraulic and Capacity Assessments, (4) Recommended Improvements, and (5) an Engineering Report.

1.1 Background

In 1959, the EWD was created as a political sub-division of the State of Florida under Chapter 2004-439. The EWD owns and operates water, wastewater, and reclaimed water infrastructure and facilities and provides service to the unincorporated areas of Englewood, Grove City, and Manasota Key in Sarasota County and Charlotte County. In 1994, EWD acquired the West Charlotte Utilities Wastewater Treatment Plant and provides reclaimed water to 22 customers within the EWD service area. In addition, EWD provides reclaimed service to Gran Paradiso located in Wellen Park in southwest Sarasota County.

The existing South WRF effluent pump station feeds one (1) onsite reclaimed storage tank, internal non-potable plant water, and the reclaimed distribution system. It also overflows to one (1) reclaimed pond. The reclaimed water can be pumped to:

- Reclaimed water customers
- Onsite storage
- Aquifer storage and recovery (ASR) well located onsite at the South WRF
- Deep injection well (DIW) located at the Holiday Ventures Lift Station (Holiday Ventures Property).

Figure 1 shows the existing EWD reclaimed water distribution system.

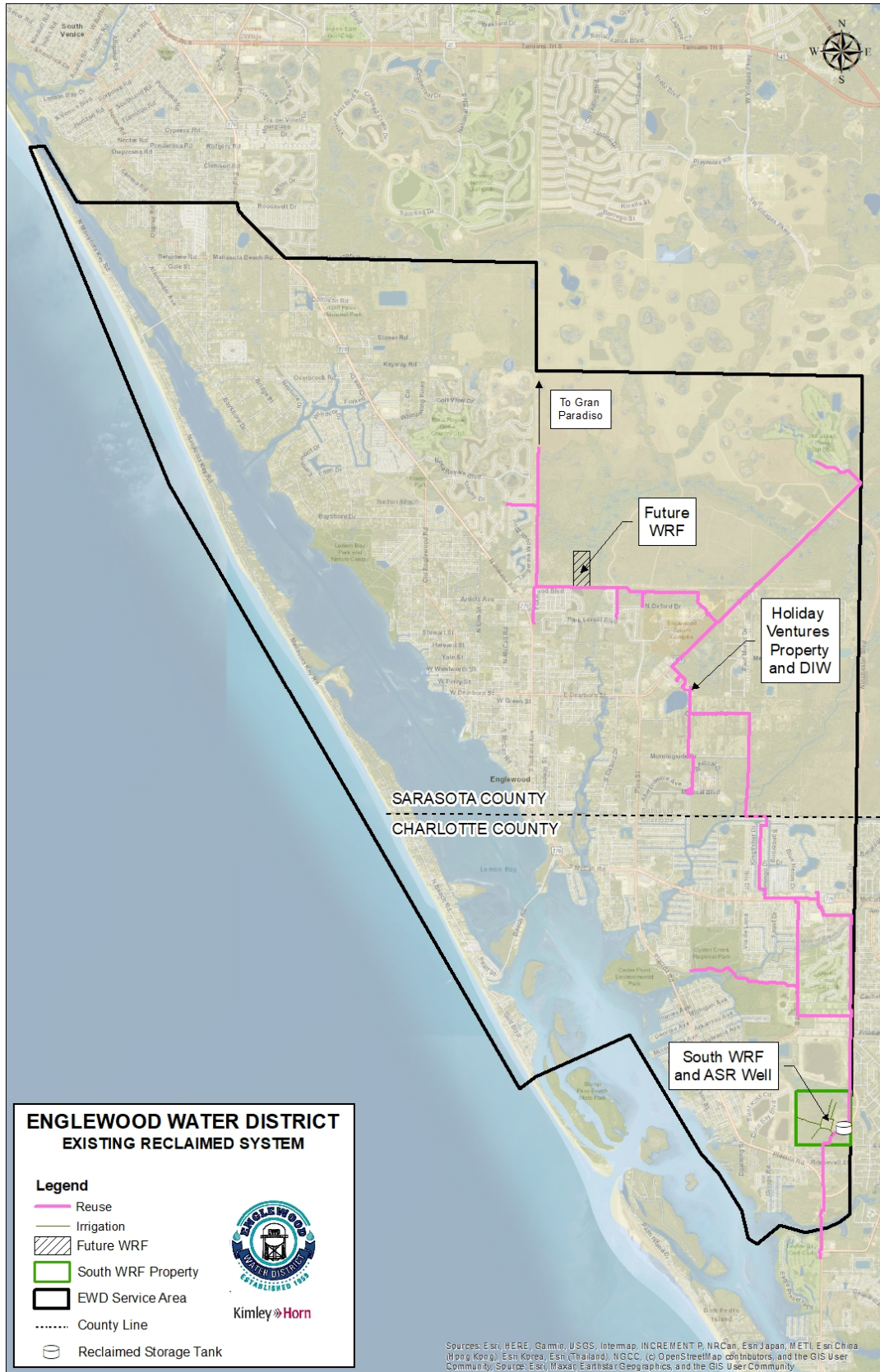


Figure 1: Existing Englewood Water District Reclaimed Distribution System

1.2 South Water Reclamation Facility and Permitting

The South WRF is located on 160 acres at 140 Telman Road in Charlotte County. The facility is an extended aeration domestic wastewater facility, that contains a headworks facility, pre- and post-headworks screening tanks, odor control, four (4) Davco package plants, three (3) tertiary filters, disinfection, sludge processing and a reclaimed water transmission and storage system. The South WRF onsite storage consists of two reject ponds with a combined volume of 5.2 Million Gallons (MG), a 3.6 MG reclaimed pond, a 1.0 MG reclaimed water storage tank, and a 1.50 million gallons per day (MGD) ASR well with wet weather capacity of 2.04 MGD.

The South WRF has a Florida Department of Environmental Protection (FDEP) operating permit (Permit No. FLA014126) for a permitted capacity of 3.0 MGD Annual Average Daily Flow (AADF).

For reclaimed water or disposal, the onsite ASR well or the offsite the Holiday Ventures Property DIW (2.94 MGD AADF permitted capacity) can be used. In addition, the reclaimed water can be land applied with a slow-rate public access system which has a permitted capacity of 4.2 MGD AADF.

1.3 South Water Reclamation Facility Effluent Pump Station and Reclaimed System

After the South WRF treats and disinfects the wastewater, the water flows from the chlorine contact tank to the effluent pump station or reject ponds. The effluent pump station has a wet well and three (3) 1,740 gpm vertical turbine pumps. Currently, two pumps run nonstop at full power; one pump runs automatically, and one runs manually. These pumps supply reclaimed water to the 1.0 MG reuse storage tank, internal non-potable plant water, and the reclaimed distribution system. The effluent pump station wet well overflows to the onsite reclaimed pond.

Per discussions with EWD operators, during the dry season, the reclaimed storage tank can be depleted within two days of filling when serving pressurized customers. When the reclaimed storage tank is full, typically during periods of wet weather, and the effluent pump station wet well reaches a set-point level, the water can be redirected to either the ASR well, the DIW at Holiday

Ventures Property, or it can overflow through an underground pipe from the effluent pump station to the reclaimed pond. The existing plant process is shown below in **Figure 2** and explained in **Table 1**.

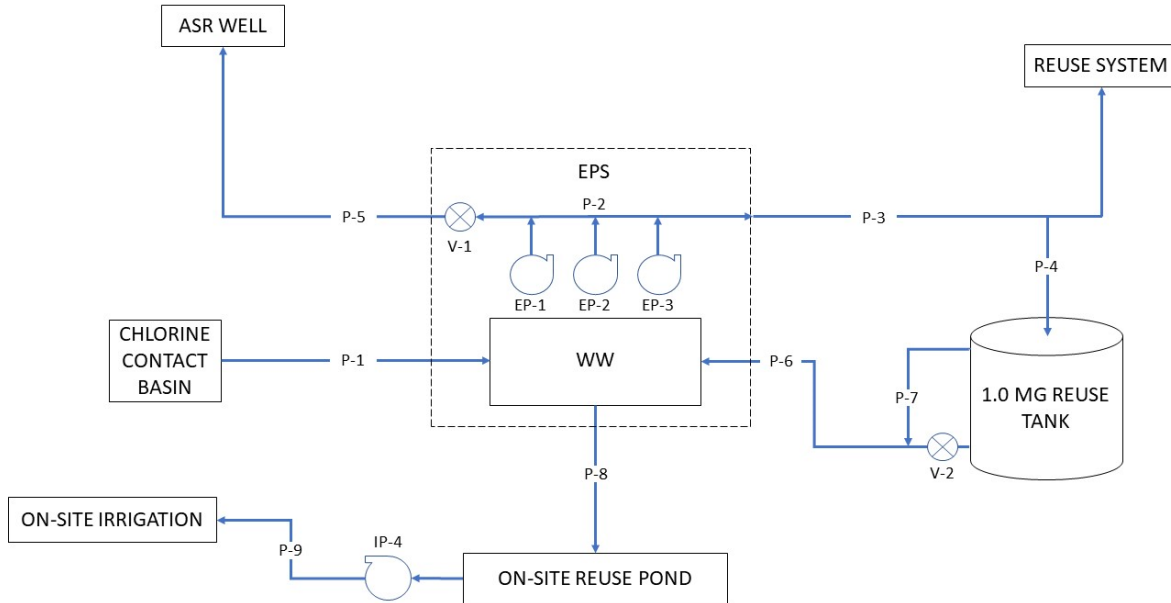


Figure 2. EWD South WRF Process Flow Diagram

Table 1. South WRF Flow Diagram Abbreviations

ID	Description	Typical Operations	Other Operations
REUSE EQUIPMENT, TANKS, AND WELLS			
EPS	Effluent Pump Station	Continuous operation	
WW	Effluent Pump Station Wet Well		
Reuse Tank	1.0 MG Reuse Storage Tank	Reuse is pumped from the EPS into the Reuse Tank and reuse gravity flows into the EPS WW	
ASR Well	1.5 MGD ASR Well	Not typically used	Stores extra reuse as needed, pumped from the EPS
Reuse Pond	3.6 MG On-Site Reuse Pond	Holds reuse to use for On-Site Irrigation	When the pond level gets high, the pump is turned on to send reuse to the On-Site Irrigation
On-Site Irrigation	On-Site Irrigation Spray field	Not typically used	Receives reuse from the Reuse Pond
Reuse System	Pressure and Non-Pressurized Customers in Charlotte and Sarasota Counties	Pressure Customers priority Tue-Thurs Non-Pressurized Customers priority Fri-Mon	

ID	Description	Typical Operations	Other Operations
PUMPS			
EP-1	Effluent Pump 1	Rotated operation with two pumps continuously operating, one in standby	
EP-2	Effluent Pump 2		
EP-3	Effluent Pump 3		
IP-4	Irrigation Pump at the Reuse Pond	Off	When the pond level gets high, the pump is turned on to send reuse to the On-Site Irrigation Spray field
PIPES			
P-1	Pipe from Chlorine Contact Basin to the EPS WW	Feeds into EPS WW	
P-2	EPS Discharge Header	Conveys flow to Reuse Tank and Reuse System	Conveys flow to the ASR Well
P-3	Pipe from EPS to the Reuse Tank and Reuse System	Continuously conveys flow to the Reuse Tank and to the Reuse System	If minimum Reuse Tank level is reached, flow to the Reuse System stops to fill the Reuse Tank
P-4	Reuse Tank Influent Pipe that enters the Reuse Tank over the top	Continuously conveys flow to the Reuse Tank	When the Reuse Tank is full, additional water entering overflows through the overflow pipe
P-5	Pipe from EPS to the ASR Well	Not typically used	When the Reuse Tank is full and EPS WW reaches more than 9 ft, reuse is sent to the ASR Well if not being sent to Reuse Pond
P-6	Reuse Tank Effluent Pipe to the EPS WW	Flow controlled by V-2, opens to the EPS WW when WW level reaches 8 ft	Stops flowing to EPS WW when WW level reaches 9 ft
P-7	Overflow Pipe from the Reuse Tank to the EPS WW	Used as needed based on tank and WW levels	Overflow from the Reuse Tank to the EPS WW when Reuse Tank reaches overflow level
P-8	Overflow Pipe from the EPS WW to the Reuse Pond	Not typically used	When the Reuse Tank is full and the EPS WW reaches more than 9 ft, reuse overflows to the Reuse Pond
P-9	Pipe from the Reuse Pond to On-Site Irrigation	Not typically used	Feeds the On-Site Irrigation if Reuse Pond reaches high level
VALVES			
V-1	ASR Well Flow Control Valve at the EPS that controls flow to the ASR Well	Closed	Open to allow flow to ASR Well
V-2	Reuse Tank Effluent Valve at the base of the Reuse Tank that controls the flow leaving the Reuse Tank going into the EPS Wet Well	Operation is based on the water level in the EPS WW, typically closed	Opens when the EPS WW reaches 8 ft to fill the EPS WW from the Reuse Tank

The effluent pump station maintains a pressure of approximately 120 pounds per square inch (psi) in the distribution system. The pressure of 120 psi is required to provide service to the customers located in the northern portion of the EWD system. This pressure is maintained by the continuous flow of reclaimed water from the reclaimed tank to the effluent pump station wet well. The reclaimed distribution system consists of approximately 25 miles of reclaimed water mains and one reclaimed booster pump station located midway up the distribution system at the Holiday Ventures Property. Currently, the reclaimed booster pump station is not in operation.

2. EXISTING CUSTOMERS AND RECLAIMED SYSTEM FLOWS

EWD supplies reclaimed or reuse water to 22 existing customers inside and outside of EWD service area. There are two types of customers categorized by EWD dependent on their reuse service: customers with pressurized connections and customers without pressurized connections. Both types of connections are classified by an account or connection that receives reclaimed water from the EWD reclaimed system and has a contract with the EWD to receive reclaimed water. These two types of customers are further defined below:

- **Pressurized Connection** – These connections are referred to as pressure customers, and typically consist of residential developments and commercial properties. Each connection has a pressure control valve that is set to open when the reclaimed system pressure reaches 40 psi at the customer connection. The pressurized customer valves are manually opened to allow reclaimed water to flow from Tuesday through Thursday over the non-pressurized customers.
- **Non-Pressurized Connection** – These connections are also referred to as irrigation or pond customers that receive reclaimed water directly into a pond. Each non-pressurized connection has a pressure control valve that is set to open when the system pressure reaches 50 to 55 psi, with the exception of Gran Paradiso in the City of North Port, which is set to open when the pressure reaches 60 psi. The non-pressurized customers have priority to receive reclaimed water from Friday through Monday when the pressure customer valves are closed.

The EWD provided 2021 billing data and information for the reclaimed water customers that was used to assess the customer counts and reuse locations. A map was generated based on this information and the meter locations, customer types, and parcels of the existing reuse customers are shown in **Figure 3**.

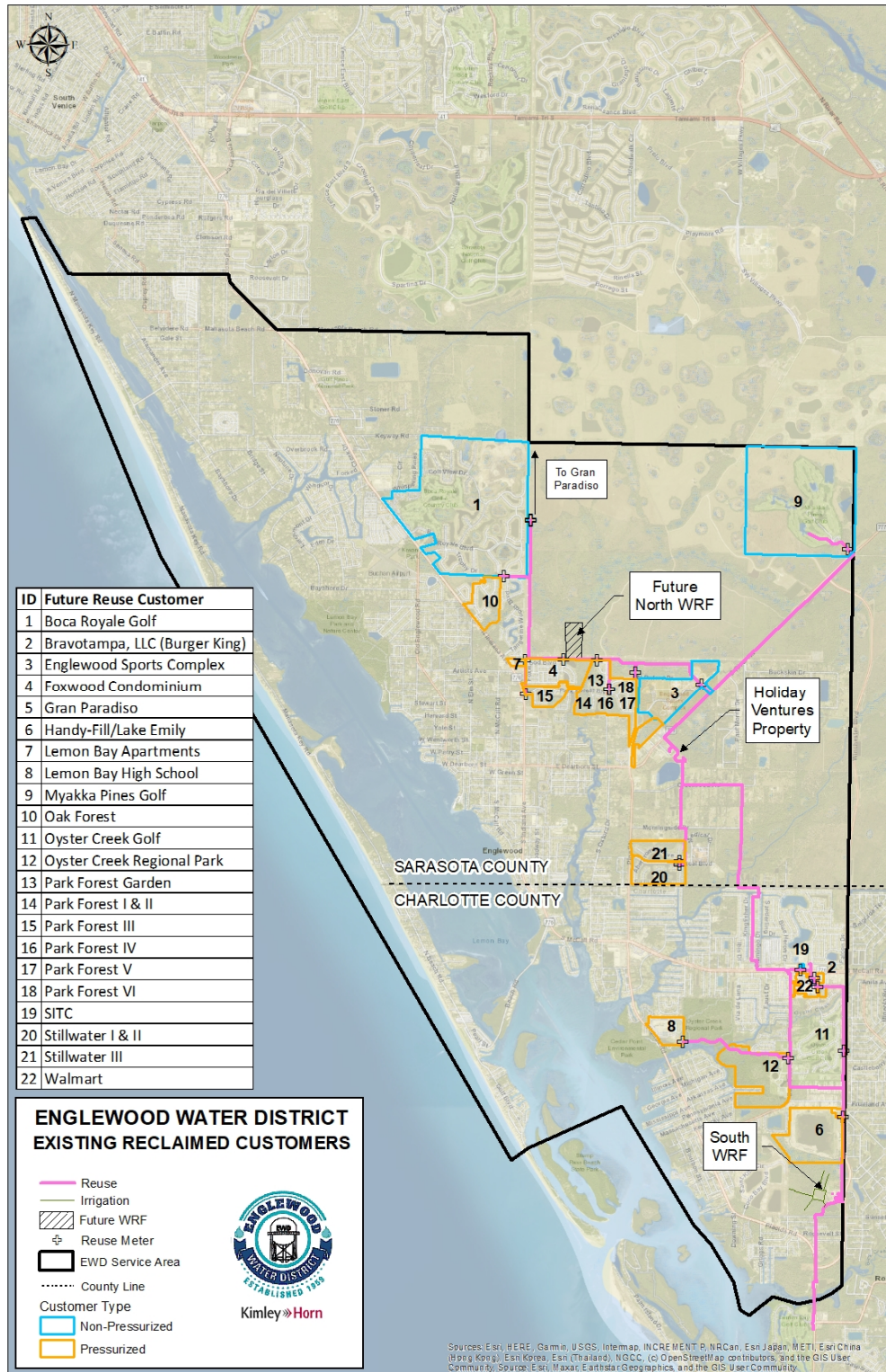


Figure 3: Englewood Water District Existing Reclaimed Customer Map

Based on the analysis of the updated 2021 EWD customer billing data, **Table 2** was developed to summarize the reuse connection types.

Table 2: 2021 Customer Billing Reuse Connection Summary

Reuse Connection Type	Number of Metered Accounts
Pressurized Connection	17
Non-Pressurized Connection	5

All connections are served by master meters in each community or at each customer connection. There are no individually served residential customers.

2.1 Existing Reuse Customer Demands

The 2021 reuse customer billing data was utilized to assess the reuse demands for each customer. This analysis is summarized in **Table 3** which contains the existing reuse customers, the type of customer, the contracted amount of reuse in their agreement for 2021, and their average day demand (ADD) for 2021. Each reuse customer has an agreement with EWD. When the agreements were put in place, an estimated flow was established and is herein referred to as a Contracted Flow. Actual demand can vary from the Contracted flow, and some customers take less, and some take more.

Table 3: Existing Customer Contracted Reuse and 2021 Historical Average Day Demand

Customer	Customer Type	2021 Contracted Flow (gpd)	2021 ADD (gpd)
Boca Royale Golf	Non-Pressurized	600,000	194,408
Bravotampa, LLC (Burger King)	Pressurized	4,500	4,025
Englewood Sports Complex	Non-Pressurized	100,000	1,844
Foxwood Condominium	Pressurized	65,000	42,748
Gran Paradiso	Non-Pressurized	600,000	233,877
Handy Fill/Lake Emily ⁽¹⁾	Pressurized	4,500	5
Lemon Bay Apartments	Pressurized	3,000	10,421
Lemon Bay High School	Pressurized	18,600	35,644
Myakka Pines Golf	Non-Pressurized	200,000	150,307
Oak Forest	Pressurized	70,000	0
Oyster Creek Golf	Non-Pressurized	250,000	148,677
Oyster Creek Regional Park	Pressurized	6,000	0
Park Forest I & II	Pressurized	98,000	60,293
Park Forest III	Pressurized	49,000	27,982
Park Forest IV	Pressurized	49,000	14,171

Customer	Customer Type	2021 Contracted Flow (gpd)	2021 ADD (gpd)
Park Forest V	Pressurized	30,000	34,025
Park Forest VI	Pressurized	60,000	54,732
Park Forest Reuse Garden	Pressurized	1,000	300
SITC	Pressurized	9,000	0
Stillwater I & II	Pressurized	12,000	146,386
Stillwater III	Pressurized	60,000	2,458
Walmart	Pressurized	11,300	319
TOTAL		2,300,900	1,162,622

Note:

- (1) Handy Fill’s reuse meter does not operate properly without back pressure; thus their 2021 ADD does not reflect actual usage.

2.2 Reuse System Historical Flows

Daily Monitoring Report (DMR) data obtained from EWD shows the historical reuse system flows in **Table 4**. This table provides the historical reuse flows from 2016 through 2021. The DMR flows calculated in Table 4 are based off Meter FLW-02.

Table 4: Englewood Water District Reuse Historical Flows

Year	Annual Average Daily Flow (MGD)	Maximum Day Flow (MGD)	Month With Max Flow
2016	1.264	2.325	June
2017	1.444	2.162	May
2018	1.427	2.216	March
2019	1.459	2.313	February
2020	1.489	2.159	January
2021	1.284	2.404	July

In 2021, the reuse AADF was 1.284 MGD and the maximum reuse flow was 2.404 MGD. Therefore, in 2021, the South WRF is operating within its permitted annual average daily reuse flow.

The 2021 flow data reveals that the South WRF plant processes approximately 96% of the wastewater into reuse on average, with 1.60 MGD total sewer flow into the plant and 1.53 total reuse flow (includes flow to the ASR).

2.3 West Villages Improvement District Coordination

The West Villages Improvement District (WVID or Wellen Park) is comprised of approximately 12,000 acres in the City of North Port and Sarasota County, including approximately 3,200 acres in the EWD service area. There is existing development in the City of North Port, where the City provides water and sanitary sewer service to the residents and commercial entities. The WVID provides reclaimed water service to all current and future developments within Sarasota County. Currently, EWD has an agreement with WVID to provide reuse water to Gran Paradiso in Wellen Park with a termination date of March 2024. All six villages and the Boca Royale expansion are shown in **Figure 4**. A meeting was held on November 19, 2021 between EWD, Kimley-Horn, WVID Operations, and Dewberry.

The meeting occurred to understand the future plans for WVID, and the irrigation and reuse demands of their residents and business owners. Dewberry stated that the plan is for all the irrigation ponds at WVID to be interconnected to transfer water as needed from pond to pond.

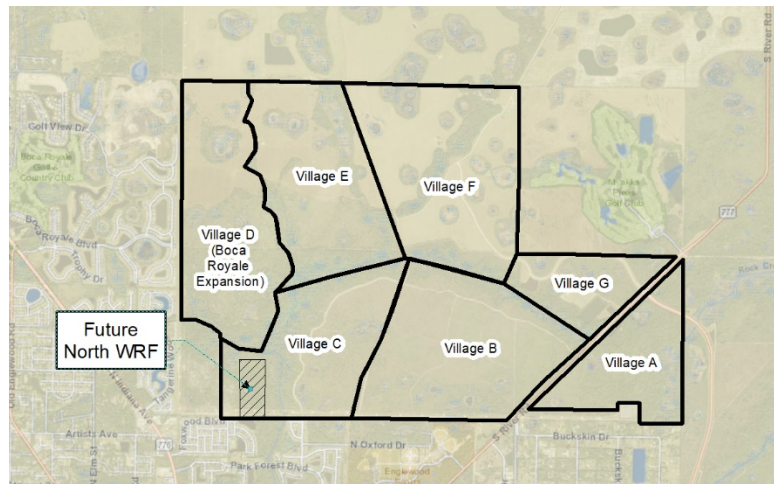


Figure 4: Future EWD North WRF Service Area in WVID

3. FUTURE REUSE ANTICIPATED DEMANDS AND AVAILABLE FLOWS

Projected over the next 20 years in the EWD service area, there will be infill in existing developed areas, and new development growth in the northeast where WVID owns the majority of the land as part of their existing master planned community of Winchester Ranch at Wellen Park.

3.1 Future Customer Demands

EWD provided Kimley-Horn with the existing reuse customers and anticipated future reuse customers. A map showing the future customer locations is shown in **Figure 5**.

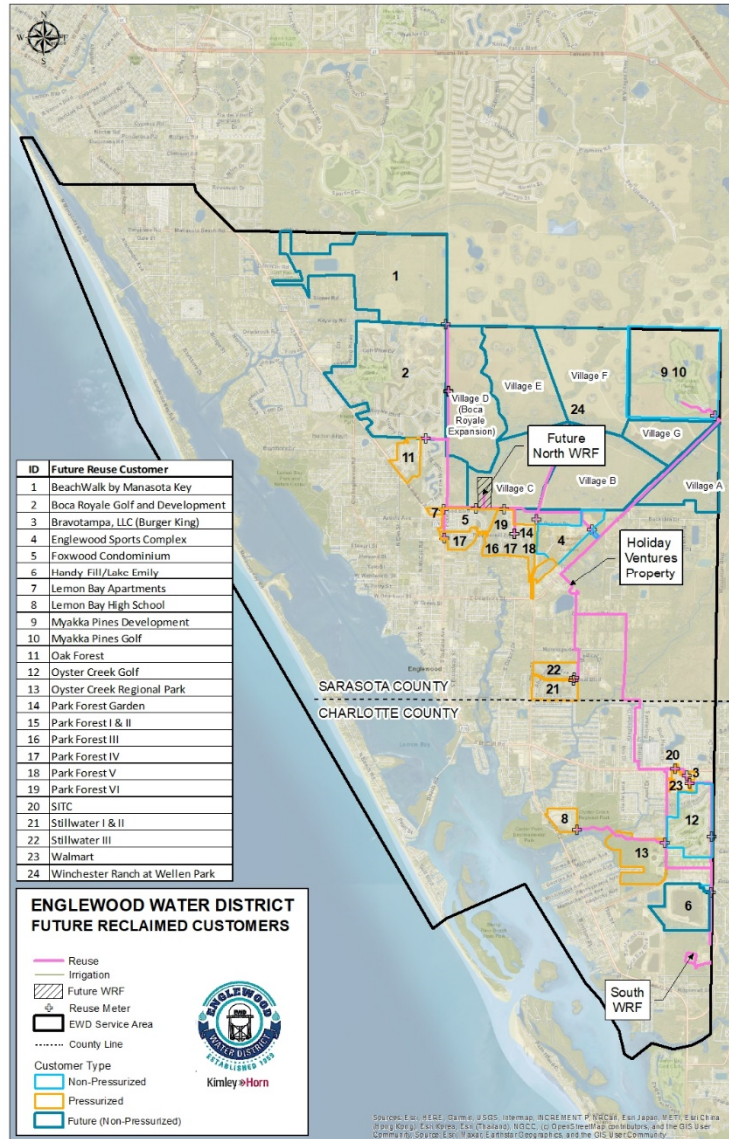


Figure 5: Englewood Water District Future Reclaimed Customer Map

3.2 Future Reuse Water Available Flows

The future available reclaimed water flows have been estimated by using the wastewater flows found in the 2021 Sewer Master Plan. Since the 2021 Sewer Master Plan, the estimated ERCs have since been updated for Beachwalk. The Boca Royale future expansion has a concept design with the number of ERCs based on information provided by Boca Royale Developer’s engineers. The reuse flows in 0-5 years have been estimated by taking 96% of the sewer flows, based on the historical sewer to reclaimed water ratio at the existing South WRF. After 5 years, the North WRF will be online, and at that time it is estimated that the Sarasota County EWD customers’ sewage

will be treated at the North WRF. It is anticipated that the Charlotte County EWD customers' sewage will continue to be treated at the South WRF with a continuance of the existing 96% of sewer flows becoming reuse. Since data is unavailable for the future North WRF treatment and reuse recovery, it is estimated for the North WRF, 96% of influent wastewater will be available as reclaimed water.

These future reuse flows are estimated to be available for reuse customers and are shown in **Table 5**.

Table 5: Future Sewer Customers and Available Reuse

Customer	0-5 Years		5-10 Years		10-15 Years		15-20 Years		20 + Years	
	ERCs	Reuse Flow (gpd)	ERCs	Reuse Flow (gpd)	ERCs	Reuse Flow (gpd)	ERCs	Reuse Flow (gpd)	ERCs	Reuse Flow (gpd)
Sewer Available-Not Connected	164	24,718	244	36,776	-	-	-	-	-	-
Sewer Not Available	72	10,852	6	904	3,719	560,528	6,084	916,980	-	-
Andress Property	273	41,147	-	-	-	-	-	-	-	-
Artist Avenue ⁽³⁾	-	-	428	71,881	-	-	-	-	-	-
Beachwalk by Manasota Key ⁽¹⁾	1,725	259,992	-	-	-	-	-	-	-	-
Boca Royale 13	3	452	-	-	-	-	-	-	-	-
Boca Royale 14	210	31,651	-	-	-	-	-	-	-	-
Boca Royale 15	28	4,220	-	-	-	-	-	-	-	-
Boca Royale 16	82	12,359	-	-	-	-	-	-	-	-
Boca Royale 17	33	4,974	-	-	-	-	-	-	-	-
Handy Fill/Lake Emily ⁽⁵⁾	180	27,130	-	-	-	-	-	-	-	-
Feldman Property ⁽⁴⁾	-	-	200	30,144	-	-	-	-	-	-
Island Lake Estates	400	60,288								
Ivory Bill Dr & Winchester Blvd	94	14,168	94	14,168	-	-	-	-	-	-
Japanese Gardens	-	-	414	62,398	-	-	-	-	-	-
Medical Boulevard	173	26,075	173	26,075	-	-	-	-	-	-
Morris Industrial Park	-	-	50	7,536	50	7,536	-	-	-	-
Myakka Pines	-	-	-	-	400	60,288	477	71,893	-	-
Paddock Pines	30	4,522	-	-	-	-	-	-	-	-
Park Forest VI	5	754	-	-	-	-	-	-	-	-
Park Forest VII	56	8,440	-	-	-	-	-	-	-	-
Pine Street Development	48	7,235	48	7,235	-	-	-	-	-	-
Tromble Bay	-	-	72	10,852	-	-	-	-	-	-

Customer	0-5 Years		5-10 Years		10-15 Years		15-20 Years		20 + Years	
	ERCs	Reuse Flow (gpd)	ERCs	Reuse Flow (gpd)	ERCs	Reuse Flow (gpd)	ERCs	Reuse Flow (gpd)	ERCs	Reuse Flow (gpd)
Wellen Park ⁽⁶⁾	500	75,360	2119	319,376	2299	346,505	2211	333,242	1280	192,922
TOTAL	4,076	587,207	3,848	587,345	6,468	974,857	8,772	1,322,115	1,280	192,922
CUMULATIVE TOTAL	4,076	587,207	7,924	1,174,552	14,392	2,149,409	23,164	3,471,524	24,444	3,664,446

Notes:

- (1) Customer, Beachwalk by Manasota Key, ERCs updated per Developer's Engineer most recent information. Updated Sewer Master Plan does not reflect change.
- (2) Customer, Boca Royale Golf & Country Club, development added per Developer's Engineer most recent information. Updated Sewer Master Plan does not reflect change.
- (3) Customer, Artist Avenue, added per Developer's Engineer most recent information. Updated Sewer Master Plan does not reflect change.
- (4) Customer, Feldman Property, added per Developer's Engineer most recent information. Updated Sewer Master Plan does not reflect change.
- (5) Handy-Fill/Lake Emily formally known as Winchester Lakes per the Updated Sewer Master Plan.
- (6) Wellen Park includes Villages A-G.

To estimate the future available reclaimed water within the EWD reuse system, various data sets were analyzed. The South WRF reuse AADF of the past five years of historical billing data, and the South WRF reuse AADF from the 2021 DMRs, the South WRF reuse AADF based off the 2021 Estimated Contracted Flows, were all considered. To be conservative and plan for growth in the system, the 2021 Estimated Contracted Flows were used along with the projected flows to estimate the future flows of the EWD reuse distribution system. The cumulative total is the estimated increase in total reuse flow available in five year increments up to 20 years. The 20-year cumulative total added to the DMR data from 2021 results in total available reuse flows of 5.19 MGD in the year 2040.

The existing customers and their contracted reuse flows, along with the future customers and their permitted or estimated contracted reuse flows are shown in **Table 6**. Beachwalk by Manasota Key is included in the FDEP permit. The increase in flows to Boca Royale Development, Myakka Pines Development, and Handy Fill/Lake Emily are not included in the permit at the time of this report. No information is available on the Myakka Pines development, so it was estimated to receive the same amount of reuse as the golf course. Dewberry recently completed a WVID Master Irrigation Plan for the Wellen Park area. The WVID Irrigation Master Plan determined 300 gpd per unit is necessary for irrigation, based on an evaluation of the area. For future customers with demands that have not yet been determined, the estimated demands were calculated based on the

evaluated 300 gpd per unit. Wellen Park is estimated to receive 96% of the EWD sewer level of service (LOS) of 157 gpd per unit.

Table 6: Estimated Future Reuse Customer Demands

Customer	Customer Type	2021 Contracted Flow (gpd)	0-5 Years Estimated Flow (gpd)	5-10 Years Estimated Flow (gpd)	10-15 Years Estimated Flow (gpd)	15-20 Years Estimated Flow (gpd)	20 + Years Estimated Flow (gpd)
Beachwalk by Manasota Key	Non-Pressurized	-	700,000	700,000	700,000	700,000	700,000
Boca Royale Golf	Non-Pressurized	600,000	600,000	600,000	600,000	600,000	600,000
Bravotampa, LLC (Burger King)	Pressurized	4,500	4,500	4,500	4,500	4,500	4,500
Englewood Sports Complex	Non-Pressurized	100,000	100,000	100,000	100,000	100,000	100,000
Foxwood Condominium	Pressurized	65,000	65,000	65,000	65,000	65,000	65,000
Handy Fill/Lake Emily ⁽²⁾	Non-Pressurized	4,500	54,000	54,000	54,000	54,000	54,000
Lemon Bay Apartments	Pressurized	3,000	3,000	3,000	3,000	3,000	3,000
Lemon Bay High School	Pressurized	18,600	18,600	18,600	18,600	18,600	18,600
Myakka Pines Development ⁽²⁾	Non-Pressurized	-	-	-	120,000	263,100	263,100
Myakka Pines Golf	Non-Pressurized	200,000	200,000	200,000	200,000	200,000	200,000
Oak Forest	Pressurized	70,000	70,000	70,000	70,000	70,000	70,000
Oyster Creek Golf	Non-Pressurized	250,000	250,000	250,000	250,000	250,000	250,000
Oyster Creek Regional Park	Pressurized	6,000	6,000	6,000	6,000	6,000	6,000
Park Forest I & II	Pressurized	98,000	98,000	98,000	98,000	98,000	98,000
Park Forest III	Pressurized	49,000	49,000	49,000	49,000	49,000	49,000
Park Forest IV	Pressurized	49,000	49,000	49,000	49,000	49,000	49,000
Park Forest V	Pressurized	30,000	30,000	30,000	30,000	30,000	30,000
Park Forest VI	Pressurized	60,000	60,000	60,000	60,000	60,000	60,000
Park Forest VII ⁽²⁾	Pressurized	-	16,800	16,800	16,800	16,800	16,800
Park Forest Reuse Garden	Pressurized	1,000	1,000	1,000	1,000	1,000	1,000
SITC	Pressurized	9,000	9,000	9,000	9,000	9,000	9,000
Stillwater I & II	Pressurized	12,000	12,000	12,000	12,000	12,000	12,000
Stillwater III	Pressurized	60,000	60,000	60,000	60,000	60,000	60,000
Walmart	Pressurized	11,300	11,300	11,300	11,300	11,300	11,300
Wellen Park ⁽³⁾	Non-Pressurized	-	75,400	394,800	741,300	1,074,500	1,267,500
TOTAL		1,700,900	2,476,300	2,849,700	3,316,200	3,792,500	3,985,500
Gran Paradiso ⁽¹⁾	Non-Pressurized	600,000	600,000	-	-	-	-

Notes:

- (1) Gran Paradiso is outside of the EWD Service Area.
- (2) Reuse flows estimated per 300 gpd/unit.
- (3) Reuse flows estimated per sewer LOS of 157 gpd/unit.

Based on the projected wastewater flows and future reclaimed water demands in the EWD service area, there is anticipated to be approximately 0.36 MGD excess reclaimed water available beginning in 10-15 years and increasing to 1.21 MGD in 15-20 years. Additional customers may be needed at that time.

4. SITE EVALUATIONS

As part of the Reuse Master Plan Update, Kimley-Horn conducted site evaluations of the existing reuse effluent pump station, reuse tank, above ground reuse piping, and irrigation pumps on the South WRF site. The site evaluations included above ground visual condition inspections, data collection, and discussions with EWD operators and engineers that are familiar with the facility and its processes. The site evaluation was held on November 16, 2021.

4.1 Effluent Pump Station Evaluation

The effluent pump station is an existing open-air pump station located at the South WRF. The pump station was installed in 2003. It consists of three (3) Flowserve variable speed vertical turbine pumps. The pumps are contained within an 18 ft by 18 ft wet well with a depth of 15 ft. These pumps send reuse to the reuse tank, reuse system, and ASR Well. They are being used as both high service pumps and transfer pumps, which is not efficient. Pump 1 was last repaired on July 19, 2021. Pump 2 was repaired on October 20, 2020 and is currently on order to be replaced. Pump 3 was repaired on February 2, 2019. Only pumps 1 and 3 are currently operational. The pump station wet well has an overflow pipe connecting to the irrigation pond. A picture of the effluent pump station header pipe is shown in **Figure 6**, and a picture of one pump assembly is shown in **Figure 7**.



Figure 6: Effluent Pump Station

To further evaluate the effluent pump station, Kimley-Horn conducted a site evaluation of the reuse components on November 16, 2021. **Table 7** provides a summary of the evaluation based on the visual assessment and discussions with EWD operations and engineering staff. Pictures illustrating any noted deficiencies are in **Appendix A**.



Figure 7: Effluent Pump at South WRF

Table 7: Effluent Pump Station Evaluation Summary

Component	Condition
Concrete	<ul style="list-style-type: none"> • Stairs at the pump station have no visible issues • Concrete base has no visible issues
Railings	<ul style="list-style-type: none"> • No visible corrosion
Support Columns	<ul style="list-style-type: none"> • Visible corrosion
Pumps	<ul style="list-style-type: none"> • All three pumps installed in 2003 and have since been repaired • Pump 2 is not functional and is currently on order to be replaced. • All three pumps are consistently having issues • Base plates have visible corrosion • Pumps must produce high pressures (120 psi) for reuse to reach all customers • High pressures are likely impacting system piping, pump station appurtenances, energy consumption, and operation and maintenance costs • Using pumps as transfer pumps (to reuse tank) and as high service pumps (to reuse system) is inefficient • There are two nonfunctional pumps located at the effluent pump station that were previously used to pump plant water • Lightning strikes are frequent
Pump Station Piping	<ul style="list-style-type: none"> • Pipe coatings have few areas with minor external corrosion • Various bolts throughout the pump station have external corrosion • Bolts on the ASR Well valve are not coated

4.2 Reuse Tank Evaluation

The reuse tank is an existing 1.0 MG composite ground storage tank with a diameter of 76.5 ft and a height of 30.5 ft. The tank was installed in 2006. Reclaimed water is currently pumped from the effluent pump station to the effluent storage tank and enters the tank via a 12-inch ductile iron (DI) pipe. The tank effluent pipe exits the tank as a 16-inch DI pipe near the base of the tank and is controlled by an automatic Flowserve Valve and a manual valve operator. The tank's effluent pipe enters the wet well of the effluent pumping station at ground level. Tank piping and valves are shown in **Figures 8** and **9**. The tank also contains a liquid level indicator and a 12-inch overflow pipe, approximately 18-inches below the top of the storage tank that runs down the side of the tank and connects to the effluent pipe. **Table 8** provides a summary of the evaluation based on the visual assessment and discussions with EWD operations and engineering staff. Pictures illustrating any noted deficiencies are in **Appendix A**.



Figure 8: Reuse Storage Tank Influent Pipe

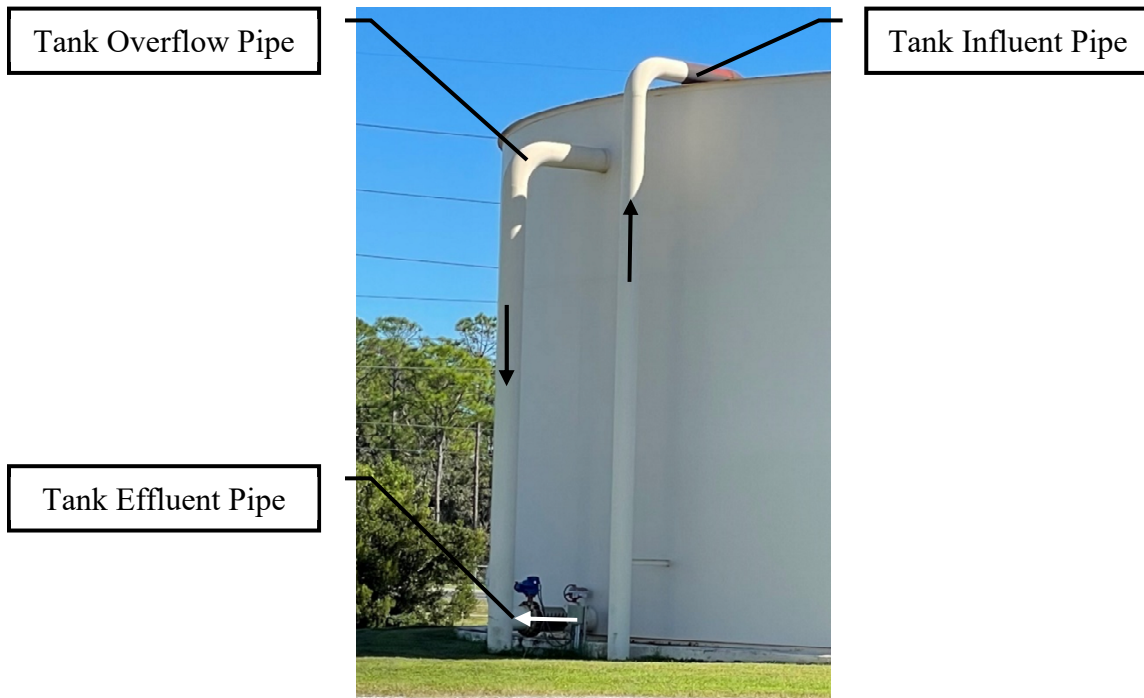


Figure 9: Reuse Storage Tank
 (Left: Tank Effluent and Overflow Pipes; Right: Tank Influent Pipe)

Table 8: Reuse Storage Tank Evaluation Summary

Component	Condition
Stairway	<ul style="list-style-type: none"> No visible issues
Railing	<ul style="list-style-type: none"> No visible issues
Tank Structure	<ul style="list-style-type: none"> External corrosion around the base of the tank External corrosion around the inner rim at the top of the tank
Reuse Tank Piping	<ul style="list-style-type: none"> No visible pipe issues at the pump station Bolts on the valve at the pump station have minor external corrosion Minor external corrosion on piping at the tank
Valve	<ul style="list-style-type: none"> Bolts on the Flowserve Valve have external corrosion and are not coated Manual valve has external corrosion

4.3 Irrigation Pumps Evaluation

The reuse system irrigation pumps and electrical panels are located south of the effluent pumping station and just north of the irrigation pond, see **Figure 10**. There are two irrigation pumps that feed the onsite irrigation. The western pump was acquired from the EWD Water Treatment Plant and has been weathered from outdoor use, see **Figure 11**. The eastern pump was installed before

2000 and is in bad condition, see **Figure 12**. In the effluent pump station wet well, there are three (3) 30-inch overflow pipes that drain to the irrigation pond, see **Figure 13**. When the pond level reaches 10 ft, the irrigation pumps are turned on to feed the onsite irrigation. **Table 9** provides a summary of the evaluation based on the visual assessment and discussions with EWD operations and engineering staff. Pictures illustrating any noted deficiencies are in **Appendix A**.



Figure 10: Irrigation Pond and Pumps



Figure 11: Western Irrigation Pump



Figure 12: Eastern Irrigation Pump



Figure 13: Overflow Pipes to Irrigation Pond

Table 9: Irrigation Pumps Evaluation Summary

Component	Condition
Concrete	<ul style="list-style-type: none"> • Concrete under eastern pump has cracking • No visible issues for western pump
Western Pump	<ul style="list-style-type: none"> • Malfunctions when used during wet weather conditions • Often requires maintenance
Eastern Pump	<ul style="list-style-type: none"> • Pump platform is corroded • Often requires maintenance
Irrigation Piping	<ul style="list-style-type: none"> • Major external corrosion on western pump piping • Bolts on the western pump have external corrosion • Minor external corrosion on eastern pump piping • No visible corrosion on eastern pump bolts

5. HYDRAULIC ASSESSMENT

The existing reclaimed model (Model) was updated and utilized to assess the existing and future reclaimed system. Multiple scenarios were developed and evaluated to assess the existing system with the South WRF online, and another for the future system with both the North and South WRFs online for 2025, 2030, 2035, and 2040. An assessment was performed on the reclaimed water system available storage and future storage requirements. The existing effluent pump station operations were evaluated to determine immediate improvement needs and future improvements based on the operations of the North and South WRFs. The existing and future reclaim system improvements were determined based on the capacity and Model evaluation results.

5.1 Existing System Hydraulic Assessment

The EWD provided historical reuse metering data for use in understanding the existing reuse customer demands. The average, minimum, and maximum demands were calculated annually and the most recent, 2021 metering data was used for the existing scenario demands. The Model was updated with the 2021 metering data and in addition, the types of customers, pressurized, or non-pressurized, demands were individually assigned for existing operational assessment of the distribution system.

Based on the model simulations of the existing system, the Model is estimating the pressures are ranging between 95 and 120 psi in the system and the velocity in the reuse distribution system piping is 2.0 fps or less.

The Model was also set up to evaluate the existing maximum day demand condition in the reclaimed system. Based on the Model evaluation, the system is anticipated to be operating with velocities up to 3.0 fps.

The average day demand modeled existing reuse system is shown in **Figure 14**.

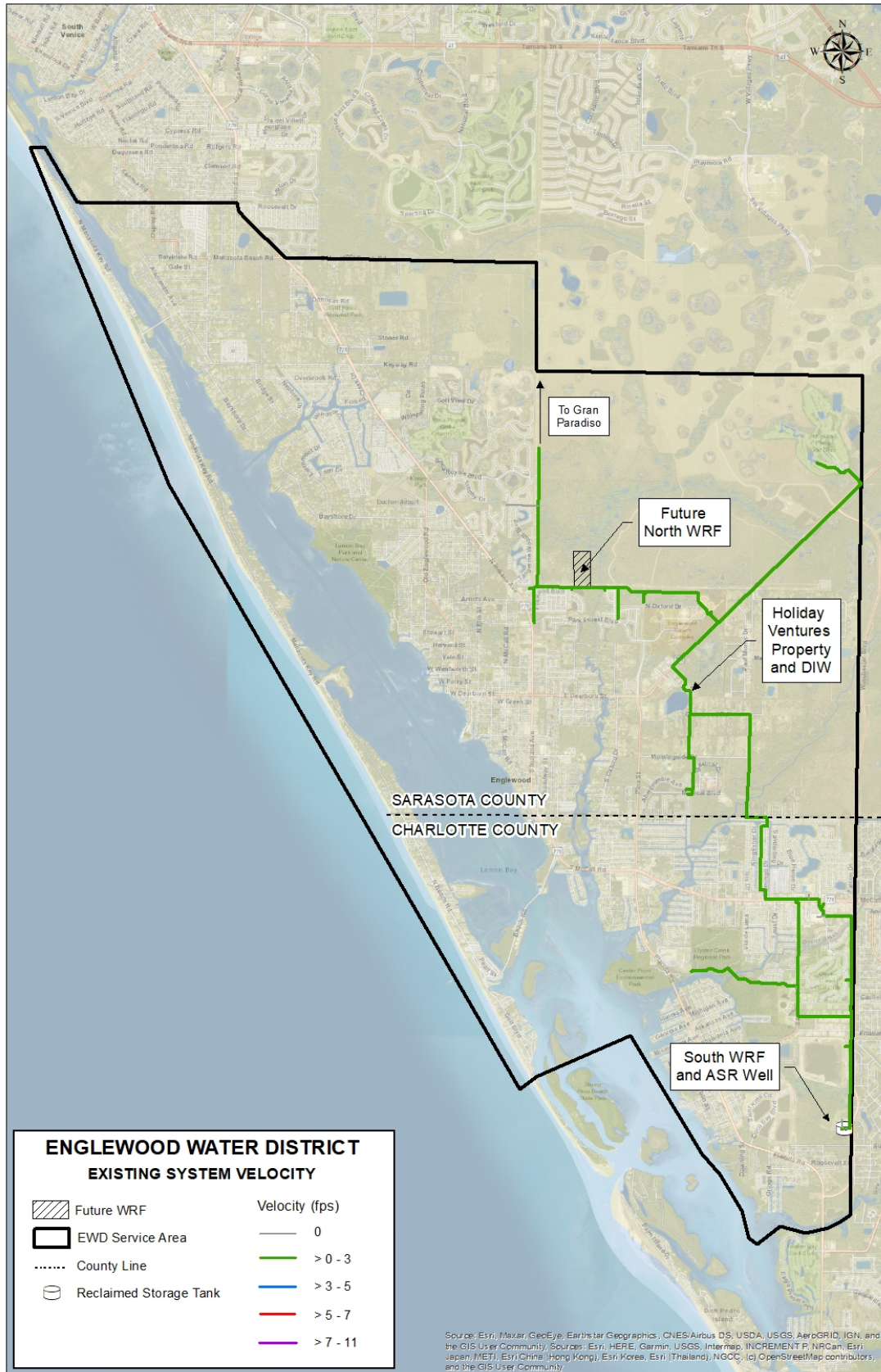


Figure 14. Existing Reclaimed Water System Velocity

5.2 2025 System Hydraulic Assessment

The Model was updated with the 0-5 Years, or 2025 estimated flows. The new reclaimed water customers in 2025 include Beachwalk by Manasota Key, the Boca Royale Development, and Winchester Ranch at Wellen Park. In addition, Handy Fill/Lake Emily will receive more reclaimed water. In order to serve the Beachwalk community, the meter assembly for Gran Paradiso will be moved approximately 3,800 feet north as stated in the Utilities Agreement. The 2025 reclaimed system map with the new pipelines and two treatment plants are shown in **Figure 15** below.

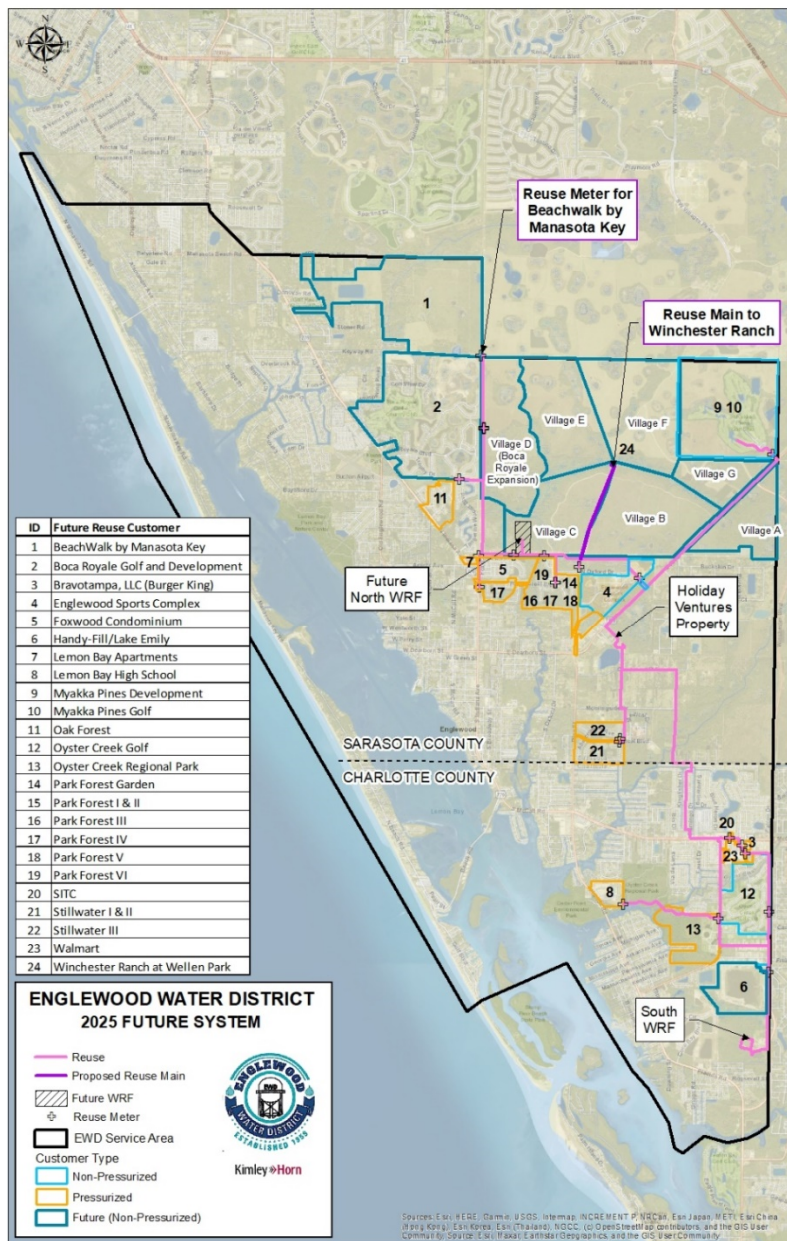


Figure 15. Future Reclaimed Water Distribution System

It is estimated that the North WRF will be online in 2025 to treat wastewater and supply reclaimed water to a portion of the EWD reclaimed system. Based on the available information at this time, it is estimated that the system will be split between Sarasota County and Charlotte County with the North WRF treating wastewater from Sarasota County and the South WRF treating wastewater from Charlotte County.

Based on the evaluation, improvements will be needed to reduce the effluent pump station pressures to the system. These improvements include replacing the effluent pumps with dedicated transfer pumps to fill the existing South WRF 1.0 MG Reuse Tank and separate high service pump station to feed the system from the tank. To better serve the customers during maximum day flows and to optimize the available peak flows from the plants, it is recommended to store the excess reclaimed water. If the water is stored off-site in the system, the pumps would be able to reduce the high pressures in the system, thus minimizing the potential for high pressure main breaks and reducing the energy costs of plant effluent pumping. Off-site storage will also provide more operational opportunities to utilize both the North and South WRF plant reuse flows. Further, it is recommended to install two 1.0 MG reclaimed water storage tanks and a pump station at the Holiday Ventures Property.

5.3 2030 Hydraulic Assessment

The Model was updated with the 5-10 Years, or 2030 estimated flows. There are not any new reclaimed water customers anticipated in 2030. The Model estimated similar system velocities and pressures as predicted with the 2025 hydraulic assessment.

5.4 2035 Hydraulic Assessment

The Model was updated with the 10-15 Years, or 2035 estimated flows. The only new customer anticipated in 2035 is the Myakka Pines Development, and no new reclaimed mains are required to serve this customer since the infrastructure exists that currently serves the Myakka Pines Golf Course. The Model is estimating similar system velocities and pressures as predicted with the 2025 and 2030 hydraulic assessments.

5.5 2040 Hydraulic Assessment

The Model was updated with the 20+ Years estimated flows. There are not any new reclaimed water customers anticipated in 2040. With the additional plant flows, more reuse water can be sent to existing customers or additional customers. The Model is estimating similar system velocities and pressures as predicted with the 2025, 2030, and the 2035 hydraulic assessments.

6. CAPACITY ASSESSMENT

6.1 FAC Storage Requirements

The EWD South WRF is permitted under Chapter 62-610 of the Florida Administrative Code (FAC) as a slow-rate land application system. The EWD reclaimed water system is a public access reclaimed system and is permitted specifically under Chapter 62-610.464 in the FAC. This chapter lists the following storage requirements.

- Storage pond capacity for public access slow-rate land application systems:
 - During wet weather conditions, system storage capacity must be three times the average daily flow (ADF) of the total reuse system capacity for which no other reuse or disposal is permitted.
- System storage ponds:
 - Do not have to be lined.
 - Can be existing or proposed lakes or ponds (such as a golf course pond) as long as the reclaimed storage does not interfere with the stormwater management of that pond.
 - Must have sufficient storage capacity to ensure retention of reclaimed water during wet weather, harvesting conditions, maintenance of irrigation equipment, etc.

6.2 Existing Reclaimed Storage Capacity

The EWD has various reclaimed water storage facilities. The existing available storage, as listed in the FDEP permit, is 15.14 MG. This exceeds the storage required by the FAC, per Chapter 62-610, of three times the ADF of 1.53 MGD, or 4.60 MGD, as shown in **Table 10**. The ASR Well and reclaimed storage tank are the only means of storage that allow for recovery and customer use.

Table 10. Available Reclaimed Water Storage

Storage Type	Name	Volume (MG)
Storage Tank	Reclaimed Water Storage Tank at the South WRF	1.0
Underground Injection	ASR Well at the South WRF	2.04
Underground Injection	Underground Injection Well System at the Holiday Ventures Property ⁽¹⁾	2.94
Unlined Pond	Reclaimed Water Storage Pond at the South WRF	3.6
TOTAL		9.58

Notes:

- (1) Existing capacity of the injection well is shared with the Water Treatment Plant. When the North WRF comes online, the DIW will be dedicated solely to the North and South WRFs.

6.3 Future Reclaimed Storage Capacity

Some reclaimed storage for the North WRF will be located at the Holiday Ventures Property. The recommended Holiday Ventures Property storage includes two (2) 1.0 MG storage tanks. When these tanks are online, the total available storage reuse customers will have access to increases to 5.04 MG, and the total available reclaimed water storage increases to 11.58 MG. Per the FAC, there must be available storage to handle triple the build out ADF of 5.36 MGD, or 16.08 MGD. The reclaimed system will be designed to have average daily storage tank turn over. A total of 5.36 MG of recoverable storage is required for this scenario. Therefore, additional storage will be required for the combined reclaimed water from the North and South WRFs to meet FAC storage requirements. With the new North WRF, the existing DIW will need to be dedicated solely to the water reclamation facilities and thus, a new DIW will be required for the water treatment plant reverse osmosis concentrate disposal.

7. OPERATIONAL ASSESSMENT

7.1 Existing Operations

The South WRF serves pressurized and non-pressurized reclaimed water customers at separate times because there is not enough reclaimed water to serve both types of customers at once with the current storage.

The metering data support the idea that customers demand less reclaimed water during the rainy season (May to October) due to wet weather adding to their pond levels and watering lawns. As expected, reuse customers demand more reclaimed water during the dry season (November to April) due to minimal rainfall supplementing the reclaimed water in ponds and pressurized customers needing to water lawns more often. The 2021 monthly customer usage curve is shown below in **Figure 16**.

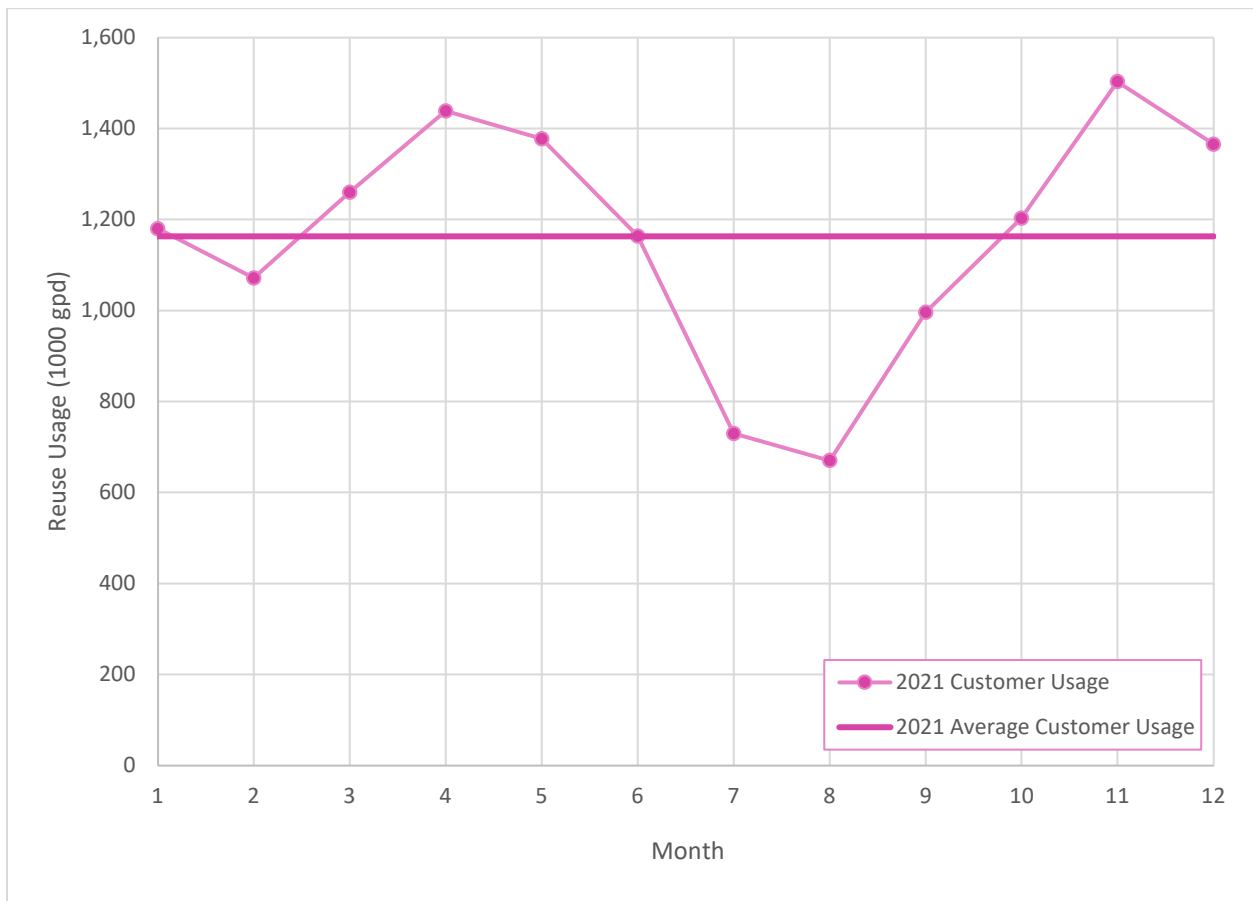


Figure 16: 2021 Customer Metering Data

Reuse System demands are lowest during the rainy season while sewer flows and reclaimed availability are at their highest, as shown below in **Figure 17**.

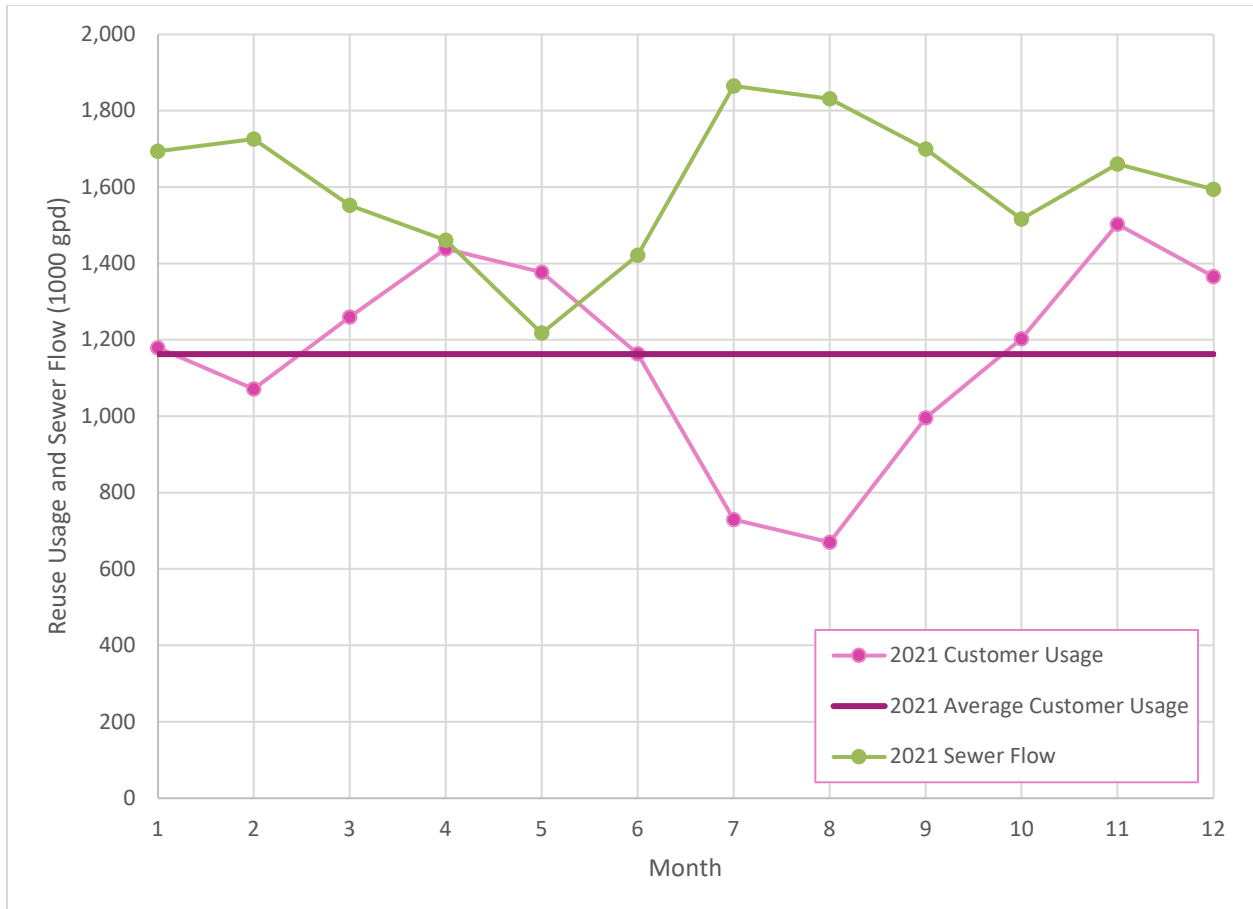


Figure 17. Reuse Usage and Sewer Flow

When the sewer flow is at the peak month and the reuse customer usage is at its lowest, there is, on average, 1.12 MGD of unused reclaimed water. This unused reuse water is sent to the onsite ASR Well or overflows to the pond and is pumped to the onsite spray field. Typical current operations use the ASR Well more often during the rainy season, and the onsite spray field is used more often during the dry season.

When pumping reuse water from the ASR Well, the water is tested for total suspended solids (TSS), fecal coliform, specific conductance, and BOD5 (biochemical oxygen demand, 5-day test). A single ASR Well sample must have less than 5.0 milligrams per liter (mg/L) of TSS. A single

100 mL sample must have less than 25 fecal coliform values. A single sample must have less than 60.0 mg/L of BOD5 and the annual average must have less than 20.0 mg/L. The specific conductance is measured weekly and reported but has no constraints as per the FDEP permit. None of the samples taken from the ASR Well in 2021 exceeded any of these limitations, as shown in the 2021 DMR data.

The reclaimed pond at the South WRF previously conveyed reclaimed water to Lemon Bay Golf. EWD no longer serves Lemon Bay Golf with reclaimed water, and the reclaimed pond irrigation pumps solely convey reclaimed water to the onsite irrigation spray field. As part of this Reuse Master Plan Update, a sample was taken from the pond and pH, TSS, and CBOD tests were conducted on the sample. The test results can be found in Appendix B. The reclaimed pond must meet the same conditions as the ASR Well, except for specific conductance. The pond water sample had too high of a pH at 9.07 and TSS at 10.4 mg/L but was below the 60.0 mg/L limit on the CBOD or BOD5 test at 15.5 mg/L.

7.2 Future Operations

The estimated future system demands and flows indicate there is not enough available reuse to serve all customers at the same time until 2033. This was determined by comparing the anticipated sewer flows, converting them to anticipated reuse flows by a factor of 96% (Table 5), and comparing to the estimated reuse customer usage (Table 6). The results are shown in **Figure 18**. Therefore, pressure and non-pressurized customers will be supplied reuse water at separate times, consistent with existing conditions, until the available reuse surpasses the reuse demands which is estimated to occur in 2033. As the future demands and flows come online, it is recommended that the customer reuse operational scheme be re-evaluated during the next reuse master plan update. In addition, a potential reuse interconnection may be needed to serve all future customers congruently.

After the available reuse supply surpasses the reuse demands, all customers will have access to reuse water during typical conditions.

To utilize the South WRF onsite reclaimed pond as recoverable storage, filters and chemical treatment would be necessary to bring the pH, TSS, and chlorine residual of the water into their required ranges. To implement this in the future, an additional project is required.

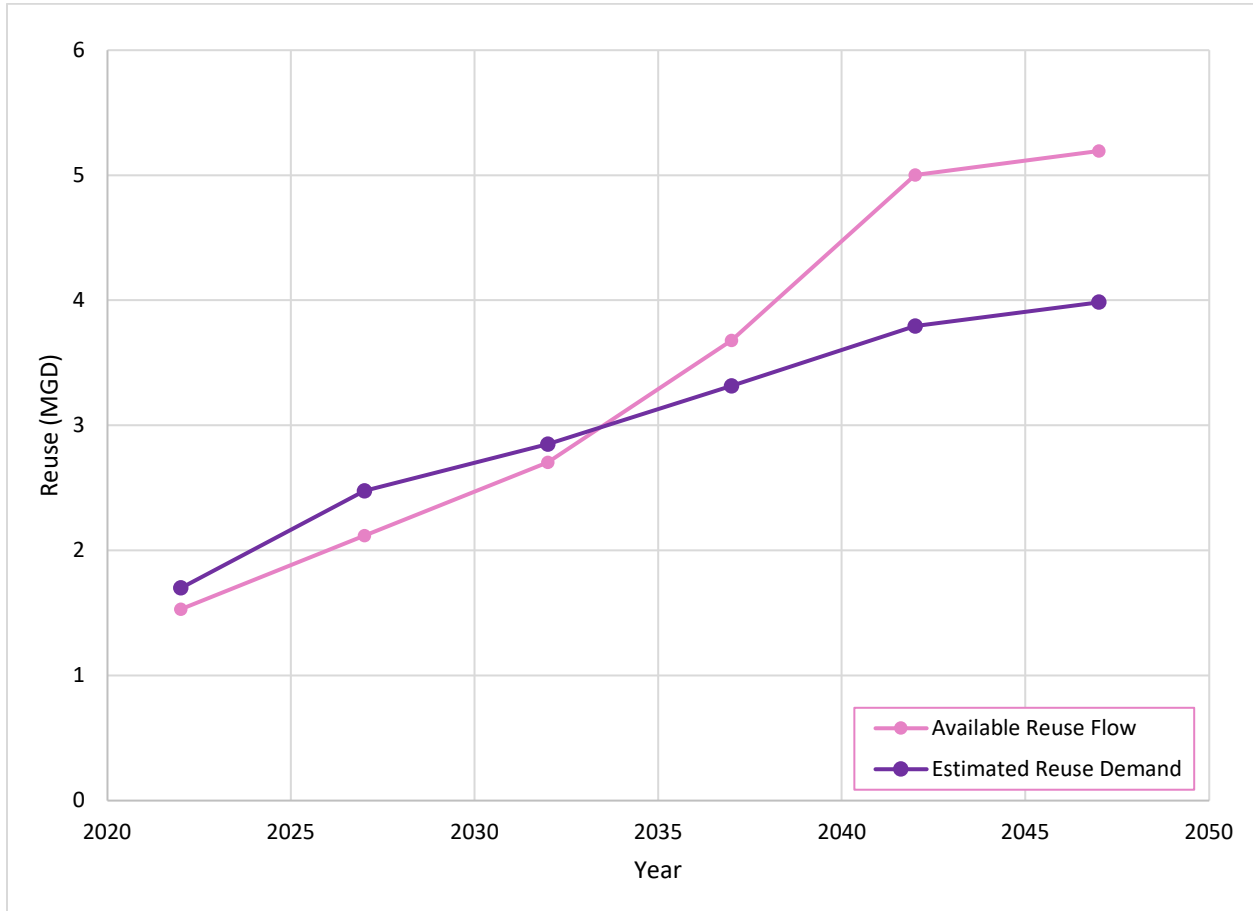


Figure 18: Available Reuse and Estimated Future Demands

8. RECOMMENDED IMPROVEMENTS

As determined through the analyses of the Reuse Master Plan Update, the following improvements are recommended.

Holiday Ventures Property Upgrades

- Install two (2) 1.0 MG reclaimed storage tanks.
- Install a booster pumping station.

- After the North WRF is installed, construct a 16-inch reclaimed transmission main from the North WRF to the two (2) reclaimed storage tanks.

South WRF Pumping Upgrades

The current effluent pump system operations are not efficient, and the pressures required to supply reclaimed water to all customers are unsustainable. The Holiday Ventures Property Upgrades must be completed before the South WRF Pumping Upgrades can begin.

- Install new high service pump station at the South WRF, including coring into the existing steel 1.0 MG storage tank.
- Replace existing effluent pump station pumps with transfer pumps to the onsite storage tank or ASR Well.
- Install a bypass reclaimed main from the reclaimed system straight to the transfer pump station wet well for emergency storage from the North WRF.
- Replace reclaimed pond pumps, deficiencies shown in the Site Evaluation and Appendix A.

Implementing a new effluent pump station will lessen the strain on the existing effluent pump station pumps and create a more sustainable and efficient reclaimed system. Due to the storage tank modifications and construction phasing, this project is recommended to occur simultaneously with the Holiday Ventures Property Upgrades.

Reclaimed System Upgrades

- Install automatic valves for the pressure customers to eliminate the need to go out to each customer and open and close their valves twice a week. Prior to the installation of the valves, it is recommended the pressure customers are mandated by schedule.
- Implement an asset management program to keep track of equipment, pipes, and appurtenances that are in need of maintenance, repair, replacement, or coating.
- Complete a SCADA Master Plan to determine the extent of the requirements to implement SCADA, determine a SCADA implementation process, and acquire an accurate cost estimate.
- Implement SCADA system into the reclaimed system.
- Reuse main from the North WRF to be completed concurrently with the North WRF.
- Reuse interconnect to supplement available reuse.

Overall System Recommendations

- All future reuse customers will be non-pressurized customers with automatic valve connections for EWD to easily control reclaimed water flows.
- All future reuse customers must have an isolated pond that does not discharge to water bodies of the state.
- In the next Reuse Master Plan Update, reevaluate the reclaimed water customer operations and determine an operational scheme to serve all pressurized and non-pressurized customers at once.

8.1 Funding Opportunities

Available funding opportunities were evaluated to provide the EWD with options to assist in implementation of the recommended projects in a timely manner. The identified methods are not all inclusive of the opportunities that exist but are believed to be the most accessible, factoring eligibility priorities. It is recommended that supplementary evaluation on options be considered prior to starting the projects as there might be new funding solutions to assist the EWD in reducing costs to a greater extent.

Based on the projects recommended in this Reuse Master Plan Update, the following are the primary recommended sources of possible funding.

1. Public Financing - The State of Florida Department of Environmental Protection (FDEP) State Revolving Fund Loan Program

This program is administered by FDEP and is supported by the U.S. Department of Environmental Protection. The program utilizes a programmatic lending approach. It establishes regulatory requirements as incentives for borrowers to lower the interest on the loans. In order to lower the loan's interest rate, borrowers will need to track certain compliance requisites and successively will receive a lower interest rate. Loans may be utilized for planning, design and construction related to drinking water, wastewater, reclaimed water, and storm water.

More specifically, under the Wastewater, or Clean Water program, acceptable submittals include construction to improve and repair wastewater treatment plants, control non-point

sources of pollution, improve resilience of infrastructure to severe weather events, create green infrastructure, manage and treat stormwater or subsurface drainage water, facilitate water reuse, and protect waterbodies from pollution, etc.

The best assets of this program are the terms of the loan and the interest rates. The terms are currently 20 years, and the interest rates are lower than commercial rates.

2. Sustainable Financing - Municipal Green Bonds

The Green Bonds market is growing exponentially, especially in the present economic climate. This alternative is emerging as the number one instrument to finance environmental efforts. Green bonds are akin to regular bonds with one key difference. Municipal green bonds finance activities that have a positive environmental impact, such as clean water and sustainable water management. Green bonds have been utilized by utilities for valve rehabilitation programs, chlorination and air scour improvements, water management and conservation plans. Across all levels of government, green bonds are yet another tool that agencies are using to demonstrate commitment to sustainability and water quality improvement endeavors.

3. Southwest Florida Water Management District (SWFWMD) Cooperative Funding Initiative Program

This program is a share cost program. The program funds initiatives that institute sustainable water resources, provide flood protection, and enhance conservation efforts. Some of the District's projects would be eligible under the guidelines of this program. According to SWFWMD's 2021 board meeting announcements, it has made considerable investments in Alternative Water Supply initiatives. Over the next 5 years, SWFWMD will be looking at supporting proposals that impact their Strategic Initiatives, one of which is Reclaimed Water. As reported, a new scoring system is being developed to be used for new applications. The new scoring system will require the EWD to show cost effectiveness, benefit, readiness, and past performance.

4. State of Florida Legislative Appropriation Requests

A Legislative Appropriation Request submittal requires support from local Senate and House representatives. The Requests commence with a visit to local legislators who are part of the local city or county Legislative Delegation. In the case of the EWD, there might be a need to coordinate meetings with legislators of the two counties that are served by EWD.

The undertaking of submitting a Legislative Request requires much coordination and assistance from the county boards, lobbyists, and other stakeholders. One of the factors that is considered in evaluating a Request is whether there is a local commitment of funds towards the project. Furthermore, the Request must reflect that the EWD is pursuing other possible funding courses of action.

5. Protecting Florida Together Fund

This Fund is administered by FDEP's new grants division. The mission of the Fund is to establish recurring public dollars for alternative water supply efforts. The money is allocated to assist communities in planning for and implementing vital conservation, reuse, and other redundancy water supply projects. The Fund's program requires a local dollar match. Moreover, this opportunity has certain technical prerequisites as part of the application process.

6. Florida Job Growth Grant Fund

The Florida Job Growth Grant Fund is focused on promoting economic development. This public Fund favors requests that improve public infrastructure and enhance workforce training. The initiatives this opportunity focuses on are infrastructure programs for public use or that predominately benefit the public. This Fund would require the EWD to show impact. The impact should demonstrate quantitative evidence on how EWD will meet the demand for infrastructure needs in the community and how the project will promote job growth.

These sources of funding are current as of the date of this report. The current economic climate is under continuous reorganization. Infrastructure initiatives are changing constantly. Modifications to opportunities presently available could be implemented, or the funding opportunity may no longer be a viable alternative to fund specific programs. New legislation may also open up additional sources of funding in the future.

8.2 Recommended Improvements

The majority of the recommended improvements are phased in the next 0-5 years. Some are existing improvements that have been noted in past master plans (RU-01 and RU-02), and some are for deficiencies found in the existing system through this master plan (RU-03, RU-05, and RU-06). For the North WRF to be constructed in 5 years, as anticipated, RU-01 and RU-04 must be completed prior to the North WRF going online.

Table 11. South WRF and Reuse System Improvement Needs

ID	2021 SEWER MP ID	PROJECT	PHASE	ESTIMATED PROJECT COST	PROJECT DESCRIPTION
RU-01	RU-02 RU-03	Reuse Booster Pumping Station at Holiday Ventures Property	0-5 Years	\$9,100,000	Install two new 1.0 MG reuse storage tanks and booster pump station at the Holiday Ventures Property.
RU-02	WRF-12	South WRF Reuse Pumping Upgrades	0-5 Years	\$2,250,000	Install pumps, piping modifications to the onsite Reuse Storage Tank, and an awning at the existing effluent pump station. Install reuse distribution pump station from the onsite Reuse Storage Tank to the Reuse System.
RU-03	-	South WRF Reuse Pond Pump Replacement	0-5 Years	\$360,000	Replace pumps and piping.
RU-04	-	Reuse Main from North WRF to Holiday Ventures Property	0-5 Years	\$6,000,000	Install new reuse main from the North WRF to the new reuse storage tanks at the Holiday Ventures Property.
RU-05	-	Automatic Valves in Reuse System	0-5 Years	\$980,000	Actuated valves and electrical services at all pressure customer connections.
RU-06	-	Reuse System SCADA Master Plan	0-5 Years	\$125,000	Engineering evaluation of the EWD system. Project will identify infrastructure and electrical improvements necessary for SCADA implementation.
RU-07	-	Reuse System SCADA Implementation	5-10 Years	TBD based on SCADA Master Plan	Install SCADA system with wireless interface. Cost will be determined after SCADA Master Plan is complete.
RU-08	-	Asset Management Program	Every 2 Years	\$40,000	Implement a maintenance schedule and database to find and keep track of items that may need painted, repaired, or replaced.

References:

HDR (2017). *Utility Master Plan*. Prepared for Englewood Water District.

Kimley-Horn (2021). *Holiday Ventures and Sewer Master Plan Update*. Prepared for Englewood Water District.

Dewberry (2021). *West Villages Improvement District Master Irrigation Plan*.

Wellen Park (2020). *Utilities Agreement*. Prepared for Manasota Beach Ranchlands, LLLP, Winchester Florida Ranch, LLLP, West Villages Improvement District, BMG Three, LLC, Pulte Home Company, LLC, and Englewood Water District.

**APPENDIX A: EWD REUSE SYSTEM PHOTOS OF NOTED
DEFICIENCIES**

PHOTOS OF PUMP STATION DEFICIENCIES



1-2. Corrosion around uncoated bolts; pump base plates are corroding.



3. Flow meter piping and bolts to ASR Well are uncoated and corroding.



4. Bolt corrosion on pump station overflow pipe.



5. Crack in steps up to effluent pump station.



6. Pipe corrosion at the effluent pump station.

NOTE: Since the Site Evaluation was completed, maintenance and repairs have been ongoing. Thus, deficiencies noted in 1-2, 3, 4, and 6 have been addressed and are no longer sited as deficient.

PHOTOS OF TANK DEFICIENCIES



1. Corrosion around the bottom of the reuse storage tank.



2. Corrosion around the top of the reuse storage tank.



3-4. Corrosion around the bolts on the Flowserve Valve; Top of manual valve is weathered.



5. Corrosion on and underneath stairs up to the reuse storage tank.

PHOTOS OF IRRIGATION PUMP DEFICIENCIES



1-2. Crack in concrete pad at eastern irrigation pump; minor pipe corrosion.



3. Eastern irrigation pump and base plate are corroded.



4. Western irrigation pump piping is uncoated and corroded.



5-6. Western pump is scorched; pipe corrosion.



7. Electrical support pole concrete is crumbling.

APPENDIX B: RECLAIMED POND SAMPLE RESULTS



ENGLEWOOD WATER DISTRICT
201 SELMA AVENUE
ENGLEWOOD, FL. 34223

General Request

Date 5-12-22

Name, Address 140 Telman Rd.
City, State, Zip Placida, FL 33947
Description: Paul J. Phillips Water Reclamation Facility #FLA014126
Lab No: 34318
Date Sampled: 5-5-22

ANALYSIS REPORT

pH 5-5-22 9.07 @ 21.5 C

TSS by SM 2540 D 5-5-22: 10.4 mg/L

CBOD by SM5210 B 5-5-22: 15.5 mg/L A, J

Comments:

A - Value reported is the arithmetic mean (average) of two or more determinations

J - Value is an estimate: >30% difference between replicates

pH not NELAC Accredited

Approved by:

 5-12-22

Sam Blumenstein

Laboratory Supervisor

Analysis By

 5/12/22
 5-12-22

APPENDIX C: ESTIMATED OPINIONS OF PROJECT COSTS

**ENGLEWOOD WATER DISTRICT
REUSE MASTER PLAN UPDATE**

OPINION OF PROJECT COST

**REUSE BOOSTER PUMPING STATION AT HOLIDAY VENTURES PROPERTY
PROJECT NO. RU-01**

ESTIMATED COSTS

<u>ITEM</u>	<u>UNIT</u>	<u>QUANTITY</u>	<u>UNIT COST</u>	<u>TOTAL COST</u>
Mobilization	LS	1	\$ 100,000	\$ 100,000
Survey	LS	1	\$ 10,000	\$ 10,000
General Conditions	LS	1	\$ 100,000	\$ 100,000
1.0 MG Reuse Storage Tank	EA	2	\$ 1,250,000	\$ 2,500,000
Pump and Motor	EA	3	\$ 80,000	\$ 240,000
16-inch Pipe, PVC	LF	4700	\$ 200	\$ 940,000
12-inch Pipe, DI	LF	75	\$ 175	\$ 13,125
16-inch Gate Valve	EA	8	\$ 18,000	\$ 144,000
12-inch Gate Valve	EA	6	\$ 6,000	\$ 36,000
12-inch Check Valve	EA	3	\$ 7,000	\$ 21,000
16-inch 90° Bend	EA	2	\$ 3,200	\$ 6,400
16-inch 45° Bend	EA	3	\$ 2,400	\$ 7,200
16-inch Tee	EA	10	\$ 5,200	\$ 52,000
Electrical Improvements including a New Service and Electrical Building	LS	1	\$ 1,265,820	\$ 1,265,820
Awning, 28'x35'	SF	980	\$ 30	\$ 29,400
Concrete Pad	CY	36.3	\$ 1,200	\$ 43,556
			SUBTOTAL	\$ 5,508,501
Insurance and Bonds (3%)				\$ 165,255
Funding Application and Administration (2%)				\$ 110,170
Engineering Design, and Permitting (20%)				\$ 1,110,000
Construction Engineering, and Inspection (10%)				\$ 550,900
Contingency (30%)				\$ 1,652,600
			TOTAL	\$ 9,100,000

Notes:

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**ENGLEWOOD WATER DISTRICT
REUSE MASTER PLAN UPDATE**

OPINION OF PROJECT COST

**SOUTH WRF REUSE PUMPING UPGRADES
PROJECT NO. RU-02**

ESTIMATED COSTS

<u>ITEM</u>	<u>UNIT</u>	<u>QUANTITY</u>	<u>UNIT COST</u>	<u>TOTAL COST</u>
Mobilization	LS	1	\$ 50,000	\$ 50,000
Survey	LS	1	\$ 10,000	\$ 10,000
General Conditions	LS	1	\$ 150,000	\$ 150,000
Transfer Pump and Motor	EA	3	\$ 80,000	\$ 240,000
High Service Pump and Motor	EA	3	\$ 80,000	\$ 240,000
Electrical Improvements	LS	1	\$ 161,065	\$ 161,065
Awning, 27'x28'	SF	756	\$ 30	\$ 22,680
Concrete Pad	CY	41.3	\$ 1,200	\$ 49,600
16-inch Pipe, DI	LF	560	\$ 200	\$ 112,000
12-inch Pipe, DI	LF	175	\$ 175	\$ 30,625
16-inch Gate Valve	EA	2	\$ 18,000	\$ 36,000
12-inch Gate Valve	EA	6	\$ 6,000	\$ 36,000
12-inch Check Valve	EA	3	\$ 7,000	\$ 21,000
16-inch Tee	EA	8	\$ 5,200	\$ 41,600
Core into Existing 1.0 MG Steel Tank	LS	1	\$ 20,000	\$ 20,000
Tank Sandblasting and Coating	LS	1	\$ 20,000	\$ 20,000
Core into Existing Transfer Pump Station Wet Well	SF	7331	\$ 10	\$ 73,310
Tapping Sleeve and Valve	LS	1	\$ 23,000	\$ 23,000
			SUBTOTAL	\$ 1,336,880
Insurance and Bonds (3%)				\$ 40,106
Funding Application and Administration (5%)				\$ 66,844
Engineering Design, and Permitting (20%)				\$ 270,000
Construction Engineering, and Inspection (10%)				\$ 133,700
Contingency (30%)				\$ 401,100
			TOTAL	\$ 2,250,000

Notes:

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**ENGLEWOOD WATER DISTRICT
REUSE MASTER PLAN UPDATE**

OPINION OF PROJECT COST

**REUSE MAIN FROM NORTH WRF TO HOLIDAY VENTURES PROPERTY
PROJECT NO. RU-04**

ESTIMATED COSTS

<u>ITEM</u>	<u>UNIT</u>	<u>QUANTITY</u>	<u>UNIT COST</u>	<u>TOTAL COST</u>
Mobilization	LS	1	\$ 800,000	\$ 800,000
Maintenance of Traffic	LS	1	\$ 125,000	\$ 125,000
Survey	LS	1	\$ 40,000	\$ 40,000
General Conditions	LS	1	\$ 200,000	\$ 200,000
16-inch Pipe, PVC	LF	12,000	\$ 200	\$ 2,400,000
16-inch Gate Valve	EA	2	\$ 9,000	\$ 18,000
16-inch 45° Bend	EA	4	\$ 2,400	\$ 9,600
16-inch 90° Bend	EA	5	\$ 3,200	\$ 16,000
			SUBTOTAL	\$ 3,608,600
Insurance and Bonds (3%)				\$ 108,258
Funding Application and Administration (3%)				\$ 108,258
Engineering Design, and Permitting (20%)				\$ 730,000
Construction Engineering, and Inspection (10%)				\$ 360,900
Contingency (30%)				\$ 1,082,600
			TOTAL	\$ 6,000,000

Notes:

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**ENGLEWOOD WATER DISTRICT
REUSE MASTER PLAN UPDATE**

OPINION OF PROJECT COST

**AUTOMATIC VALVES IN REUSE SYSTEM
PROJECT NO. RU-05**

ESTIMATED COSTS

<u>ITEM</u>	<u>UNIT</u>	<u>QUANTITY</u>	<u>UNIT COST</u>	<u>TOTAL COST</u>
Mobilization	LS	1	\$ 100,000	\$ 100,000
Maintenance of Traffic	LS	1	\$ 50,000	\$ 50,000
General Conditions	LS	1	\$ 140,000	\$ 140,000
6" Actuated Butterfly Valve, 120 Volt AUMA SQ-05	EA	8	\$ 5,285	\$ 42,280
4" Actuated Butterfly Valve, 120 Volt AUMA SQ-05	EA	2	\$ 5,110	\$ 10,220
3" Actuated Butterfly Valve, 120 Volt AUMA SQ-05	EA	1	\$ 5,077	\$ 5,077
2" Actuated Butterfly Valve, 120 Volt AUMA SQ-05	EA	3	\$ 4,935	\$ 14,805
Electrical Service Installation	EA	14	\$ 10,000	\$ 140,000
Conduit	EA	14	\$ 5,000	\$ 70,000
Concrete Pad	CY	2.3	\$ 1,200	\$ 2,800
			SUBTOTAL	\$ 575,182
Insurance and Bonds (3%)				\$ 17,255
Funding Application and Administration (5%)				\$ 28,759
Engineering Design, and Permitting (20%)				\$ 120,000
Construction Engineering, and Inspection (10%)				\$ 57,600
Contingency (30%)				\$ 172,600
			TOTAL	\$ 980,000

Notes:

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**ENGLEWOOD WATER DISTRICT
REUSE MASTER PLAN UPDATE**

OPINION OF PROJECT COST

**REUSE SYSTEM - SCADA IMPLEMENTATION
PROJECT NO. RU-07**

ESTIMATED COSTS

<u>ITEM</u>	<u>UNIT</u>	<u>QUANTITY</u>	<u>UNIT COST</u>	<u>TOTAL COST</u>
SCADA for the Reuse System	LS	1	\$	-

Based on SCADA Master Plan (PENDING)

	SUBTOTAL		\$	-
Insurance and Bonds (3%)			\$	-
Funding Application and Administration (5%)			\$	-
Engineering Design, and Permitting (20%)			\$	-
Construction Engineering, and Inspection (10%)			\$	-
Contingency (30%)			\$	-
	TOTAL		\$	-

Notes:

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ENGLEWOOD WATER DISTRICT
REUSE MASTER PLAN UPDATE

OPINION OF PROJECT COST

SOUTH WATER RECLAMATION FACILITY - ASSET MANAGEMENT PROGRAM
PROJECT NO. RU-08

ESTIMATED COSTS

<u>ITEM</u>	<u>UNIT</u>	<u>QUANTITY</u>	<u>UNIT COST</u>	<u>TOTAL COST</u>
Manhours of Labor per Year	LS	350	\$ 30	\$ 10,500
Software Subscription per Year	EA	1	\$ 20,000	\$ 20,000
	SUBTOTAL			\$ 30,500
Contingency (30%)				\$ 9,200
	TOTAL			\$ 40,000

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